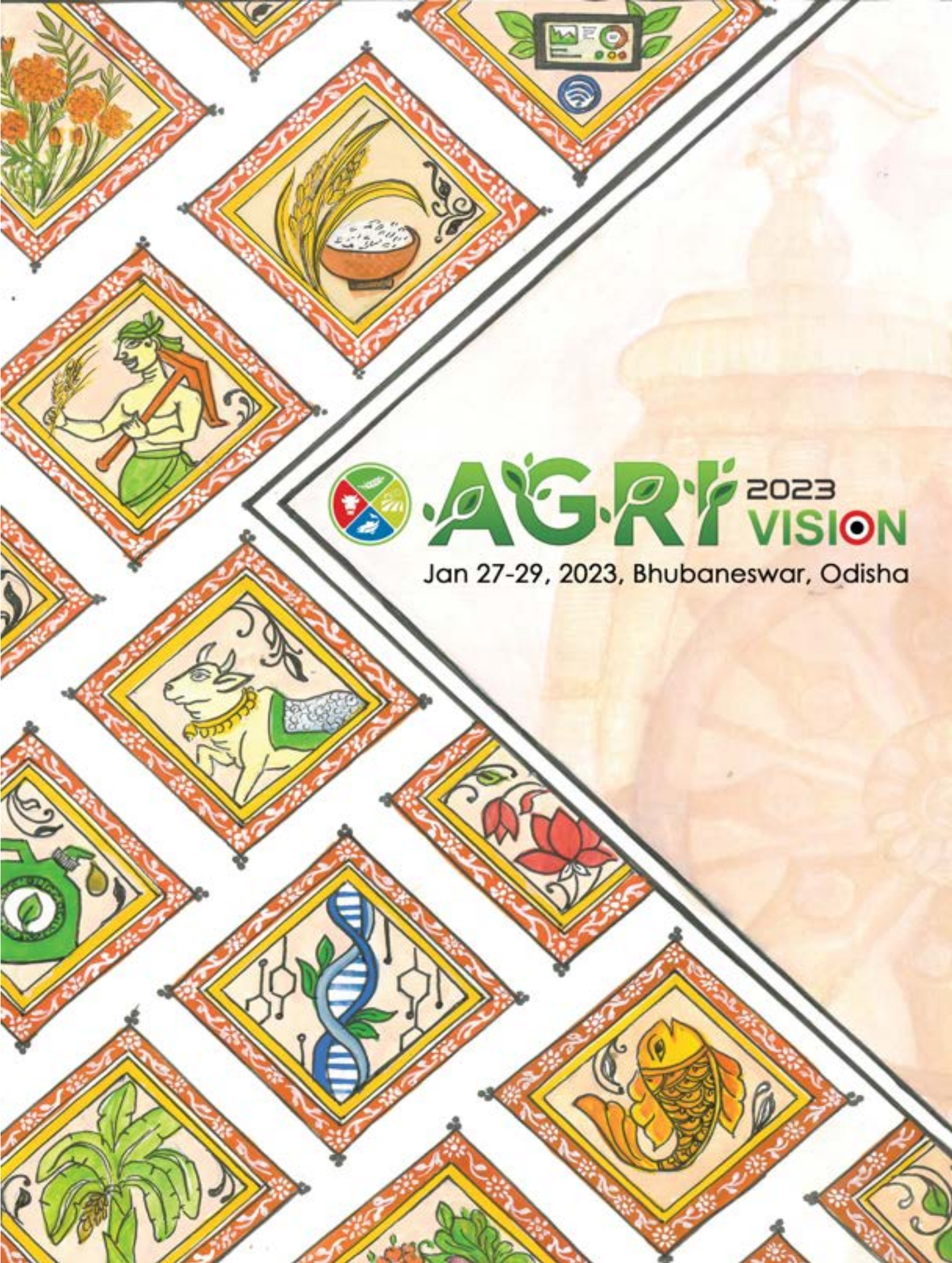

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Jan 27-29, 2023, Bhubaneswar, Odisha

CONFERENCE PROCEEDINGS

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AGRI VISION 2023

International Conference on

Agriculture & Rural Development

January 27-29, 2023 | Centurion University of Technology & Management, Bhubaneswar, Odisha, India

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Conference Proceedings of

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Agriculture & Rural Development

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Bhubaneswar, Odisha, India

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Dr HIMANSHU PATHAK
SECRETARY (DARE) & DIRECTOR GENERAL (ICAR)

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MINISTRY OF AGRICULTURE AND FARMERS WELFARE
KRISHI BHAVAN, NEW DELHI 110 001
Tel.: 23382629; 23386711 Fax: 91-11-23384773
E-mail: dg.icar@nic.in

Message

It gives me immense pleasure to know that the Society for Agricultural Research & Management (SARM) along with Centurion University, Bhubaneswar is organizing the International Conference on Agriculture & Rural Development (Agri Vision-2023) on January 27-29, 2023 at Bhubaneswar, Odisha.

In an agrarian economy like ours, speedy and sustainable development of agriculture and allied activities is the potent tool for the progress of the rural population. Since primitive time, agriculture and hunting have been the major source of livelihood, food and income which gradually diversified towards commercialization for raw materials to the industries like textiles, sugar, food processing, dairying, logging, fishing, etc. The agriculture is vital for ensuring food security to all in a given geography and the major source of income and employment in the rural India for those who opt it as a primary occupation. Under the developing economies like ours, the demand for food and other related commodities has been increasing steadily. On the other side, the resources for agriculture like land and water, being finite, are not available beyond a point. This competition in production and resource use caused larger sustainability issues over time. The agriculture research has been the saviour for addressing the food security, income to farmers and those who work on the farms and farm related activities as well as to the sustainability of the natural resources for the very sustenance of the mankind. By addressing the pre-harvest and post-harvest management, it ensured the three facets of food security-availability, access and affordability and helped rural transformation.

The farmers are the backbone of our country. The overall growth of farmers will bring prosperity to our nation. I am happy to learn that the Agri Vision will discuss issues and challenges concerning agricultural development.

I wish the conference a great success.

(Himanshu Pathak)

15 December, 2022
New Delhi

डॉ. मृत्युंजय महापात्र
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Member of Executive Council, WMO

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India Meteorological Department
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MESSAGE

I am pleased to learn that Society for Agricultural Research & Management, a non-profit organization is organizing "Agri Vision International Conference on Agriculture & Rural Development" during 27 – 29 January, 2023 at Centurion University, Bhubaneswar, Odisha.

The theme of this International Conference is "Strengthening rural economy through smart and sustainable agriculture" and is aimed to cover each and every field related to agriculture, horticulture, aquaculture, bio-energy etc.

It is heartening to note that Society for Agricultural Research & Management has focused on this key topic aiming to strengthen rural economy and making agriculture and allied sectors a strong viable source of income. It is under concerted scheme of Government of India to make agriculture and allied industries strong and lucrative livelihood options.

I congratulate Society for Agricultural Research & Management for choosing this apt topic and hope that valuable recommendations would emerge from this Conference, which may help our policy makers in future.

I wish this International Conference all the best.

(Mrutyunjay Mohapatra)

Phone : 91-11-24611842, Fax : 91-11-24611792, Res.: 91-11-47100152
E-mail : directorgeneral.imd@imd.gov.in / dgmmet@gmail.com / m.mohapatra@imd.gov.in

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महानिदेशक
Prof.(Vaidya) Rabinarayan Acharya
Director General

22nd December 2022

MESSAGE

It gives me immense pleasure to extend my good wishes to the Society for Agricultural Research & Management (SARM) for conducting the International Conference "Agri Vision- 2023" from January 27-29, 2023, at Bhubaneswar. Contribution and efforts of Centurion University, Bhubaneswar are also praiseworthy for hosting this event.

Ayurveda being a nature-based holistic system holds an unyielding relationship with agriculture. About 90% of Ayurvedic preparations are plant-based. Medicinal plants are considered rich resources of ingredients which can be used in drug development, either pharmacopoeial, non-pharmacopoeial or synthetic drugs. Along with increased global demand for Ayurveda, the scarcity of medicinal plants became a big challenge for the manufacturing industries. In this context, cultivating medicinal plants would contribute to the country's economic growth, which is also tinted in the theme of this event, "Strengthening rural economy through smart and sustainable agriculture."

I hope and believe that the effort of SARM will stride in undertaking and promoting the cultivation of Ayurvedic Medicinal plants to maintain a sustainable chain of raw materials. I wish all success to this event and SARM in all its future endeavours.

I am sure this would be an excellent platform to engage with multiple stakeholders of agricultural supply chains in the context of developing and emerging economies.

29/12/22

(Prof. Vaidya Rabinarayan Acharya)

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କୁଳପତି
Prof. Pravat Kumar Roul
Vice-Chancellor

Dated the January, 2023

MESSAGE

Innovative technology in agriculture and allied sectors plays a vital role in strengthening rural economy. I am glad to know that Society for Agricultural Research and Management is organising an International Conference on Agriculture & Rural Development with involvement of scientists, academicians, students, farmers and other stakeholders. I hope, the outcome of the Conference will pave the path for generation of technical know-how on agriculture & allied areas for enhancing farmers' income.

I wish the endeavour all success.

20/01/2023

(P. K. Roul)

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GOVERNMENT OF INDIA
MINISTRY OF MICRO, SMALL AND MEDIUM ENTERPRISES

MESSAGE

I would like to congratulate 'Society for Agricultural Research & Management' (SARM) for organizing "Agri Vision 2023: an International Conference on Agriculture & Rural Development", January 27-29, 2023 to be held at Centurion University Bhubaneswar Campus, Bhubaneswar, Odisha, India.

This Agri Vision 2023 is based on the theme "Strengthening rural economy through smart and sustainable agriculture". It covers all the aspects of Agriculture including Plant Science, Agriculture & Horticulture, Animal Science & Dairy, Fisheries & Aquaculture, Agri-Business, Rural Banking, Agri waste upscaling, Bio-energy from Agri waste and Agri-policies etc.

It will help to serve as a bridge to promote research and innovations in Agriculture and allied sectors, encourage the members and provide the opportunities to promote innovations & exchange of knowledge.

I wish 'SARM' a grand success and extend my best wishes to the organizers, participants and all persons associated with this event.

(B B Swain)

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निदेशक
Dr. Vinod Kumar Singh
Director

MESSAGE

It gives me immense joy to know that Society for Agricultural Research and Management (SARM), Cuttack, in collaboration with Centurion University, Bhubaneswar is hosting International Conference on Agriculture and Rural Development from January 27-29, 2023 at Bhubaneswar, Odisha, India.

The International conference" focused on ***"Strengthening rural economy through smart and sustainable agriculture"*** is timely and appropriate. The listed topics and themes have both regional and global significance. This conference offers a forum for bringing together world leaders, academics, and educators for an open and honest discussion on the current state of science, technological advancements, and ideas to strengthen our rural economy.

Finding appropriate solution will necessitate knowledge sharing and information exchange at such international conferences and beyond. Science and evidence-based solutions must be effectively communicated to public, decision-makers, and practitioners in order to have an impact. I congratulate the Agri Vision 2023 organisers and all partners on putting together such an excellent programme that will prove useful to a wide range of stakeholders. All stakeholders, including the government, the private sector, universities, philanthropists, policy makers, academics, and practitioners, will benefit immensely in the research outputs and technologies presented.

I wish Agri Vision 2023 a grand Success.

(Vinod Kumar Singh)

Date: 28.10.2022

भा.कृ.अ.प.–राष्ट्रीय पादप जैवप्रौद्योगिकी संस्थान
ICAR-NATIONAL INSTITUTE FOR PLANT BIOTECHNOLOGY
लाल बहादुर शास्त्री भवन, पूसा परिसर, नई दिल्ली–110012, भारत
LAL BAHADUR SHASTRI BUILDING, PUSA CAMPUS, NEW DELHI-110012, INDIA
(An ISO 9001:2015 Certified Institute)

डॉ. अजित कुमार शासनी
एफएनएएएस, एफएनएएससी
निदेशक
Dr. Ajit Kumar Shasany
FNAAS, FNASc
Director

MESSAGE

It is pleasure to know that Society for Agricultural Research & Management (SARM) is hosting the International Conference on Agriculture & Rural Development (Agri Vision 2023) at Centurion University, Bhubaneswar from January 27-29, 2023.

During the last 75 years after independence, the country has witnessed unparallel growth in all sectors of agriculture. Achieving self-sufficiency in the production of most of the agricultural commodities is becoming a reality and the country at present is aiming to double the income of farmers besides keeping the pace in production and productivity. Agriculture shares a major part of our country's GDP growth and directly or indirectly getting strengthened through the growth of the rural economy. Still a huge percentage of farmers are moving away from agriculture and to motivate farmers at grass root level a sustainable way of agriculture is the future need.

The platform given in Agri-Vision 2023 at Odisha will discuss important issues associated with the Agricultural sector and provide certain pragmatic strategies. The farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers of different session's viz., Plant Science & Agriculture/Horticulture, Fisheries & Aquaculture, Dairy, Veterinary & Animal Sciences, and Agri-Business & Policies.

Hence, I convey my best wishes to the organizers, delegates, exhibitors, and all stakeholders for the success of the program.

Shasany 17/01/23

(Ajit Kumar Shasany)

Ph. : +91-11-25848783
E-mail : director.nrcpb@icar.gov.in

MAHESH SAHOO
Member of Parliament
(Lok Sabha)
Dhenkanal, Odisha

सत्यमेव जयते

Member :
- Standing Committee on Science & Technology, Environment & Forests.
- Committee on Welfare of Other Backward Classes.
- Consultative Committee, Ministry of Environment, Forest & Climate Change.

Letter No.: 1580/MP/LS/DKL

Date : 07.09.2022

MESSAGE

It gives me immense pleasure to know that **Society for Agricultural Research & Management (SARM)**, Cuttack, Odisha is organizing an International Conference on "Agriculture & Rural Development" (**AGRI VISION 2023**) in collaboration with Centurion University of Technology & Management (CUTM), at CUTM Campus, Bhubaneswar, Odisha.

It is the time to shift from the traditional Agriculture to the modern and sustainable way of Agriculture to meet the future needs of India. We believe that the vision of doubling farmer's income can be achieved easily in coming five years through the modern ways of farming.

It is good to know that the Agri Vision-2023 at Odisha is addressing the challenges of the four quadrants of Agriculture sector i.e Plant Science & Agriculture/Horticulture, Fisheries & Aquaculture, Dairy, Veterinary & Animal Sciences, and Agri Business & Policies.

I am confident that the farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers. This platform will address the challenges of the current agri-system is facing and will pave a way for the future sustainable agriculture. This platform will support the farmers in strengthening their economic status and growth of the society.

I express my best wishes to the organizers, delegates, exhibitors, and all stakeholders for a successful program.

(Mahesh Sahoo)
MAHESH SAHOO
Member of Parliament
Dhenkanal-09

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Centurion University of Technology & Management

Established vide Orissa Act 4 of 2010

Centurion UNIVERSITY

Shaping lives ... Empowering Communities

Prof. (Dr.) Mukti K. Mishra
MA (Applied Eco), MA (Pub Admin)
MBA, PhD (Victoria University)
PRESIDENT

6 January 2023

Message

It is extremely heartening to learn that SARM is hosting an International Conference on Agriculture and Rural Development "AGRIVISION- 2023" in partnership with Centurion University of Technology and Management.

Congratulations indeed!

While agriculture in Indian context is the *sine qua non* for rural development, the very existence of the Universe is intrinsically interwoven with Agriculture and Allied Sectors. To me, agriculture encompasses and transcends through Mother Earth and anything that looks green. The fulcrum of ecosystem and environment sustainability is the agriculture and agriculture allied sector. With the shrinking landmass, unpredictable nature and population explosion, redefining and re-imagining agriculture is the only way for the human race and the Universe to survive.

I have gone through the focus of the Conference, which is comprehensive and inclusive. The deliberations and debates in the Conference would not only share knowledge about agriculture research, techniques & technology, and new developments, but also the positive outcome and impact elsewhere, which could be relevant to Odisha.

Centurion University has an insatiable hunger for new ideas, innovation and information and I am personally looking forward to implement a few ideas emanating out of this conference and navigate these to fruition.

I am sure the Conference would be a landmark event for the University.

Wish the event all success!

M. K. Mishra

Mukti Mishra

AGENDA

2023

AGRI 2023 VISION

International Conference on

Agriculture & Rural Development

Jan 27-29, 2023 | Centurion University, Bhubaneswar, Odisha, India

In Collaboration with

Centurion University
Shaping Lives...
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Knowledge Partner

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www.agrivision.in

AGRI 2023 VISION

AGENDA

Day-1 Jan 27, 2023 **Location:** Hall 6 (Ground Floor) Aryabhatta Building

08:30-09:30	**Registration**
09:30-09:45	The opening ceremony, Candle lighting, and Opening remarks **Dr. Arup K. Mukherjee** Principal Scientist, ICAR-NRRI, Cuttack and President of SARM
09:45-10:00	Special Session by NABARD **Shri D.P. Dash** AGM, NABARD, Odisha Regional Office, Bhubaneswar
10:00-10:25	**VK1:** Application of genomics to the sustainable use of plant biodiversity for food and energy **Prof. Robert Henry** The University of Queensland, Australia
10:25-10:50	**Plenary Speech:** Next-Gen Agriculture: Visions and Missions **Prof. C. Kole** President, Genome India International
10:50-11:15	**K1:** Conversion of C3 plats to C4- How far and how near **Prof. Baishnab Charan Tripathy** Sharda University, Greater Noida, India
11:15-11:35	Coffee Break & Group Photo @Annex-1 Lobby
11:35-12:00	**K2:** **Prof. K.C. Bansal** Secretary, NAAS, New Delhi, India
12:00- 12:25	**VK2:** The Potential of Genome Editing for Sustainable Agriculture **Dr. Leena Tripathi** International Institute of Tropical Agriculture (IITA), Nairobi, Kenya
12:25-12:50	**VK3:** **Dr. JLN Shastry** Former CEO, NMPB and Managing Partner - Jata's Ayurvedic Healthcare Systems
12:50-13:00	QA & Discussion
13:00-14:00	Lunch & Networking Near Swimming Pool
14:00-14:40	**VBT:** High-Throughput qPCR for Plant and Animal Genomic Applications **Dr. Ganesh Babu** Standard BioTools, Singapore
14:40-15:05	**VK4:** Developing an orphan legume for protein nutritional security in the 21st century **Dr. Abhimanyu Sarkar** Group Leader – Legume Genetic, NIAB, UK
15:05-15:30	**K3:** Marker-Free Rice (Oryza sativa L. cv. IR 64) Overexpressing PDH45 Gene Confers Salinity Tolerance by Maintaining Photosynthesis and Antioxidant Machinery **Dr. Ranjan Kumar Sahoo** Associate Professor, Dept. Of Biotech. Centurion University, Bhubaneswar

15:30-15:55	**K4**: Shelf-life of different processed tea: An estimation in relation to their antioxidant potentialities. **Dr. Sauren Das** Indian Statistical Institute, Barrackpore, India
15:55-16:15	Coffee Break & Networking
16:15-16:35	**Title:** Exploring the impact of vermicomposting on soil health and growth of *Triticum aestivum* L. under organic farming system **Dr. Sagarika Parida** Associate Prof. School of Applied Science, Centurion University, Bhubaneswar
16:35-17:00	**Title:** In-silico prediction of hub genes and pathways related to osmotic tolerance in Arabidopsis thaliana **Dr. Raghunath Satpathy** Asst. Prof. of Biotech., G.M. University, Sambalpur
17:00-17:25	Official Inauguration of AGRIVISION – 2023 at Volley Ground
17:25-20:00	Meeting & Cultural Program (Folk Dance and Music)
20:00-21:00	Dinner

PARALLEL SESSION

DAY-1	Place- Seminar Hall (Second Floor) Aryabhatta Building
10:00-10:20	**Title:** Rice straw biochar-based slow-release fertilizers **Abhilasha Tripathi** IIT, Kanpur, India
10:20-10:40	**Title:** Identification of Integrated Farming Systems in Udaipur District of Rajasthan: A Field Survey **Akansha Yadav** Maharana Pratap University of Agriculture and Technology, Udaipur, India
10:40-11:00	**Title:** Ecotoxicity studies for Indian honeybees foraging in moringa and mango **A. Suganthi** TNAU, Coimbatore, India
11:00-11:20	Coffee Break & Group Photo @Annex-1 Lobby
11:20-11:40	**Title:** Deciphering the regulation of nutritive value and abiotic stress response in Moringa Oleifera through genomic approach **P Sushree Shyamli** Institute of Life Sciences, Bhubaneswar, India
11:40-12:00	**Title:** PolyC stretch in utrophin-A 5'UTR retains the transcript in the nucleus **Subhanwita Das** University of Kalyani, Kalyani, India
12:00-12:20	**Title:** Mangrove algae could be a one pot platform for cellulosic waste recycling and biodiesel precursor lipid generation **Shrestha Debnath** JIS University, Kolkata, India
12:20-12:40	**Title:** Isolation and characterization of phosphate solubilizing bacterial inoculants to improve soil fertility and Plant growth **Palash Ghorai** JIS University, Kolkata, India

12:40-13:00	**Title:** Utilization of Different Models to Predict Tea Crop Yield: A Critical Review **Sagar Aditya** National Institute of Technology, Agartala, India
13:00-14:00	Lunch & Networking — Garden Near Swimming Pool
14:00-14:20	**Title:** Application of lignocellulolytic bacterial consortia on jute crop waste processing and valorization **Somnath Das** JIS University, Kolkata, India
14:20-14:40	**Title:** Organic Agriculture in India: A review **Roshan Raj Bhujel** Manipal Institute of Management, Manipal, India
14:40-15:00	**Title:** Review on the study of disparate leaf diseases and analysis of the methodologies used in leaf disease detection **Muskan Dixit** Chitkara University, Chandigarh, India
15:20-15:40	**Title:** Response of rice cultivars to moisture stress **Dr. Priyadarsini Sanghamitra** ICAR-NRRI, Cuttack, India
15:40-16:00	**Title:** Molecular Dissection of Sheath Blight Tolerance in Rice (Oryza sativa L.) **Pankajini Samal** ICAR-NRRI, Cuttack, India
16:00-16:20	Coffee Break & Networking
16:20-16:40	**Title:** Special variability using GIS for soil properties in an Alfisol **Rahul Adhikary** Centurion University of Technology and Management, Paralakhemundi, India
16:40-17:00	**Title:** Agriculture 4.0 - a fourth revolution of agriculture through plasma - the fourth state of matter: Review of recent development, challenges & future scope **Harsh K. Shastri** Gujarat Technological University, Ahmedabad, India

Abbreviations:

- K: Keynote Lecture
- V: Virtual Presentation
- TBA: To be Announced
- VK: Virtual Keynote Lecture
- P: Poster
- BT: Business Talk
- VBT: Virtual Business Talk

AGENDA

Day-2 Jan 28, 2023 **Location:** Hall 6 (Ground Floor) Aryabhatta Building

08:30-09:15	**Registration**
09:15-09:25	The Opening ceremony, Candle lighting, and Opening remarks
09:25-09:45	**VK1**: Genome editing for "Genome editing for building greater climate resilience of Indian farming" **Prof. Channapatna S. Prakash** Dean School of Arts & Science, Tuskegee University, Alamba, USA
09:45-10:05	**VK2**: Role of germplasm repositories in crop improvement, production, and protection **Dr. Madhugiri Nageswara-Rao** USDA - Agricultural Research Service, Miami, USA
10:05-10:25	**K1:** Root and tuber crops for entrepreneurship development **Dr. M. Nedunchezhiyan** Principal Scientist, ICAR-CTCRI, Bhubaneswar, and Vice President, SARM
10:25-10:45	**VK3:** Special Session by NMPB **Prof. (Dr.) Tanuja Manoj Nesari** CEO, National Medicinal Plant Board, Ministry of AYUSH, Govt of India
10:45- 11:05	**K2**: Developing essential oil extraction clusters for a sustainable rural economy **Dr. Ajit Kumar Shasany** Director, ICAR- National Institute for Plant Biotechnology, New Delhi, India
11:05-11:25	Coffee Break & Group Photo @Annex-1 Lobby
11:25-11:45	**K3**: Agriculture to Agribusiness **Dr. Samarendra Mahapatra** Former Prof. & head, Dept. of AGBM, OUAT, Bhubaneswar
11:45-12:05	**BT1**: Sarvathobhadram-Organic Farmers' cooperative unites people and environment to promote food and nutrient security as well as improved livelihood and income **Dr. Sreeni K.R.** Sarvathobhadram-Organic Society, Avanangattil Kalari, India
12:05-12:30	**K4:** TBA **Dr. Sharat Kumar Pradhan** ADG (FFS), Indian Council of Agricultural Research (ICAR), New Delhi, India
12:30-12:55	**BT2:** Special session on qPCR, Agrigenomics & GTS **By: Thermo Fisher Scientific**
12:55-13:05	QA & Discussion
13:05-14:00	Lunch & Networking Near Swimming Pool
14:00-14:20	**K5**: Integrated Tea Research for Darjeeling Tea Industry – Present Status and Roadmap for Future **Dr. Biswajit Bera** Tea Board India, Kolkata

14:20-14:40	**K6:** Impact of climate change on agriculture: Mitigation and adaptation strategies for food security **Dr. R. Raman** Director, CNF&SA, Annamalai University, Chennai
14:40-15:00	**Title:** Innovations to improve rice crop health for sustainable small-holder farming **Dr. Deo Mishra** APAC Plant Health Risk Assessment Lead, Bayer Crop Science, Hyderabad
15:00-15:20	**Title:** Ethology of Lycaenid (Lepidoptera: Glossata) butterflies **Dr. C. Kathirvelu** Annamalai University, Chennai, India
15:20-15:40	**Title:** Simultaneous presence of Sub1 and SK locus - a prerequisite for future submergence resilient rice **Dr. Narottam Dey** Visva-Bharati, Santiniketan, India
15:40-16:00	**Title:** Genetic modification strategies to develop transgenic pigeonpea events for pod borer resistance **Dr. Dipankar Chakraborti** University of Calcutta, Kolkata, India
16:00-16:20	Coffee Break & Group Photo @Annex-1 Lobby
16:20-16:40	**Title:** Legume Green Manuring Inhibit Veterinary Antibiotics Uptake and Accumulation by Different Vegetable Crops **Dr. Saranya Kuppusamy** Anna University, Chennai
16:40-17:00	**Title:** Push - pull strategy for FAW management in maize **Dr. A.P. Sivamurugan** Tamil Nadu Agricultural University, Coimbatore, India
17:00-20:00	Meeting & Cultural Program (Folk Dance and Music)
20:00-21:00	Dinner

PARALLEL SESSION

DAY-2	Place- Seminar Hall (Second Floor) Aryabhatta Building
10:00-10:20	**Title:** Diversity, Distribution and Phytochemical Analysis of selected species of Hypericum in Meghalaya **Harekrushna Swain** Botanical Survey of India, Eastern Regional Center, Shillong
10:20-10:40	**Title:** Antioxidant activity, phytochemical composition, and gene-specific molecular phylogeny of plant species in the Cactaceae family **Sheerin Bashar** Centurion University of Technology and Management, Bhubaneswar, India
10:40-11:00	**Title:** Effects of organic manures on the development, nutritional content, and biochemical activity of three Odisha species of Curcuma **B. Jyotirmayee** Centurion University of Technology and Management, Bhubaneswar, India
11:00-11:20	Coffee Break & Group Photo @Annex-1 Lobby

11:20-11:40	**Title:** Allelopathic effect of aqueous extract of Mikania micrantha Kunth on seed germination and seedling growth of Macrotyloma uniflorum Lam. **Ipsita Priyadarsini Samal** Centurion University of Technology and Management, Bhubaneswar, India
11:40-12:00	**Title:** Effect of postharvest treatments on custard apple (Annona Squamosa L.) **Sujata Chhatria** Department of Agriculture & Farmers' Empowerment, Govt. of Odisha
12:00-12:20	**Title:** Suplimentation of Drumstick (Moringa Olifera) leaf meal as a herbal growth promoter on growth performance of broilers **Pranjali Bhaudas Meshram** Mahatma Phule Krishi Vidyapeeth, Rahuri, India
12:20-12:40	**Title:** Studies on Preparation and Sensory evaluation of turmeric incorporated paneer **Chetan Chougale** Mahatma Phule Krishi Vidyapeeth, Rahuri, India
12:40-13:00	**Title:** Selection of sex-limited breeds of cocoon colour of silkworm, Bombyx mori L. for field trials based on nutritional indices **Madhavi Prasad K** GITAM University, Vizag, India
13:00-14:00	Lunch & Networking — Near Swimming Pool
14:00-14:20	**Title:** Transcriptome Analysis of Thermotolerant Bivoltine Silkworm Breeds of Bombyx mori L **Prashant N Bavachikar** GITAM University, Vizag, India
14:20-14:40	**Title:** Seed biopriming of endophytic fungi isolated from wild rice enhances growth promotion and disease resistance in rice crop **Rupalin Jena** ICAR-NRRI, Cuttack, India
14:40-15:00	**Title:** Economic Grasses of India: An overview **Dr. Nagaraju Siddabathula** Botanical Survey of India, Kolkata
15:20-15:40	**Title:** Moderate disease resistance in rice cultivars enhances the bio-efficacy of fungicides against blast disease **Dr. D. Pramesh** University of Agricultural Sciences, Raichur, India
15:40-16:00	**Title:** RNAi toxicity assays confirmed HvSar1 to be a novel molecular target for Henosepilachna vigintioctopunctata control **Dr. Satyabrata Nanda** Centurion University of Technology and Management, Bhubaneswar, India
16:00-16:20	Coffee Break & Networking
16:20-16:40	**Title:** Rhizosphere: Role of Rhizodeposits in Plant- Plant/Microbe interactions **Dr. Mondam Muni Raja** Rythu Sadhikara Samstha, Guntur, India
16:40-17:00	**Title:** Many paths to one goal: Identifying integrated rice root phenotypic and anatomical traits for diverse water stress environments **Dr. Madhusmita Barik** Centurion University of Technology and Management, Bhubaneswar, India

14:00-16:00	**Farmer - Expert Interaction @ Exhibition Meeting Area**

POSTER SESSION		
DAY-2	**Location:** Near Exhibition Area (Parking)	
Group-1	Poster No P1-P30	10:00- 13:00
Group-2	Poster No P30-P60	
Group-3	Poster No P61-P87	

POSTER SESSION		
DAY-2	**Location:** Exhibition Meeting Area	
Group-4	e-Poster (eP-01-12)	10:30- 12:30

Instructions

- *It is mandatory to print the poster as per the prescribed size i.e **6FeetX4Feet (Height: Width)***
- *As poster frames are fix, any other size will not be accepted*
- *It is mandatory to submit the posters on Day-1 at registration desk and need to sign on the submission form*
- *For e-Posters, maximum two slides are allowed*
- *AGRI VISION logo should be included in the poster & e-Poster. Logo can be downloaded from: https://agrivision.in/wp-content/uploads/2022/09/SARM-Agri-Vision-2023-Logo-NEW.png*
- *Poster template is also available at: https://agrivision.in/abstract/*

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AGRI 2023 VISION

AGENDA

Day-3 Jan 29, 2023 **Location:** Hall 6 (Ground Floor) Aryabhatta Building

08:30-09:30	**Registration**
09:20-09:30	The Opening ceremony, Candle lighting, and Opening remarks
09:30-09:55	**Title:** i-Farming: Managing Crop Production in the Digital Era **Dr. Ravishankar Narayana** Fernlea Flowers Ltd, Florida, USA
09:55-10:15	**K1:** TBA **Prof. Bijoy Kumar Sahoo** Vice Chancellor, S'O'A University, Bhubaneswar, India
10:15-10:35	**VK1:** Genomics-assisted breeding: success stories in legume crops **Prof. Rajeev K. Varshney** Mudroch University, Australia
10:35-10:55	**Special Session**
10:55-11:15	Coffee Break & Group Photo @Annex-1 Lobby
11:15-11:35	**K3:** TBA **Dr. Trilochan Mohapatra** Former DG (ICAR) and Secretary (DARE), Govt. of India, New Delhi, India
11:35-11:55	**Special Session**
11:55-12:15	**K5:** TBA **Dr. A.K. Nayak** Director, ICAR-National Rice Research Institute, Cuttack, India
12:15-12:35	**K6:** Understanding flowering time control as means of agricultural productivity **Dr. Kishore CS Panigrahi** School of Biological Sciences, HBNI, NISER, Bhubaneswar, NISER, Bhubaneswar
12:35-12:55	**VK2:** A New Paradigm of Future Agriculture: Human Friendly Agriculture **Prof. Yong Pyo Lim** Human Friendly Agricultural Research Institute, Korea
12:55- 14:00	Lunch & Networking Near Swimming Pool
14:00- 14:20	**Title:** Optimization of an efficient protoplast isolation and tranfection procedure for validation of different Cas9/gRNAs in Rice **Dr. Subhasis Karmakar** ICAR-NRRI, Cuttack, India
14:20- 14:40	**Title:** Studies on algae based Single Cell Protein isolated from Kangsaboti River, West Bengal: a potential nutritional food supplement **Dr. Dipankar Ghosh** JIS University, Kolkata, India
14:40-15:00	**Title:** Synthesis of silica nanoparticle from Paddy straw using hydrolysis process **Dr. Surajit Ghosh** Malaviya National Institute of Technology, Jaipur, India
15:00-15:20	**Title:** Effect of introgression of prolific Booroola gene (FecBBB) on thermal tolerance of Avishaan rams in semi-arid subtropical region. **Dr. Vijay Kumar** ICAR-CSWRI, Avikanagar, India

15:20-15:40	**K3:** TBA **Dr. N.P. Sahu** Joint Director, ICAR-CIFE, Mumbai, India
15:40-16:00	**Title:** Pond sediment amended with Potassium enriched biochar enhances shrimp growth **Dr. Vidya Shree Bharti** ICAR CIFE, Mumbai, India
16:00-16:15	Coffee Break & Group Photo @Annex-1 Lobby
16:15- 16:35	**Title:** Expression and activity of pepsin, trypsin and chymotrypsin during larval development of the striped murrel (Channa striata) **Dr. Rakhi Kumari** ICAR-CIFA, Bhubaneswar, India
16:35-16:55	**Title:** The effects of high salinity on plasma steroid levels in common carp (Cyprinus carpio) **Dr. Iffat Jahan** Centurion University of Technology and Management, Paralakhemundi
16:55-20:00	Meeting & Cultural Program (Folk Dance and Music)
20:00-21:00	Dinner

PARALLEL SESSION

DAY-3	Place- Seminar Hall (Second Floor) Aryabhatta Building
10:00-10:20	**Title:** A Survey on Pest Alert: Invasive thrips, Thrips parvispinus (Karny) threatening Chilli Cultivation in India **Dr. Goutam B Hosamani** Centurion University of Technology and Management, Paralakhemundi
10:20-10:40	**Title:** Transcriptional regulation underlying the responses to fungal infection in tea plant **Dr. Anjan Hazra** University of Calcutta, Kolkata, India
10:40- 11:00	**Title:** In vitro regeneration of chrysanthemum using petal as explants in selected varieties **Dr.Ganisetti Anitha** Centurion University of Technology and Management, Paralakhemundi
11:00-11:15	Coffee Break & Group Photo @Annex-1 Lobby
11:15- 11:35	**Title:** Integrated nutrient management in Sunflower (Helianthus annus L.) under southern Odisha conditions. **Dr. Rajesh Shriram Kalasare** Centurion University of Technology and Management, Paralakhemundi
11:35-11:55	**Title:** Management of integrated nutrient in laterite soil for enhancing nutritional quality and yield of rice **Dr. Sunita Satapathy** Centurion University of Technology and Management, Bhubaneswar
11:55-12:15	**Title:** Perception of Students toward RAWE (Rural Awareness Work Experience) Programme **Dr. Ashok Kumar** Centurion University of Technology and Management, Paralakhemundi

12:15-12:35	**Title:** A Purview of Ganoderma lucidum: The magical Mushroom **Dr. Abha Manohar K** Centurion University of Technology and Management, Paralakhemundi
12:35-12:45	QA & Discussion
12:45-14:00	Lunch & Networking — Garden Near Swimming Pool
14:00-14:20	**Title:** Genomic selection: An approach to fasten the breeding cycle **Dr. Niranjan Kumar Chaurasia** Centurion University of Technology and Management, Paralakhemundi
14:20-14:40	**Title:** Insects as food **Dr. Manish K. Yadav** Centurion University of Technology and Management, Paralakhemundi
14:40-15:00	**Women Entrepreneur Presentation** **Ms. Sushree Sangita Priyadarshini** Founder, Kaagaja Phula Arts
15:00-15:20	**Women Entrepreneur Presentation** **Ms. Durga Priyadarshini** Founder, Gaumaya Agro Pvt. Ltd.
15:20-15:40	**Women Entrepreneur Presentation** **Ms. Rashmi Sahoo** Founder, FROZIT & Director, RUCHI
15:40-16:00	**Women Entrepreneur Presentation** **Ms. Baishakhee Jena** Founder, Flowra

14:00-16:00	**Farmer - Expert Interaction @ Exhibition Meeting Area**

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AGRI 2023 VISION

Posters List

SL	Name	Title
P1	**Aaheli Mazumdar** Centurion University of Technology and Management, Paralakhemundi	Crop Production
P2	**Abasaheb Kalyan Parade** Mahatma Phule Krishi Vidyapeeth, Rahuri	Beneficial effect of feeding Lemongrass (Cymbopogon Citratus) leaf meal as a natural feed additive on growth performance of broilers
P3	**Abhrajyoti Dalal** Centurion University of Technology and Management, Paralakhemundi	Effects of crop establishment methods on performance of different finger millet (Eleusine coracana L.) varieties
P4	**Adapa Shalini Pujitha** Centurion University of Technology and Management, Paralakhemundi	Robotics In Agriculture
P5	**Akash Kumar Tudu** Centurion University of Technology and Management, Paralakhemundi	Influence of Urea and Nano-Urea Foliar Application on Maize
P6	**Akash Mohanty** Centurion University of Technology and Management, Paralakhemundi	Performance of urea and nano-urea at different nitrogen levels on growth and productivity of finger millet [Eleusine coracana (L.) gaertn]
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Genome editing for "Genome editing for building greater climate resilience of Indian farming"

Prof. Channapatna S. Prakash
Tuskegee University, Tuskegee, USA

Abstract:

Genome editing technology holds considerable potential for advancing sustainable farming of crops in India. CRISPR is among the most promising gene editing tools that can be employed to develop nutritionally rich crops with reduced toxins, enhanced tolerance to diseases and pests, and increased climate resilience. Unlike genetically modified crops, gene-edited crops do not necessarily entail the transfer of foreign genes and thus carry a low regulatory footprint and, hopefully, greater public acceptance.

There are several ways in which genome editing could be used to improve the climate resilience of farming in India. It could be used to develop crops that are more tolerant of extreme temperatures or that require less water to grow. This could be particularly useful in regions of India that are prone to drought or that are experiencing more extreme weather patterns as a result of climate change.

Another way in which genome editing could be used to improve climate resilience in India is by developing crops that are more resistant to pests and diseases. This could help to reduce the need for pesticides and other chemicals, which can have negative environmental impacts. In addition, genome editing could be used to create crops that are more nutritious, which would be especially beneficial in areas where malnutrition is a problem. Finally, genome editing holds great promise for Indian crops such as millets and pulses that are already climate resilient but suffer from poor productivity or quality issues.

Policymaker engagement and public education are critical for fostering genome editing technology in India. Here, we can draw from our experience dealing with the GMO controversy over the past three decades and ensure that we do not make the same mistakes as with GM crops. The Indian scientific community, especially in the public sector, such as agricultural universities and ICAR, must proactively engage stakeholders and be transparent in addressing their concerns about the technology. The scientific community must interact with the media, consumers, and policymakers and share this technology's benefits and safety aspects. The Indian scientific community must also use innovative information and communication technology tools, primarily social media, to enhance societal understanding and acceptance of new crop varieties developed through new breeding techniques.

Biography:

Dr. Channa S. Prakash, Dean of the College of Arts and Sciences (CAS) at Tuskegee University (USA) where he has served on faculty since 1989, is professor of crop genetics, biotechnology. Dr. Prakash's research expertise is on genetic improvement research on food crops of importance to developing countries. His lab was among the first to develop transgenic sweet potato and peanut plants and conduct pioneering genomic studies on the peanut. Dr. Prakash was recognized for his outstanding work on agricultural biotechnology outreach with the award of the prestigious 2015 Borlaug CAST Communication Award, by CAST. He has an active presence in the social media, with 75,000 followers, generartes an average of ten million impressions per month on Twitter (@agbioworld) & Facebook (/agbioworld), and is globally ranked as top influencer on 'agricultural biotechnology' issues. He also serves as Editor-in-Chief of a highly respected journal GM Crops & Food. He has been named one of the 'Top Personalities Who have made the Most Significant Contribution to Biotech' by Nature Biotechnology: Who's who in biotech - Some of biotech's most remarkable and influential personalities from the past 10 years; 'one of the 100 Top Living Contributors to Biotechnology' by The Scientist (chosen by peers via polling); Biotech Food Hero by Crop Life International and 'Foodfluencer' award by the US Soybean Export Council .

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Keynote

Role of germplasm repositories in crop improvement, production, and protection

Dr. Madhugiri Nageswara-Rao
United States Department of Agriculture - Agricultural Research Service, Miami, USA

Abstract:

Germplasm repositories are the greatest critical component of species conservation and food security worldwide. They provide baseline materials for both basic and applied research work. They also make unique contributions to climatic research, food crop and nutrition improvement, and provide national-international species protection networking opportunities as well as public engagement. The USDA-ARS National Plant Germplasm System (NPGS) is a major source of global plant germplasm repositories with accessions representing crop-wild relatives, trait-selective landraces, and native, threatened, rare, endangered, and endemic plant species. There are more than 500,000 accessions of distinct varieties of plants in the NPGS's Germplasm Resources Information Network database representing more than 10,000 species of plants. The mission of the NPGS is to support agricultural production by acquiring, conserving, characterizing, documenting, and effectively distributing crop germplasm. As an example, this presentation discusses consolidated efforts, challenges, and research opportunities in meeting the above mission in one of the prime clonal repository areas at the Subtropical Horticulture Research Station in Miami, Florida.

Keywords: plant germplasm, propagation and horticulture techniques, population genetics, conservation biology, ecological assessment, regulatory science, phenomics, and genomics

Biography:

Dr. Madhurgiri Nageswara-Rao works as an Ornamental Project Lead Scientist at the USDA Agricultural Research Service's Subtropical Horticulture Research Station in Miami, Florida. His research focuses on Subtropical and Tropical Ornamental Genetic Resource Management. Before joining USDA ARS, Dr. Rao worked with USDA APHIS on regulatory sciences at Linden, NJ. He has worked in the Pharmaceutical and Biotechnology Industries and with various Universities. Dr. Rao has diverse expertise in working with population genetics, conservation biology, ecological assessment, regulatory science, and genomics of various ornamental plants (e.g., coreopsis, bamboo, palms, daylily, and sandal), fruit crops (e.g., citrus, grapes, pineapple, mango, and papaya), other agricultural plants and forest wild species. Dr. Rao's research contributions have been published in several reputed and peer-reviewed international journal articles. He has also contributed various book chapters, co-edited international books, and made > 100 scientific presentations at various national and international scientific meetings. Dr. Rao's outreach activities include conducting trainings, workshops, interacting with farmers, and responding to stakeholder needs.

Research Interest: plant germplasm, propagation and horticulture techniques, population genetics, conservation biology, ecological assessment, regulatory science, phenomics, and genomics

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Keynote

Developing an orphan legume for protein nutritional security in the 21st century

Dr. Abhimanyu Sarkar
Group Leader – Legume Genetics, NIAB, Cambridge, UK

Abstract:

The world population is projected to increase by a nearly a third from current levels (8 billion to 9.8 billion) in less than 30 years (2050), most of it in developing countries. India is projected to become the world's most populous country this year. Protein availability is probably the most critical limitation in achieving adequate human nutritional/food security. Soil degradation and nitrogen availability are critical limiting factors in agricultural production, while climate change is already impacting yield sustainability. Legumes, with their high protein content and ability to fix nitrogen by symbiosis, offer potential solutions to these problems. There is a need to develop climate-smart legume varieties that are appropriate for local agro-climatic conditions. Recent research on grasspea (Lathyrus sativus), a hardy legume, is presented as an example on the use of genomics, speed breeding, gene editing and other molecular techniques to develop a so-called orphan (neglected) legume for agriculture in the 21st century.

Keywords: Grasspea, khesari, legume, genomics, speed breeding, gene editing.

Biography:

Dr Abhimanyu Sarkar is a molecular biologist whose areas of expertise include legume biology, speed breeding, gene discovery and genomics. His group at NIAB, Cambridge, U.K. works on a range of crop legumes, including soybean, chickpea, and lentil. He previously worked at the John Innes Centre, Norwich, U.K. on the biology and genomics of the orphan legume grasspea (Lathyrus sativus), and was involved in sequencing the genome of grasspea, as well as developing various biological resources such as mutagenized populations, recombinant inbred lines (RILs) and an EcoTILLING platform for grasspea. He obtained his Ph.D. in Molecular and Cell Biology from the University of Maryland, College Park, U.S.A., a Master's degree in Genetics from the Indian Agricultural Research Institute, Pusa, New Delhi, India and a Bachelor's degree in Agriculture from the Govind Ballabh Pant University of Agriculture and Technology. Pantnagar, India.

Research Interests: Legume genetics, plant biology, genomics, protein nutritional security.

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Keynote

Application of genomics to the sustainable use of plant biodiversity for food and energy

Prof. Robert J. Henry
Queensland Alliance for Agriculture and Food Innovation, University of Queensland, Australia

Abstract:

Plant biodiversity is a key resource supporting food and energy security. Conserving and capturing more plant diversity is a key to ensuring greater food security. Advances in DNA sequencing are facilitating the rapid characterization of this diversity and use in the development of new crops. Plants also represent a source of renewable carbon for use in replacing fossil carbon for applications that cannot be addressed with other technologies. This presentation will review advances in the technologies to support the path to balanced and sustainable use of plant genetic resources.

Keywords: plant, genomics, food, energy, genetic resources

Biography:

Professor Robert Henry conducts research on the development of new products from plants. He is Professor of Innovation in Agriculture and was Foundation Director of the Queensland Alliance for Agriculture and Food Innovation (QAAFI), a Research Institute of the University of Queensland established in collaboration with the Queensland Government. He was previously Director of the Centre for Plant Conservation Genetics at Southern Cross University, Research Director of the Grain Foods CRC and Research Program Leader in the Queensland Agricultural Biotechnology Centre. His current research targets plant genome sequencing for the capture of novel genetic resources for diversification of food crops to deliver improved food products.

Research Interest: plant conservation, new plant products, domestication, plant biotechnology

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Keynote

The potential of genome editing for sustainable agriculture

Dr. Leena Tripathi
International Institute of Tropical Agriculture, Nairobi, Kenya

Abstract:

Sustainable intensification of agriculture is essential for accomplishing food and nutritional security and addressing the rising concerns of climate change. There is an urgent need to close the yield gap in staple crops and enhance food production to feed the growing population. More efficient approaches for producing food are needed to meet the increasing demand for food. All the tools available in the toolbox, including modern biotechnology, must be applied for crop improvement. The full potential of new breeding tools such as genome editing needs to be exploited in addition to conventional technologies. Clustered regularly interspaced short palindromic repeats/CRISPR-associated protein (CRISPR/Cas)-based genome editing has rapidly become the most prevalent genetic engineering approach for developing improved crop varieties because of its simplicity, efficiency, specificity, and easy to use. Genome editing improves crop variety by modifying its endogenous genome free of any foreign gene. Hence, genome-edited crops with no foreign gene integration are not regulated as genetically modified organisms in several countries. Researchers are using CRISPR/Cas-based genome editing to improve several staple crops for biotic and abiotic stress resistance and improved nutritional quality. There is a need to create an enabling environment with science-based regulatory guidelines to release and adopt the products developed using CRISPR/Cas9-mediated genome editing. A synopsis of recent advancements in the application of genome editing for the improvement of banana will be presented during this seminar. It will also briefly describe the current status of regulatory requirements for releasing genome-edited crops in different countries.

Biography:

Dr. Leena Tripathi is the Director of Eastern Africa Hub and Leader of the Biotechnology Program at the International Institute of Tropical Agriculture (IITA). She is leading the transgenic and gene-editing research at IITA. She has been involved in plant biotechnology research for more than 25 years. She focuses on "Science to Practice" and linking scientific innovations to practical applications to solve food production issues worldwide. Her primary research focuses on genetically improving important staple food crops like banana/plantain, cassava, and yam to control diseases and pests. Her scientific contributions have been recognized internationally through several awards and honors. She has been honored as an Elected Fellow of the American Association for the Advancement of Science (AAAS) for her contributions to Agriculture. Dr. Tripathi and her team have established a robust genetic transformation platform at IITA-Kenya, to develop transgenic and gene-edited products and transfer these technologies to national agricultural research systems in sub-Saharan Africa. She serves as Editorial Board Member for several journals. Leena obtained her Ph.D. in plant molecular biology and M.Sc. in molecular biology and biotechnology. She worked at the University of North Carolina at Greensboro before joining IITA.

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Keynote

A new paradigm of future Agriculture: Human friendly Agriculture

Prof. Yong Pyo Lim
Human Friendly Agricultural Research Institute, Korea

Abstract:

Agriculture has been developed as production-oriented, for the survival of mankind for many years. Agricultural production throughout these years has been developed focusing on the taste and quality of agricultural products. Recent advances in agricultural practices have led to environmental issues resulting to serious problem in human health. To overcome these issues, eco-friendly agriculture can be considered as a tool for agricultural production.

As the economy in human's life is increasing, the demand for improving human health and quality of life is also parallelly increasing. To meet these demands, a new paradigm of agricultural production models need to be developed. The future agricultural model should ultimately be developed into a new system of paradigms covering breeding, cultivation, and food supply to personalized medicine. I want to term this model as " human-friendly agriculture".

'Human-friendly agriculture' is a personalized agriculture based on individual's biological and genetic information. This system should include an optimized breeding system for a specific cultivar that can produce high amount of health promoting metabolites (nutritional components). Robotic plant factories and automated precision farming systems may be able to produce crops with enriched targeted nutritional components. Target-oriented agricultural products will be supported by the new food system as the concept of personalized food. I believe that "human-friendly agriculture" including personalized varieties, cultivational practices, and nutritionally enriched agricultural food products, will achieve to improve healthy and happy life.

Keywords: Agricultural practices, environmental issues, human health, human-friendly agriculture, personalized food.

Biography:

Dr. Yong Pyo Lim received the B.S. & M.S. degrees in Horticulture from Seoul National University, Korea, and graduated Ph.D. in Plant Science from University of Rhode Island, USA. Dr. Lim has joined and retired at Chungnam National University from 1992 to 2022. He was the founder of Multinational Brassica rapa Genome Sequencing Project (MBrGSP) and advanced many researchers to complete the genome. From 2022, he established and became the president of the Human Friendly Agricultural Research Institute. He has published 324 peer-reviewed articles, including 194 in SCI Journal. He's also an author of 15 technical books. He was selected as a Director of Golden Seed Project, Vegetable Seed Center from 2012 to 2021. Dr. Lim was served as the Presidents of the Korea Genome Organization, Korean Society of Plant Biotechnology, and Korea Society for Horticultural Science. In 2018, he became a Fellow of Korean Academy of Science and Technology.

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Keynote

Conversion of C3 plats to C4- How far and how near

Deepika Kandoi and Prof. Baishnab Charan Tripathy
Sharda University, Greater Noida, India

Abstract:

For crop improvement, several attempts are being made to genetically transform C# plants to make them C4 type. It has several limitations. An important method to improve photosynthesis in C3 crops, such as rice and wheat, is to transfer efficient C4 characters to them. Here, cytosolic carbonic anhydrase (CA: βCA3) of the C4 *Flaveria bidentis* (Fb) was overexpressed under the control of 35 S promoter in Arabidopsis thaliana, a C3 plant, to enhance its photosynthetic efficiency. Overexpression of CA resulted in a better supply of the substrate HCO3- for the endogenous phosphoenolpyruvate carboxylase in the cytosol of the overexpressers, and increased its activity for generating malate that feeds into the tricarboxylic acid cycle. This provided additional carbon skeleton for increased synthesis of amino acids aspartate, asparagine, glutamate, and glutamine. Increased amino acids contributed to higher protein content in the transgenics. Furthermore, expression of FbβCA3 in Arabidopsis led to a better growth due to expression of several genes leading to higher chlorophyll content, electron transport, and photosynthetic carbon assimilation in the transformants. Enhanced CO2 assimilation resulted in increased sugar and starch content, and plant dry weight. In addition, transgenic plants had lower stomatal conductance, reduced transpiration rate, and higher water-use efficiency. These results, taken together, show that expression of C4 CA in the cytosol of a C3 plant can indeed improve its photosynthetic capacity with enhanced water-use efficiency. The results obtained in the model plant *Arabidopsis thaliansa* may be duplicated in crop plants to improve photosynthetic efficiency and crop productivity.

Biography:

Prof. Baishnab Charan Tripathy, from Cuttack, Odisha earned his BSc and MSc degrees with Botany major from Utkal University, after which he joined Jawaharlal Nehru University where he worked for his PhD on Primary processed of photosynthesis and plant productivity in the Schools of Life Sciences and Environmental Sciences under the supervision of late Prof. Prasanna Mohanty. From 1981-1987 he studied and worked in the USA, first at the Ohio State University, Columbus (1981-83) as a post-doctoral researcher and worked on bioenrgetics of chloroplast and mitochondria. Subsequently he moved to University of Illinois, Urbana-Champaign (1984-87) where he worked as a research associate and worked on heterogenity of chlorophyll biosynthesis. Dr. Baishnab C Tripathy joined as Assistant Professor in the School of Life Sciences, Jawaharlal Nehru University, New Delhi, where he started his photobiology laboratory and subsequently promoted to Associate Professor and Professor. On deputation from JNU, in 2011, Professor Tripathy joined as Vice-Chancellor of historic Ravenshaw University, Cuttack, Odisha and is worked with distinction on education reforms and infrastructure development of the University. Upon completion of his 3 year tenure as VC, he joined back Jawaharlal Nehru University and served as the Dean, School of Life Sciences, JNU. In August, 2019, Prof. Tripathy joined as a distinguished professor in the Department of Biotechnology, School of Engineering and Technology, Sharda University, Greater Noida, UP.

For more details PS: https://agrivision.in/personnel/prof-baishnab-charan-tripathy/

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Next-Gen Agriculture: Vision and Missions

Prof. Chittaranjan Kole
Chairman, Prof. C. Kole Foundation for Science & Society, India
President, International Climate Resilient Crop Genomics Consortium
President, International Phytomedomics & Nutriomics Consortium
President, Genome India International

Abstract:

Global agriculture is facing a number of alarming challenges today! It needs to augment crop production by about 70% to feed a huge world population projected at 9.7 billion by 2050 plus by an additional 12-15% to neutralize the adverse effect of climate change and global warming on crop production. It is also expected to provide bioactive phytomedicines to prevent and cure enormous people with incidences of chronic and fatal diseases, specifically cancer (estimated at ~ 24 million by 2035) and diabetes (estimated at ~366 million by 2030). International society is becoming more and more dependent on nutritionally rich crops to combat malnutrition that is affecting about 820 million people. A daily consumption of about 100 million barrel of fossil fuel is adding to the dependence on crops as a source of bioenergy. Most importantly, agriculture is expected to play the pivotal role in mitigating and remediation of environmental pollution. At the end of the day future agriculture has vision of addressing FHNEE (food, health, nutrition, energy and environment) security by providing higher quantity but better quality of the F7: food, feed, fuel, fiber, furniture, f(ph)ytomedicine and f(phy)toremediation. But sharp decrease in per capita arable land from 0.42ha to 0.19ha during 1960 to 2050 invokes for exploration of novel agricultural concepts and strategies. Adoption of innovative strategies including precision, digital, smart, urban, vertical, protected and marine farming has to be researched and implemented following the I3 (Innovation-Incubation-Implementation) approach as one of the potential missions. Moreover, a pragmatic balance must be maintained between innovative agriculture and so-called natural agriculture contributed by regenerative, organic, sustainable, integrative, and conservation farming. The next-generation agriculture will be successful only by adopting crop varieties with designed genomes grown under designed crop production systems for effective adaptation to specific situations.

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Keynote

Advances in Agri-biotechnology for national Food Security (With special reference to climate change)

Prof. K.C. Bansal
Secretary, National Academy of Agricultural Sciences, New Delhi

Biography:

Prof. K.C. Bansal obtained doctoral degree with Gold Medal from the country's premier institute – the Indian Agricultural Research Institute. He pursued advanced research from Harvard University, Cambridge, USA. Since his return from USA, he occupied eminent positions in ICAR (Department of Agri Education and Research, Govt. of India) as Professor (Plant Biotechnology) (2004-2010) at IARI, New Delhi; Coordinator, National Project on Transgenics in Crops (2006-10); and Director, National Bureau of Plant Genetic Resources, Pusa, New Delhi (2010-16).

Prof. Bansal is an accomplished scientist of international repute. Currently, he is the Secretary of the National Academy of Agricultural Sciences, and Member, Board of Directors, Global Plant Council. He was the first to get selected for the prestigious Norman Borlaug Chair for crop improvement by the ICAR in India.

He has contributed significantly in the area of plant biotechnology and plant genetic resources. He has published over 150 research articles in journals of international repute including Nature Biotechnology and Proceedings of National Academy of Sciences, USA. He was instrumental in the implementation of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in India. He was elected as Vice-Chair from Asia for the 15th Regular Session of the Commission on Genetic Resources for Food and Agriculture of the United Nations, 2013-2015.

Prof. Bansal has won several awards: To cite a few: i) The highest award of the ICAR for an individual's contribution – the Rafi Ahmad Kidwai Award, ii) An award of the Indian Science Congress conferred upon by the Hon'ble PM of India, iii) Biotech Career Award of the Rockefeller Foundation, USA, iv) Recognition Award of the National Academy of Agricultural Sciences, and v) the prestigious Haryana Vigyan Ratna conferred upon by Hon'ble Governor and Chief Minister of Haryana. Recently, Prof. Bansal was awarded the 2nd highest award of the National Academy of Agricultural Sciences by the Hon'ble Minister of Agriculture, Govt. of India.Prof. Bansal has supervised over 20 doctoral students, and imparted training to over 300 scientists at national and international level. Many of his students got national level awards like Jawaharlal Nehru best thesis award of the ICAR, National young scientist awards and the IARI Gold Medal.

He took an unprecedented initiative to evaluate the entire wheat germplasm (~ 22000 accessions) conserved at the Indian National Genebank, and identified trait-specific reference sets. Prof. Bansal served as Vice-Chair (Asia), Commission on Genetic Resources for Food and Agriculture, FAO, United Nations (2013-15). He is recipient of the Indian Science Congress award conferred on him by the Prime Minister of India, and the Haryana Vigyan Ratna (Highest State Science award).

As Director of the NBPGR, Prof. Bansal was conferred upon the Research Leadership Award for his outstanding contributions in research, education, science coordination and management. He is Fellow of the two prominent Science Academies of the country – i) National Academy of Agricultural Sciences, and ii) the National Academy of Sciences, India.

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Keynote

Root and tuber crops for entrepreneurship development

M. Nedunchezhiyan, Kalidas Pati, V.B.S. Chauhan and K. Hanume Gowda
ICAR-CTCRI, Bhubaneswar, India

Abstract:

Root and tuber crops are third most important food crop after cereals and grain legumes. The root and tuber crops, including cassava (Manihot esculenta Crantz), sweet potato (Ipomoea batatas), yams (Dioscorea sp.), taro (Colocasia esculenta), elephant foot yam (Amorphophallus paeoniifolius) and other minor tuber crops play a crucial role in providing food security for about 2.2 billion people in the World besides contributing to animal feeds and industry. Among total World production, about 45% of root and tuber crop production are consumed as food, with the rest converted as animal feed or industrial products. Root and tuber crops are important sources of starch after cereals. Cassava and sweet potato are the most important among the root and tuber crops. Cassava starch finds application in array of industrial products, textiles, corrugation box, paper conversion, liquid gum for domestic sector, paper industry etc. Besides food, sago industry is the major one. A number of stable and marketable food products as well as less stable snack food can be made from tuber crops. Cassava rawa, semolina and fried cassava chips are successful stable products that can be made from cassava tubers. Besides, cassava flour fortified with cereals and legumes flours can be used for making extruded fried foods which also have good post product shelf life. Cassava starch is a valuable stock for bio-ethanol and biodegradable plastic production. Sweet potato is used as raw materials in the manufacture of products such as deep processing starch, alcohol, liquid glucose, high fructose syrup, maltose and for food processing fresh roots dry flour or starch can be used for noodles, fried chips and canned flakes production. In feed processing the main product is sweet flour used by the compound feed industry. The industrial utilization of sweet potato is rudimentary in India. Starch of colocasia and arrowroot is very fine and it is used in cosmetic and pharmaceutical industries.

Keywords: Root and tuber crops, tuber crops-based cropping and farming system

Biography:

Dr. Maniyam Nedunchezhiyan, Principal Scientist & Head (i/c), Regional Centre of ICAR-Central Tuber Crops Research Institute, Bhubaneswar – 751 019, Odisha, India is a renowned agronomist in root and tuber crops. He has 30 years experience in tropical root and tuber crops. He is specialized in root and tuber crops based farming and cropping systems, weed and drip fertigation management. He is also looking after production and distribution of quality planting materials of root and tuber crops. He has more than 200 research papers in International and National peer reviewed journals and more than 90 popular articles. He has authored 14 books, 30 book chapters, 7 technical bulletins and 10 training manuals. Last twenty years he is working in hilly areas for food and nutritional security of tribal farmers of Eastern and North-Eastern India through tuber crop technologies. He has guided 4 Ph.D. students and 3 M.Sc. students. He is a life member of 7 scientific societies. He is a reviewer and referee of 7 scientific research journals including international journals.

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Keynote

Marker-free Rice (*Oryza sativa* L. cv. IR 64) overexpressing PDH45 gene confers salinity tolerance by maintaining photosynthesis and antioxidant machinery

Dr. Ranjan Kumar Sahoo
Centurion University of Technology & Management, Bhubaneswar, India

Abstract:

Helicases function as key enzymes in salinity stress tolerance, and the role and function of PDH45 (pea DNA helicase 45) in stress tolerance have been reported in different crops with selectable markers, raising public and regulatory concerns. In the present study, we developed five lines of marker-free PDH45-overexpressing transgenic lines of rice (Oryza sativa L. cv. IR64). The overexpression of PDH45 driven by CaMV35S promoter in transgenic rice conferred high salinity (200 mM NaCl) tolerance in the T1 generation. Molecular attributes such as PCR, RT-PCR, and Southern and Western blot analyses confirmed stable integration and expression of the PDH45 gene in the PDH45-overexpressing lines. We observed higher endogenous levels of sugars (glucose and fructose) and hormones (GA, zeatin, and IAA) in the transgenic lines in comparison to control plants (empty vector (VC) and wild type (WT)) under salt treatments. Therefore, to solve this problem we have raised marker and reporter-free salinity tolerant PDH45 overexpressing transgenic rice (*Oryza sativa* L. cv. IR64) driven by CaMV35S promoter through an unique in vivo inexpensive salt selection method, instead of expensive antibiotic selection.

Biography:

Professor Ranjan Kumar Sahoo has 11 years teaching and 10 years research experience in the field of biotechnology. He has published 4 text books, more than 60 research publications in reputed Indian and foreign journals. He has 1 patent and he has developed 2 new techniques/ protocols for generation of transgenic crop plants. He has published several publications on soil microbes, plant microbe interaction. He was working as a researcher in International Centre for Genetic Engineering and Biotechnology (UN organization), New Delhi, and School of Life Sciences, Jawaharlal Nehru University, New Delhi for 12 years.

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Keynote

In-silico prediction of hub genes and pathways related to osmotic tolerance in *Arabidopsis thaliana*

Dr. Raghunath Satpathy
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Abstract:

Plants respond to environmental stresses at molecular levels by altering the expression of specific genes through the complex signaling pathways. The regulation and interaction activity of specific plant genes are directly linked to the osmotic regulation mechanism. These pathways begin with signal perception and end with the expression of stress-responsive target genes. Ultimately, the selective upregulation of target genes leads to altering physiological responses to confer stress tolerance. Therefore, deciphering the mechanisms underlying plant responses to abiotic stress is critical for improving plant stress resistance. The gene regulation process in response to osmotic stress are known at the level of transcription; however, little is known about their interaction pattern and mechanism. This work is an in-silico approach to identify the hub genes associated with the osmotic balance in the plant. To perform the analysis, the raw gene expression profiles (ID: GSE132978) of *Arabidopsis thaliana* plant was considered. A total of 297 differentially expressed genes (199 up regulated genes; 98 down regulated genes) were obtained by analysing the gene expression data. Further analysis resulted the genes such as NUDT7, CBP60G, WRKY33, TCH3, SYP122, and SOBIR1 as the hub genes from the network analysis by Cytoscape 3.9.1 tool.

Keywords: plant osmotic stress, hub genes, analysis, microarray, gene expression data

Biography:

Dr. Raghunath Satpathy received his M.Sc. in Botany (Specialization Biotechnology) from Berhampur University Odisha, (Post M.Sc.) Advanced P.G Diploma in Bioinformatics from University of Hyderabad, M. Tech. degree in Biotechnology from VIT University, Vellore India, also he was awarded the degree for the doctor of philosophy (PhD) in Biotechnology by Sambalpur University, Odisha. Currently he is continuing as the Assistant Professor in the School of Biotechnology, Gangadhar Meher University, Odisha. He has 14 years of teaching and research experiences. His current research interest is development and application of Bioinformatics tools/databases in the areas of environmental science and human therapeutics. He is the principal investigator of a research project sponsored by Odisha Higher education Council (OSHEC). He has authored 35 journal papers, 18 book chapters and one book to his credit and he is the recipient of many academic and research awards.

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Keynote

Impact of climate change on agriculture: Mitigation and adaptation strategies for food security

Prof. R. Raman
Annamalai University, Chennai, India

Abstract:

Agriculture is totally dependent on weather and climate. Most agriculture scientists believe that high temperatures and droughts caused by climate change will depress crop yields in many developing countries in coming decades. Global climate changes are caused by increasing atmospheric concentration of carbon dioxide and other trace gases. Climate change affects agriculture and food production in complex ways. It affects food production directly through changed agro-ecological conditions and indirectly by affecting growth and distribution of incomes, and thus demand for agricultural produce especially in the developing world. Developing countries are more vulnerable to climate change because most of the peoples depend on agriculture for their livelihood. Thus, for farmers struggling under the burden of cultivating land under the ever-present threat of drought, floods, and mid-season dry spells. Land degradation, water scarcity such problems associated with climate change will have to be answered more frequently. Climate change will directly affect the agriculture in tropical countries and the mean temperature is around 40 degree Celsius. These high temperatures could completely destroy crops if they coincide with flowering period. Climate related disaster have brought widespread misery and huge economic losses to many countries, it adversely affecting the food security, agriculture, water resources, public health and biodiversity. Agriculture of any kind is strongly influenced by the availability of water. Climate change will modify rainfall, evaporation, and runoff and soil moisture storage.

Effective utilization of natural resources with due care and adopting integrated crop production technologies can increase productivity of agricultural crops. To mitigate the effects, the following crop management strategies are recommend to overcome the impact of climate change i.e. alternate cropping, planting date adjustment, irrigation and fertilizer optimization ,cover crop, zero tillage, mulching practices and use of slow release fertilizers . Diversity farming is the single most important modern technology to achieve food security in a changing climate .There is abundant scientific evidence that crop biodiversity has an important role to play in the adaptation to our changing environment. These technologies are more concern for improvement in nutrition, food security, food safety, and local environment with the economics of the local communities.

Keywords: Climate change, agriculture, food security, mitigation

Biography:

Prof.Dr.R.Raman received his B.Sc(Ag) in 1990, M.Sc(Ag) in 1992 and Ph.D in 1998 from Annamalai University. He joined as Lecturer in 1994, elevated as Associate Professor in 2003 and Professor in 2007.Recently he appointed as Director in Centre for Natural Farming and Sustainable Agriculture His research interest focus on: Organic farming, post harvest technology and climate change studies. He has presented many of his research papers in International and National conferences as a keynote speaker/ plenary speaker, invited speaker and also served as Chairman/ convener of scientific session. He was recipient of International Young and Deserving Weed Scientist award from Asian pacific Weed Science Society in 1999, Crop Research Award from Agricultural research Information Centre in 2004, United Nations University Fellowship from United Nations University Tokyo, Japan in 2008 and best Oral presentation award at the 2nd International Conference on Agriculture and Biological Sciences in 2016 held at Shanghai, China. He has served as National Level Monitoring team member in the National Food Security Mission, Ministry of Agriculture, Government of India.He is operating many research projects in his capacity as Principal Investigator. He has published many of his research papers in the reputed scientific journals. He is a life member of many National and International organizations. He has visited 14 countries for the research and academic purposes.

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Keynote

Agriculture to Agribusiness

Dr. Samarendra Mahapatra
Former Prof. & Head of Dept .of ABM, OUAT, Bhubaneswar, India

Abstract:

There is a transition taking place world over from subsistance and traditional agriculture to commercial,profitable and sustainable agriculture. Agribusiness includes all economic activities in the area of agri-inputs,agri-production, agri-logistics & Supply chain,agri-processing,agri-financing,agri-food marketing etc. Agribusiness principles relates to managerial functions i.e.planning ,organising, directing and controlling of agricultural inputs and outputs both in public and private sector. Agribusiness links agriculture to industry & manufacturing sector. Emerging areas of agribusiness development taking place in high value agriculture and allied areas as fruits,vegetables,floriculture dairy,poultry,fishery,meat and egg etc. Agribusiness assist in facing challenges like

- Cope with climate change
- Satisfy changing consumers tastes and expectations
- Meet rising demand for food of high quality
- Invest in farm productivity
- Adopt and learn new technologies
- Threat of resource depletion

It is very difficult to find well organised market for agripreneurship. Agribusiness leads to more food, nutritional security and affordable price for consumers.Agribusiness model raises farm income through improved marketability of farm produce linking firms as well as reduce risk in agriculture implementing crop diversification,crop insurance,contract farming and new technologies etc. It is able to tackle the challenges of agro-based industries. Agribusiness focus on empowering majority of small and marginal farmers by forming farmer producer organisations(FPO) in general and farmer producer companies in specific in different blocks and talukas of various states of India with the support of organisations such as National Bank for Agriculture and Rural Development(NABARD),National Cooperative Development Corporation (NCDC),National Agricultural Cooperative Marketing Federation of India Ltd(NAFED) and Small Farmers Agribusiness Consortium(SFAC) etc.Agribusiness also leads to protected farming as a process of growing crops in a controlled environment for a healthier and higher produce.Agribusiness focus on technological breakthrough like renewable energy applications ,Drone & remote sensing IoT technology,Robots,Sensors,GPS,GIS based harvesting,AI enabled data gathering,Supply chain optimisation and Smart farming etc.Another focus area of agribusiness is developing efficient supply chain by way of value chain analysis and mapping for various high value agricultural commodities with the support of corporates as well as government schemes.Agribusiness leads to developing agripreneurs for improving the livelihood and income generation in rural as well as urban belt.Agribusiness will boost the contribution of primary sector to GDP as well as make it a profitable occupation for the younger generation to come leading to Rural development.

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Keynote

Shelf-life of different processed tea: An estimation in relation to their antioxidant potentialities

Anjan Hazra and Dr. Sauren Das
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Kolkata, India

Abstract:

Recognizing the most prevalent, inexpensive and health-attributed drink, Tea is secondly consumed after water across World. Being a simple habitual practise, tea consumption need no publicising or attentiveness program for its wide acceptance. Ingesting tea is an age-old habit and thought to origin in China and subsequently popularized to entire East Asian countries to Western Europe and the Americas. Normally infused in hot water, processed leaves of Camellia sinensis is used for ingestion. Owing to its health-benefit properties, past few decades' tea has attracted much attention to the health-conscious people and demand for quality tea production has increased a lot. Therefore, tea research conquers a front-line issue to the tea growers, business houses and as well as scientific world. Tea leaves comprises several naturally occurring phytochemicals which are all attributed to commendable antioxidant properties. Antioxidants are evidencing to be essential as it deactivates free radicals (freely evolved during different metabolic activities), if persist unattended in cells over time, causes destruction of cellular elements, such as lipids, proteins and DNA molecules, ultimately leading to some chronic disease and/or cellular necrosis.

Shelf life studies play an important role as tea is a consumable product and reinforce brand value of the tea. This study would be beneficial to consumers, manufacturers and are equally significant for supporting the regulatory body towards the labelling of the packaged product with an expiry date by "best before use" and perform much vital role in the assurance of product quality towards end-users' after packaging.

Based on growing stages of the harvested leaves and diverse processing practises the major tea types i.e. black, green, white and oolong types of teas are produced. They have their own diverse taste, odour and colour due to presence of unique constituents those are conserved during the processing techniques. In order to determine the shelf-life of four types of processed (packaged) teas, 15 antioxidant parameters have been assessed and temporal data of each parameter have been generated at 30 days interval for one year. The declination percentage of each individual parameter in each month's (30 days) interval have been calculated as follows: Dividing the changes in each activities by its initial appearances.

$$\text{Decline \%} = \frac{A0 - An}{A0} X\ 100$$

Where, A0 is assayed antioxidant value at initial time and An is the definite day.
The mean declination percentages for 15 studied parameters have considered as predictor value of shelf life. In regression analysis, predictor is dependant variable and the independent variable is 'storage time'. Best fit curve has been extrapolated and from this, credible time periods for 25%, 50% and 75% declination have been calculated. The calculated results have been depicted in the following Table, where oolong tea showing the greater value of preservation time at 25%, 50% and 75% of degradation of antioxidant quality and black tea showing shortest preservation time in all the designated declination percentages. Estimated shelf life of various Indian teas in terms of their overall antioxidant properties.

Decline (%)	Predicted shelf life of antioxidants (days)			
	Black	*Green*	*White*	*Oolong*
25	46.4	55.4	98.6	114.7
50	186.2	200.5	247.9	300.7
75	326.0	345.6	397.1	486.7

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Keynote

Optimization of an efficient protoplast isolation and tranfection procedure for validation of different Cas9/gRNAs in Rice

Debasmita Panda, Subhasis Karmakar , Manaswini Dash, Priya Das , Mirza J Baig, Kutubuddin Molla

ICAR-National Rice Research Institute, Cuttack, India

Abstract:

Rice (Oryza sativa L.), a major staple food, provides the source of energy for half a billion populations of the world. There is an urgent need for new breeding technologies which can rapidly breed crops suitable for climate change. The CRISPR/Cas system can create genetic diversity for breeding in an unparalleled way in a single generation. Cleavage efficiency of sgRNA largely depends on the accessibility of genomic targets. Protoplast transfection presents a great way to rapidly validate cleavage efficiency of different guide RNAs. Multiplex CRISPR-Cass system allows simultaneous targeting of more than one locus in a single event, enabling modifications of multiple traits either for gene function study or crop improvements. We have developed a procedure that describes highly efficient protoplast isolation from rice, transfection using PEG (polyethylene glycol), and validating the accessibility of sgRNA into target plant genomic loci. Plasmid vector harboring the Cas9 and sgRNA was introduced into protoplast using PEG mediated transfection. After 48 hours, GFP and BFP fluorescence was visualized under fluorescent microscope using a GFP and UV filter. In our protocol, the transfection efficiency of isolated protoplast was counted as high as 81%. Using protoplast system, we have targeted genes related to C4 photosynthesis (OsPEPC, OsPPDK, OsME, and OsCA), circadian clock (OsCCAI), and disease susceptibility gene (OsSWEET14). The polycistronic tRNA-gRNA system was used for CRISPR multiplexing. We have selected two guides for each of targeted genes, driven by OsU3 promoter. The assembled product was cloned into vectors harboring Cas9 expression cassette. After protoplast transfection, gDNA was isolated and target regions were amplified using specific primers. Successful editing was confirmed through sanger sequencing of the amplified products. This high efficiency protocol of rice protoplast isolation and transfection will facilitate CRISPR mediated gene editing by testing guide RNA cleavage efficiency rapidly before going for final stable transformation. The isolation and transfection method can also be used for protoplast regeneration.

Keywords: Protoplast, Rice, Genome editing, CRISPR-Cas9, GFP, BFP, PTG

Biography:

Dr. Subhasis Karmakar has completed his Ph. D in the field of Botany (Plant Molecular biology and Biotechnology) from University of Calcutta in 2017. He was also worked as a Research Associate at Department of Botany, University of Calcutta from 2017 to 2019 on "Translational Research on Transgenic Rice (Phase-II)" programme. During that time, he was not only involved with rice research group but also actively involved in transgenic legume research, especially on chickpea, pigeon pea, and soybean. He has joined C4 Rice and Genome editing laboratory at ICAR-National Rice Research Institute, Cuttack, Odisha in 2020 after being awarded the DBT-RA programme in Biotechnology and Life sciences (National) from Department of Biotechnology, Govt. of India for perusing his work on genome editing in rice. Now he is working on diverse area in the field of plant genome editing after being awarded as DST-SERB-National Post-Doctoral Fellowship (NPDF) in 2022. He focuses on developing new genome editing tools using novel effectors and apply them for crop improvement. He has published research papers in several renowned international peer reviewed journals as first author and several other papers as co-author. He has more than 10 years of research experience in the field of plant biotechnology especially in transgenic research.

Research Interest: Genome editing, Base editing, Biotic and Abiotic stress tolerance

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Keynote

Integrated tea research for Darjeeling tea industry – Present status and roadmap for future

Dr. Biswajit Bera, Anjan Hazra, Pradosh Mahadani and Sauren Das
Ex-Director (Research), Tea Board India, Kolkta, India

Abstract:

Darjeeling tea industry has been in existence since more than a century and has been contributing immensely to the rural economy (ie. Darjeeling district of West Bengal) as well as enhancing Indian economy as foreign exchange earner exporting Darjeeling tea to international market. Darjeeling tea is very famous worldwide due to its unique flavor/aroma.

Continued research effort for Darjeeling tea has been going on since the inception of the industry. However, these research findings are mostly field/factory based experiments conducted in Darjeeling tea plantation areas. Some of the important areas of tea research includes clonal selection from commercial Tea Estates for cultivar development, use and application of different field cultural practices (pruning, plucking, manuring etc.) adopted for Darjeeling tea industry. All these research findings have contributed in the form of scientific guidelines/recommendation for the overall development of the industry.

In the recent past, biotechnological intervention has started to explore more avenues of tea research for Darjeeling tea industry using latest molecular tools. These include different areas of tea genomics (structural, functional and comparative genomics etc.) and also some areas like metabolomics. In order to use the full potential of these powerful tools and techniques of frontier areas of science and technology, an integrated approach is envisaged/proposed which is considered to be important for future direction of tea research for Darjeeling tea industry. Since most of the tea plantation in Darjeeling is currently practicing organic way of agriculture, development of bioproducts (biopesticides and biofertilizers) deserves special attention. While emphasizing the use of latest molecular and advanced tools and techniques, it may be mentioned here that conventional methods are not to be ignored/undermined. In fact, both conventional and molecular methods need to be continued in an integrated manner.

A majority of tea plantation workers are dependent on the Darjeeling tea industry for their livelihood and they are considered the poorer section of the society. In order to enhance their income, sustainability of the industry and the use of modern tools and techniques both in field and factory are mandatory these days in order to cope with the international competition. Since some of the tea growing countries are adopting modern tools in agriculture following mechanization of field practices, it is important for us to make sure that our tea plantation workers are also at par with the advancement of precision agriculture.

While formulating roadmap for future tea research, some of the areas like protection of Darjeeling tea GI (Geographical Indication), critical analysis for ongoing work, in depth review of research for avoiding duplication of efforts, participatory approach of tea research and multidisciplinary/international collaboration will be discussed/presented.

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Keynote

Understanding flowering time control as a means of Agricultural productive

Dr. Kishore CS Panigrahi
School of Biological Sciences, HBNI, NISER, Bhubaneswar, India

Abstract:

Traditional farming in India uses conventional methods of burning of remaining paddy straws after the harvest of rice during November and December. This is a unique time of the year when the combination of cold, dew and may also be fog is possible creating an unique ambience for transformation of the burnt product on the soil. The probability of formation of Nano-particles of various compounds that may have higher physiological activity in modulating plant growth and productivity has been predicted. Towards this objective, the primary emphasis has been given to carbon.

Here I will discuss and present some of our recent findings that Carbon-nano particles effect the productivity and plant development by compromising with light and thermal sensing mechanism in both model plants namely, Arabidopsis thaliana and *Oryza sativa*.

Biography:

Dr. Kishore Panigrahi is currently heading the Plant Science Lab at School of Biological Sciences, NISER. His areas of interest are light signalling and understanding the control of flowering time in Arabidopsis. However he has a diversified interests in the field of Plant biology research. He has forayed into the field of Production of immunomodulatory protiens using Physcomitrella as a model.

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Oral Presentations

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Oral

Legume green manuring inhibit veterinary antibiotics uptake and accumulation by different vegetable crops

Saranya Kuppusamy and Heshma Sri V
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Abstract:

Veterinary antibiotics like tetracyclines and sulfonamides are frequently detected in arable lands and they can potentially contaminate food crops. It is thus of greater importance to identify strategies to reduce food crops uptake of antibiotics. The use of organic matter such as green manure/cover crop is especially environmental friendly rather than chemical fertilizers and is recommended for sustainable agriculture. Previous studies have reported the effect of green manures on weed control, soil chemical/ biological properties, crop growth and yield. However, the impact of green manure on plants grown in the antibiotic-contaminated soil is not available. In India, legume- and non-legume based green manures which are an important NPK source is widely used in sustainable agriculture. For the first time, using pot culture experiments (Antibiotics concentrations: 1,5 and 20 mg/kg; Crops: Tomato, Radish and Spinach; Treatments: NPK, Compost, Sunhemp and Daincha), we have found that application of green manures, especially sunhemp followed by daincha could effectively enhance biodegradation (>95%) and thereby reduce antibiotics (Model antibiotics: sulfamethoxazole) availability for plant uptake in soil. Indeed, incorporation of green manures in soil prior to cropping had large impact on the soil microbial growth and activity, affecting the subsequent fate of antibiotics and no impact was observed on crop growth. Further, antibiotics were highly accumulated in root crops compared to leaf or fruit crop. Hence, we conclude that utilization of green manures and cultivation of leaf crops are the viable strategies for safer crop production in antibiotic contaminated soils.

Keywords: Sulfonamides; Plant accumulation; Soil amendment; Daincha; Sunhemp

Biography:

Dr. Saranya Kuppusamy obtained MSc in Agricultural Microbiology (2011) from Tamil Nadu Agricultural University, India. She joined University of South Australia in 2012 for her doctoral research with prestigious fellowships and obtained PhD in Environmental Remediation (2015). Later she joined Gyeongsang National University, South Korea and worked as a Research Professor until 2018. She has been availing the prestigious DST-SERB Ramanujan Fellowship awarded (2018-23) by the Govt. of India at the Centre for Environmental Studies, Anna University, India. She has been actively involved in different areas of Agriculture and Environment, and had published 47 journal articles, 3 book chapters and 2 books.

Research Interest: Soil chemistry, fertility and management; Soil and Water Remediation; Waste Management

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Oral

Rice straw biochar-based slow-release fertilizers

Abhilasha Tripathi and Purnendu Bose
Indian Institute of Technology Kanpur, India

Abstract:

One of the causes of steeply degraded air quality of Indo- Gangetic region during every onset of winter is biomass burning (Parali). It also reduces soil proficiency as a growth medium due to elevated soil temperature by damaging soil inherent nutrients and microbes. Another issue related to agricultural fields is nutrient leakage. Commercial inorganic fertilizers readily dissolve in irrigation water to release nutrients that leach/ enter waterbodies to induce eutrophication. This calls for frequent fertilizer application. This research aims to provide a collective solution to the aforementioned agrarian issues. Therefore, the biomass, rice straw, i.e., burnt frequently, is utilized as the main ingredient of biochar-based slow-release fertilizers (BSRF) that prevent sudden nutrient release.

In the study, rice straw biochar is used to prepare two kinds of BSRF: (a) Magnesium modified SRF (MAB) [Patent No.: 369627] and (b) Struvite embedded SRF (SAB) [Patent application no.: 202111060822]. MAB has a high phosphate uptake capacity (~64 mg/g), while SAB consists of both N and P, although it is found to be a P fertilizer predominantly. The fertilizers are characterized and tested for slow-nutrient release studies and pot experiments. MAB and SAB consist of C, Ca, Mg, S, and Si, i.e., major macronutrients for plants. Since biochar consists of higher fixed carbon, it enhances the soil carbon sequestration potential and acts as a soil conditioner; by imparting properties like reduced bulk density, increased CEC (cation exchange capacity), pH, water holding capacity, etc. In the slow-release study, it was observed that nutrient release from both MAB and SAB was diffusion controlled i.e., nutrients are released only when there is a zone of unsaturation in pore water around the beads placed in the rhizosphere.

In the pot experiment, Phosphate-loaded MAB with a recommended dose of fertilizers (RDF) performed better than similar nutrient dose of commercial fertilizers (CF) in terms of dry biomass (~1.5 times higher) (with Cicer Arietinum). The second fertilizer, SAB (contains struvite) + RDF, also performed better than CF-treated (similar nutrient dose) pots when tested on Spanicia Oleracie with ~2 times higher dry biomass. Both the fertilizers imparted dense rhizosphere compared to control and CF; therefore, the soil will be clasped into the roots and remain protected during soil erosion. Thus, developed BSRFs demonstrate the utilization of rice straw for efficient and advanced slow-release fertilizers by enhancing nutrient use efficiency (NUE) and yield of plants.

Keywords: Biomass burning, Nutrient runoff, Slow- release fertilizers, Biochar, Soil amendment, Agriculture residue management

Biography:

Abhilasha Tripathi has been a Ph.D. scholar at the Department of Civil Engineering, IIT Kanpur, and a Research Coordinator at the International Biochar Initiative, US, since December 2019. Her research interest is in water/ wastewater treatment and tapping the potential of agricultural residue as a value-added product for environmental remediation. She has worked on multiple biochar-based slow nutrient release fertilizer systems during her research. A Patent was granted for one of the products, and other Patent has been filed under similar research.

Research Interest: Water and wastewater treatment, Biochar, Fertilizers

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Oral

Identification of integrated farming systems in Udaipur district of Rajasthan: A field survey

Akansha Yadav and Rajshree Upadhyay
Maharana Pratap University of Agriculture and Technology, Udaipur, India

Abstract:

The integrated farming system (IFS) is an integrative whole farm approach that is effective in solving the problems of small and marginal farmers. The main aim of integrated farming system is to enhance the employment and income from small-holding by integrating various farm enterprises, and recycling crop residues or by products within the farm itself. The farmers need to be settled of regular income for living at least above poverty line. This research study is conducted in district Udaipur, Rajasthan. This study is experimented by randomly selecting 4 panchayat samitiees among available 20 panchayat samitiees of Udaipur, district of Rajasthan. Thus, final sample size is 320. A field survey has been conducted with the aim of identification of existing farming system among farm families in Udaipur district of Rajasthan. With this study, five prominent farming system were observed in this area, viz. FS-I; Crop + Dairy (C+D), FS-II; Crop + Dairy+ Vegetables (C+D+V), FS III; Crop + Dairy + Goatery (C+D+G) FS-IV; Crop + Vegetable + Fruit + Dairy (C+V+F+D), FS-V; Crop + Dairy + Goatery + Poultry (C+D+G+G). This study has focused on possible combinations of existing IFS models in the considered areas. Among these enlisted combinations, the IFS has been identified through focus group interview process and available key informants technique. This study demonstrates that the IFS has adopted by maximum farm families using mentioned observed areas where out of existing 5 prominent farming systems, the crop+ dairy (C+D) were adopted by most of the farm families.

Keywords: Identification, Adoption, Crops, Animal Husbandry, Horticulture, Integrated Farming System

Biography:

Ms. Akansha Yadav is pursuing PhD from the dept. of extension education and communication management, CCAS, Maharana Pratap Agriculture University, Udaipur, Rajasthan, India. Ms. Akansha has earned M.Sc. in home science extension from SHIATS Allahabad. She has completed BSc (Home science) From MJPRU Bareilly. Ms. Akansha has attended various workshops seminars, training programmes and conferences.

Research Interest: Integrated Farming System, Agriculture, ICT

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Oral

Ecotoxicity studies for Indian honeybees foraging in moringa and mango

A. Suganthi, M.R. Srinivasan, P.A. Saravanan, K. Bhuvaneswari, S.V. Krishnamoorthy, M. Shanthi, P. Karthik, R. Surya Raj, and Amol Ulhas Chaudhari
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Abstract:

The aim of this study was to assess the lethal effect of insecticides applied on mango and moringa crop to Indian honey bees, Apis cerana indica, their impact on colony performance and the assessment of risk to bees. LC50 and LD50 of insecticides recommended /applied on mango and moringa crop was determined by oral feeding and topical application. Field experiments were conducted by placing Honey bee (Apis cerana indica) colonies in moringa field and mango orchard treated with insecticides, to study the impact of insecticides on colony population, brood and food reserves, to quantify the insecticide residues and to assess the risk of oral and contact exposure. A simple multi-residue method for analysis of 22 analytes in bee was developed using Liquid Chromatography-Mass Spectrometry-Mass Spectrometry.

Under field conditions, bee colonies were adversely affected by exposure to applied concentrations of fipronil and chlorantraniliprole in moringa and mango. Significant reduction in number of bees and colony performance was observed. In moringa field trial, LC-MS/MS analysis of bees for residues revealed longer persistence of chlorantraniliprole and presence of emamectin, thiamethoxam, fipronil and imidacloprid residues until 5 to 7 days. Residue analysis of bees exposed to treated mango crop showed the presence of imidacloprid and thiamethoxam until seven days after treatment.

In conclusion, the results demonstrated that neonicotinoid insecticides, fipronil and chlorantraniliprole can pose significant risks to Indian bees with lethal and sub lethal effects. Future investigations are needed on the likelihood of sublethal effects under field conditions. The findings will be helpful in fitting the best insecticide crop amalgamations to maximise the benefits from honey bees in moringa and mango crop.

Keywords: Ecotoxicity, Indian honeybees, moringa and mango

Biography:

Working as Associate Professor (Agricultural Entomology) at Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore. Specialized in Insecticide Toxicology and Pesticide Residues, serving as technical Manager for NABL accredited Pesticide Toxicology Laboratory of TNAU,, involved in teaching of undergraduate and post graduate students, Research guide for 6 PG students, Principal Investigator for GOI - National Bee Board funded Scheme, Co- Principal Investigator for GOI scheme and ICAR scheme on Pesticide Residues, Co- Principal Investigator for Private Industry schemes, Published more than 30 research articles in peer reviewed journals with high NAAS rating and 2 books (ISBN), reviewer for 5 international journals and life member in 7 academic/research societies.

Research Interest: Pesticide residue analysis, techniques and management

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Oral

Push - pull strategy for FAW management in maize

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Abstract:

Field experiment was carried out at Department of Millets, Tamil Nadu Agricultural University, Coimbatore during Kharif, 2020 to study the influence Push - pull strategy for FAW management in maize The soil was sandy clay loam and low in available N, medium in available P and high in available K with a pH of 8.16.The experiment was laid out in a Randomized Complete Block Design (RCBD) with the following treatments viz., T1 –Maize + Tephrosia,T2 - Maize + Fenugreek, T3 - Maize + Coriander ,T4 - Maize + Marigold, T5 – Maize alone and replicated thrice. A row of C: N hybrid grass was planted in the brim of the field. Experimental results revealed that incidence of FAW were observed only in maize. On 20DAS and 30 DAS, the effect of different intercropping on incidence of FAW was not significant. Nevertheless, low incidence of 57.8 per cent and 55.5 per cent was observed in Maize + Tephrosia intercropping on 20 DAS and 30 DAS, respectively. On 40 DAS also, the different intercrops failed to exert significant influence on incidence of FAW. However, low incidence of FAW was observed in Maize + Marigold intercropping compared to other intercropping. There was no significant influence of intercropping on incidence of FAW in maize with respect to FAW incidence through TNAU scale. Nevertheless, low incidence of FAW was observed in Maize + Tephrosia intercropping on 20DAS and 30 DAS. Low incidence of FAW was observed in Maize + Marigold intercropping compared to other intercropping on 40DAS.Based on the results of experimentation, it is concluded that among the intercropping systems in maize, maize + marigold was found to be superior for the management of FAW in maize which recorded higher maize equivalent yield (6215 kg ha-1), net return (Rs. 47,181/ha) and BC ratio (1.87).

Keywords: Maize, intercrops, FAW infestation and yield

Biography:

Working as Associate Professor (Agronomy) at Water Technology Centre, Tamil Nadu Agricultural University, Coimbatore. Specialized in Farming systems and Maize Agronomy. Involved in teaching of undergraduate and post graduate students.Worked in AICRP on Maize from 2015 to 2021 and written more than 30 research articles in peer reviewed journals with high NAAS rating and 5 books (ISBN).

Research Interest: Cropping systems, Weed and nutrient management

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Oral

i-Farming: Managing crop production in the digital era

Ravishankar Narayana, Brianna Humphreys, and Kyle Shelton
Fernlea Flowers Ltd. USA

Abstract:

An innovative wave of merging farming practices with technology strives to revolutionize agriculture around the world by employing novel digital methods to improve the productivity along with cost reduction. With worldwide growth in population size (doubled in the last four decades), loss of farmlands due to urbanization, erosions and abusive practices, as well as indirect impacts of climatic changes on crop productivity, coming up with new and sustainable measures to produce enough food for demanding consumers is an inevitable challenge. Adaptation of digital farming techniques, an alternate to genetic breeding, is shown to facilitate crop management and productivity. Digital technology has introduced innovative changes in both small and large-scale farming. This would also impact the livelihood of growers with optimal work environment, food security and food safety which in turn would result in protecting our planet and its finite resources.

To increase productivity and reducing the corresponding cost, numerous corporations around the world have focused their efforts and investments to offer newer versions of seeds, fertilizers, irrigation supplies, and machineries for advanced farming and crop management. The recent innovations in virtual farming have resulted in development of applications that would assist growers in reaching out to consultant firms for optimal farming practices. Moreover, literature compiled in worldwide web is readily available to establish trends in farming, or to improve productivity by taking advantage of available technology. Advanced and smart machineries enable growers to improve work efficiency either in croplands or chicken, meat and dairy farms.

Mobile electronic devices and innovations in information technology (IT) such as soil and crop sensors, mobile applications, big data analytics, agricultural robots, closed ecological systems, precision agriculture tools, smart power systems, geological position systems (GPS) provide great impact on farming.

Many of these new technologies leverage improved artificial intelligence algorithms to solve problems that were too hard to be tackled just few years ago. Such algorithms allow the development of improved Decision Support Systems which may process large amounts of data in real time and supply the much-needed advice to the growers. To extract such data, artificially intelligent machines can now infer meaningful information from different raw data inputs such as graphics in a level that is comparable to a human expert, thanks to recent break throughs in machine learning research. Better tools for data analysis and decision making will improve farming outcomes and reduce labour costs.

With the same token, manufacturers producing farm technology and resources (e.g., seeds, fertilizers, pesticides, etc.) are reengineering products to increase plant's tolerance to drought, rate and speed of growth, and enhancing the shelf life. Precision Livestock Farming (PLF) systems (e.g., precision feeding systems, precision milking robot, stable and farm management systems) use advance technologies that are assisting growers to collect livestock biometrics data for sustainable agriculture practices leading to increase in corresponding income. Lastly, the farmers are also seeking the best storage methods and technologies to increase the durability of fresh products.

Digital technology plays major roles in the development of agricultural sectors by bridging the gaps, spreading the knowledge and information and growth in the agro-market. Overall, digital technology is transforming plant production in both developing and developed countries. In particular, while developed countries gain great advantages of these technologies, developing and underdeveloped countries are using these technologies for better, faster, and cheaper products/services which would increase farmer productivity provide gains in poverty reduction, nutrition, education, and sustainable income.

The greatest need is to deliver targeted and timely information to growers based on their needs. The empowerment that comes from providing farmers with informed options is transformational, especially for women and youth.

The good news is that new digital technologies now make it possible to collect and leverage huge amounts of critical data at minimal costs—thus making a farmland operation more insight driven, and potentially more productive and efficient. The agriculture ecosystem has already started to invest in these digital technologies. The total market size for digital-based services, known as "precision agriculture," is expected to grow at a CAGR of 12.2 percent between 2014 and 2020 to reach $4.55 billion. Greater use of precision agriculture services is vital to not only improving the financial performance of croplands, but also to meet with food demands of an expanding population.

Biography:

Dr. Ravishankar Narayana is an experienced Biologist with a demonstrated history of working in the area of agriculture research and development. He received the B.Sc. Agriculture (2003) and M.Sc. degree in Plant Pathology (2005) from the University of Agricultural Sciences, India and a Ph.D. degree in Plant Biology from the University of Torino, Italy, in 2011. Strong research professional skilled in multiple scientific disciplines, including pathology, entomology, molecular and microbiology, genetics, agronomy, and horticulture, as well as in quality control lab protocols, food production compliance and ornamental crop production. He secured third Rank in Postgraduate Diploma (Plant Protection) program at National Plant Protection Training Institute, India. As a Senior Research Fellow at Indian Institute of Horticultural Research he worked on Panama wilt of banana.

He moved to Canada to work as Postdoctoral Scholar under Dr. Claudio Stasolla, University of Manitoba and then to Penn State University, USA. At Penn State, Ravishankar supported cutting edge research projects in collaboration with organizations such as the International Institute of Tropical Agriculture, Tanzania, Africa, and FAO. He also worked as a Biological Scientist at the Citrus Research and Education Centre, University of Florida, USA. He is currently working as Research and Development Manager at Fernlea Flowers Ltd, Florida, USA coordinating research in Florida, California and Ontario, Canada. His research interests include plant-pathogen/insect/environment interaction, transcription, and signal transduction, digital agriculture, integrated pest management. A passionate advocate for the use of data and technology to enhance agriculture production for small scale farmers.

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Oral

Diversity, distribution and phytochemical analysis of selected species of *Hypericum in Meghalaya*

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Abstract:

The genus Hypericum comprises approximately 500 species occur temperate regions of all over the world. In India the genus is represented by twenty five species in India and mainly distributed in Himalayas, north eastern state and Western Ghats. Members of the genus are known for its aesthetic value, its traditional uses in health care, and considered as a potential plant for drug development in curing many diseases especially cancer, tumor, AIDS, and as an antidepressant etc. Despite of such high economic value, sporadic information is available on the diversity, distribution, habitat preference, nativity, endemism, status and indigenous uses of the species of genus *Hypericum* in Northeastern states. In the present investigation complete diversity, distribution, habitat preference of the genus Hypericum distributed in Meghalaya and phytochemical screening of selected species of the genus in Meghalaya is carried out. Six species of the genus *Hypericm* (i.e. Hypericm hookerianum Wight & Arn., *Hypericum gracillipes* Stapf ex C.E.C. Fisch., Hypericum japonicum Thunb., Hypericum *monanthemum* Hook.f. & Thomson ex Dyer, *Hypericum lobbii N.Robson* and *Hypericum williamsii* N.Robson) are distributed in different areas of Meghalaya. The study is aimed at to analyze presence of different chemical constituents in the above mentioned Hypericum species. The study aimed to analyse several bioactive compounds such as gallic acid, vanillin, p-coumaric acid, rutin, quercetin, kaempferol, caffeic acid, tannic acid, flavonoids etc. in the Hypericum species could pave a way for the better utilization of the species from Meghalaya.

Keywords: Hypericum; Meghalaya; Bioactive compounds; Antidepressant

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Oral

Deciphering the regulation of nutritive value and abiotic stress response in *Moringa oleifera* through genomic approach

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[2]Regional Centre for Biotechnology, Faridabad , India

Abstract:

Moringa oleifera (drumstick tree), a tropical multipurpose plant with medicinal and nutritional properties and with an ability to grow in low water conditions. Moringa leaves are an excellent source of protein. It has 13 known species mostly possessing nutritional, phytochemical and pharmacological properties. All parts of the plant have been used for a number of health benefits and play a distinct role in treating several health conditions. However, abiotic stress factors have an adverse impact on the nutritional quality. The present study is therefore, designed to determine the effect of abiotic stress on gene expression in the plant with focus on transcription factors. We generated and assembled a draft genome sequence of *M. oleifera* (var. Bhagya) which is an indigenous variety into 915 contigs with a N50 value of 4.7 Mb and predicted 32,062 putative protein-coding genes using Next Seq platforms. DNA libraries were prepared for sequencing on PacBio Sequel and Illumina HiSeq 2500 platforms to generate long and short reads respectively. RNA Seq was carried out with control and drought stressed samples. We predicted a total of 21 Heat Shock factors (HSFs) in the M. oleifera genome and carried out phylogenetic analyses, motif identification, analysis of gene duplication events, and differential expression of the HSF-coding genes in *M. oleifera*. Analyzing the effect of abiotic stress on nutritional value as well as deciphering the genomics of nutrient assimilation will enable us to correlate and study the interaction of the genes responsible for nutrigenetics and the regulation by HSFs in presence or absence of abiotic stress.

Keywords: abiotic stress, genome assembly, HSFs, nutrigenetics

Biography:

P Sushree Shyamli. Currently, I am working as a PhD Scholar (SRF) at Institute of Life Sciences, Bhubaneswar with Late Dr. Ajay Parida's group (Ex-Director, ILS). She has completed my post-graduation with distinction from Central University of Punjab and was awarded Gold Medal in Master of Science (Life Sciences) in 2017. I have been awarded with DST-INSPIRE Fellowship in August, 2018. Apart from this, I qualified several National level entrances - CSIR-UGC NET in Life Sciences, ASRB-NET held by Indian Council of Agricultural Research, and GATE in Life Sciences. Our research group at ILS is dedicated towards developing location specific crop varieties to cope with the adverse impact of climate change and basic understanding of the process and mechanisms associated with genetic resources characterization, conservation genetics and stress biology. My PhD work aims at building comprehensive reference grade genome for medicinally important plant, Moringa oleifera and finding the effect of abiotic stress on its nutritive value. I have contributed in seven articles, including research and review articles in International peer-reviewed journals.

Research Interest: plant biotechnology, nutrition biology, stress tolerance mechanism, genomics, and molecular biology

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Oral

Expression and activity of pepsin, trypsin and chymotrypsin during larval development of the striped murrel (*Channa striata*)

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[2]ICAR-Central Institute of Fisheries Education, Mumbai, India
[3]Dr Rajendra Prasad Central Agricultural University, Samastipur, India

Abstract:

Understanding the species-specific development of fish digestive capacity during ontogeny is critical for meeting fish larvae nutritional needs. The present study was aimed to provide a comprehensive analysis of the transcriptional and biochemical ontogeny of key digestive enzymes involved in protein digestion in striped snakehead (*Channa striata*) larvae, a commercially important species for aquaculture diversification in India and South East Asia. The gene expression pattern and enzyme activity of pepsin (pg), trypsin (try) and chymotrypsin (ctr) were investigated from hatching to 35 days post-hatch (dph). mRNA expression level of try increased from 3dph onward which was con-current with yolk sac absorption and showed a peak at 12 dph and 25 dph ($p<0.05$). Maximum levels of ctr expression were observed at 21 dph. The pepsin mRNA levels were not detectable from hatching to 3dph but showed a significantly higher expression at 25 dph ($p<0.05$). Maximum specific activity of trypsin was observed at 18 dph, while chymotrypsin showed significantly higher ($p<0.05$) activity at 21 dph. Specific activity of pepsin showed increasing trend from 18 dph onwards with maximum activity at 30 dph. Based on our results, we conclude that the weaning time for C. striata larvae could be between 18 and 25 dph, as the activities were significantly increased after this stage which marks the functional development of the exocrine pancreas and stomach.

Keywords: *Channa striata*, larval development, digestive enzyme expression and activity, Ontogeny

Biography:

She is a Scientist, working in ICAR-Central Institute of Freshwater Aquaculture, Kausalyaganga, Bhubaneswar, Odisha, India. My area of research interest is larval nutrition. At present, she is working on development of feed and feeding strategy for Channa striata, a commercially important species for aquaculture diversification in India.

Research Interest: Larval nutrition and Digestive physiology

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Oral

PolyC stretch in utrophin-A 5'UTR retains the transcript in the nucleus

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Abstract:

Most common X-linked hereditary disorder Duchenne Muscular Dystrophy (DMD) affects one in every 3500 males globally. Dystrophin gene mutation causes the fatal condition and as of now, there is hardly any remedy. Although the therapeutic effectiveness has not been yet attained, overexpression of Utrophin, the autosomal homologue Dystrophin and chromosome 6 encoded protein, can compensate for Dystrophin loss in Duchenne Muscular Dystrophy. The poly (C) binding protein 2 (PCBP2) has been discovered as a post transcriptional suppressor for the expression of utrophin-A, the utrophin isoform specific for muscles, as evident in the current study. The research supports PCBP2's role in the nucleus retention of utrophin-A mRNA in C2C12 cell line. Its participation in the retention of mRNA in the nucleus reveals a novel function of PCBP2 that reduces the availability of utrophin-A mRNA in the cytoplasm. In order to remove repression of utrophin-A repression PCBP2 may be a targeted challange.

Biography:

Perusing PhD. at the Department of Molecular biology and Biotechnology, University of Kalyani. I have completed my graduation in 2017 in Molecular Biology and Biotechnology from Kalyani Mahavidyalaya and masters from Kalyani University in 2019 in Molecular Biology and Biotechnology. She has cleared GATE examination in 2019 in Life Science with GATE Score 454.

Research Interest: Regulation of gene expression, RNA Metabolism.

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Oral

Mangrove algae could be a one pot platform for cellulosic waste recycling and biodiesel precursor lipid generation

Shrestha Debnatha and Dipankar Ghosh
JIS University, Kolkata, India

Abstract:

Human race have been facing tremendous depletion in reserved natural energy resources due to massive climate change and usage of fossil fuels in our routine life. Biofuel generation using lignocellulosic waste biomass could be a potent alternative platform to tackle aforementioned problems. Biodiesel is one of potent biofuel which considers as fossil fuel alternative. Existing biodiesel production processes are directly competing with food chain. Algae are impressive alternatives for biodiesel generation as algae grow without competition with food chain, have an inherently faster growth rate, and have higher lipid content under diverse nutrient-limiting environments. Lignocellulosic waste (LCW) accumulation has been increasing through anthropogenic activities. Accumulation of LCW causes ill effects on environment and human health. Thus, a faster paradigm shift needs to be required for establishing a single platform to perform lignocellulosic biomass degradation along with higher lipid production as biodiesel precursor. Few studies show algal endoglucanase or cellulase activities for degrading LCW to generate monomeric constituents which can further be channelized to produce higher biomass and lipid contents as biodiesel precursor. Thus, the present study focuses on a feasibility attempt to show that mangrove algal isolate could be single pot platform for cellulose waste degradation as a major constituent of LCW and higher lipid production as potential precursor for biodiesel production.

Keywords: Algae, Biomass production, Lipid content, Biodiesel, Cellulosic biomass degradation.

Biography:

Ms. Shrestha Debnath is Ph.D. Scholar, MEAB Laboratory, Department of Bioscience, JIS University. My research work is going on under Dr. Dipankar Ghosh, Associate professor, Department of Bioscience, JIS University, Kolkata. Ms. Debnath has completed B.Sc. Biotechnology from Maulana Abul Kalam Azad University of Technology (formerly known as West Bengal University of Technology) West Bengal, India. She has completed her M.Sc in Biotechnology from JIS University, West Bengal, India. She has published several book chapters, review articles, research articles, and multiple international conference proceedings under the guidance of Dr. Ghosh in Scopus, SCIE indexed, and UGC-care listed- journals from publishing houses like Elsevier, Taylor and Francis, Springer, etc.

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Oral

Isolation and characterization of phosphate solubilizing bacterial inoculants to improve soil fertility and Plant growth

Palash Ghoraia and Dipankar Ghosh
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Abstract:

In agriculture, phosphate (P) is essential for plant growth and food production. In advanced agriculture practice, chemical phosphate fertilizer use is an unacceptable remedy for improving soil fertility and agricultural productivity in long-term bases. An excessive amount of chemical fertilizer (CF) used affects the quality of crop production. The malpractice of chemical fertilizers links soil chemical properties to an increase the diseases through the mediation of long-term adverse effects to plant growth and food productivity. Mostly CF contamination of aquifers is a severe issue in the water system in many rural regions and environments. Increasing inflation of chemical phosphate in agricultural soil primarily affects the porosity by precipitation as an insoluble form. Moreover, most agronomic soils contain large reserves of insoluble phosphorus, which is not accessible by the plant. To address the phosphate requirements of plants, phosphate solubilizing bacteria have offered a biotechnological alternative to sustainable agriculture. Phosphate solubilizing bacteria have been providing the insoluble phosphate to soluble phosphate to plant accessible form by enzymatic and biochemical activity. Despite their different ecological niches and multiple functional properties, P-solubilizing bacteria have yet to find promising solutions as bio-inoculants. Finding P-solubilizing bacteria that might be utilized as crop inoculants was the practical goal, but this needed more economic and commercial success. In this current situation, this work focuses on isolation and characterization of phosphate-solubilizing bacteria from the mangrove ecosystem to improve plant growth features.

Keywords: Chemical fertilizer, Environmental pollution, Soil fertility, P-solubilizing bacteria, Sustainable biofertilizer.

Biography:

Mr. Palash Ghorai has completed B.Sc & M.Sc in Biotechnology from Panskura Banamali College under Vidyasagar University and JIS University, Kolkata, respectively. Mr. Ghorai is currently pursuing Ph.D. in Biotechnology from Department of Bioscience at JIS University under the supervision of Dr. Dipankar Ghosh (Associate Professor, JIS University Kolkata). He has published few book chapters, review articles, research articles (communicated), and multiple international conference proceedings under the guidance of Dr. Ghosh in Scopus, SCIE indexed, and UGC-care listed- journals from publishing houses like Elsevier, Taylor and Francis, Springer, etc.

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Oral

Utilization of different models to predict tea crop yield: A critical review

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Indian Space Research Organization, Nagpur, India

Abstract:

The most popular drink in the world is tea (Camellia sinensis), which is second only to water in terms of consumption. 50 nations manufacture it, with China, India, Kenya, Sri Lanka, Vietnam, Turkey, Indonesia, and Iran serving as the top exporters (FAO 2014). One of the most important cash crops, tea is crucial for rural development, poverty reduction, and food security in both exporting and developing nations. Utilizing different models' techniques that have been trained on past yields and some standardised meteorological parameters, such as average growing season temperature, precipitation, wind speed, sunshine hour etc. are a frequent strategy. There hasn't been any systematic analysis of different models' performance in comparison to other approaches, despite the fact that their general advantages and disadvantages are well established. Different models will probably continue to be crucial in predicting future effects of tea yield because it is at these larger scales that climate projections are also most accessible and trustworthy. The tea produced in recent years has been slowly affecting the quality of tea produced in the world as well as the declining quality cultivated in North East India. This paper provides a review report on the implementation of different techniques for tea cultivation along with their advantages and drawbacks which will help in the further development and improvement of the system.

Keywords: Artificial Neural Network (ANN); GIS & RS; Machine Learning (ML); Regression Model; Tea

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Oral

Application of lignocellulolytic bacterial consortia on jute crop waste processing and valorization

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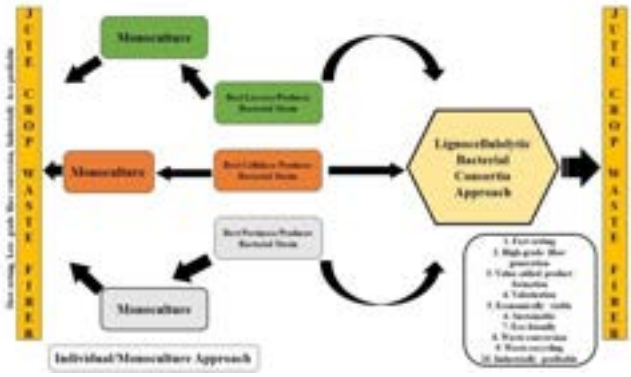
Abstract:

Lignocellulose biomass (LCB), a type of plant waste produced in large quantities annually worldwide, may serve as an alternate carbon source for producing various products with added value. However, LCB conversion demands multiple treatment methods, such as physical, chemical, and physicochemical, which are not sustainable or economically viable. Microbial lignocellulolytic enzymes frequently degrade lignocellulosic waste for industrial applications.

Because of their capacity for bioremediation, rapid development, and robust environmental adaptation, bacterial systems are attracting increased attention. In this study, three bacterial strains from the Sundarban mangrove ecosystem in West Bengal, India, were isolated and screened for lignocellulolytic activities using the selective plate methods and dye decolorizing capacity; their ability to reduce sugar was assessed using the DNS method. In this study, the isolated strains treated jute root waste fiber as lignocellulosic waste biomass and different toxic dyes individually and in different consortia combinations. We have also examined the treated products utilizing SEM inspection to determine their considerable impact on fiber modification and its valorization by generating value-added everyday products like rope, home decoration materials, sacks, and textile products. It was observed that the consortia showed much better results than that with the monoculture approach. Nowadays, consortia strategies precede monoculture for improving LCB waste conversion and creating value-added products. To this end, this consortia mechanism can open some new ideas for scientists to enhance fiber quality, generating waste recycling pathways that can make sustainable, pollution-free, viable socio- economic eco-biome.

Keywords: Jute crop waste processing, Dye decolorization, Lignocellulolytic enzymes, SEM analysis



Biography:

Somnath Das is Ph.D. Scholar, MEAB Laboratory, Department of Bioscience, JIS University, under the supervision of Dr. Dipankar Ghosh, Associate professor, Department of Bioscience, JIS University, Kolkata. Mr. Das has completed B.Sc. in Microbiology from Calcutta University. He has completed M.Sc in Molecular Biology and Biotechnology from the University of Kalyani, West Bengal, India. He has qualified for DBT-BCIL in 2016 and worked as a research trainee at BioBharati Life science Pvt. ltd. Kolkata. He has qualified for GATE-XL in 2018, conducted by IIT- Guwahati. He has published several book chapters, review articles, research articles (communicated), and multiple international conference proceedings under the guidance of Dr. Ghosh in Scopus, SCIE indexed, and UGC-care listed- journals from publishing houses like Elsevier, Taylor and Francis, Springer, etc.

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Oral

Studies on algae based Single Cell Protein isolated from Kangsaboti River, West Bengal: a potential nutritional food supplement

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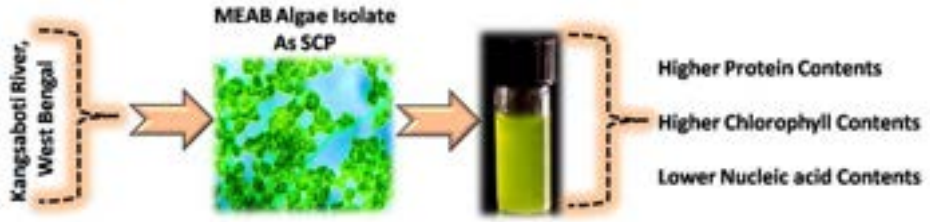
Abstract:

Malnutrition and reduction in nutritional quality of dietary foods have become burning issues due to our hectic life schedule. Due to time constraints, human races are being enforcing them to consume modern unhealthy fast foods and to distort food habits. To this end, human communities need to access to additional food constituents or supplements which enrich with dietary proteins. Proteins in diet serve as a major source of energy, nitrogen source, and key constituents of amino acids to make essential metabolic enzymes and hormones in human body. Instead of complete reliant on plants, biomass of algal communities could be a promising protein rich food supplements having higher contents of proteins, chlorophylls and less nucleic acids constituents. Algal cultivation and biomass productivities (i.e. single cell protein) are comparatively faster than do the plant regimes. So, with increasing population hike and consecutive demands on protein richen food supply encourages algae based single cell protein production as potential alternative. Moreover, existing algae based single cell proteins likely Spirullina sp and Chlorella sp. have shown good amount of protein contents but also contain highest levels of nucleic acids which is not good for heath as current state of art. Higher levels of nucleic acids show multiple health hazards and human diseases etc. Based on this scenario, current study focuses on screening of algae from sweet water river (i.e. Kangsaboti River, West Bengal) and characterization (biochemical and molecular) of algal isolates as single cell protein concerning higher quantity of proteins and lower contents of nucleic acids.

Keywords: Single cell protein, Algal biomass, Nutrition, Food supplement, Malnutrition, Protein content, Nucleic acid content.



Biography:

Dr. Dipankar Ghosh is Associate Professor at Department of Bioscience at JIS University Kolkata. His research interest is Microbial Engineering and Algal Biotechnology. He has completed PhD from University of Montreal Canada having PBEEE Doctoral merit scholarship from Govt. of Canada, M.Phil from Annamalai University and M.Sc from Calcutta University India. He has qualified and completed a short term course on Forensic Sciences from University of Cambridge, UK. He has pursued his research work as Post Doctoral Research Associate and Research Fellow with full scholarships in different prestigious organizations likely University of Cambridge UK, Imperial College London UK, Pasteur Institute of Paris France, McGill University Canada, Pusan National University South Korea, University of Turku, Finland and IIT Kharagpur etc. for diverse academic and research purposes. He has already published more than 100 peer reviewed high impact research articles, book chapters, conference proceedings and scientific magazines. Moreover, he has been funded with Industry sponsored Research Projects to support his research activities at JIS University Kolkata at present. Currently He is supervising 4 Ph.D. research scholars, 23 M.Sc project research trainees and 5 internships students.

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Oral

Simultaneous presence of Sub1 and SK locus - a prerequisite for future submergence resilient rice

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Abstract:

Submergence 1 (Sub1), a well characterized group of ERFs are associated with flash flood tolerance from lowland areas of South and South East Asia have been well explored since 1950s. The other loci Snorkel (SK) has only been recently (last two decades) reported from a few studies to be associated with deep water submergence which may continue for more than 3-4 weeks. Though the structural and functional role of both the loci have been well established, no attempts have been taken to study their simultaneous presence followed by combinatorial effect of both the quiescence and elongated growth under flash flood followed by deep water submergence. Considering the significance of this area of research an attempt was taken to identify the rice lines showing their simultaneous presence and combinatorial effect under flash flood followed by deep water submergence. A total of 10 rice lines from lowland rice field of South Bengal and Assam were experimented physio-biochemically under variable submergence. The rice lines showing differential presence of Sub1 and SK were subjected for sequence diversity in which they were detected with a number allelic form for the studied loci. Additionally in order to develop functional signature inform of miRNA linked molecular marker linked with SK loci (as Sub1 linked marker is already developed) a bioinformatics pipeline was developed followed by validation on a rice line (var. Kumrogarh) showing both types of growth under flash flood and deep-water submergence. Two miRNAs (osa-MIR1319b and osa-MIR1439) which target two ERFs (SK1 and SK2) located on 12th rice chromosome involved in escaping mode of adaptation in tall type rice were studied in details. The predicted binding sequences were aligned with their respective miRNAs to find out the most probable binding region showing higher base conservation. Secondary structure of the studied miRNAs was analysed for the minimum free energy to determine structure-function relationship of the miRNAs with target loci (SK). The bioinformatically predicted putative miRNAs were validated for their binding with the target sequences through qRT-PCR based expression analysis of both the miRNAs and respective target sequences in a selected indigenous semi deep rice line (var. Kumrogarh) carrying both the components of SK loci linked with elongated growth under submergence. The experiment conducted in this study construct a basic framework for miRNA regulated snorkelling type elongation in rice during prolonged deep submergence along with availability of both the loci for development submergence resilient rice lines for future.

Keywords: Rice, submergence, Sub1A, SK, miRNA, miRNA linked marker development.

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Oral

Moderate disease resistance in rice cultivars enhances the bio-efficacy of fungicides against blast disease

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Abstract:

Blast disease of paddy caused by Magnaporthe oryzae can be effectively controlled by host plant resistance and fungicide application. We hypothesized that disease moderate resistance (MR) in the host is essential for managing blast disease using fungicides. To test our hypothesis, field experiments with different fungicides were conducted during Kharif 2017 and 2018 using two rice varieties, HR-12 (susceptible) and GNV-10-89 (MR). Initially, both cultivars were evaluated for their reaction against a virulent strain of M. oryzae in a pot experiment wherein GNV-10-89 and HR-12 showed MR and susceptible reactions, respectively. On susceptible cultivar, HR-12, pooled analysis of two-season data revealed that blast disease severity in terms of percent disease index (PDI) among treatments was 70.85–87.83 with grain yield of 34.70-44.15 qha-1. On the MR cultivar, PDI and grain yield among treatments were 14.78–25.09 and 55.51–65.43 qha-1, respectively. Our results indicated that none of the fungicides effectively reduce the blast PDI when the cultivar is suscep-tible to the disease. Whereas, on MR cultivar, many novel fungicides or their combinations, such as Trifloxystrobin 25% WG + Tebuconazole 50% WG at 0.4 gL-1, Picoxystrobin 22.52% SC at 1.0 gL-1, Tricyclazole 18% + Mancozeb 62% WP at 1.5 gL-1and Tricyclazole 75% WP at 0.6 gL-1are effective in reducing the blast PDI. Our study demonstrated that some degree of host plant resistance is essential for managing the disease using fungicides.

Keywords: Rice, Blast disease, Magnaporthe oryzae, Susceptible variety, moderately resistant, Fungicides

Biography:

Dr. Pramesh D. has contributed significantly to plant pathology research, teaching, and extension. His significant contributions include (i) development of infectious clones of the Croton yellow vein mosaic virus and its pathogenicity in tomato. (ii) immuno- and PCR-based diagnostics Garlic common latent virus, (iii) solar-heat treatment of garlic cloves followed by meristem tip culture to produce virus-free plantlets. (iv) initiation of the research on host plant resistance, microbiome, pathogenomics, and on-field diagnostics at UAS Raichur. (v) first report of Alternaria-fungal disease of oat and little millet, spatiotemporal distribution of blast and false smut in different ecosystems of south India, (vi) use of seaweed extracts to alleviate the fungicidal stress on rice plants, (vi) disease-resistant rice varieties, and four innovation patents from the Australian and German governments (vii) chemical-based management of false smut, brown spot, stem rot, blast, and sheath blight diseases of rice. He has published more than 70 research articles in peer-reviewed journals. In addition, he is involved in the PG teaching and guiding students for their Master's and Doctoral Degrees. He is actively involved in the farmers' extension service via on-field training, diagnostic field visits, and radio and TV programs to educate the farmers about disease identification and management.

Research Interest: My research mainly focused on the characterization of fungal and bacterial pathogens infecting rice, it includes monitoring virulence dynamics, on-field diagnostic, pathogenomics, microbiome, host plant resistance, and disease management.

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Oral

Organic Agriculture in India: A review

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Abstract:

Organic agriculture is a promising approach that could push countries to deal with the critical problem of food security, which threatens the long-term survival of all people on Earth. India's strategic goal was to eliminate food shortages, and the Green Revolution of the 1950s and 1960s played a vital part in that. However, conventional farming methods brought new challenges. As opposed to conventional farming methods, organic agriculture in India has many advantages. This paper reviews several journal articles that focus on organic farming in India. It highlights similarities and commonalities between the research, challenges, and future directions. Literature shows that organic farming can improve food security, human health, the nutritional value of crops and products, the sensory appeal of food, and the preservation of agricultural diversity. The review also shows that organic farming practices are linked to higher crop yields and output in agriculture. Organic agriculture could be a good way for India to improve the country's environment, economy, and food supply for the sake of future generations.

Keywords: Organic Farming, Sustainable Agriculture, Vermicomposting, Sustainability

Biography:

Dr TMA Pai PhD research scholar from Manipal Institute of Management, Manipal Academy of Higher Education. Research Interest: Sustainable agriculture, Organic Farming, Agribusiness, Marketing, Entrepreneurship

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Oral

Review on the study of disparate leaf diseases and analysis of the methodologies used in leaf disease detection

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Abstract:

Initial studies give us a detailed idea of the leaf diseases and their worsening effects on food security. In India, the major sector compiles up the agriculture sector which indeed plays a major role in the economy. The yield rate in agriculture is completely dependent upon the health of crops. Leaf diseases impact harshly on the yield outcome and so their detection is crucial. As the yield percentage of crops plays a significant role in terms Global Food Security Index hence there is an exigency in studying the consequences caused by the leaf diseases. Lessening the plant diseases allows for substantially improving the quality of the products leading to criterion on yield percentage. Day by day the techniques and methodologies are improving to deal with an individual problem and correspondingly in terms of detection of leaf diseases, there are an end number of mechanisms. The objective of this paper is to discuss the various types of leaf diseases and their causes and to review the prevailing technologies, deep learning methods, and the role of machine learning in detecting leaf diseases. This review will conclude with a comparison of the most suitable methodology and the limitations of potential methods. The challenges faced in the detection of leaf diseases are also compiled.

Keywords: Artificial Intelligence, Machine learning, Algorithms, SVM (Support Vector Machine), Image Processing

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Oral

Ethology of Lycaenid (Lepidoptera: Glossata) butterflies

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Abstract:

The Lycaenidae, are blues, coppers, hairstreaks, metalmarks and related butterflies are the most diverse and classified under the superfamily of Papilionoidea, comprise between 30 and 40% of all butterfly species and considered as world's smallest butterflies. It is an important part of biodiversity and ecologically vital due to the role they play in the food chain and act as bio-indicators of environmental variation and quality that reflect a particular suite of ecological conditions or indicate broader effects of environmental changes. The present study was conducted to observe the behavior of lycaenids in an ecosystem. The diversity of lycaenid butterfly species and their attraction to nectar plants, host plants for oviposition and mud puddling behaviour were observed and photographed in the study area. The plant species pollinated by the lycaenid butterflies, their colour changes due to seasons of the study area and wing position during foraging were also recorded. The nectar yielding plants species for lycaenids viz., Zizyphus spp., Tridax procumbens, Celosia argentea, Saraca asoca, Parthenium hysterophorus and Bidens pilosa were predominant in the study area. Rounded Pierrot and Gram Blue were depend for feeding nectar on Zizyphus spp., Indian Sunbeam on Pongamia pinnata and Lantana camara, Red Pierrot on Tridax procumbens, Capparis zeylanica and Lantana camara. The plant species namely, Ziziphus jujube, Pongamina pinnata, Punica granatum, Pisum sativum and Vigna cylindrica were most preferred by many of the lycaenid butterfly species for oviposition in the study area. Among the plant species pollinated by lycaenid butterflies, the plants belong to Asteraceae, Myrtaceae, Rhamnaceae, Fabaceae and Rutaceae were most benefited by the lycaenids namely Indian, Sunbeam, Common Acacia Blue, Pale Grass Blue, Dark Pierrot, Lime Blue and Common Cerulean. During survey, it was found that

Keywords: Butterflies, Ethology, Lycaenidae, Mud puddling, Seasonal forms

Biography:

Dr. C.Kathirvelu, has been working as Associate Professor in the Department of Entomology, Faculty of Agriculture, Annamalai University since 2002. Besides teaching B.Sc. (Ag.) and M.Sc. (Ag.) Entomology students, he has completed research projects funded by University Grants Commission and DST - Science and Engineering Research Board, New Delhi. Currently, he is undertaking a project sponsored by RUSA 2.O funded by MHRD, New Delhi. He has to his credit 60 research papers published in national / international journals/ book chapters and published 3 books. He is specialized in Lepidopterology and Storage Entomology. He discovered a tribal rat trap and remodelled it for easy and effective usage and gathered 300 and odd tribal pest control practices for field, horticultural crops and storage pests. Developed a Lepidoptera Repository at the Dept. of Entomology, Annamalai University.

Research Interest: Lepidopteralogy and storage Entomology

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Oral

Agriculture 4.0 - a fourth revolution of agriculture through plasma - the fourth state of matter: Review of recent development, challenges and future scope

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Abstract:

Food is one of the prime needs for any living essence and a prime source of food is Agriculture. We have achieved a remarkable boost in Agriculture production due to the previous three revolutions through Irrigation, Fertilizers and Genetic modification. However looking at current trends, agriculture production has reached its saturation. On the other side, world food demand is increasing. So if we continue on the same track, it will be almost impossible to feed everyone in the future. Apart from the future scarcity of food another big threat, we are witnessing today is the contamination and degradation of food. This leads to the wastage of food and the potential outbreak of deadly diseases. Research communities have come on the common platform for the fourth revolution of agriculture, which targets production boost while maintaining food quality and safety. Industrial revolutions have also helped the agriculture sector with mechanical equipment, metrological forecasting, drones, sensors, Big data analytics, Blockchain, IoT, etc. Apart from these technological enhancements, important research is going towards the use of Plasma for boosting the upcoming agricultural revolution. Some of the discoveries like fluorescent tubes to power generation and complex solutions for industries have been possible due to Plasma technology. A lot of work is being currently undertaken to apply plasma-based technology for various applications in the Agriculture and FMCG sectors for seed germination, plant growth, preservation, improving shelf life, detoxification, decontamination, etc. In this work current findings, challenges and scopes on Plasma based technologies for applications in the agriculture and food industries are discussed.

Biography:

Harsh K. Shastri is research scholar of Gujarat Technological University, Ahmedabad under guidance of Dr. Manish T. Thakker. He is having Master Degree in Field of Instrumentation and Control engineering from DDU-Nadiad. He has been serving as Project and Automation engineer in industries like Amul for around 7 years. Currently he is working as Assistant Professor at Department of Instrumentation and Control Engineering in the L. D. College of engineering Ahmedabad.

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Oral

Suplimentation of Drumstick (*Moringa Olifera*) leaf meal as a herbal growth promoter on growth performance of broilers

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Abstract:

The present investigation was carried out on "Supplimentation of Drumstick (Moringa olifera) Leaf Meal as a Herbal Growth Promoter on Growth Performance of Broilers" The research was conducted in the poultry house of Department of Animal Husbandry and Dairy Science, college of Agriculture, Latur, VNMKV, Parbhani during the year 2018-19.

The experimental trial of six weeks was undertaken for Eighty, day old, broiler chicks divided in four treatments of 20 chicks in each treatment with 4 replications of five chicks. The control (T1) group was fed with standard broiler ration and T2, T3 and T4 groups were provided same broiler ration supplemented with 0.5 per cent, 1 per cent and 1.5 per cent moringa leaf meal, respectively. It was observed that at the end of 6th week average cumulative body weights (g) in T1, T2, T3 and T4 were 2473.25, 2626.99, 2580.62 and 2562.99 per bird, respectively.

The average cumulative body weight of broiler birds in the treatment groups T3 and T3 were significantly ($P<0.05$) higher as compared to those in T1 and T4 groups. The total body weight gain at the end of six week was 2426.28, 2579.66, 2533.22 and 2515.77 g per bird in treatmentT1, T2, T3 and T4, respectively. The chicks in treatment groups T2, T4, and T3 grew significantly ($P<0.05$) faster than T1 control group. The total feed consumption at the end of six week was 4715.28, 4395.16, 4463.73 and 4407.24 g per bird in treatments T1, T2, T3 and T4, respectively. After the sixth week it was seen that the total feed consumption of birds among treatment group T2 (4395.16 g) was significantly superior ($P<0.05$) as compared to T1 (4715.28 g), T3 (4463.73 g) and T4 (4407.24 g) groups.

The average feed conversion ratio from first to sixth week ranged from 1.95 to 1.70 which was significantly ($P<0.05$) better in T2 (1.70) as compared to T4 (1.75), T3 (1.76) and T1 control (1.95) groups. The total water intake at the end of six week was 6910.55, 7856.05, 7759.57 and 7040.45 ml per bird in treatments T1, T2, T3 and T4, respectively. After the sixth week it was seen that the total water intake of birds among treatment group T2 (7856.05 ml) was significantly superior ($P<0.05$) as compared to T1 (6910.55 ml), T3 (7759.57 ml) and T4 (7040.45 ml) groups. The inclusion 0.5% per cent Moringa olifera leaf meal in broiler diet as an herbal feed additive is economical.

Keywords: Growth performance, Feed Intake, Water Intake, FCR

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Oral

Studies on Preparation and Sensory evaluation of turmeric incorporated paneer

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Abstract:

India is considered as an agrarian country in which major proportion of population is vegetarian. Milk plays an important role in the diet of such persons as a source of animal proteins. Paneer is an important indigenous product which is obtained by heat treating the milk followed by acid coagulation using suitable acid viz. citric acid, lactic acid, tartaric acid, alum, sour whey. Standard serving size (50 g) of Paneer contains 156 calories (Kcal) of which 108 calories are from fat. Out of 12 g fat, 8 g are saturated fat along with 35 mg of cholesterol. It also contains on average 10 mg sodium, 16 mg potassium, 138 mg calcium, 102 mg phosphorus and 1 mg iron (Aneja et al., 2002). The poor keeping quality of paneer is a major obstacle in its large-scale industrial production. there is a very scanty work has been reported about use of turmeric in extending shelf life of paneer. Therefore, the present study has been contemplated to select stage for addition of turmeric, a well-known antibiotic in paneer and to evaluate turmeric as a preservative for paneer. The main objective of present investigation was to study the effect of addition different levels of turmeric powder on preparation and sensory evaluation of paneer. During the study cow milk paneer incorporated with turmeric was analysed for sensory properties such as colour and appearance, flavour, body and texture and overall acceptability. Storage study on the base of sensory evaluation was carried out with 3 days of interval. The data were statistically analysed by using Completely Randomized Design (CRD). The paneer prepared by adding 0.6 per cent turmeric powder showed highest overall acceptability sensory score 8.36. The sensory quality of paneer prepared by addition of 0.6 per cent having score for colour and appearance 8.08, flavour 8.20, body and texture 7.70 and overall acceptability 8.36. The paneer sample with 0.6 per cent turmeric weight of expected yield of paneer remains acceptable up to 12th day of storage at refrigerated temperature.

Keyword - Turmeric powder, paneer, sensory evaluation etc.

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Oral

Genetic modification strategies to develop transgenic pigeonpea events for pod borer resistance

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Abstract:

Production of high yielding cultivars of pigeonpea (Cajanus cajan (L.) Millsp.) has gained priority to satisfy the global demand of growing population in developing countries. The pod borer Helicoverpa armigera causes extensive damage and severe economic loss of pigeonpea every year. Lack of genetic resources and unsuccessful conventional breeding strategies are main hindrances to combat the insect attack through classical approaches. The study was designed to develop novel Agrobacterium – mediated transformation strategies in pigeonpea. These strategies improved the Agrobacterium – mediated transformation frequency. Cry expressing pod borer resistant transgenic pigeonpea events were developed using these methods and analysed up to T3 generation. Constitutive promoter was more effective than tissue specific promoter to exhibit desired larval mortality of cry gene. In selected cry expressing pigeonpea events, crossing based Cre/lox recombination was implemented to eliminate selection marker gene nptII. In subsequent generations, transgenic pigeonpea events devoid of nptII and cre genes were identified and these events exhibited 80-100% *H. armigera* larval mortality. Development of such Cry toxin expressing plants would greatly support the sustainable transgenic development program for pod borer resistance in pigeonpea.

Biography:

Dr. Dipankar Chakraborti studied Botany at the University of North Bengal, West Bengal, India and graduated as Master of Science in 2000. He then joined the research group of Prof. Sampa Das at the Bose Institute, Kolkata, India. He received his Ph.D. degree in 2008 at Jadavpur University, Kolkata, India. He joined as postdoctoral fellow in a Carl Trygger Foundation project under the supervision of Prof. Catherine Bellini at the Umea Plant Science Centre, Umea, Sweden. He also worked as a visiting researcher at the INRA, Versailles, France under the supervision of Dr. Sylvie Dinant. After two years postdoctoral fellowship, he obtained the position of an Assistant Professor of Biotechnology at the St. Xavier's College, Kolkata, India, during 2009. He joined as an Associate Professor of Genetics at University of Calcutta, India during October, 2019. He published 35 research articles in peer reviewed journals, several book chapters and articles and has an Indian Patent on mannose binding lectin from Allium sativum leaves.

Research Interest: Plant Functional Genomics and Biotechnology

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Oral

Transcriptional regulation underlying the responses to fungal infection in tea plant

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Abstract:

Fungal infections are the imperative limiting factor affecting the yield and quality of tea. Plants respond against any pathogen attacks by employing a multitude of defense mechanisms to prevent or restrict infections. Transcriptome reprogramming is the vital route that imposes stress response through the recruitment of multiple layers of regulation. This study was performed using a large amount of well-replicated transcriptomic datasets, meta-analysis and system biology to understand the underlying molecular defense responses in tea. The RNA-seq meta-analysis involving both healthy and infected plants associated with four major fungal diseases in tea resulted in the identification of a core set of differentially expressed genes (DEGs) cumulatively. The DEGs were implicated in several functional categories as unveiled by Gene Ontology (GO) and the Kyoto Encyclopedia of Genes and Genomes (KEGG) enrichment analyses. Individual MAPMAN analyses of each studied condition resulted in identified DEGs to be significantly enriched in multiple pathways. A major fraction of the transcription factor gene families showed significant fold changes during fungal infections in tea plant. The core set of DEGs are also targeted by various microRNAs, which mediates post-transcriptional regulation of transcribed mRNAs. Protein-protein interaction network analyses of the common DEGs resulted in the documentation of the secondary metabolism pathway genes modulated concurrently. In conclusion, this study elucidates the gene regulatory mechanisms operating in tea plants when they are infected with fungal pathogens and thus, identified candidate genes that may benefit marker-assisted breeding programs in tea.

Keywords: Biotic stress, Camellia sinensis, differential expression, gene regulation, RNA-Seq, transcriptome

Biography:

Dr. Anjan Hazra is a National Post-Doctoral Fellow awarded by the Science and Engineering Research Board, Govt. of India at the Department of Genetics, University of Calcutta. He formerly served as a Visiting Scientist at the Agricultural and Ecological Research Unit, Indian Statistical Institute, Kolkata. Following his Master's in Botany in 2015, he accomplished Ph.D. from ISI Kolkata and the University of Kalyani in 2019. Besides, he has qualified CSIR-UGC NET 2015, GATE 2015, ICAR-NET 2016 and WBSET 2015. Dr. Hazra is now involved in various research programs spanning plant genomics, molecular markers and crop improvements etc. He authored 22 research articles in various SCI/Scopus-indexed journals of international repute and five book chapters. He also has received several best oral presentations awards at various national/ international conferences across the country.

Research Interest: Plant genomics, Molecular Markers, Crop improvement

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Oral

Synthesis of silica nanoparticle from Paddy straw using hydrolysis process

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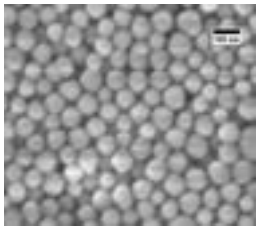
Abstract:

The creation of amorphous silica nanoparticles from burned paddy straw has been accomplished chemically. The hydrolysis process used in the synthesis was carried out using alkaline-acidic treatments. High-resolution microscopy showed that the resulting silica particles ranged in size from 50 to 100 nm. High resolution scanning electron microscope, X-ray diffraction and Fourier-transform infrared spectroscopy were used to undertake structural, crystalline and chemical investigations for both rice straw ash and synthetic silica nanoparticles. The burned straw's silica content was estimated to be 26.2 %. The surface chemical bonding with Si-O-Si, stretch of Si-O, and symmetric Si-O bonds at peaks of 1090, 471, and 780 cm-1, respectively, was the most noticeable on the produced silica nanoparticles. X-ray photoelectron spectroscopy and energy dispersive X-ray spectroscopy were used to investigate the generated silica in order to validate the presence of impurities of the elements. Zeta potential and thermogravimetric analyses were used to examine the stability of silica nanoparticles. The measured size from zeta potential analysis was 409–490 nm.

Keywords: agricultural residue, SiO2 nanoparticles, waste to resources, circular economy



Biography:

Dr. Surajit Ghosh is an Assistant Professor in the Chemical Engineering Department of Malaviya National Institute of Technology, Jaipur. His research expertise is in synthesis of metal oxide nanomaterials using low cost route. Dr. Ghosh has more than 3 years of teaching and research experience in materials science and engineering. **Research Interest:** nanotechnology, agricultural waste, water treatment

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Oral

Effect of introgression of prolific Booroola gene (*FecB^{BB}*) on thermal tolerance of Avishaan rams in semi-arid subtropical region.

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Abstract:

The effect of introgression of prolific Booroola gene (*FecB^{BB}*) on thermal tolerance of adult Avishaan rams raised under semi-arid subtropical region, was studied in prolific Avishaan rams (n=13) with homozygous Booroola gene (*FecB^{BB}*) introgressed in their genetic constitution through selective breeding. Native non-prolific (*FecB^{++}no allele present)* adult Malpura rams (n=12) served as controls. All rams were maintained as per standard management practices in semi-open sheds. Circadian physiological responses and meteorological elements were recorded every 4h for 24h beginning with 06.00h twice in Summer and Winter season each. The mean dry bulb, wet bulb temperatures and relative humidity varied between 11.5°C, 9.5°C, 78.2% (06.00h) to 28.5°C, 16.5°C, 27.4% (14.00h) during winter; and 29°C, 22.75°C, 67.9% (06.00h) to 37.75°C, 23.75°C, 35.85% (14.00h) during summer respectively. The mean±s.e. values of the rectal temperature of Avishaan and Malpura rams varied between 37.77±0.11°C, 37.47±0.18°C (06.00h) and 38.68±0.06°C, 38.63±0.09°C (at 14.00h) during winter and 38.43±0.05°C, 38.34±0.05°C (02.00h) and 39.17±0.05°C, 39.12±0.05°C (18.00h) respectively. The corresponding values of the respiration rates (breaths per min) of Avishaan and Malpura rams varied between 19.00±0.49 (2.00h), 17.92±0.53 (18.00h) and 25.44±1.49, 28.35±2.2 (14.00h) during winter and 35.89±3.58, 38.25±3.35 (02.00h) and 59.92±4.06 (14.00h), 66.33±4.31 (10.00h) during summer respectively. The corresponding values of pulse rates (beats per min) of Avishaan and Malpura rams varied between 50.85±0.88, 52.42±0.83 (2.00h), and 57.28±1.31 (14.00h), 59.57±1.44 (10.00h) during winter and 65.77±1.39, 64.58±1.38 (06.00h) and 77.23±1.81, 78.50±2.77 (10.00h) during summer respectively. Benezra's Coefficient of Adaptability as index of thermal Tolerance varied between 2.61±0.02, 1.98±0.03 (06.00h) and 2.81±0.04, 2.60±0.12 (14.00h) during winter and 3.18±0.08 (06.00h), 3.13±0.09 (02.00h) and 3.67±0.10 (18.00h), 3.88±0.11 (10.00h) during summer respectively. Circadian rhythmicity as assessed by significance ($p<0.05$) of the attributes of cosinor analysis was found in both the breeds in all the physiological responses in both the seasons except for Coefficient of Adaptability during winter. The dry bulb temperature and relative humidity thus contributed to circadian rhythmicity in the physiological responses in rams. While seasonal and circadian variations were significant ($p<0.05$) within a breed, the breed wise variations were mostly absent. This leads us to conclude that the newly synthesized breed, Avishaan through introgression of the prolific Booroola gene (FecB^{BB}) over the past decade has progressed towards stabilization in the semi-arid subtropical region. Assessment of diurnal activities (06.00 and 14.00h) of circulatory enzymes resulted in significant ($p<0.05$) yet variable differences (between both breed as well seasons) for creatine kinase, gamma glutamyl transferase, lactate dehydrogenase. Therefore further assessment of circulatory and cellular markers of stress are necessitated in order to confirm the adaptability of Avishaan breed to the semi-arid climate as is the native Malpura breed of sheep.

Keywords: Rams, physiological responses, circadian rhythmicity, thermal tolerance, adaptability semi-arid climate.

Biography:

Dr. Vijay Kumar is Principal Scientist (Animal Physiology) at ICAR-Central Sheep and Wool Research Institute (ICAR-CSWRI), Avikanagar (Rajasthan). He completed B. Sc. (Hons) B.Ed from Regional College of Education (NCER&T) Ajmer before obtaining his masters and doctoral degree from National Dairy Research Institute (Deemed University), Karnal. He has served as ARS Scientist since 1999 at ICAR-National Institute of Animal Nutrition and Physiology, Bangalore and ICAR-National Research Centre on Equines, Hisar (Regional Station, Bikaner) before joining at ICAR-CSWRI in 2017. He has also been to Department of Agriculture, Forests, Nature and Energy, University of Tuscia, Viterbo, Italy for NAIP sponsored International Training (Animal Science). He has conducted specialized research on Environmental Stress, Exercise, and Reproductive Physiology of various livestock species with several International and National Research publications to his credit.

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Oral

Molecular dissection of sheath blight tolerance in Rice (*Oryza sativa* L.)

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Abstract:

Rice sheath blight (ShB) disease, caused by the fungal pathogen *Rhizoctonia solani* (Kuhn) AG1-IA, is one of the devastating diseases and causes severe yield loss all over the world. No complete resistant germplasm is reported till now, and as a result, the progress in resistance breeding is not up to the satisfaction. Even, the mechanism of resistance against sheath blight is yet to be understood clearly. The most recent report of Samal et al. (2022) clearly indicated that the regulatory and signaling pathways play pivotal role in host-pathogen (*Rice-R. solani*) interaction. In this study, a new ShB tolerant rice genotype CR 1014 has been identified out of 200 rice genotypes screened against a virulent strain of R. solani. Further, CR 1014 has been used for both transcriptomics and proteomics study to understand the mechanism underlying resistance against sheath blight disease. The result showed that the ability to upregulate genes for glycosyl hydrolase, secondary metabolite biosynthesis, cytoskeleton and membrane integrity, the glycolytic pathway, and maintaining photosynthesis make CR 1014 a superior performer in resisting the ShB pathogen. The DEGs were validated through quantitative real time PCR. For the first time, the present study revealed the basis of ShB tolerance in the germplasm CR 1014 and should prove to be particularly valuable in understanding molecular response to ShB infection. The knowledge could be utilized to devise strategies to manage the disease better and also the genotype can be used in resistance breeding for developing ShB resistant variety.

Keywords: Rice, Transcriptomics, Proteomics, Differential gene expression, qRT PCR

Biography:

Dr. Pankajini has recently completed her Ph.D. in Biotechnology at Utkal University, Odisha, India. She is working as a Senior research fellow at ICAR-National Rice Research Institute, India with Dr. Arup Kumar Mukherjee and Dr. Meera Kumari Kar. During her dissertation, she has identified a novel source of resistance to Sheath Blight disease of rice caused by *Rhizoctonia solani,* and further it was used for studying the mechanism of resistance using the transcriptomics approach. She has also identified a sheath blight-resistant QTL *qShB-1.1* by using a biparental mapping population of sheath blight susceptible and resistant parents. One major part of her thesis work was to understand the host-pathogen interaction between *Rhizoctonia solani* and rice using comparative transcriptomics and proteomics approaches. She has used a high-yielding but susceptible to sheath blight disease as one genotype and a newly identified source of resistance as another genotype for comparing them at mRNA and protein levels.

Research Interest: Plant Biotechnology, Molecular Plant Pathology, Genetics and Plant Breeding

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Oral

Seed biopriming of endophytic fungi isolated from wild rice enhances growth promotion and disease resistance in rice crop

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Abstract:

Endophytes are usually describing the harmless microorganisms which live inside the plant parts (tissue).Their informal association and beneficiary activities towards their plant partners have stemmed in them giving to a high range of plant growth benefits and biomass accumulation as self-control to biotic and abiotic stresses, as nutrient assets and as role in controlling plant pest management is highly appreciable. The main aim to choose endophytes is rapid increase in the cost of synthetic fertilizers and their negative impact on both human and environment along-with frequent precipitationwhich damage the soil fertility. From different research analysis, investigation explained that the wild rice species are the major sources of different economically important traits like resistant to biotic stresses, tolerant to abiotic stresses, might stand in way of that endophytes may hold for crop improvement and can fulfil some of ourimportant bottlenecks which are still unresolved. Hence, current research focussed on the endophytic fungus isolated from wild rice species only such as *Oryza granulate, Oryza latifolia,Oryza rufipogon*, *Oryza nivara*, *Oryza barthii*, *Oryza fficinalis,Oryza rufipogon,Oryza grandiglumis* etc.used for studying the growth promotion and numerous facades of the endophyte-plant implication for their beneficial bid in the disease control mechanism.

In the current investigation, isolation and molecular characterization of entophytic fungus was done from different plant parts of wild rice. The antagonism properties of this identified endophytic fungus were examined against different rice diseases under both in vitro and in vivo conditions. The current investigations aim towards the growth promotion of rice crops both in in vitro and in vivo condition for the better health management of rice crops. The endophytic fungi characterised on the basis of their morphological and molecular characters. Antagonistic activity was performed against Rhizoctonia solani, Sclerotium oryzae, Sclerotium rolfsii and Sclerotium delphinii. In vitro and In vivo experiment was carried out with the best entophytic fungus to study the growth promotion and defense mechanism in different rice varieties. Different agronomical parameters were also statistically analysed. So, may it can be possible that the entophytes might be a substitute for better health management of rice crops which is completely environment friendly.

Biography:

Rupalin Jena is currently working as a PhD. Scholar under principal scientist Dr. Arup Ku. Mukherjee at ICAR NRRI, Cuttack as DST Inspire Fellow. She is doing her research on Endophytic Fungus isolated from wild rice species. She did her M.Sc degree from Annamalai University. She loves to do research and involve with new and interesting technology and always wants to develop her skills.

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Oral

Selection of sex-limited breeds of cocoon colour of silkworm, *Bombyx mori* L. for field trials based on nutritional indices

Madhavi Kasa, J.Seetharamulu, P. J Raju and Anitha Mamillapalli
GITAM University, Visakhapatnam , India

Abstract:

Silkworm,Bombyx mori L. is an monophagous insect which solely feeds on mulberry leaves and converts it to valuable silk which is economically important. Sex-limited breeds for cocoon colors are advantageous for egg production in grainages. In the present study, an attempt was made to study the importance of nutritional indices on the growth parameters for the selection of sex-limited breeds for cocoon colour. The fifth instar silkworm larvae of selected breeds were reared under standard rearing conditions up to spinning. Five replications were maintained. In case of sex-limited breeds 25 Male and 25 female were selected and in other breeds 50 larvae were selected randomly and kept as control. The nutritional indices like consumption index, approximate digestibility, efficiency of conversion of digested food were studied for the selected breeds on day six of 5th instar larval stage. The results of the study show differences in consumption index and approximate digestibility among the breeds. A positive correlation was found between nutritional indices and larval growth. Field level trials were initiated based on the nutritionally efficient sex limited breed.

Biography:

K. Madhavi did her M.Sc Biotechnology at City College, University of Bangalore, Bangalore and present she has been pursuing her Ph.D at Dept. of Biotechnology, GITAM Deemed to be University, Visakhapatnam. She has worked as a Project Fellow at Andhra Pradesh State Sericulture Research and Development Institute (APSSRDI), Kirikera, Hindupur under various Research projects funded by Dept. of Biotechnology (DBT), Biotechnology Industry Research Assistance Council (BIRAC) during 2013 to 2022. During her tenure at APSSRDI she involved in the development of sex-limited silkworm breeds for cocoon colour, involved in maintenance of silkworm Germplasm and Mulberry Garden management.

Research Interest: Silkworm Breeding and Genetics, Microbiology and Biotechnolgy.

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Oral

Transcriptome Analysis of Thermotolerant Bivoltine Silkworm Breeds of *Bombyx mori* L

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Andhra Pradesh State Sericulture Research and Development Institute, Kirikera, India
GITAM University, Visakhapatnam, India

Abstract:

In India, tropical climate is suitable for sericulture.However, at higher temperature the bivoltine cocoon production reduces significantly. It is important to evaluate the thermal tolerance of some of the better performing silkworm varieties that can be used for rearing at higher temperature.Silkworm breeds at high temperature 34±1°C and low relative humidity of 50 ± 5 % were reared from brushing to spinning which resulted in the selection of eight best performed breeds based on the survival rate at higher temperature. Transcriptomic analysis was performed for the shortlisted eight breeds. Results showed that genes of heat shock proteins (HSPs)are spread over the entire genome and 2250 genes were found to be differentially expressed. Small HSP genes showed greater variation in expression when compared to HSP70. The potential breeds which have better thermal tolerance that can be taken for field trials were identified in the current study.

Key words: Silkworm, Transcriptomic, thermal tolerance, *Bombyx mori*.

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Oral

Antioxidant activity, phytochemical composition, and gene-specific molecular phylogeny of plant species in the *Cactaceae* family

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Abstract:

Herbal treatments have gained appeal in part due to the reduced likelihood of adverse side effects. Traditionally, numerous illnesses have been treated with thousands of different herbs. Cactacea species are among the most important medicinal plants utilised in a range of medical systems. In conventional medicine, *cactacea*, including the Ayurveda medical system, have been utilised. Despite the fact that there are multiple indications for its use, controlled trials are necessary to determine its efficacy. The antibacterial activity of an aqueous extract of Ferocactus acanthodes was evaluated using the agar-well diffusion method against four clinically isolated strains of Staphylococcus aureus (MTCC 96), Escherichia coli (MTCC 443), Pseudomonas aeruginosa (MTCC 424), and Staphylococcus coagulase (-ve). Although the cactus's aqueous extract had no substantial antibacterial activity, other species of Ferocactus demonstrated robust antibacterial activity. Since species of the same family, i.e., Ferocactus, have demonstrated great results in terms of antibacterial action, it is necessary to conduct additional genomic research in order to determine which gene sequence is responsible for the aforementioned findings. Keeping these species as controls, genomic research will be conducted to discover the source of the discrepancy in gene sequence.

Biography:

Sheerin Bashar has pursued her graduation in Biochemistry from Calcutta University and completed her Post-Graduation in Forensic Science (Specialized in Forensic Biology) from Centurion University of Technology and Management. Sheerin is researching on plant genomes, specifically the Cactacea family, as she pursues her PhD in Applied Sciences at Centurion University of Technology and Management.

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Oral

Innovations to improve rice crop health for sustainable small-holder farming

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Abstract:

Around the world, it is estimated that there are about 500 million farms less than two hectares in size. These smallholder farms operate on ~12% of the world's agricultural land and produce around 80% of the food that is consumed in Asia and sub-Saharan Africa, parts of the world where food security and stable income are still inadequate. Rice is a crop that fulfills the caloric needs of half of the world population and most of them comes from these regions. Rice farming community faces a lot of challenges during crop cultivation including many biotic and abiotic stresses that cause huge economic loss annually. Among them brown plant hopper, bacterial leaf blight and submergence are most devastating stresses accounting ~20% annual loss of rice production. With the aim of having in-built protection in rice against these stresses, we developed rice hybrids by incorporating native traits for strong resistance/tolerance to help smallholder rice farmers by protecting their yield in a sustainable way. We explored pathogen variability based on population genomics and identified effective genetics for resistance/tolerance for target traits and then integrated them to develop multi-trait rice hybrids suitable for target geographies. Developed cultivars vigorously tested and deployed in Asia and are providing big relief to small-holder rice farming. With these innovations we are confident of delighting our farming community and making significant contribution towards realizing our vision "Health for All, Hunger for None".

Keywords: rice, resistance, virulence, genomics, pathogen

Biography:

Dr. Deo Mishra currently leading APAC Plant Health Risk Assessment activities at Bayer CropScience, R & D Division, Hyderabad, India. He obtained Ph.D. in Plant Pathology in 2002 from GB Pant University of Agriculture and Technology, India. During last 20 years, research focus of Dr Mishra has been to tackle major biotic stress challenges primarily in rice-bacterial blight (Xanthomonas oryzae pv. oryzae) patho-system, by investigating pathogen virulence shifts and new race evolution with respect to the deployment of resistance genetics. His studies integrated physiological, molecular, and genomic approaches along with laboratory and field experimentation to identify sources of long-lasting, broad-spectrum disease/insect resistance in rice, allowing for the development of customer-designed sustainable solutions for small-holder farmers in Asia. This resulted into development of rice hybrids resistant to Bacterial Leaf Blight (BLB) and Brown plant hopper (BPH), those are currently being grown in >4-million-acre area across Asia.

Research Interest: Microbial genomics, host plant resistance, tailored solutions

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Oral

Economic Grasses of India: An overview

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Abstract:

The family *Poaceae* is the largest family in the Indian flora, being represented by about 1760 taxa (309 Genera) followed by Leguminosae 1292 taxa (176 Genera), *Orchidaceae* 1270 taxa (155 Genera), Asteraceae 1171 taxa (193 Genera), Rubiaceae 635 taxa (101 Genera) and Cyperaceae 609 taxa (32 Genera) respectively. Among 1760 taxa, 425 taxa (108 Genera) are endemic to India. India is one of the 17 mega biodiversity countries in the world and Poaceae plays a major role to conserve biodiversity. The economic uses of plants are varied and the scope for improvement to meet man's ever-increasing needs is immense. The primary needs of mankind are food, clothing and shelter. However, grasses are an important source of food for human beings (cereals, essential oils, flavoring agents, millets and sugar) and animals (seeds and fodder). All cereals and millets are rich in starch, contain vitamins A, B and C and minerals. About 300 taxa of grasses are recorded as in economic use in any form. Among the important food crops of India, cereals take up about 60% of the total area under cultivation, pulses about 18% and oil-yielding plants about 8%. Other than the food, they also have an economic, ecological and medicinal significance. Conservation of the gene pool of wild relatives of edible grasses is very important for breeding programs and genetic engineering for increasing populations. India harbours many types of grasslands, which are the ideal habitats for various species of plants and animals.

Keywords: Cereals, Fodder, Grasses, India, Millets, Poaceae

Biography:

Dr. Nagaraju Siddabathula working as a Botanist at Botanical Survey of India, Headquarters, Kolkata, since 2013. After obtaining the undergraduate degree in science from Andhra University, Visakhapatnam in 2003, worked as a Multipurpose Extension Officer in the Department of Agriculture, Govt. of Andhra Pradesh from July 2003 to September 2004. Later joined the Acharya Nagarjuna University at Guntur and obtained the Master's degree in Botany in 2007. Subsequently, joined as a Lecturer at Elite Junior College, Dubacherla, Andhra Pradesh in June 2007, and worked for an year till June 2008. I was selected as a Senior Research Fellow at Indian Institute of Oil Palm Research, Indian Council of Agricultural Research (ICAR-IIOPR), Pedavegi, Andhra Pradesh in June 2008, and got appointed as a Research Associate in August 2009 and worked in the same capacity till August 2010. My research experience at ICAR-IIOPR was extremely beneficial to get appointed as a Seed Production Officer at Vibha Agrotech Limited, Hyderabad, where I worked from August 2010 to January 2013. Subsequently, joined as a Botanical Assistant at Central Botanical Laboratory of Botanical Survey of India (BSI), Howrah in March 2013, and got promoted as a Botanist (Gazetted B Officer) in 2022. During the past ten years of my service at BSI, I have successfully completed five Annual Action Research Projects dealing with subjects such as flora of biosphere reserve, tiger reserve, sacred groves, ethnobotany, non-detrimental finding of endemic and threatened plant species and exclusive taxonomic studies on grasses of southern India. I have undergone training programmes on Geospatial Technologies and Applications and Application of Remote Sensing and GIS in Forest Resource Management conducted by Indian Space Research Organisation, Hyderabad and Forest Research Institute, Dehra Dun, respectively, and also attended a workshop on Botanical Art held at Eastern Regional Centre of Botanical Survey of India, Shillong. I have also qualified ASRB (ICAR)–NET (Economic Botany and Plant Genetic Resources) and Andhra Pradesh Teacher Eligibility Test. He has published 45 research articles in various national and international peer-reviewed journals so far, which includes discovery of 8 plant species new to science. *Besides, I have authored one book chapter and two books, "Grass Genera of Southern India: A Pictorial Guide and Checklist" and "Grasses of Telangana" and for the first book the foreword was written by our former honourable Vice President of India, Shri Muppavarapu Venkaiah Naidu.*

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Oral

Special variability using GIS for soil properties in an Alfisol

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Abstract:

Digital soil maps showing the soil properties consistent with the landscape are required for site-specific management of plant nutrients, land use planning and process-based environmental modelling. We characterized the short-scale spatial heterogeneity of soil properties in an Alfisol in a tropical landscape of Gajapati, Odisha. The impact of different land-uses (paddy, vegetable and un-cultivated) was examined to assess the impact of cultivation activities on the variability of soil properties. Conditioned Latin hypercube sampling was used to collect 107 geo-referenced topsoil samples (0–30 cm) from the study area. Soil samples were analyzed for pH, EC, organic carbon (OC), available Nitrogen and texture. The spatial correlation between soil properties was analyzed by computing R software and subsequent fitting of theoretical model. Spatial distribution maps were developed using ordinary kriging. The range of soil properties, pH: 4.3–7.9; EC: 0.01–0.18 dS m−1 ; OC: 0.1–1.37%; available nitrogen 125-251 kg/ha; clay: 1.5–25% and sand: 59.1–84.4% and their coefficient of variations indicated a large variability in the study area. Electrical conductivity and pH showed a strong spatial correlation which was reflected by the cross-variogram close to the hull of the perfect correlation. Moreover, cross-variograms calculated for EC and Clay, Nitrogen and OC, and pH indicated weak positive spatial correlation between these properties. Investigated soil properties showed distinct spatial structures at different scales and magnitudes of strength. Our results will be useful for digital soil mapping, site specific management of soil properties, developing appropriate land use plans and quantifying anthropogenic impacts on the soil system.

Keywords: Soil properties, soil map, alfisol

Biography:

Dr. Adhikary, Dr. Pal and Dr. Pholane are working as Assistant Professor in department of Soil Science under M.S Swaminathan School of Agriculture, CUTM, Odisha. They have vast experience in the nutrient management, soil conservation and digital soil mapping using GIS software. In just 5 years published more than 50 research papers and 2 patents.

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Oral

Effect of postharvest treatemnts on custard apple (*Annona Squamosa* L.)

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Abstract:

A Laboratory experimental study entitled "Effect of Postharvest treatments on custard apple was conducted in the laboratory of the Dept. of Fruit Science and Horticulture Technology, framed in complete Randomized Design (CRD) with three replication. Custard apple fruits were harvested at physiological stage of maturity. Fruits were washed, graded and dried under fan. After that fruits were treated with various concentrations of post harvest chemicals viz., CaCl2 @1%, @2%, @4%, sodium Benzoate @0.05% , @0.1%, @0.15%, Ascorbic acid @0.05%, @0.1% , @0.15% and wrapped inside cling film with KMnO4 soaked chalk. The result emerged out after 4 days of storage condition indicates that CaCl2 @4% show high percentage of marketability (73.33%), less spoilage (13.33%), highest ripening percentage (73.33%) and loss of physiological weight (33.5%) at the end of 4th day of storage. Highest total sugar (26.61%) and TSS (27.830BRIX) recorded in sodium benzoate @ 0.5% highest ascorbic acid recorded in CaCl2 @ 2% (i.e 50.12 mg/100ml pulp). Highest titrable acidity recorded in ascorbic acid @ 0.05% (i.e 29%). During the storage of custard apple fruit, the TSS, total sugar, reducing sugar increased significantly while non-reducing sugar, ascorbic acid, titrable acidity decreased , At the end of the experiment all treatment showed extened shelf life upto 4 days and maintain quality of custard apple fruit during storage, but CaCl2 @ 4% is the best among all in retention of postharvest qualities with score point 8.6 in overall acceptability.

Biography:

Sujata Chhatria an agriculture graduated from OUAT, BBSR in the year 2015. After that she had persuade her Msc , in Fruit & Post Harvest technology from the same institute.Its been almost 5years she is working as Assistant Agriculture Officer in Kalampur block of Kalahandi district, Now she is discharging her duties in bolangir block, After working in field level she has observed that farmers are facing lots of postharvest losses as the production is high and to keep that produce in storage condition is not strengthen yet. Most fruit and vegetable crops are affected by it. Which leads to distress sale and fetch very low price.So, it's the responsibility of the young scholar to study the genuine problem technically and brings the solutions in form of their research work. I She tried her best in her research to extend the selflife which is one of the process to mitigate postharvest loses.

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Oral

Effects of organic manures on the development, nutritional content, and biochemical activity of three Odisha species of *Curcuma*

B Jyotirmayee and Gyanranjan Mahalik
Centurion University of Technology and Management, Bhubaneswar, India

Abstract:

Biological fertilizers and herbicides derived chiefly from animal and plant wastes and nitrogen-fixing cover crops are utilized in organic agriculture. Modern organic farming emerged in response to the environmental damage caused by conventional agriculture's use of chemical pesticides and synthetic fertilizers. Studies on the antimicrobial properties of plants have evolved from multidisciplinary investigations to include more targeted studies into certain aspects of phytochemical data. The study's primary goal is to compare the antimicrobial and biochemical activities of three different Curcuma species, i.e., Turmeric, mango ginger, and East Indian arrowroot cultivated organically, to those of the same species grown conventionally. These three Curcuma rhizomes have been used for centuries in Ayurvedic and other alternative medicine due to their many documented health benefits. The rhizome has the potential for more effective principles to be synthesized, leading to the development of pharmaceutical molecules with positive health effects. Different parts of these plants exhibit various biological actions, including antioxidant, antiallergic, antibacterial, cytotoxic, anti-inflammatory, and hypotriglyceridemic effects. Research into medicine's molecular, phytochemical, and pharmacological impacts helps expand the knowledge of drug interactions and dietary needs. Using organic manures, three Curcuma species in Odisha were studied to see how their growth, nutrient content, and biochemical activity were affected. The results indicate that plants grown in organic soil outperform those cultivated in conventional soil in terms of growth, nutrient content, antibacterial activity, and yield. Organic fertilizer profoundly affects the morphological, physiological, and biochemical performance of three species of Curcuma. Thus, organic agricultural methods should be utilized for enhanced development, harvest, improved health, and new medication production.

Keywords: Fertilizers, Curcuma, Phytochemical, Biochemical, Pharmaceutical, Organic

Biography:

B Jyotirmayee currently pursuing PhD under the guidance of Dr. Gyanranjan Mahalik, Associate professor, Department of Botany, School of Applied Sciences, Centurion University of Technology and Management, Bhubaneswar, Odisha. I have completed M. Sc and Mphil from the Ramadevi Women's University. Her research interest is microbiological area, pharmacological activities and drug design. The mentioned work is a small portion of my PhD work with future works in the field of effective antimicrobial study.

Research Interest: Microbiology, Plant Pharmacological activity, Drug design.

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Oral

Allelopathic effect of aqueous extract of *Mikania micrantha* Kunth on seed germination and seedling growth of *Macrotyloma uniflorum* Lam.

Ipsita Priyadarsini Samal and Gyanranjan Mahalik
Centurion University of Technology and Management, Bhubaneswar, India

Abstract:

Allelopathy refers to the beneficial or harmful effects of one plant on another plant from the release of biochemical known as allelochemicals. The weeds are very common, dominant, and spread in any crop fields. These are unwanted, undesirable and plant that compete with cultivated crop for water, nutrient and sunlight and another several reasons such as high growth rate, high reproductive rate and produce harmful or beneficial allelopathical effect of cultivated crop. Yield loss due to weeds is one of several reasons for developing countries' poor economies. The effects of one such weed i.e. *Mikania micrantha*, on the rate of seed germination, growth, biomass, photosynthetic pigments, total soluble protein, phenolics, and proline content of *Macrotylama uniflorum* leaves were studied. Control and four concentrations (10 mg/ml, 50 mg/ml, 100 mg/ml, and 200 mg/ml) of M. micrantha aqueous leaf extracts were tested on M. uniflorum seeds in a completely randomised setup. Germination, growth, biomass, chlorophyll, carotenoid, and protein content were all inhibited by the extracts. At 200 mg/ml, the protein content of *M. uniflorum* decreased to 8.48 mg/g. Similarly, as the concentration of weed extracts increased, shoot length and root length decreased up to 5.11 cm and 0.85 cm, respectively, while water content increased. The leaf extracts increased the crop plant's phenolics (19.66 mg) and proline (24.49 mg) content. The preliminary study found that weed plant aqueous leaf extracts had a negative or detrimental effect on plant growth and physiology, which could be attributed to the release of secondary metabolites. The current study may lead to the identification of specific secondary metabolites or allelo-chemicals that may have important agricultural applications for sustainability and may improve crop protection against a variety of other harmful plants.

Keywords: Allelopathy, seed germination, total soluble protein, phenolics, proline content, allelo-chemicals

Biography:

Ipsita priyadarsini Samal is now working as a Full time PhD Scholar under the supervision of Dr. Gyanranjan Mahalik, Associate Professor, Department of Botany, School of Applied Sciences, Centurion University of Technology and Management, Bhubaneswar. I have completed my bachelor's degree from Utkal University and Master's degree from Department of Botany, Centurion University of Technology and Management. The mentioned work is a small part of my PhD Programme with future works in the field of agriculture.

Research interest- Allelopathic study, Taxonomy, Tissue culture Techniques

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Oral

Rhizosphere: Role of Rhizodeposits in Plant- Plant/Microbe interactions

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Abstract:

Without healthy soils, we won't have healthy plants or food. Above 95% of our food comes from soils and healthy soils contain most of the essential elements that plants necessitate to be healthy and productive. Plant growth and development depend on cell division, cell elongation, and cell differentiation; these activities switch over by specific vital chemical molecules which are lifted from the rhizosphere through the plant root system. In the growth stage, plants produce sugars into the soil termed as rhizodeposits they make through photosynthesis, which influence microbial activity and creating a healthy soil natural ecosystem by altering soil physicochemical properties at the rhizosphere. On other hand, soil microbes such as free living beneficial fungi (FLBF), plant growth promoting rhizobacteria (PGPR) can trigger plant immunity, growth, and developmental processes directly or indirectly. These mutualistic interactions between the two partners were responsible for several transformations in the rhizosphere such as soil organic carbon sequestration, ecosystem functioning, building up plant nutritional hot spots and cycling. In this review, we discussed recent developments on plant root exudates and their communication with rhizospheric microbes in a beneficial way. This sound knowledge on plant-microbes interactions could leads to improvement of novel agricultural applications.

Keywords: Rhizosphere, Free Living Beneficial Fungi (FLBF), Plant Growth Promoting Rhizobacteria (PGPR), Soil Organic Carbon (SOC)

Biography:

Dr. M. Muni Raja, Project Executive (PE), APCNF-RySS, Guntur, Andhra Pradesh, India. He has completed his Ph.D. in the field of Life Sciences (Botany) entitled "Anther wall differentiation, microsporogenesis, microgametogenesis and pollen biology of Mango (Mangifera indica L.)" under the guidance of Prof. P. S. Sha Valli Khan, Department of Botany, Yogi Vemana University, Kadapa during August 2014 to July 2019. This research work was generously supported by University Grants Commission (UGC), New Delhi. My research work has been done in the broad area of Plant Reproductive Biology, Plant Tissue Culture, and Plant Physiology of flowering plants. My research accomplishments were published in international peer-reviewed journals as the first author.

Research Interest: Plant Reproductive Biology, Plant Physiology, and Natural Farming

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Oral

Many paths to one goal: Identifying integrated rice root phenotypic and anatomical traits for diverse water stress environments

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Abstract:

Water stress is a major source of yield loss in rice (Oryza sativa L.) production and cultivars that maintain yield under water stress across environments and water stress scenarios are urgently needed. Rice (*Oryza sativa* L.) roots play important role in the absorption of water, nutrients, and also in stress tolerance such as desiccation, salt and water stress. The root's anatomical and histological features showed large xylem vessels and reduced aerenchyma formation in resistant genotypes under water stress. Root phenotypic traits directly affect water interception and uptake, so plants with root systems optimized for water uptake under water stress would likely exhibit reduced grain yield loss. Deeper nodal roots with smaller root diameter and/ or reduced aerenchyma and that transport water efficiently through smaller diameter metaxylem vessels may be beneficial during water stress.

A set of 20 genotypes were grown in cemented tanks under water stress to assess different shoot and root phenotypic traits. Shoot and root phenotypic traits in response to water stress varied with genotype and environment. The best-performing genotypes in the cemented tanks had less plasticity of living tissue area in nodal roots than the worst performing genotypes. The ratio of aerenchyma formed in water-stressed roots was 49.34% lower than the constitutive aerenchyma formed in well-watered roots. Among the genotypes, the aerenchyma cell formation was lowest in AMPI and AC 42997 helping to enhanced water uptake efficiency under stress compared to IR-64 (susceptible check). These results reflect how some root morphological and anatomical traits work in concert as integrated phenotypes to influence the performance of plant under water stress. Multiple integrated root phenotypes are therefore recommended to be selected in breeding programs for improving rice yield across diverse environments and water stress scenarios.

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Oral

RNAi toxicity assays confirmed *HvSar1* to be a novel molecular target for *Henosepilachna vigintioctopunctata* control

Satyabrata Nanda
Centurion University of Technology and Management, Paralakhemundi, India

Abstract:

The coat protein II (COPII) complex is a class of coated vesicles that are crucial for protein transport in insects regulating growth and development. In this study, one of the COPII genes, HvSar1 was selected to investigate the RNA interference (RNAi)-mediated silencing effects on the solanaceous crop pest Hadda beetle or potato ladybird (*Henosepilachna vigintioctopunctata*). To administrate the double-stranded (ds) RNA targeting HvSar1, the dietary RNAi or oral feeding technique was implemented. The RNAi results revealed that silencing of HvSar1 had a significant lethal effect on the 1st and 3rd instars of H. *vigintioctopunctata*. Additionally, the oral feedings of the bacterially-expressed dsHvSar1 resulted in high mortality and impaired the feedings in the larvae and adults of the Hadda beetles. More importantly, the use of dsHvSar1 onto the phylogenetically closely related species Propylaea japonica for evaluating the non-target effects ensured its safety and specificity. In P. japonica, administration of the dsRNAs caused no transcriptional or organismal adverse effects. Moreover, the findings of this study suggest that HvSar1 could be used as a promising molecular target for the RNAi-biopesticide-mediated control of Hadda beetle.

Keywords: RNAi, Hadda beetle, COPII proteins, Molecular target, Pest control

Biography:

Dr. Satyabrata Nanda is currently heading the Department of Biotechnology, at MS Swaminathan School of Agriculture, Centurion University, Odisha. He has a Ph.D. in Biotechnology with a specialization in Plant Protection and an Overseas Postdoctoral experience from China National Rice Research Institute. His research is primarily focused on plant protection by using functional genomics and targeted genome engineering. He has received grants from different funding agencies, including the Science and Engineering Research Board, Postdoctoral Science Foundation of China, and Zhejiang Provincial Grant, and honors, such as "Young Scientist Award", "Certificate of Excellence", and "Eminent Achiever Award" for his research excellence. He has published more than 50 articles in several journals of international repute.

Research Interest: Plant Protection, Functional Genomics, Genome Engineering

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Oral

A Purview of *Ganoderma lucidum*: The magical Mushroom

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Abstract:

Macro fungi have been associated with many civilizations as one of the most nutritionally rich medicinally valued floral component used from time immemorial. Tropical forests has rich wealth of mushroom species. Besides their global distribution, mankind has always been sceptical about its use. Traditionally used species have been very much restricted to few commercial species as the uses of many are presently unknown. Mushrooms possess yet to untapped source of powerful pharmaceutical products. As most of them are collected from wild, the habitat destruction, global warming and deforestation are the major causes for mushroom resource depletion. The mushroom of immortality, Ganoderma lucidum is used in many asian countries. This polypore fungi is a well known asian herbal remedy with many majestic applications. Its fondly regarded as the most commercially and pharmacologically exploited mushroom with billion dollar market. Active principles of this species is used in improving several vital functions. In the present pandemic times we need to consume nutrient rich sustainable products which even the rural populations can afford. Ganodema lucidum is such a wonderful mushroom with promising future.

Key words: Ganoderma lucidum, Traditional uses, medicinal property, conservation

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Oral

Integrated nutrient management in Sunflower (*Helianthus annus* L.) under southern Odisha conditions

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Abstract:

A field experiment was carried out at, M.S. Swaminathan School of Agriculture, Paralakhemundi, Gajapati District, Odisha in sandy clayey loam soil during *rabi* season of the year 2021-2022 with a view to study the Integrated nutrient management in Sunflower (*Helianthus annus* L.) under southern Odisha conditions. The experiment followed Randomized Block Design (RBD) with 10 treatments in combination of organic and inorganic sources in triplicate *viz*. T_1: 100% RDF, T_2: 75% RDF + 25% RDF from FYM, T_3: 75% RDF + 25% RDF from FYM + *Azospirillum*, T_4: 75% RDF + 25% RDF from FYM + *Azospirillum* + PSB, T_5: 50% RDF + 50% RDF from FYM, T_6: 50% RDF + 50% RDF from FYM + *Azospirillum*, T_7: 50% RDF + 50% RDF from FYM + *Azospirillum* + PSB, T_8: 25% RDF + 75% RDF from FYM, T_9: 25% RDF + 75% RDF from FYM + *Azospirillum* and T_{10}: 25% RDF + 75% RDF from FYM + *Azospirillum* + PSB. The results revealed that seed yield, stover yield, growth and yield attributing character of *Helianthus annus* were significantly influenced ($p<0.05$) due to integrated nutrient management. Treatment T_4 consistently gained superior plant height of 95.8 cm, 138.4 cm and 153.2 cm at 60, 90 DAS and day of harvest, respectively. Significantly the higher seed yield (1802 kg ha^{-1}) and stover yield (3293 kg ha^{-1}) was recorded under the T_4, which was at par with treatments T_3, T_7, T_6. It can be concluded that application of 75% RDF from chemical fertilizers along with 25% RDF from FYM in combination with *Azospirillum* and PSB, improved growth, yield attributes and net realization in sunflower crop cultivated under southern Odisha conditions.

Keywords: Helianthus annus, sunflower, nutrient management.

Biography:

Dr. Rajesh Shriram Kalasare, currently working as Associate Professor Department of Agronomy, M. S. Swaminathan School of Agriculture, Centurion University of Technology and Management, Paralakhemundi, Odisha. My research area is on Integrated Nutrient Management, Intercropping and Weed Management. I am associated with teaching of B.Sc. Ag. , M.Sc. Ag. and Ph.D. Students. He is also handling In-charge of PG Experimental Farm, M. S. Swaminathan School of Agriculture, my career motive is to help the farmers in increasing their income through farming and to minimize the cost of cultivation.

Research Interest: Weed Management, Nutrient Management, Intercropping

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Oral

Perception of Students toward RAWE (Rural Awareness Work Experience) Programme

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Abstract:

In India majority of people living in rural areas and dependents on agriculture. Development cannot be possible without strengthening the socio-economic condition of farming community in rural area. The rural work experience is basic for developing a graduate's competence in functioning as an effective key communicator, teacher, researcher and extension professional in the transfer of technology to rural area. Agricultural education is an important tool in ensuring increased agricultural productivity, sustainability, environmental and ecological security, livelihood security, profitability, job security and equity. RAWE (Rural Awareness Work Experience) program was introduced in the Agricultural Universities and offered in final year of the B.Sc. (Hons.) Agriculture degree programme which includes rapport building, training, demonstration, observation, practice and participation in purposeful activities and to orient agricultural graduates for participation in various rural and agricultural developmental programme. Agricultural Graduates are exposed to learn the knowledge and skills by staying with host farmers in the village. This study about RAWE was conducted to study the perception and attitude of RAWE programme by the students. From study majority (>85.00 %) of the students were strongly agreed that RAWE programme had helped to get familiar with rural people followed by RAWE had helped to understand village situations (>80.00 %). This programme has gained much importance among the farmers and extension workers as RAWE has helped to strengthen the linkage mechanism among technology generation and dissemination process. This help to the undergraduate students to have thorough understanding of rural scenario and problems encountered in adoption of technologies besides practicing PRA tools.

Key words: RAWE, perception, graduates, extension workers, rural area

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Oral

Management of integrated nutrient in laterite soil for enhancing nutritional quality and yield of rice

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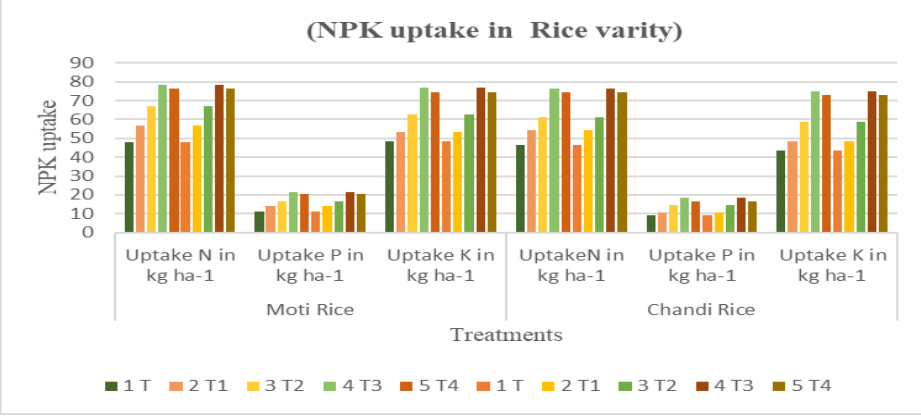
Abstract:

The present investigation was focus on the crop improvement of rice. Rice is an essential diet especially in the community of south-east India. The research was carried out by taking different treatments laterite soil (LS) in the research laboratory of Centurion University of Technology and Management, Bhubaneswar, Odisha. The treatments tested were T1-LS(1kg)+Green manure(GM)100%, T2- LS(1kg) at incorporation with GM(50%) +inorganic fertilizer(50%) of 1 kg, T3-Vermicompost (50%) at incorporation with (GM) 50% + LS(1kg), T4-Vermicompost obtained from industrial waste (50%) at incorporation with (GM) 50% + LS(1kg) and T- 100% LS. The result showed that the yield of rice (Oryza sativa) varieties Moti was more as compared to Chandi with specific to all treatments and these from the nearby village in Jatni, Odisha. It was observed that the N uptake varied from 47.80 to 78.65 kg ha-1, P from 11.24 to 21.68 kg ha-1 and K from 48.60 to 76.82 kg ha-1 was more in Moti as comparison to Chandi with N uptake varied from 46.60 to 76.44 kg ha-1, P from 9.21 to 18.64 kg ha-1 and K from 43.56 to 74.76 kg ha-1. The carbohydrate content in Moti rice grain varied from 70. 84 to 72.91 percent is more in comparison to Chandi rice grain varied from 68.77 to 70.61 percent. The application of vermicompost incorporation with GM into laterite was found more suitable treatment in respect to crop yield and nutritional quality of rice. However, it was also observed that the result of industrial waste vermicompost incorporation with GM in LS was approximate in NPK uptake with vermicompost incorporated GM soil and obtained with suitable result than inorganic fertilizer.

Keywords: Laterite soil, Green manure, Vermicompost, Industrial waste, inorganic fertilizer, Oryza sativa

Fig. Shown the uptake of NPK in Rice varity of Moti and Chandi



Biography:

Working as assistant professor in the department of Zoology, Centurion University of Technology & Management, Odisha, India. Experienced with teaching profession and research in the field of Biochemistry, Animal Physiology, Cell Biology. Research Interest: Biochemistry, Biotechnology, Environmental biology.

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Oral

Exploring the impact of vermicomposting on soil health and growth of *Triticum aestivum* L. under organic farming system

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Abstract:

Climate resilient agriculture (CRA) includes sustainable use of natural resources through crop production to attain long-term higher productivity and income from farm under variable climatic conditions. Though organic farming is criticized as low yielding system than the conventional system and is unable to meet the food demand of world's population still simultaneously it has positive impact on environment and on maintaining soil ecosystem including positive impact on human health. Therefore, consumer demand on organic products is increasing which encourages organic farming systems. This paper focuses on integrating organic farming particularly the use of organic compost in promoting soil health and wheat crop growth. In this study, vermi-compost and cow dung compost was applied to observe its impact on the growth of wheat (Triticum aestivum L.) crop under pot experiments. Pot containing normal soil was taken as control, soil: cow dung (2:1) and vermi-compost was applied in different proportions of soil and vermicompost (S: V) in 1:1, 2:1 and 4:1 ratio to evaluate the vegetative crop growth. For wheat crop, application of vermicompost (S: V with 2:1) in soil showed better result on crop growth than the cow dung compost (S: C with 2:1). Mineral contents of leaf were also analyzed by X-Ray Fluorescence (XRF) study and detected more in the leaves of wheat plant raised in S: V with (2:1) than the S:C (2:1) pots. Organic farming system can be used for superior nutritional qualities in comparison to conventional system.

Keywords: Crop growth; Triticum aestivum; mineral contents; organic farming; vermi- compost

Biography:

Associate Professor, Department of Botany, School of Applied Sciences, Centurion University of Technology and Management, Odisha, India.

Research Interest: Antimicrobial activity study, Drug discovery and standardization of herbal drugs, Integrated pest disease management and crop growth and productivity, Phytochemical analyses

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Oral

Response of rice cultivars to moisture stress

Priyadarsini Sanghamitra, Jyotirmayee Mishra, Swastideepa Sahoo, S Sabarinathan, Nabaneeta Basak, and Gaurav Kumar
ICAR-National Rice Research Institute, Cuttack, India

Abstract:

Moisture stress is the one of the major environmental factor affecting seed germination, crop growth and productivity (Thabet et al., 2018). Identifying promising genotypes at seed germination stage will help in breeding drought tolerant cultivars which can sustain the productivity by ensuring optimum plant stand in the field. Sixty rice genotypes were subjected to moisture stress by using polyethylene glycol (PEG 6000: 20%) to study the variability in responses to drought stress conditions at seed germination stage. Seed quality traits such as seed germination, speed of germination, seedling length, seed vigour index I,drought tolerance index were estimated. For all the traits, genotypes and temperature effect were significant. In control condition,all the genotypes had more than 80 % germination that ranged from 87.00 Kabokphou) - 98.54 % (Gondia champeisiali and Magra). At moisture stress, germination value ranged from 50.67(Kabokphou)-73.0 % (Magra). Average reduction of 33 % in germination value, 60 % in speed of germination ,68 % in seed ling length ,79 % reduction in seed vigour index was observed among the genotypes subjected to moisture stress condition. For all the traits lowest reduction in seed quality traits was observed in the genotype Magra with drought tolerance index of 74.03. A high correlation of germination and speed of germination with drought tolerance index was also observed. The genotype Magra could suitably be used for breeding varieties that can withstand moisture stress at germination stage.

Biography:

Dr. P.Sanghamitra has 20 years research experience in various field of research related to invitro conservation, evaluation of genetic purity based on isozyme/SSR matkers, morphological characterization and doccumentation of rice germplasm based on DUS characteristics.Involved in nucleus and breeder seed production of NRRI varieties. Evaluated of rice genotypes for various antioxidants such as total anthocyanin content,gamma oryzanols, total phenolics, total flavonoids and antioxidant activity. Phenotyped rice genotypes for seed dormancy, seed vigour traits based on physical/physiological/biochemical traits and mapped QTL associated with seed vigour which is reflected in research publications in national and international journal of repute.

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Oral

Pond sediment amended with Potassium enriched biochar enhances shrimp growth

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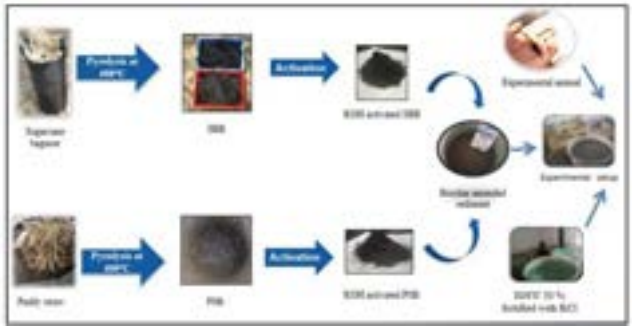
ICAR-Central Institute of Fisheries Education, Mumbai, India

Abstract:

A 45 days' experiment was conducted with *Penaeus vannamei* (2.74±0.03 g), stocked at 90 juveniles m-2 in 300L capacity FRP with sediment amended with potassium enriched biochar applied at the rate of 100g per 25 kg sediment to study the effect on growth and water quality in inland saline water deficient in potassium. Among different treatments T1, indicates paddy straw biochar (PSB) application in sediment; T2, sediment amended with KOH activated PSB; T3, sugarcane bagasse biochar (SBB) application in sediment and T4, sediment amended with KOH activated SBB, respectively. Compared to the control the potassium (K+), alkalinity, total hardness, calcium:magnesium ratio and pH of the water increased significantly (P≤ 0.05) in treatments where biochar was used as an amendment in sediment. In water, the magnitude of increase in K+ concentration from high to low followed the order; T2>T4>T1>T3>Control. The concentration of NH4+-N in water was found to be increasing in control, whereas in the rest of the treatments, it decreased significantly from day 1, till the end of the experiment. The SGR (2.38b±0.05 % day-1) and weight gain (%) in T2, and survival (96.1b±2.0 %) in T3 treatment were found to be the highest at the end of the experiment. Weight gain (%), specific growth rate (SGR), survival (%), and feed conversion ratio of *P. vannamei* differed significantly in T1, T2, T3, and T4 compared to the control. When biochar was mixed with sediment in the inland saline system, an improvement was seen in both the water quality and growth characteristics of *Penaeus vannamei*.

Keywords: Biochar, agro waste, shrimp , Inland Saline , Potassium



Biography:

Dr. (Mrs) Vidya Shree Bharti was born on 10th July in Bihar. She completed her BSc(Ag)Hons from B.C.K.V, Nadia, W. B, MSc (Soil Science) from G.B. P.U.A &T, Uttrakhand and Ph.D. from Indian Institute of Technology, Mumbai, India. She joined as a Scientist in the Indian Council of Agricultural Research on 27th June 2005. She published articles, book chapters, training manuals, and papers in National and International journals and guided 13 MFSc students and co-member in more than 20MFSc and PhD students. She is working in the area of soil-water management for aquaculture, biochar application in aquaculture, climate change study mainly carbon sequestration and greenhouse gas estimation and mitigation in aquaculture, pollutant remediation with biochar, remote sensing and GIS application and precision Aquaculture. She visited CSIRO environmental lab, Australia as visiting scientist in 2022. She had worked on 11 projects and was awarded Geomatrix 2012, the INRIA Best paper award at IIT, Mumbai in 2012, and the Japan society of photogrammetry and Remote sensing outstanding Paper Award in Bali Indonesia in 2013.

Research Interest: Biochar for aquaculture production, sediment health , water quality, climate change

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Oral

Research on the different kinds of sugar used in culinary products

Radhika Awasthi and Kahkashan Parvin
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Abstract:

Typically, sugar cane and sugar beet are used to make commercially produced sugar. Cane sugar and beet sugar are frequently utilized in the hotel industry, despite the fact that there are many different forms of sugars on the market. These are utilized due to their qualities and function in the creation of baking and confectionery goods. Data was gathered from cooks at various five-star hotels for this descriptive study piece. The type of sugar that is approved for use in recipes for confectionery and baking differs significantly, according to an alternative theory. According to the study, the majority of the sample prefers granular and icing sugar since these two types of sugar increase volume perfectly when used in cake creaming and caramelize gently and evenly when baked. During the preparation of confectionery products, icing sugar dissolves more quickly than other forms of sugar, and it can be used to garnish sweets.

Keywords: Confectioners' sugar, brown sugar, castor sugar, and food items

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Oral

The effects of high salinity on plasma steroid levels in common carp (*Cyprinus carpio*)

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Abstract:

The effect of various salinities on reproductive gonadal development and plasma steroid levels at regular interval of the experimental period were investigated. Fishes were stocked in eight rectangular earthen ponds in duplicate under four different salinities of 0, 5, 10 and 15 0/00. Changes in serum concentration of Cortisol, 17 β – Estradiol, Progesterone; 17α, 20β *Dihydroxyprogesterone & androgens* and gonadal histology in male and female common carp (Cyprinus carpio) were studied at different stages of gonadal maturity till spermiation or ovulation. Plasma steroid analysis showed significantly high levels in fish groups reared at 0 & 5 0/00 compared to 10 & 15 0/00. Significantly higher cortisol levels found during ovulation or spermiation at 10 & 15 0/00. The gonadal histological study of oocytes and testis revealed that C. carpio matures significantly at higher salinities but standardized the optimum salinity for culture at 5 $^{0}/_{00}$.

Keywords: Salinity; maturation; Gonadal steroids; *Cyprinus carpio*

Biography:

Ph.D. (Aquaculture) from ICAR- Central Institute of Fisheries Education-Panch Marg, Off Yari Road, Mumbai, India 400061. Masters in aquaculture from ICAR-CIFE, Mumbai and B.F.Sc. completed from KUFOS kerala. Currently working as Assistant Professor in CUTM.

Research Interest: Aquaculture, saline water, breeding, culture, biofloc, shrimp culture

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Oral

Genomic selection: An approach to fasten the breeding cycle

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[2]Agriculture University, Jodhpur, India
[3]Assam Agricultural University, Jorhat

Abstract:

Genomic selection is an approach for the future breeding to enhancing the genetic gain in crops plants, here added the molecular marker such as single nucleotide polymorphism (SNP), simple sequence repeats (SSR) etc., in the place of conventional phenotypic selection strategies for increasing the genetic gain. Genomic selection (GS) is more advantageous than marker assisted selection (MAS), marker assisted recurrent selection (MARS), association mapping (AM) because we can use the greater number of quantitative trait loci (QTLs) and also helps to early identification of the best individuals for selection. Unlike marker assisted backcrossing (MABC) or marker assisted recurrent selection (MARS), the genome wide selection (GWS) calculates the marker effects across the entire genome that explains entire phenotypic variation. The genome-wide marker data (marker loci or haplotypes) available or produced on the progeny lines, therefore, are used to calculate genomic estimated breeding values (GEBV). The integration of classical breeding methods with genomic tools would be helpful. Even with the new tools, genotyping methods must initially be adjusted to be consistent with phenotyping, a relatively laborious and costly step.

Keywords: Genomic selection, Genomic estimated breeding value, Marker assisted selection

Biography:

Awarded PhD in Plant Breeding and Genetics from Bihar Agricultural University Sabour Bhagalpur Bihar, M.Sc. (Ag) in Plant Breeding and Genetics from Assam Agricultural University Jorhat Assam and B.Sc. (Horticulture) from University of Horticultural Sciences NAVANAGAR Bagalkot Karnataka. He was awarded National Talent Scholarship from Indian Council of Agricultural Research New Delhi during my studies. He has a copyright for book entitled" Seed Technology A Competitive Approach" published by Kalyani Publishers New Delhi. He has several original research articles published in peer reviewed International and National journal. He has published several books chapters in edited book having ISBN number. He has attained several national and international seminars, conferences, workshops and training.

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Oral

Insects as food

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Abstract:

Nowadays, the population is rising significantly, which requires high intake of food. Hunger and malnutrition are a serious problem in the ever-expanding human population. With the high rate at which the world population is growing, the world food supply should grow at the same rate, if not faster. Entomophagy, the consumption of insects, is rooted in human evolutionary history. Insects have played an important part in the history of human nutrition in Africa, Europe, Asia, and Latin America. Over 1900 species of insects are known worldwide to be part of human diets; some important groups include grasshoppers, caterpillars, beetle grubs, wringed termites, bees, worms, ant brood, cicadas, and a variety of aquatic insects. Scientific research has shown that edible insects are a very rich source of proteins and other nutrients. Hence, insect consumption might help revolutionaries' food and feed insecurity and thus replace the conventional animal source. Insects have been in existence for at least 400 million years, making them among the earliest land animals. They diverged as members of one of the largest subphyla in arthropods more than 390 million years ago experiencing a rapid evolution and radiation that is considered faster than any other group. In order to meet this demand, country should allow edible insect recipes as part of the food.

On the other hand, few individuals argue that eating insects is not healthy. In Mexico, Peru & Thailand there is high willingness to consume insect products when compared to other countries & the price for the Insects products are also very high when compared to other products hence, we can see a trend here that as the demand for insect products are high the price is also high. Japan, Russia & India accounts for less willingness to consume insect products among all the other countries as their consumption is mainly meat products. Here as there is high demand for meat products in the above 3 countries but the prices of meat are less when compared to the insect products. Thus, one can conclude from the above chart that there is an inverse relationship between the demand & price of meat products but there is a direct relationship between the demand & price of insect products. Over 1900 species of edible insects in 300 ethnic groups in 113 countries worldwide have been recorded by various authors to be part of human diet.

Keywords: insect-protein, food, grubs, maggots

Biography:

Dr Manish K. Yadav, working as an Assistant Professor in the Department of Entomology, MSSSoA, CUTM Paralakhemundi. He is from Barabanki Uttar Pradesh. He has completed his PhD from Dr Rajendra Prasad Central Agricultural University Pusa Samastipur Bihar and worked on Host Plant Resistance field of Entomology.

Research Interest: HPR, Ecology, IPM, Bio-Control

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Oral

A survey on pest alert: Invasive thrips, *Thrips parvispinus* (Karny) threatening chilli cultivation in India

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[2]University of Agricultural Sciences, Dharwad, India
[3]Anand Agricultural University, Anand, India

Abstract:

In India, the thrips species, *Thrips parvispinus* (Karny) was first reported on *Carica papaya* L. (Caricaceae) in Bengaluru 2015. Survey of *T. parvispinus* (Karny) has been conducted in two states of India 2021 viz., Andhra Pradesh and Karnataka (Bengaluru, Bellary and Raichur Districts have been done. Vegetables and field crops reflecting the adaptability of this thrips to feed and breed in diverse agro-ecosystems. The thrips cause large scale shedding of flowers, malformation of fruits and fruit drop in chillies, leading to severe yield loss. Subsequently, diagnostic field surveys were undertaken in the infested fields which revealed the incidence of thrips on flowers in alarming proportions. About 90 to 95 per cent flowers were badly damaged by the thrips, and on an average, 18.20 thrips were recorded per flower. Serious damage was recorded in Andhra Pradesh and Karnataka on *Capsicum annuum*. The prime reason that farmers were unable to control this species after repeated application of insecticides.

In this context, establishment of *T. parvispinus* in different states of India demands a special attention as a major pest inflicting severe crop losses. Although not currently reported to be a vector of Tospoviruses, it may likely acquire viruliferous trait. Therefore, it is imperative that the domestic quarantine mechanisms are to be strengthened further to check the spread of this notorious pest to the rest of India and create awareness programmes among farming community by involving Scientist and state extension functionaries at village level (KVK`S). Community based IPM management practices / Strategies should be followed (Crop Protection Practices) for the welfare of farmers.

Keywords: Invasive, India, Thrips parvispinus, Chilli and Farmers

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Oral

In vitro regeneration of chrysanthemum using petal as explants in selected varieties

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Abstract:

Chrysanthemum (*Dendranthema grandiflorum* Tzvelev.) is one of the most widely cultivated herbaceous perennial plant belongs to family Asteraceae and commonly grown in Asia and Europe. Chrysanthemum produces showy flowers with different flower color and shape. It is one of the most important cut flower and pot species in the market that traditionally propagated by root suckers or terminal cuttings. These methods are very slow processes, and the risk of transmission of the virus and other diseases is very high. Tissue culture techniques can improve the efficiency of plant propagation processes and as well as facilitates the rapid replication and development of superior genotypes. In our study, we have taken 3 varieties of Chrysanthemum was done using in vitro propagation approach. Petals used as explants with different concentration and combinations of BAP, NAA and kinetin in MS media were utilized. The results showed that, 4mg/l of BAP and 1mg/l of NAA initiated rapid regeneration of callus within 7 days. More number of shoots were produced in the media with 5mg/l of BAP and 1mg/l of NAA. Elongation was good in the media with 2 mg/l BAP and further rooting was responded good in the media 1.5 mg/l of IBA. Around 23±2°C with 16 hours day light and 8 hours dark was maintained. We have developed a protocol for rapid multiplication of Chrysanthemum in three varieties.

Keywords: In vitro propagation, chrysanthemum, growth regualtors

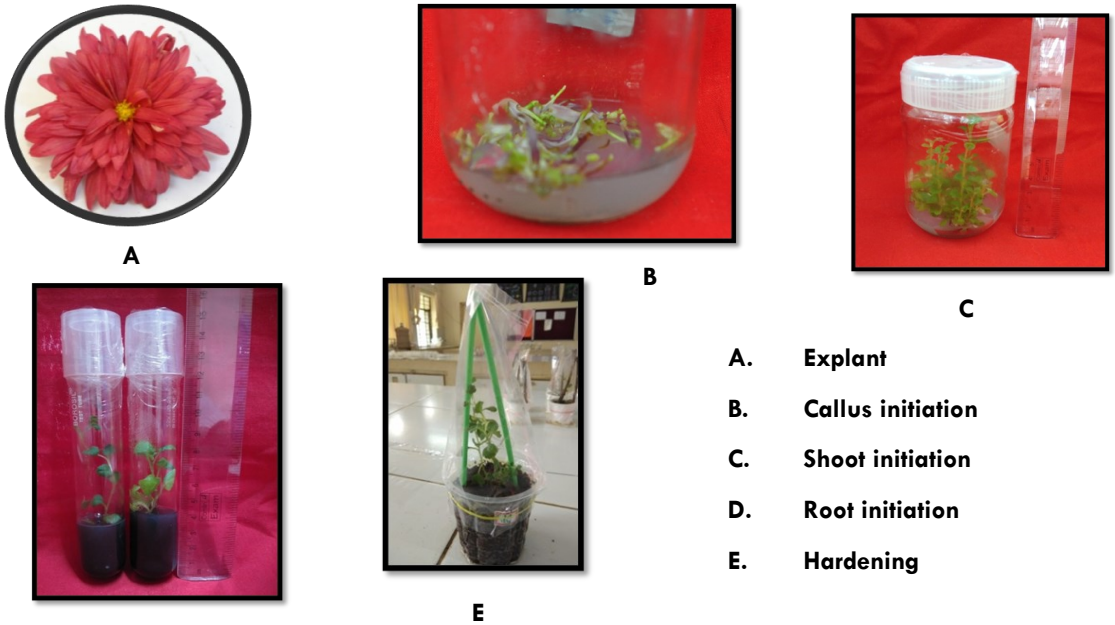

Plate 3. *In vitro* propagation protocol in chrysanthemum varieties

Biography:

G.Anitha, working as assistant Professor in Department of Horticulture, MSSSoA, Parlakemundi, Centurion university. She has completed her B.sc (Hons.) Horticulture in Dr. YSRHU, Andhra Pradesh, M.Sc and Ph.D in Floriculture and Landscape Architecture in University of Horticultural Sciences, Bagalkot, Karnataka

Research Interest: Floriculture, Landscaping, Tissue culture

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Oral

Summary of the project: National Rural Rood and Artisan Parks Project Complex

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Abstract:

- It is aimed to facilitate post harvest management of small and marginal farmers produces.
- The complex is proposed to cover 25 acres of uncultivable waste lands covering 6-7 villages and 16,000-17,000 acres of cultivable agriculture land at the cost of Rs. 25 crore, with storages, platforms, processing, value addition etc. requirements on no cost basis.
- Throughout the nation it is proposed to have 50,000 numbers of complexes.
- The main composition of the complex is to accommodate warehouses, cold storages, thrashing, winnowing and grading etc. platforms.
- Also to cover 200-300 cattle sheds for accommodating milch animals, tractors, storage for fodder, agriculture implements, gober has production, scientific farm yard manure production and milk and milk products production etc. of 5 to 7 cents size.
- Food processing units, certification like fssia, natural and organic products enabling exports etc.
- To provide facilities to artisans to promote local indigenous production of farm implements etc. and occupational castes to have self employment.
- To cover the entire block with 'simarouba' to produce vegetable edible oil trees of 1 lakh numbers avenue plantation gives 65% of edible oil which is better than palm oil, ground nut oil, sun flower oil etc. whose cultivation is cheap soil requirements are also very easy that is saline and alkali soils with rainfall range 500mm – 2000mm. The balance of 35% remains after oil extraction is to increase natural fertility of cultivated soils by using the oil cakes. Also for climate mitigation with greenery.
- The total area of the project 25 acres about 20 acres are under permanent structure construction. The terrace of the constructed structures are proposed for solar energy production. The produced energy will be sufficient to cover 10,000 habitations or 6-7 villages besides utilizing the requirement in the complex.
- Flower, vegetable and fruit produced also have place in the farmer rythu bazaar sheds. It encourages local production on large scale and invites traders to come to the farmer for business from far places like Delhi, Mumbai, Bangalore, Bhopal, Chennai etc. metros also.
- As was available to AP mee-seva kendras to replace with f-seva (farmers) kendras to meet credit, crop insurance, crop damage, crop coverage areas etc. to eliminate the farmer movement to urban areas and save time of the farmers to be on the farm to have next crop also and increase the on-farm man working days.
- It helps in increased crop intensity by clearing the first crop field in 10-15 days time and to take up second crop by utilizing irrigation facilities, micro irrigation etc. there by farmer income as well as national grass domestic production is increased.

- National foreign exchange savings will be 50% in cases of chemical fertilizers, edible oils, petrol, diesel, gas, lubricants due to the simarouba avenue plantation.
- Simarouba avenue plantation helps in greening and carbon-dioxide reduction, carbon foot prints and water foot print to meet the targets fixed by the internal fora.
- Hydro, thermal and atomic power dependence will be reduced to 50% due to solar energy production.
- Exodus to the urban areas and urban agglomeration for under utilization of man power will be reduced with crop intensity, food processing units etc.
- Local employment with crop intensity and food processing units will double the man working days.
- The capital investment by the Government of India towards GDP growth will have great effect in capital growth, per capita income as well as national GDP growth on a long term, on the lines of railways, national highways, sea ports, air ports, etc. These infrastructures will also be accessible to small and marginal farmers in shape of trade and commerce which are hither to be used by the traders, large size exporters etc. as a service sector organization.
- Complex facilitates collaborated exports also. There by the national export will double.
- Highlight of the project, last but not the least is the farmer will be selling his produce at his door-step/ storage points.
- The returns in the complex through the out-gate charge to the trader, purchaser @ Rs. 0.10 per Kg. of the product that goes out there by the farmer is not charged and the trader is charged..
- It results in reducing the pressure on MSP (Minimum Support Price), MRP (Maximum Retail Price), CPI (Consumer Price Index orienting to the Dearness allowance of the Central and State Governments etc.). " The total process can be managed by an estate officer, the group management at RDO level with 15-18 complexes with the coordinator support, necessary technical advice by the Agri. MBA candidates, at the district level and state level, supported by a team of technical people and lead by the Agri. MBAs from IIMS, senior IIM Agri. MBAs at the centre.
- The site selection done through the NRSA (National Remote Sensing Agency) using Satellite Imageries since no crop or any other agricultural activity will be there in the complex but for the simarouba plantation, degraded soils with 5.0 pH to 8.2 pH. Only soil requirement is red murrum in the soil depth is the pre- requisite. There by the pressure on cultivated area will not be there and also the human activity in the area facilitates economic viability in and around 200 acres in the degraded lands.

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ଓଡିଶା କୃଷି ଶିଳ୍ପ ନିଗମ ଲିଃ.

(A Govt. of Odisha undertaking)

୯୫,ସତ୍ୟନଗର, ଭୁବନେଶ୍ୱର, ୭୫୧୦୦୭

(ବେୟମୁକ୍ତ ଟୋଲ ଫ୍ରୀ ଫୋନ ନଂ.୧୮୦୦ ୩୪୫୭୧୩୭)

କୃଷି ଓ କୃଷକ ସେବାରେ ଓଡିଶା କୃଷି ଶିଳ୍ପ ନିଗମ ଲିଃ

କୃଷି ଶିଳ୍ପ ନିଗମ ଦ୍ୱାରା କାର୍ଯ୍ୟକାରୀ ହେଉଥିବା କୃଷକ କଲ୍ୟାଣକାରୀ ଯୋଜନା

- ସାର ଓ ଜୀବନାଶକ :

  ସମସ୍ତ ଚାଷୀ ଭାଇମାନଙ୍କୁ ସୁଇଲ ମୂଲ୍ୟରେ ସମସ୍ତ ପ୍ରକାର ରାସାୟନିକ ସାର, ଜୈବିକ ସାର ଓ ଜୀବନାଶକ ଔଷଧ ଯୋଗାଣ।

- କୃଷିଯାନ୍ତ୍ରିକରଣ :

  ରାଜ୍ୟରେ ଚାଷୀ ଭାଇମାନଙ୍କୁ ସମସ୍ତ ପ୍ରକାର ବ୍ରାଣ୍ଡର ଟ୍ରାକ୍ଟର, ପାୱାର ଟ୍ରିଲର, (ଭିଏସଟି, କାମକୋ) ଓ ଅନ୍ୟାନ୍ୟ କୃଷି ଉପଯୋଗୀ ଉପକରଣ ରିହାତି ମୂଲ୍ୟରେ ଯୋଗାଣ।

- ଜଳସେଚନ :

  ଓଡିଶା କୃଷି ଶିଳ୍ପ ନିଗମ ଦ୍ୱାରା ସରକାରଙ୍କ ଜଳନିଧି-୨ ଓ ବିଜୁ କୃଷକ କଲ୍ୟାଣ ଯୋଜନାରେ ଉଠାଜଳସେଚନ ପ୍ରକଳ୍ପ, କ୍ଷୁଦ୍ର ଜଳସେଚନ ପ୍ରକଳ୍ପ, ଗଭୀର ଓ ଅଗଭୀର ନଳକୂପ ମାନ ନିର୍ମାଣ।

- ଗୋ ଖାଦ୍ୟ :

  ଓଡିଶା କୃଷି ଶିଳ୍ପ ନିଗମର ନିଜସ୍ୱ ପ୍ରସ୍ତୁତି ସୁରଭି ବ୍ରାଣ୍ଡର ଗୋ ଖାଦ୍ୟ ଯୋଗାଣ।

- ସୁରଭି ବିକ୍ରୟ କେନ୍ଦ୍ର :

  ଏ ସମସ୍ତ ସେବା ନିଗମର ଜିଲ୍ଲା ପରିଚାଳକ କର୍ଯ୍ୟାଳୟ ଓ ବ୍ଲକରେ ସ୍ଥାପିତ ସୁରଭି ବିକ୍ରୟ କେନ୍ଦ୍ରରେ ଉପଲବ୍ଧ।

ଏହି ଯୋଜନା ଗୁଡିକ ଆମର ଜିଲ୍ଲା କାର୍ଯ୍ୟାଳୟ ଗୁଡିକରେ ଉପଲବ୍ଧ।

ଜିଲ୍ଲା ପରିଚାଳକଙ୍କ କାର୍ଯ୍ୟାଳୟରେ ଯୋଗାଯୋଗ କରନ୍ତୁ ।

District	Mobile No. of District Manager	District	Mobile No. of District Manager	District	Mobile No. of District Manager
Angul	9439946274	Ganjam	8249547458	Mayurbhanj	9078859007
Balasore	9438159749	Jagatsinghpur	7008624803	Nawarangpur	9438121855
Bargarh	9437084797	Jajpur	9861078999	Nayagarh	9337692056
Bhadrak	9437270567	Jharsuguda	9437923556	Nuapada	9438121855
Bolangir	8249078736	Kalahandi	9438121855	Phulbani	7326885296
Boudh	8328912054	Kendrapara	8670991340	Puri (Pipili)	7978265167
Cuttack	8917282857	Keonjhar	9861078999	Rayagada	8658491054
Deogarh	9439946274	Khordha	7978856372	Sambalpur	8895190983
Dhenkanal	9337949474	Koraput	7750947562	Subarnapur	8249078736
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AGRI 2023 VISION

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Poster

Effect of pruning time and fertilizer doses on growth, flowering and yield parameters of phalsa cv. Local

O. S. Warang, N. I. Shah and N. J. Jadav
Anand Agricultural University, Anand , Gujrat, India

Abstract:

Phalsa, belonging to genus *Grewia* of the family Malvaceae, is native fruit of India and is now widely cultivated in arid parts of tropical and subtropical regions Phalsa fruits are borne in clusters in the axils of the leaves on new growth. So, Annual pruning is essential to have more fruiting area to ensure higher yield. An experiment was conducted to study the effect of round the year pruning and fertilizer doses on growth, flowering and yield parameters of phalsa cv. Local during the years 2020-21 and 2021-22 at Horticulture Research Farm, Anand Agricultural University, Anand. The experiment was laid out in completely randomized design (Factorial) with two factors with eighteen treatment combinations and three repetitions. Pruning in 1st week of March (P2) resulted in maximum number of sprouted shoots per cane, length of shoot at harvest, weight of fruit per plant, fruit yield and minimum days taken for flowering, fruit set and first picking after pruning. Fertilizer dose of 300:100:100 g NPK/plant (F3) recorded maximum number of sprouted shoots per cane and length of shoot at harvest. Minimum number of days taken to flowering, fruit set and first picking was found with fertilizer dose of 100:50:50 g NPK/plant (Control) (F1). The maximum weight of fruit per plant and fruit yield was recorded with fertilizer dose of 200:75:75 g NPK/plant (F2). The pruning in 1st week of March with fertilizer dose of 200:75:75 g NPK/plant was found significant for increasing yield of phalsa.

Keywords: Phalsa, Pruning, Fertilizer doses, Growth, Flowering, Yield.

Biography:

O. S. Warang has completed B.Sc. (Horticulture) and M.Sc. (Horticulture) Fruit Science from Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, and Ph.D. (Horticulture) Fruit Science form Anand Agricultural University, Anand with Senior Research Fellowship awarded by Indian Council of Agricultural Research, New Delhi.

Research Interest: Horticulture, Fruit Science, Canopy Management, Nutrient Management, Special Horticultural Practices.

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Poster

Transcriptomics of *Vigna aconitifolia* for developing a gene expression atlas

Sandhya Suranjika[1,2], Seema Pradhan[1], Ajay Parida[1], Nrisingha Dey[1]
[1]Institute Of Life Sciences, Bhubaneswar, India
[2]Kalinga Institute of Industrial Technology, Bhubaneswar, India

Abstract:

Demand for food legumes as one of the basic nutritional requirements is inflating globally. Due to supply -demand imbalance, conventional pulses are becoming unreachable for a sizable population due to their rising prices, thereby suffering acute malnutrition debilities. The underutilized species *Vigna aconitifolia* (Moth bean) is an important legume crop and is valued for its seeds for their high protein content that can be recommended for human wellness. Despite its economic potential, genomic resources for this crop are scarce and there is limited knowledge of the developmental process of this plant at a molecular level. Therefore, we have chosen to study the molecular mechanisms that regulate plant development in *V. aconitifolia*, with a special focus on flower and seed development. We have performed a comprehensive de novo transcriptome assembly using six types of tissues of *Vigna aconitifolia* (var. RMO-435), namely, leaves, roots, flowers, pods, and seed tissue in the early and late stages of development, using the Illumina nextseq platform. We obtained 150938 unigenes with an average length of 937.78 bp. Real-time PCR analysis further validated that the unigenes displayed significant differential expression in the late stages of seed development. The *Vigna aconitifolia* transcriptomic resources generated in this study will provide foundational resources for gene discovery with respect to various developmental stages under stress conditions. Using the data from this analysis, we will develop a stress-resistant (abiotic/biotic) and high-yielding varieties with enhanced yield as well as nutritional quality employing plant biology based approaches.

Keywords: Plant development, transcriptome assembly, Vigna aconitifolia

Biography:

Sandhya Suranjika was working as a Ph.D. Scholar (SRF) at Institute of Life Sciences, Bhubaneswar with Late Dr. Ajay Parida (Ex-Director, ILS). Currently, now working under the supervision of Dr. Nrisingha Dey (Scientist-F, ILS). She has completed her Master's in Biotechnology from Ravenshaw University, Cuttack. Our research group focuses on promoter analysis as well as understanding the important molecular mechanisms that regulate the response of plants to abiotic stress and improve nutritional value. Her PhD work aims at developing a comprehensive gene expression atlas based on the transcriptome of the nutritionally rich plant, *Vigna aconitifolia* to study the dynamics of gene expression in various tissues and under abiotic stress such as drought and salinity. Our approach involves using modern nest generation sequencing (NGS) platforms to generate high-quality whole genome assembly of this nutraceutical plant and re-sequencing of well-characterized core accessions for identifying variations (such as SNPs). He has published six articles, including research and review articles in International peer reviewed journals.

Research Interest: Plant biotechnology, genomics, transcriptomics, stress tolerance mechanism, plant tissue culture

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Poster

Effect on yield and land use productivity due to spatial arrangement of cereal crops in Kalmegh [*Andrographis paniculata (Burm. F.) Wall ex. Nees*] based intercropping system

Kirti Verma[1,2] and Saudan Singh[1,2]

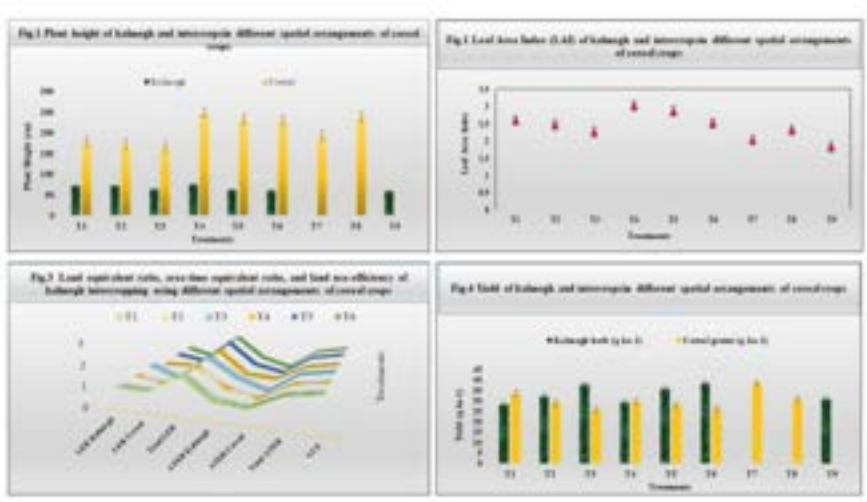
[1]CSIR- Central Institute of Medicinal and Aromatic Plants, Lucknow, India

[2]Academy of Scientific and Innovative Research, Ghaziabad, India

Abstract:

Agronomic indices revealed that all applied intercropping systems with crop density treatments were more efficient than sole cropping system. Our results showed that wider-space of kalmegh- maize and pearl-millet crops grown as 1:0.5 crop density had significantly higher total dry matter accumulation (38.30 q ha-1 and 37.81 q ha-1) in pearl millet and maize intercropping than sole crops; this is likely due to the progressive effects of cereal crops shading on kalmegh. In the intercropping systems, the land equivalent ratio varied in between 2.09-1.92 in pearl millet and 1.90-1.79 in maize intercropping system, proclaiming that kalmegh-cereals intercropping is an effective way to maximize land use efficiency. Thus it could be suggested that the kalmegh-cereals intercropping system with different crop density increasing economic stability and using this strategy, it may be productive and sustainable. According to the study, it is also concluded that increasing the productivity of kalmegh, the efficiency of land use, and the profitability of smallholder farmers can improve household food security.

Keywords: Kalmegh (Andrographis paniculata), cereal crop, crop density, land use efficiency.



Biography:

Kirti Verma, Ph.D. research scholar (Supervisor: Dr. Saudan Singh) of Academy of Scientific and Innovative Research (AcSIR), as well as working as a Project Assistant-II in Aroma Mission Phase-II. M.Sc in Environmental Sciences from Amity Institute of Environmental Sciences at Amity University, Noida, U.P, with CGPA 8.69 in 2017. B.Sc (Life science) from Isabella Thoburn College, Lucknow University, Lucknow, UP, with 65.66%. Till date I have 8 research article publications, 1 popular article, and 2 agro-technology booklets.

Research Interest: Agronomy, sustainable agriculture, environmental factors, quality of crops.

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Poster

Assessment of productivity of different cultivars of *Withania Somnifera* under different harvest management

Anjali Singh[2], Saudan Singh[1,2]

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[2]Academy of Scientific and Innovative Research, Ghaziabad, India

Abstract:

The roots of *Withania somnifera* (L.) Dunal have been used to treat various illnesses, including bronchitis, dropsy, stomach issues, lung inflammation, tuberculosis, and asthma, male impotence and skin conditions. There is an increase in demand for somnifera Dunal in the global market, which can be met through the adoption of appropriate agricultural practices, productivity and quality can be enhanced. However, the complete information on input efficient agro-practices is still limited on this plant. Hence, the present studies were planned to assess the productivity of different cultivar of Ashwagandha through different harvest management. Therefore, a field experiments were conducted at CSIR-CIMAP Farm, Lucknow.

The treatment were comprised of 2 variety i.e., NMITLI-118 and NMITLI-101 of Ashwagandha, and Four Harvesting stages viz. (H1) - 1st harvest for leaves yield only after 90 days of sowing, (H2) - Crop harvest (digging) at flowering stage, (H3) - Crop harvest (digging) at seeds maturity stage and (H4) - 2nd harvest of treatments no.1 for leaves and digging. The root yield was about two fold higher in cv- NMITLI-118 at 2nd harvest of the crop which was left after 1st leaves harvested. Root yield enhanced up to 20% because of 1st harvest which was already taken earlier make root hardier @ 36.0t/ha in NMITLI-118 cultivar. Similarly as root yield the herbage (leaves) yield was also about two fold in cv-NMITLI-118 over NMITLI- 101. 1st harvest above ground level had positive response on herb yield in both cultivars.

Keywords: Ashwagandha (Withania somnifera), Yield and Productivity.

Digging at Flower initial stage

Digging after seed maturation

Digging after two harvest of leaves

Biography:

Anjali Singh, Ph.D. research scholar (Supervisor: Dr. Saudan Singh (Chief Scientist)) of Academy of Scientific and Innovative Research (AcSIR), as well as working as a Project Assistant in NMITLI-TLP-000. She has completed both MSc. And BSc. from Lucknow University. She has published 10 research papers

Research Interest: Agronomy, sustainable agriculture, environmental factors, quality of crops.

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Poster

Evolution of generation-wise comparative reproduction performance of half-bred and three-breed crosses of Gir

S.R.Garudkar, S.D.Mandakmale, A.K.Chakravarty and P.R.Tambe
College of Agricultural Biotechnology, Ahmednagar, India

Abstract:

The data on reproduction traits of halfbred (523) and three breed crosses (524) of Gir maintained at MPKV, Rahuri, Maharashtra from 1972 to 2012 (41 years) were used to investigate the generation-wise comparative reproduction performance. Pedigree of each animal born during this period was traced back up to foundation stock. The cows up to 8th generation from maternal side in halfbred and three breed crosses of Gir were observed. The result indicated that the generation had significant effect on age at first calving (AFC) in FG group, Waiting period (WP) in FJG group, service period (SP) in IFG and IFJG group, and non-significant effect on pregnancy rate (PR) in all given groups. The first generation of FG halfbred and three breed crosses of Gir showed significantly higher performance over their interbred because of hybrid vigour, subsequent decline in further generations which may be partly due to the differences in the breeding values of the sires used for producing F1 and F2 generations. Therefore, it indicated to restrict the Interse mating and adopt suitable breeding system to retain hybrid vigour like possibly selective rotational crossing. Also, essential to use only proven crossbred bulls for producing F2 generation to minimize this decline.

Keywords: Generation, AFC, Waiting Period, Service Period, Pregnancy Rate

Biography:

Dr. Suwarna is working as an Assistant Professor at College of Agricultural Biotechnology, Ahmednagar. She has awarded with (INSPIRE) Fellowship for Doctoral Program from GOI, New Delhi. She has completed her Ph.D from MPKV, Rahuri University. She has bagged numerous awards such as M.Sc. Gold Medal (2011), INSPIRE Fellowship for Doctoral Program (2011), Invited to National Education Summit, Gujrat (2014), Best Young Scientist Award in IJTA 2nd International Conference held at Shimla (2015), Best Article Award" in National Level Article Writing Competition by Agricultural Doctorate Association, MPKV, Rahuri (2020), 1st prize in National Level Essay Writing Competition by Govt. College of Agri-Business Management (Malegaon) (2021). She has published 9 Research articles, 17 Popular articles, and delivered 5 Radio talks.

Research Interest: Animal Genetics and Breeding

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Poster

Farming of geranium as a persistent crop under natural climatic condition of Indo-Gangetic plains

Archana Chaudhary[1,2] and Saudan Singh[1,2]

[1]CSIR- Central Institute of Medicinal and Aromatic Plants, Lucknow, India

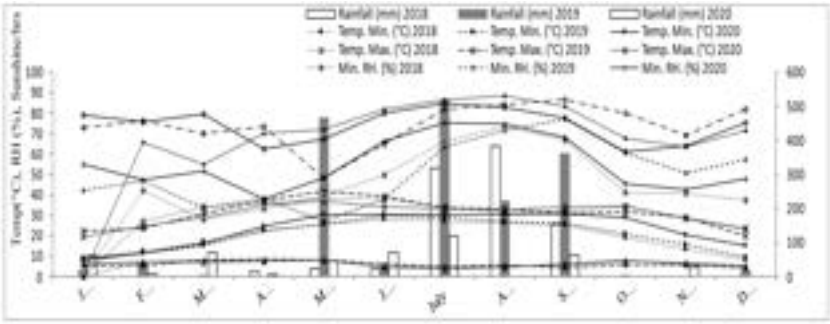
[2]Academy of Scientific and Innovative Research, Ghaziabad, India

Abstract:

Pelargonium graveolens L., also known as rose-scented geranium, is an herbaceous medicinal and aromatic crop grown for its highly valued essential oil. The majority (50–70%) of its oil comprises the aroma-producing compounds viz, geraniol, citronellol. Consequently, it widely excels in the food, cosmetics, aromatherapy, smell, and medicinal industries. The present study focuses on perennial cultivation of geranium for taking multi-harvest in a year by the Shed-saving Agro- Technology for generating higher yield of essential oils and maximum monitory returns. A four- year field experiment was conducted at the research farm of the CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow, India. During the course of the experiment, the crop was harvested nine times at various intervals while being partially shaded. According to the study's findings, the IIIrd harvest produced the maximum fresh herbs yield (14.04 t/ha) and the Ist harvest had the maximum oil yield (23.75 kg/ha). After carefully examining the trial results, it is suggested

that geranium cultivation can be definitely continued as a persistent crop for multiple number of harvests under semi-protective shed in order to obtaining higher yields with better financial returns.

Keywords: Rose-scented geranium, perennial crop, multi-harvest, Shed-Agro Technology



Graph: Weather graph of four year during the experimental period

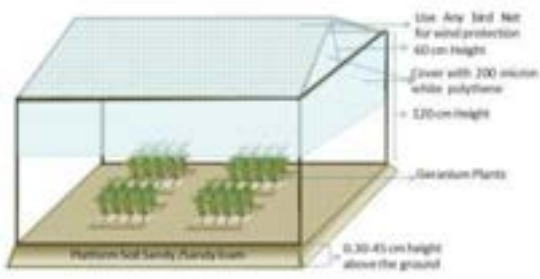


Fig: Saving of geranium under semi protective shed

Biography:

Archana Chaudhary, working as Ph.D. research scholar (CSIR-SRF NET) under the supervision of Dr. Saudan Singh (Chief Scientist) in (Academy of Scientific and Innovative Research (AcSIR- PhD Programme) at CSIR-CIMAP, Lucknow. She has qualified CSIR-NET JRF in 2018. She has completed her M.Sc. (Botany) and Bc. (Life Sciences) from Kanpur University in 2016 and 2014. She has published 2 research article publications and 2 agro-technology booklets.

Research Interest: Agronomy, sustainable agriculture, environmental factors, quality of crops

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Poster

Effect of date of harvesting and age of leaves on essential oil content, oil yield and oil quality in menthol mint (*Mentha arvensis* L.)

Kushal Pal Singh[1,2] and Saudan Singh[1,2]

[1]CSIR- Central Institute of Medicinal and Aromatic Plants, Lucknow, India

[2]Academy of Scientific and Innovative Research, Ghaziabad, India

Abstract:

Menthol mint (*Mentha arvensis* L.) is an important essential oil-bearing plant that belongs to family Lamiaceae. The essential oil extracted from the leaves which is used in flavor and pharmaceutical industries. The field experiments were conducted in two consecutive years, 2018 and 2019, at the farm of CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow. The experiment consisted of five date of harvesting, and six age of leaves was conducted in randomly plot design with three replicates. The aim of this study was to optimize date of harvest and age of leaves for enhancing productivity and resource use efficiency of menthol mint. Results revealed that maximum fresh herb yield and oil yield were recorded when the crop harvest at 30 May as compared with other dates. Moreover, the highest essential oil content, menthol content, oil yield and menthol yield was recorded in old leaves. Correspondingly, maximum gross return, net return and B: C ratio was recorded when crop harvest at 30th May. However, it provides an opportunity to check the exact date of harvesting along with size of leaves. Overall, the treatment combination of 30th May of harvesting and old leaves enhancing the productivity and resource use efficiency.

Keywords: Menthol mint, size of leaves, date of harvesting, menthol yield.

Biography:

Kushal Pal Singh, Ph.D. research scholar (Supervisor: Dr. Saudan Singh) of Academy of Scientific and Innovative Research (AcSIR), as well as working as a Project Assistant-I in GAP-0484. Completed M.Sc: Agricultural Economics from Dr. Bhimrao Ambedker University Agra UP in 2017 and B.Sc: (Agriculture) from Dr. Bhimrao Ambedker University Agra UP in 2015. Till date published 6 research articles, 1 popular article, and 2 agro-technology booklets.

Research Interest: Agronomy, sustainable agriculture, environmental factors, quality of crops.

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Poster

Evaluation of cropping system productivity, profitability and economic efficiency of wheat (*Triticum aestivum* L.)

Kobaagapu Mani Ratnam
Sam Higginbottom University of Agriculture, Techonology & Sciences, Prayagraj, India

Abstract:

Rice–wheat cropping system (RWCS) of the South Asia is labour-, water-, capital- and energy-intensive, and become less profitable as the availability of these resources diminished. This could be further aggravated with deterioration of soil structure, declining underground water and lesser land and water productivity which ultimately are threat in front of sustainable and profitable RWCS in the region. For improving the profits, production and sustainability of this sequence - a paradigm shift is required. Scientists recommended different resource-conserving technologies (RCTs) viz. zero tillage, laser levelling, irrigation based on soil matric potential, bed planting, direct seeding, mechanical transplanting of rice and crop diversification for this purpose. These technologies are site specific and before selecting any particular RCT for a particular region, soil texture and agro-climatic conditions must be considered.

A solitary approach/RCT might not be effective to solve the upcoming issue of producing more food grains with inadequate available water and land. Therefore, an integrated approach is required. But before implementing any approach, different issues relating to RWCS must be discovered, considered and addressed in a holistic manner. Cropping system throughout assessment exhibits importance for the crop production and cultural practices profitability.

This field study was undertaken in semi-arid climate to devise suitable system. Wheat is grown mainly in cropping sequences like Rice-Wheat, Jowar-Wheat, Bajra-Wheat, Maize-Wheat, Pulse-Wheat, Cotton-Wheat, Soybean-Wheat etc. in different parts of the country under irrigated condition although Rice-Wheat system is the most common. Under rainfed condition, fallow-Wheat is most common, but sometimes short duration pulse crops are also grown. Growing water guzzling crop of rice creates depletion of ground water thereby reducing the availability for irrigation. Besides, non judicious and imbalanced application of fertilisers makes the system less sustainable.

Rice - Wheat, Maize - Wheat, Sesame - Wheat, Soyabean - Wheat, Sorghum - Wheat, Cotton - wheat, Pigeonpea - Wheat, Bajra - Wheat, Sugar cane – Wheat, among these cropping systems Cotton - Wheat pattern gives higher yield and profitability and Rice - Wheat pattern most commonly practiced in northern states of India. The popularity of the Rice – wheat system in the NEPZ states can also be attributed to most of the similar reasons as in NWPZ.

Keywords: NWPZ, NEPZ, Profitability, Productivity, Net Returns, RWCS, RCTs

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Poster

Generating genomic resources for an invasive halophyte, *Phragmites karka* .

Soumya Shree Nayak, Seema Pradhan and Ajay Parida
Institute of Life Sciences, Bhubaneswar, India

Abstract:

Phragmites karka belongs to the family Poaceae and is widely distributed in India. In Odisha, this species is widely distributed in the regions of Chilika and has rapidly invaded north and north-western segments of this lake. It occurs mostly in waterlogged, saline area. It accumulates a high amount of soluble sugar and lignocellulosic biomass which helps for ethanol and biofuel production and traditionally used as a remedy for diabetes, heart diseases, urinary troubles. It also used as a biosorbent for the removal of mercury ions from an aqueous solution and act as an excellent stabilizer of eroding river banks. Given its ability to grow well in conditions of higher salinity, we were interested in finding out the genes responsible for this. Therefore, we assembled the transcriptome of P. karka under conditions of salinity stress using high-throughput RNA sequencing. A total of 161,403 unigenes were assembled with the average length of the transcript being 1354bp. In leaves, 954 unigenes, and in roots, 1097 unigenes were significantly differentially expressed and coded for genes like Heat shock proteins, chaperones, kinases, etc. We have also identified a total of 11,242 transcription factors including members of ARF, BBR-BPC, bHLH, bZIP, ERF, FAR1 in response to salinity. We have also assembled the whole genome to enrich genomic resources for this plant and obtained a total of 12704 scaffolds. The analyses have led to some interesting findings and helped us to identify some essential genes that could be crucial to the study of salinity stress response in plants.

Keywords: *Phragmites karka*, Transcriptome, RNA sequencing, Salinity stress

Biography:

Soumya Shree Nayak, pursuing Ph.D in Plant and molecular biotechnology at Institute of Life Sciences, Bhubaneswar with Dr. Nrisingha Dey. My research topic on generating genomic resources for an invasive halophyte, Phragmites karka. I have completed M.Sc Micrbiology in 2015 from Odisha University of Agriculture and Technology and B.Sc Biotechnology in 2013 from Ramadevi Women's Autonomous College with distinction.

Research Interest: Plant tissue culture, Molecular biology

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Poster

Characterization of sub-genomic transcript promoter from Horseradish Latent Virus (HRLV) and its utilization in plant translational research

Tsheten Sherpa[1,2] and Nrisingha Dey[1]

[1]Institute of Life Sciences, Bhubaneswar, India

[2]Regional Centre for Biotechnology, NCR Biotech Science Cluster, Faridabad, India

Abstract:

Plant pararetroviruses are a rich source of unique plant promoters widely used in plant biotechnology research. We have characterized a sub-genomic transcript (Sgt) promoter of the Horseradish Latent Virus (HRLV) and found a small fragment (HS4) with high expression efficiency in the *Nicotiana tabacum* plant. From site-directed mutagenesis studies, we found that the as-1 element and W-Box cis-regulatory elements played a major role in its activity. We developed transgenic tobacco plants having HS4 promoter and expressing the GUS reporter gene and found that the promoter was active throughout the plant tissue, with high expression in the leaves. We also found that this small fragment was induced by exogenously treated Salicylic acid. Further, we enhanced the expression efficiency of the HS4 promoter by hybridizing an enhancer domain from the Figwort Mosaic Virus full-length promoter. This new hybrid promoter, 'FHS4', was strong and constitutively expressed throughout the plant in both vegetative and reproductive tissues. Its expression efficiency even surpassed the most widely used strong promoter, CaMV35S. We realized this hybrid promoter could be useful in developing plants with increased against diseases. To prove that, we developed a transgenic tobacco plant expressing an anti-microbial peptide (AMP) gene driven by the FHS4 promoter. The agar diffusion anti-fungal assay done against a fungal pathogen *Alternaria alternate* using the crude extract from these transgenic plants showed an enhanced resistance. Finally, we concluded that the FHS4 promoter has a high potential to become an efficient tool in plant biotechnology and agritech.

Keywords: Plant promoters, Genetic engineering, Plant Biotechnology

Biography:

Tsheten Sherpa is working as a senior research fellow (SRF) in the Plant Molecular Biology lab of the Institute of Life Sciences, Bhubaneswar. I have done my B.Sc. and M.Sc. in Life Sciences from Presidency University, Kolkata, and I am on an SRF fellowship from CSIR, India. working on discovering unique plant promoters (gene drivers) for developing plants with increased resistance to diseases under principal investigator Dr. Nrisingha Dey. My project is based on the promoters from plant pararetroviruses, which are efficient plant-infecting viruses that have evolved remarkable promoters. I have published one book chapter entitled "Synthetic promoters in regulating disease gene expression" and one research article entitled "Further characterization of MUAS35S and FUAS35S recombinant promoters and their implication in translational research" this year (2022).

Research Interest: Agronomy, sustainable agriculture, environmental factors, quality of crops

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Poster

Studies on effect of soil macro and micronutrient Status of Tamarind (*Tamarindus indica* L.)

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College of Agriculture, Latur, India
Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, India

Abstract:

The present investigation was carried out to study the soils macro and micro nutrient status of tamarind orchards in Latur district during the year 2017-2018. The framed experiment was concentrated, to assess and find out the soil nutrient status of tamarind orchards, relation between soil nutrients and yield of sole and bund crops and unfruitfulness of sole crops in tamarind orchards in Marathwada region. Twenty tamarind orchards of eight to thirty-five years age planted at different spacing ranging from 8 x 8 m to 10 x 10 m with plant density of 100 to 150 plant ha-1 under varied management practices located in different tehsils of Latur district were selected for the experiment. In Marathwada region, in sole planting, soil macro-nutrients ranged from N (129.28 to 250.00 kg ha-1), P (11.00 to 38.00 kg ha-1), K (172.00 to 998.00 kg ha^{-1}), Ca (19.00 to 55.23 cmol(p+) kg^{-1}), Mg (186.00 to 397.00 $cmol^{(p+)}kg^{-1}$), S (11.25 to 18.00 $cmol^{(p+)}kg^{-1}$), and soil micro-nutrients ranged from Fe (1.20 to 3.92 mg kg^{-1}), Mn (3.51 to 19.78 mg kg^{-1}), Cu (1.30 to 8.60 mg kg^{-1}), B (0.17 to 1.40 mg kg^{-1}) and Zn (0.21 to 2.79 mg kg^{-1}) were observed. However, in bund planting, soil macro-nutrients ranged from N (137.25 to 258.01 kg ha^{-1}), P (11.01 to 37.25 kg ha^{-1}), K (178.11 to 998.80 kg ha^{-1}), Ca (19.20 to 55.80 $cmol^{(p+)}kg^{-1}$), Mg (197.80 to 395 $cmol^{(p+)}kg^{-1}$) and S (11.50 to 18.40 $cmol^{(p+)}kg^{-1}$) and soil micro-nutrients ranged from Fe (1.05 to 3.91 mg kg^{-1}), Mn (3.34 to 18.28 mg kg^{-1}), Zn (0.21 to 2.95 mg kg^{-1}), Cu (1.05 to 7.95 mg kg^{-1}), and B (0.5 to 1.90 mg kg^{-1}) were observed. The results showed that, these soil macro and micro nutrients ranges are also beneficial to the fruitfulness of tamarinds. Hence, it can be concluded that, there is no effct of soil macro and micro nutrients in unfruitfulness of sole orchard and fruitfulness and in case of bund crop orchards it could get proper aeration and sunlight properly.

Biography:

Pooja Sadashiv Urade, has successfully completed her Masters in Horticulture during 2016 -2018 and admitted to the university for PhD. In the year 2019.

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Poster

Effect of nutrients and biostimulants on flowering yield of loose flowers of tuberose (*Polianthes tuberosa* L.) cv. Bidhan Rajini - 1

J. Archana

Sri Konda Laxman Telangana State Horticultural University, Rajendra Nagar, India

Abstract:

The present investigation on tuberose were carried out at the Floriculture Research Station Rajendra Nagar, Hyderabad, to find out the effect of nutrients and biostimulants on tuberose flower yield. The experiment was laid out in Randomized Block Design and consisted of four biostimulants viz., Humic acid, Fulvic acid, Potassium humate, and Arka Microbial Consortium in combination with nutrients. Further, regarding the flower yield contributing parameters, the application of 75% RDF along with Humic acid-12% (3ml/l) resulted in the maximum number of spikes per clump (3.30), number of florets per spike (66.0), weight of individual florets (2.56gm) and 100 flowers weight (256.6gm), and flower yield ha -1 (44 t).

Keywords: Biostimulants, foliar spray, humic acid, RDF, tuberose

Biography:

Archana is from Hyderabad, and completed her graduation in horticulture from SKLTSHU University, Rajendra Nagar. Further she has completed her masters in horticulture specialization in department of floriculture and landscape and floriculture architecture

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Poster

Toxicity of insecticides with different modes of action to *Apis mellifera larvae* (Hymenoptera, Apidae)

Mohammad Abdul Waseem and Meena Thakur
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Abstract:

Apis mellifera is an important pollinator in commercial fruit orchards. Little information has been published about toxicity to *A. mellifera*, especially the larvae. The risk of commonly used insecticides with different modes of action, Fipronil and lambda-cyhalothrin, were selected to evaluate their acute toxicity to the larvae of *A. mellifera*. The test chemicals were given to larvae that were three days old. Treatments were administered using a micropipette at the bottom of each chosen comb cell. Each treatment included 60 larvae per dosage, and the experiment was repeated three times. Larvae were given only acetone in the control treatment. Fipronil and lambda-cyhalothrin were toxic to the larvae of *A. mellifera* with LD50 values of 0.163 and 0.83 µg/larvae, respectively, after 7 days of exposure. The maximum mortality of 81.35 per cent was recorded with a dose of 0.38µg/larvae in Fipronil, whereas in lambda-cyhalothrin, it was 94.23 per cent with a dose of 1.70 µg/larvae. Overall, their results suggested that Fipronil and lambda-cyhalothrin should not be applied, especially during the flowering phase.

Keywords: Fipronil, Lambda-cyhalothrin, Honey bee larvae, Mortality, Lethal-dose

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Poster

Beneficial effect of feeding Lemongrass (*Cymbopogon Citratus)* leaf meal as a natural feed additive on growth performance of broilers

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[2]Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, India

Abstract:

The present investigation was carried out on "Beneficial effect of feeding Lemongrass (*Cymbopogon citratus*) Leaf Meal as a Natural Feed Additive on growth performance of broilers". The research was conducted in the poultry house of Department of Animal Husbandry and Dairy Science, College of Agriculture, Latur, VNMKV, Parbhani during the year 2018-19. The experimental trial of six weeks was undertaken for Eighty, day old, broiler chicks divided in four treatments of 20 chicks in each treatment with 4 replications of five chicks.

The control (T1) group was fed with standard broiler ration and T2, T3 and T4 groups were provided same broiler ration supplemented with 0.5 per cent, 1 per cent and 1.5 per cent lemongrass leaf meal, respectively. It was observed that at the end of 6th week average cumulative body weights (g) in T1, T2, T3 and T4 were 2473.25, 2632.50, 2548.95 and 2635.45 per bird, respectively. The average cumulative body weight of broiler birds in the treatment groups T4and T2were significantly ($P<0.05$) higher as compared to those in T1 and T2 groups. The total body weight gain at the end of six week was 2426.28, 2585.10, 2501.53 and 2588.23 g per bird in treatmentT1, T2, T3 and T4, respectively. The chicks in treatment groups T2, T3, and T4 grew significantly ($P<0.05$) faster than T1 control group. The total feed consumption at the end of six week was 5114.77, 5097.35, 4839.42and 5203.81 g per bird in treatments T1, T2, T3 and T4, respectively. After the sixth week it was seen that the total feed consumption of birds among treatment group T4 (4400.63 g) was significantly superior ($P<0.05$) as compared to T1 (4715.28 g), T2 (4540.39 g) and T3 (4448.66 g) groups.

The average feed conversion ratio from first to sixth week ranged from 1.94 to 1.70 which was significantly ($P<0.05$) better in T4 (1.70) as compared to T2 (1.75), T3 (1.78) and T1 control (1.95) groups. The total water intake at the end of six week was 6910.55, 7250.16, 7089.00 and 7566.79 ml per bird in treatments T1, T2, T3 and T4, respectively. After the sixth week it was seen that the total water intake of birds among treatment group T4 (7566.79 ml) was significantly superior ($P<0.05$) as compared to T1 (6910.55 ml), T2 (7250.16 ml) and T3 (7089.00 ml) groups. The inclusion 1.5 per cent lemongrass leaf meal in broiler diet as an herbal feed additive is economical.

Keywords: Growth performance, Feed Intake, FCR, Water intake

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Poster

Effect of replacement of concentrate mixture by hydroponic maize fodder on proximate composition, chevon quality and quantity of Sangamneri goat

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Mahatma Phule Krishi Vidyapeeth, Rahuri , India

Abstract:

The experiment was conducted to study Effect of replacement of concentrate mixture by hydroponic maize fodder on proximate composition, chevon quality and quantity of Sangamneri goat meat at AICRP on Goat Improvement and Department of AHDS, MPKV, Rahuri. Thirty Sangamneri male goat kids of 6-9 month age were kept under five treatments and six replication using RBD. T0 (Roughages And concentrate mixture), Cocentrate mixure was replaced by hydroponic maize as in T1 (20%), T2 (40%), T3(60%) and T4 (80%).

In proximate analysis of chevon samples moisture range from 74.89-76.33 %, protein range from 18.95-20.11%, Fat range from 1.98-2.37%, Ether extract 1.98-2.26% and Ash range from 0.95-1.10%. The quality and quantity of chevon dressing percentage ranges from 46.25-48.87%, yield of primal cut (Leg, Loin, Rack, Breast- foreshank and Neck & Shoulder), yield of visceral organs (liver, kidney, heart, testes, spleen, lung with trachea, abdominal fat and GI tract empty), proportion of meat and bone range from 1.94-2.19 chevon organoleptic characteristics tenderness, flavor, juiciness, color, appearance and overall acceptability were not influenced in kids fed with rations replacing the concentrate mixture by hydroponic maize fodder.

Acknowledgement: AICRP on Goat Improvement project by ICAR New Delhi and Department of AHDS, MPKV, Rahuri

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Poster

Preliminary screening of Artocarpus *lacucha* Buch. -Ham. germplasm for their effective cryopreservation

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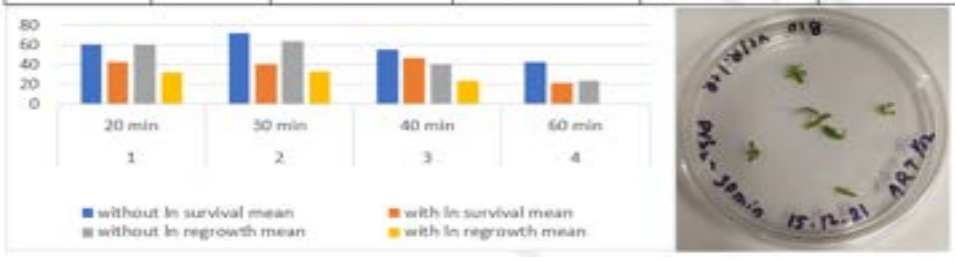
Abstract:

Artocarpus lacucha Buch. -Ham. (Monkey jack), is an underutilized fruit crop with Southeast Asia as its major center of diversification. The seeds inside the fruits are recalcitrant in nature which assumes considerable significance when viewed in terms of long-term conservation of the genotypes. Conventionally seeds can be left inside the fruit until right before sowing in absence of cold storage facility where, the fruit's seeds quickly lose viability within a week. Using cryopreservation techniques, long-term conservation of this species' genotypes may be attainable. Using V cryo plate methods, an effective procedure for cryopreservation has been created. Shoot tips isolated from cultures kept at Culture Room Temperature (25±2°C, 16 hr light/ 8hr dark) for 3 weeks. Shoot tips were precultured on MS medium supplemented with 0.3 M sucrose for overnight and then placed on aluminum cryo-plates. Osmoprotection was performed by immersing the cryo-plates with loading solution (2M glycerol + 0.4M sucrose). Dehydration was done by immersing cryo-plates in PVS2 vitrification solution for 20, 30, 40, 60 min followed by immersion of cryo-plates in liquid nitrogen at least for 1 hr. Rewarming was done by immersion of cryo-plates in unloading solution (1.2 M sucrose). The outcomes showed V cryo plate method enable effective cryo-storage of A. lacucha germplasm. It has been observed that cryopreservation treatment for 20 min and 30 min were showing optimum result. From all the treatments, 33% post thaw regrowth was obtained in shoot tips treated with PVS2 for 30min. PVS2 toxicity was observed in longer duration PVS2 treatments.

Keywords: *Artocarpus lacucha* Buch. -Ham., cryopreservation, long-term conservation

Treatment	Duration (min.)	-LN		+LN	
		SURVIVAL	REGROWTH	SURVIVAL	REGROWTH
T-1	20	61.21±2.21^{a}	61.21±2.21^{a}	42.58±4.11^{a}	32.51±3.24^{a}
T-2	30	72.28±8.85^{a}	63.84±8.07^{a}	41.15±1.92^{a}	33.00±3.65^{a}
T-3	40	54.99±4.22^{ab}	41.07±5.15^{ab}	46.92±1.92^{a}	23.85±2.71^{ab}
T-4	60	43.07±1.92^{b}	23.85±2.71^{b}	21.14±2.71^{b}	.00±.00^{b}



Biography:

MSc research scholar, Division of Plant Genetic Resources, National Bureau of Plant Genetic Resources, ICAR-Indian Agricultural Research Institute, New Delhi.

Research Interest: Tissue culture, Cryopreservation, Germplasm Conservation

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Poster

Contaminants in aquaculture products producing from India: An overview of analytical methods for their determination

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Abstract:

Increasing attention has been focused on the presence of contaminants (Antibiotics, Pesticides & Heavy metals) in aquaculture products (fish, crustaceans, and mollusks). Such contaminants enter in aquaculture, mainly in feed, and they are transferred to organisms. Sensitive and reliable determination of contaminants in aquaculture samples become crucial for controlling food safety hazards, and the efficient assessment of extraction and clean-up methods is essential to contribute to overall data quality. This overview discusses the analytical techniques for determination of contaminants in aquaculture which could interfere with the food safety of produced organisms such as fish, crustaceans, and mollusks. The comparison of the concentrations of contaminants found in the aquaculture products with those established in global or European legislations for foodstuffs are also considered. Finally, future perspectives on the determination of aquaculture contaminants are also proposed.

Keywords: Aquaculture products, chromatography, contaminants, Antibiotics, pesticides, mass spectrometry, shrimp, seafood.

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Poster

Generating genomic resources for *Coccinia grandis* and identification of genes regulating fruit morphology

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[2]Regional Center for Biotechnology, Faridabad, India

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Abstract:

Fruit morphology is a major trait targeted for selection during domestication of fruit-producing crops, which has resulted in dramatic increase of shape variation in cultivated fruits compared to their wild ancestors. The family Cucurbitaceae is characterized by great variations in fruit shapes and sizes and extensive genetic and genomic studies have been carried out for the other members of Cucurbitaceae family like Cucumber, watermelon ,melon. *Coccinia grandis* commonly known as Ivy gourd, is a popular cucurbit, commonly used as vegetable.

Cultivars of *Coccinia grandis* with different fruit sizes can be valuable genetic material for the study of fruit morphology. This study is aimed at examining the molecular regulation of fruit size In Ivy gourd. We performed comparative transcriptomics of two Ivy gourd cultivars namely Arka Neelachal Kunkhi (larger fruit size) and Arka Neelachal Sabuja (smaller fruit size) differing in their average fruit size.

Transcriptome sequencing and assembly resulted in 155205 unigenes. We found 2,228 differentially expressed genes between the two cultivars, out of which, 65 showed especially promising results. We also identified 38 transcription factors, 618 potential long noncoding RNAs (Lnc RNAs) out of which 4 Lnc RNAs were found to be differentially expressed, and 112933 simple sequence repeats (SSRs) in the transcriptome of Ivy gourd. The present study will contribute to further understanding of the molecular mechanisms regulating fruit morphology and genes that determines fruit sizes and may lead to the development of molecular marker tools for selecting genotypes with desired morphological traits.

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Poster

Study the effect of wheat bran extract on the growth of *Spirulina maxima* in indoor culture

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Abstract:

Spirulina is a cyanobacterium, also known as blue-green algae, which grows in both fresh and salt water. It may grow and develop best in warm, alkaline ponds and rivers. Protein is an essential nutrient in the diet. It is one of the best potential protein sources. The most significant microalgae for the production of biomass as a healthy food for both human and animal use is *Spirulina*. Light, pH and nutrients are also very important to maintain the quantity, quality and production of *Spirulina*. Nutrients and their content in growth medium have a significant impact on biomass growth rate and quality. *Spirulina maxima* is grown in 200 ml medium (modified) and without wheat bran extract (0 ml) as a control. In this study, five different concentrations of wheat bran extract (0 ml, 0.2 ml. 1 ml, 2 ml, 3ml, 4ml) were used to investigate *Spirulina maxima* growth rates. In indoor culture, blue light for 8 hours was provided. Moderate pH 9.5 and agitation 3-4 times was done daily. The experiment was terminated in 18 days. Dry biomass was noted highest (0.164 gm) at 200 ml/3 ml concentration. At a concentration of 200 ml/4 ml, chlorophylls a (12.2692 mg/L), b (3.9454 mg/L) and c (1.8909 mg/L) were observed in the highest concentrations. Dry weight and chlorophyll concentration a, b and c were noted highest compared to control.

Keywords: *Spirulina maxima*, Wheat bran extract, Growth (Dry weight), Chlorophyll

Biography:

Chaudhari Ankitkumar Umedbhai is a research scholar at the Department of Aquatic Biology, Veer Narmad south Gujarat University. His research continues on Spirulina culture media. Submitted two patents on Spirulina culture media with the help of SSIP (Student Startup and Innovation Policy) under the guidance of Dr. Kapila Manoj.

Research Interest: Hydrobiology, Algal culture, Planktonology, Benthology, Pollution and Toxicology

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Poster

Integrated farming system: An attractive technique for small and marginal farmers

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Abstract:

Integrated farming system evolved in space and time, took rapid evolution in last two decades. It is an integration of different enterprises like crop husbandry, livestock, fishery, piggery, apiary, mushroom unit, vermicompost unit, fruit cultivation, plantation crops, sericulture, Agro-forestry, goat rearing together in the same place. Here resource management or utilization of resources occurs and no wastage of resources takes place. Integrated system of farming generates income throughout the year from different enterprises and maintains the socio-economic status of the farmers. For the small and marginal farmers, this system is very beneficial by increasing their profitability. Employment generation also occurs for family labour. The use of manures which are obtained from different enterprises, reduces the use of the chemical fertilizers. Manures which are received from different enterprises like poultry, piggery etc. are applied to the crop field which improves the soil texture, structure, water holding capacity and fertility. Cash flow occurs throughout the year by various activities of farm enterprises. To establish many enterprises together, land availability is one of the major obstacle. Thus farming system can be described and understood by its functioning and the structure. Further the role of skilled as well as educated workers are needed for managing the intensive farming system efficiently. Integrated farming system also plays an important role by enhancing the soil organic carbon content. This system offers unique opportunity for maintaining and extending biodiversity. Maximizing of the nutrient use efficiency and minimizing the nutrient losses.

Keywords: Enterprise, Integrated system of farming, Management

Biography:

Vytla. Sravya, completed her graduation from Acharya N.G Ranga Agricultural University, now she is studying in Centurion university of technology and management (CUTM) doing masters in department of agronomy in parlakhemundi campus and I am involving in research work in masters.

Research Interest: Use of organic waste in agriculture, Impact of organic farming systems on human health and environmental health

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Poster

Impact of nano-urea and nano-DAP application on winter paddy (*Oryza sativa* L.)

Triptesh Mondal, Tanmoy Shankar, Tandrangi Sravani, Karimi Jagadeeswari, Adapaka Sravanthi, Bankapalli Vishnu

Centurion University of Technology & Management, Paralakhemundi, India

Abstract:

An experiment was done in kharif, 2022 on winter paddy variety RNR 15048 (Telangana Sona) to find out the impact of nano-fertilizer application on its growth and yield. The experimentation site was the field of Parlakhemundi campus, Centurion University of Technology and Management. The experiment was designed in complete randomized block design with 3 replications and 11 treatments which are randomly allocated. In treatment 3 there is no spraying which were 40 kg N/ha applied as basal; 80 kg N/ha applied as basal and 120 kg N/ha applied as basal. In the remaining 8 treatments, nano-urea spray twice at tillering and booting @1 ml/lit of water; nano-urea spray twice at tillering and booting @2 ml/lit of water; nano-urea spray twice at tillering and booting @3 ml/lit of water; nano-urea spray twice at tillering and booting @4 ml/lit of water; nano-DAP spray twice at tillering and booting @1 ml/lit of water; nano-DAP spray twice at tillering and booting @2 ml/lit of water; nano-DAP spray twice at tillering and booting @3 ml/lit of water and nano-DAP spray twice at tillering and booting @4 ml/lit of water. In each of the above 8 treatments, 40 kg N/ha was applied as basal. Spray volume was maintained 500 lit of water/ha in all the cases. Results showed that nano-urea spraying at tillering and booting @4 ml/lit of water after 40 kg N/ha application as basal was superior than all other treatments in terms of growth attributes (plant height at harvest and tiller density/sq. m), yield attributes (spike density/sq. m and 1000-grain weight) and yield (grain yield and straw yield). This treatment was followed by nano-urea spraying at tillering and booting @3 ml/lit of water after 40 kg N/ha application as basal and nano-DAP spraying at tillering and booting @4 ml/lit of water after 40 kg N/ha application as basal, respectively.

Keywords: Growth, Nano-DAP, Nano-urea, Paddy, Yield

Biography:

Triptesh Mondal currently working as assistant professor in the department of agronomy and agroforestry, M.S.S.S.O.A. He has published12 research articles in different national peer reviewed journals,2 popular articles, 3 book chapters, 2 extended summaries in 4th and 5th international agronomy congress and 9 abstracts published in different seminars and conferences. He has qualified ICAR NET conducted by ASRB in the discipline of agronomy the year 2017 and 2019.

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Poster

Sensory evaluation of different value added products of Aonla (*Emblica officinalis* G.) squash during storage

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Abstract:

A research experiment was conducted during the year 2019-20 and 2020-21 in the Fruit and Vegetable Processing Unit Laboratory, Department of Horticulture, College of Agriculture, Gwalior with seven different varieties of aonla viz., NA-4, NA-5, NA-6, NA-7, NA-10, Laxmi and Chakaiya. It was studied about the preparation of various value added product such as aonla squash. Observations were recorded up to storage period of six months at ambient conditions. This study is analyzed in a completely randomised design with three replications. Laxmi and Chakaiya varieties was found superior with respect to colour and appearance, taste, aroma, flavour as well as overall acceptability. It has been noticed that the overall acceptability of processed products have been found significant with the storage intervals such as 30, 60, 90 and 120 days. As far as sensory evaluation of different aonla varieties of squash was concerned, the Laxmi and Chakaiya varieties are found to be superior for the purpose of processing industry.

Keywords: Aonla, processing industry, storage and value addition.

Biography:

Ashwini Chandanlal Uikey, a PhD scholar (Fruit science, Department of Horticulture, Rajmata Vijayaraje Scindia Agricultural University, Gwalior , Madhya Pradesh).

Research Interest: Value addition, Physico-chemical , Evaluation

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Poster

An insight of isochoric freezing: A new horizon in shelf-life enhancement of fish products

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Abstract:

Food preservation at low temperatures is a tried-and-true method. Traditional food freezing methods frequently result in a number of irreversible changes that can significantly degrade the quality of frozen meals, even if they rely on the isobaric (constant pressure) approach. As a dependable method of food preservation, isochoric (constant volume) freezing, which has its origins in the biomedical field, has recently received academic and business interest. The major goal of this review is to demonstrate the state-of-the-art in isochoric freezing of foods while highlighting the underlying ideas that provide it particularity and understanding its effects on food quality while taking into consideration reports from the last 10 years. A unique section of this poster is devoted to the process' non-food applications, and it also provides insights into the method' costs and economics. The review concludes by highlighting the challenges and suggesting potential areas for future research, keeping in mind that this is a young discipline.

Keywords: Fish processing, freezing, isochoric freezing, application

Biography:

Ankures Bhattacharya, Ph. D. scholar, Department of Fish Processing Technology, Faculty of Fishery Sciences, West Bengal University of Animal and Fishery Sciences, Kolkata.

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Poster

Germplasm conservation- The conservation of plant genetic resources (PGRs)

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Abstract:

Germplasm of a crop or its wild varieties, refers to its complete set of genes. Several breeding programmes performed by various researchers use it as genetic resource. Biodiversity and its germplasm signify sustainable agricultural production, survival mechanisms against changes in climate, sufficient need for nutrients and secures future in terms of both plant and animal breeding. Plant genetic resources (PGRs) depicts and confirms the inherent worth of various plants and their wild varieties in numerous aspects of life. A recent trend of employing several biotechnological tools has been adopted to conserve the genetic resources and germplasm of numerous plants that are at a risk of becoming endangered or extinct. A reform needs to be brought about in this particular field of research that will encourage the release and collection of much needed crop varieties possessing necessary attributes for the production of food, fuel and medicines. Conservation is an act of using all the resources in a balanced way that ensures the well-being of future generations. The natural resources can be preserved and sustained by conservation. Both in-situ and ex-situ conservation methods are used for preservation of plant genetic resources (PGRs). The process where the plant crops are grown and preserved on field in their natural or self-maintaining environment refers to in-situ conservation. In contrast, ex-situ conservation implies the assortment of seed banks of genes assembled from plant that are grown naturally to form beneficial crop types. An in-vitro technique that involves tissue culture carried out in the laboratory is another type of ex-situ conservation method. For the preservation of nearly endangered species, cryopreservation is an in-vitro technique that incorporates freezing at much lower temperature than that of freezing point i.e., -196 °C in liquid nitrogen. At biotechnological and molecular level, the potential sources for conservation are the DNA or gene or seed banks.

Keywords: Germplasm conservation, Plant genetic resources, Ex-situ, In-situ, Cryopreservation, Endangered, Extinct species

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Poster

Impact of naphthalene acetic acid on the morpho- physiological traits and yield attributes of Dahlia (*Dahlia variabilis* L.)

Vertika Tripathi and S.P. Tiwari
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Abstract:

A field experiment was formulated to determine the effect of Naphthalene Acetic Acid (NAA) on the morphology, yield, and yield-contributing attributes of two Dahlia (Dahlia variabilis L.) cultivars, Topstar and Figaro. The study was carried out at the Research Farm, College of Agriculture, Raipur, during the Rabi season of the year 2021–22 and laid out following the complete randomized block design (CRBD) in three replications. At 30 and 60 days after transplanting, the growth hormone NAA (0, 60, 90, and 120 ppm) was applied foliarly, and various morphological, yield, and yield-attributing traits were recorded following foliar application. The results from the present study revealed that morphological traits such as plant height, stem girth, leaf area, and the number of leaves plant-1 were maximized with the application of NAA at 120 ppm concentration. Furthermore, when plants were treated with NAA at 90 ppm, yield and yield-attributing traits such as fresh flower weight, bud weight, and total biological yield were found superior.

Keywords: Dahlia, NAA, Foliar application, morphology, yield and yield contributing traits

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Poster

Anti-disease property of Bitter Melon (*Momordica charantia*)

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Centurion University of Technology and Management, Bhubaneswar, India

Abstract:

Currently, several medicinal plants are considered as Nature's natural ornaments and are gaining immense attention in drug discovery due to their versatile safety profile and potential to treat wide range of ailments. Further, modern science and technology have made it possible to find active constituents present in these plants to examine their role as biological targets for treatment options of many diseases. Momordica charantia, also known as bitter melon or bitter gourd, belongs to family Cucurbitaceae that grows in tropical and sub-tropical regions. This plant is cultivated all over the world, including tropical areas of Asia, Amazon, East Africa, and the Caribbean and used as vegetable as well as folk medicine. The versatile functions of Momordica including its anti-inflammatory and anti-disease properties are widely reported. Specifically, bitter melon extract and its derived compounds are known to cure diseases such as Cancer, Rheumatoid Arthritis, Diabetes, Parkinson disease, Depression, Alzheimer's disease, Inflammatory Bowel's Disease, Fatty liver disease, Obesity, Asthma and Hypertension. Several animal model based experimentation studies suggested that phytocompounds can cure these diseases by altering host's molecular and biochemical signaling pathways. Understanding the mode of action of Momordica charantia derived compounds against several diseases may pave way for discovery of new drug formulations.

Keywords: Phytocompounds, Alzheimer, Bitter Melon

Biography:

Sanjib Kumar Mohanty continuing his PhD in Centurion University of Technology and Management, Bhubaneswar in the Department of Zoology under the guidance of "Dr. Yashaswi Nayak" on the topic "Momordica charantia phytochemicals against senile plaques causing Alzheimer's disease". He has done his MSc .Zoology in Centurion University of Technology and Management, BBSR, Odisha. His objective to establish a long-term career in a Health Science of Research Centre, where he may utilize his Research Scholar professional skills and knowledge to be an effective researching skills and inspiration to those around him. During the course of his Master's he had an opportunity to work on "In Silico analysis of phytochemicals from Coriander treatment against Prostate cancer".

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Poster

Immunological approaches for Candida detection

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Abstract:

Candida species are regarded as commensal fungal species of the oral cavity in healthy individuals. These organisms mostly cause mucosal mouth infections and they can also invade the bloodstream resulting in deep-tissue infections under favorable conditions in host. For appropriate diagnosis of Candida borne diseases, accurate and precise detection of the Candida sp. is vital. Inaccurate detection of a pathogen causing improper diagnosis disable treatment options. To detect Candida species, several methods including conventional, molecular and biochemical assays are available and these methods are more or less accurate. On the other hand, immunological assays for detection of Candida sp. have always gained demand due to higher degree of precision, specificity and sensitivity. Most of the immunological techniques are time consuming to perform; nevertheless, researchers rely on these techniques due to high level of accuracy caused by specific antigen-antibody interactions. Indeed, there are rapid immunological techniques too for quick detection of Candida sp. Several precise immunological methods, such as ELISA, RIA, Immunofluorescence, Flow cytometry, and immunochromatography are reported for detection of Candida sp. Antigen-antibody based coagulation and lateral flow-based immunoassays are considered point of care detection approaches that are used widely for rapid detection of Candida sp.

Keywords: Invade, conventional, coagulation

Biography:

Somya Sephalika, continuing her PhD at Centurion University of Technology and Management, Bhubaneswar in the department of Zoology. She has completed her M.Sc., in Zoology at Indira Gandhi National Tribal university (IGNTU), Amarkantak in the year of 2020. During MSc, she worked on a dissertation topic entitled 'Role of antennae in the behavioral activities of insects' at lab of Entomology and Behavioral ecology, Department of Zoology, IGNTU. During her Masters degree, she got a sound exposure and experience in handling several laboratory equipment such as Biochemical Oxygen Demand incubator, Microtome, Centrifuge, Microscope, Micropipette and learnt techniques such as Gel electrophoresis and Centrifugation. Additionally, she also, learnt about rearing of insects and observed the behavioral pattern manifested by them. My career goal is to engage myself in an organization where I can show my expertise on research skills.
Research Interest: Applied immunology

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Poster

Effect of organic manure on *Macrotyloma uniflorum's* bio chemical parameters

Pratikshya Mohanty, Kalpita Bhatta, Swarna Sarita Sahoo
Centurion University of Technology and Management , Bhubaneswar, India

Abstract:

The main objective is to optimize the concentration of FYM, Vermicompost and Rhizobium, which can be applied in the treatment of the soil, to maximize the Macrotyloma uniflorum yield and find out the most treatment combination of plant growth, yield and quality. Macrotyloma uniflorum is one of important tribal pulses and has anti-hypercalciuric activity. The plant was subjected to seven different treatments, control (C), soil with rhizobium inoculated seed (S+R), soil with Vermicompost application (S+V), soil with farmyard manure (S+FYM), soil and Vermicompost along with rhizobium inoculation (S+V+R), soil with farmyard manure and vermicompost (S+FYM+V), and soil with Vermicompost and inoculation of rhizobium (S+FYM+V+R), soil with farmyard manure and vermicompost (S+FYM+V), and farm yard manure with Vermicompost (FYM+V) for observations. Replicates of each in three are taken. V+R has lowest (7.55 mg/g) chlorophyll content, and highest is seen in (7.92 mg/g) S+V+F. S+V+F (37.5 µg/ml) has a greater protein content, while S+F (19.88 µg/ml) has low value. The maximum proline is found in S+R (207.32 µg/g) and S+V+R (57.01 µg/g) has high concentration. The maximum value of total phenolic is found in S+V+F (3.66 mg/ml), whereas the lowest is found in S+V+F+R (3.07 mg/ml). The highest carbohydrate concentration is observed in Control Conditions, 0.087(µg/g). As such, future experiments are needed to explore the result recorded for first recommended package for cultivation of the crop and its yield.

Keywords: Macrotyloma uniflorum, Organic manure, Vermicompost, Rhizobium, protein

Biography:

Pratikshya Mohanty is now working as a Full time PhD Scholar Under the supervision of Dr. Kalpita Bhatta, Assistant Professor, Department of Botany, School of Applied Sciences, Centurion University of Technology and Management, Bhubaneswar. I have completed my bachelor's degree from Utkal University and Master's degree from Centurion University of Technology and Management. The mentioned work is a small part of my PhD Programme with future works in the field of Agriculture.

Research Interest: Nanotechnology and Tissue culture Techniques

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Poster

Macrotyloma uniflorum and fly fsh: An evaluation

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Centurion University of Technology and Management , Bhubaneswar, India

Abstract:

The current investigation has been carried out to evaluate safe, sustainable and potential use of fly ash in agriculture. As Coal is commonly used in developing countries for electricity generation. Fly ash management is a source of threat to the environment. However, it has soil parameters such as alkali pH, good electric conductivity, porosity, and high water holding capacity that can be explored for soil amelioration. Therefore in 2003, Central Fuel Research Institute has developed FASAT (Fly Ash Soil Amendment Techniques) technique for crop improvement. FASAT technique was used to evaluate the different parameters of *Macrotyloma uniflorum*. Which is commonly know as KULTHI. It has antiureothelic properties and widely used for protein rich diets The experiment was designed by taking C1(soil), C2(fly ash), and pots of different ratios such as of 1:1, 2:1, 3:1, 4:1 by mixing fly ash with CUTM garden soil in the above said proportion. High protein content was observed (18.66mg/g) in the 3:1. While growth was stunted, and protein content was lower (6.0995 mg/g) in the fly ash alone. C1(soil) shows highest percentage (95%) of germination. Based on the above observation, it can be concluded that fly ash can be employed in cultivation with a fixed ratio for the better yield of crop. XRF data of Fly ash shows it contain a reliable amount of K, Na, Zn, Ca, Mg and Fe which can be utilized for future prospect of it.

Keywords: FASAT, Macrotyloma uniflorum, antiureothelic, Germination, Protein

Biography:

Snigdha Behera, now working as Ph.D Scholar under the supervision of Dr. Kalpita Bhatta, Assistant Professor, Department of Botany, School of Applied Sciences, Centurion University of Technology and Management, Odisha, India. She has completed her bachelor's degree from North Orissa University, Baripada, Mayurbhanj, Odisha and Master's degree from Department of Botany, Centurion University of Technology and Management.

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Poster

Herbarium preparation of angiosperm plants

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Abstract:

Plant specimens are fundamental to taxonomic teaching and research. Methods of collection, preparation (pressing and drying), and identification of plants specimens are itemized. An herbarium is a depository of plant specimens which are collected, dried and mounted on handmade chemical free paper sheets. Herbarium procedures include collection of plant specimen, pressing, drying, mounting, labelling. The specimens were collected randomly from the botanical garden of Centurion University of Technology and Management (CUTM) Bhubaneswar campus. Pressing and drying of the collected specimens were done using herbarium pressure. For preservation of the collected specimens, naphthalin balls were used. They are arranged as per the system of classification and kept in pigeon holes of steel or wooden cup boards and maintained carefully for current and future studies. It can be used as reference material for naming, identification and classification of the plants. The identification and voucher specimen number are essential in these days for research as well as for publications. Herbaria round the world are recording the planet's plant diversity and the people of future generations will be enriched about the endangered or extinct plants of the world due to the rate of extinction of species. This current part of our study will focus on future conservation and preservation of the collected specimens that are on the verge of extinction.

Keywords: Herbarium, Conservation, Preservation, Plant specimen, Plant identification, Voucher specimen number

Biography:

Ashish Panigrahi pursuing his Bsc Botany in Centurion University Bhubaneswar Odisha. He has done his schooling and intermediate from Kendriya Vidyalaya No.1 Sambalpur Odisha. His hobbies are Reading books and travelling. His future goal is to become an academician. Now he is indulged in Projects like Hydroponics, Cactus grafting which is ongoing.

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Poster

Extraction of Gelatin from fish scale

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Abstract:

Gelatin is a protein made from animal collagen, it's commonly used to make capsules, cosmetics, ointments and foods. Gelatin also used as finishing agent in leather manufacturing industry. In this project we determined the physical appearance of gelatin extracts through physical observation and we had taken the Lobeo rohita fish scale for extraction of gelatin. Here first we have taken the fishscale and washed it properly. Then we prepared the NaoH solution in 1:10 ratio then we put all the scale in solution for 6 hours and then scales are again washed properly. After that we prepared the Hcl solution and put all the scale in that Hcl solution. After extraction of scale from Hcl solution we had put it in distilled water. And then we took the solution for waterbath in 70'c for 6 hours. Then we extracted the water from scale and now water solution is ready for defreezing in -18'c. After extraction from defreezing then we kept the solution ice in hot air oven for 6 hours and then the final product of gelatin was extracted from hotair oven and packaged it properly. Finally we obtained or get 23 grams of Gelatin from Fish scale.

Keywords: Gelatin, Collagen, Lobeo rohita, Fishscale, NaoH solution, Waterbath, Defreezing

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Poster

Breeding of gold fish (*Carassius auratus*)

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Abstract:

Carassius auratus is a freshwater ornamental fish known for its bright colour. It has a great demand in ornamental fish industry. It is an egg layer, and its egg is adhesive in nature. Breeding of gold fish is comparatively easy than any other ornamental fish. The most important factor that influence goldfish breeding is temperature.

The most important thing in breeding is to identify the male and female individuals. In case of goldfish the females are little larger in comparison to males. Females have rounded belly where as males are slim in structure. Males have tubercules on pectoral fins, which seems to be like little white spots. In general, 2:1 ratio of male and female respectively is being maintained. Before introducing the goldfish to the breeding tank, they should feed properly. Then the minimum temperature is maintained in the tank which will be in between 20°C-26°C. For smooth breeding spawning mop was introduced which was made by using polythene, pebble and elastic rubber and mechanical filter was removed and sponge filter or aerator was introduced. After 2-3 days they will lay their eggs and hatching will be done in 5-7 days. Then for feeding the fingerlings green water (generally the pond water) and infusoria water (mainly made by adding 3 banana peels to 1 litre of water, and providing heavy aeration continuously for 3 days) was being added to the breeding tank. Then their growth rate was being observed.

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Poster

Aquaponics and its types

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Abstract:

Aquaponics is a farming of fish and plants in a single recirculating system. In aquaponics, the plants are grown in the grow bed, and fish are placed in the fish tank. The water from the fish tank that contains fish waste is fed to the grow bed, where billions of naturally occurring beneficial bacteria break the ammonia down into nitrites and then into nitrates. Plants absorb these nitrates and other nutrients to help them grow. In return, the plants clean and filter the water into the system. The fresh, clean, and oxygenated water then recirculates back to the fish tank, where the cycle will begin again. There are three main types of aquaponics that are 1. Gravel Bed Culture (GBC), 2. Raft system or Deep-Water Culture (DWC), 3. Nutrient Film Technique (NFT). A media-based system uses a grow bed or container filled with grow media (usually gravel, lava rock, or clay pebbles) to plant the crops. The grow bed is periodically flooded with water from the fish tank through a bell siphon so that the plants can access the nutrients. The water then drains back into the fish tank, in which a new cycle begins. The Nutrient Film Technique (NFT) is a hydroponic growing technique adapted to aquaponics because of its simple yet effective design that works well in some environments. This method uses horizontal pipes (PVC) with shallow streams of nutrient-rich water flowing through them. The NFT is famous for commercial aquaponics and is also helpful in urban places where space and food production are problems. The Deep-Water Culture (DWC) is also known as the raft system of aquaponics is one of the most efficient aquaponics system designs. This system is often used in large-scale or commercial aquaponics systems because of its mass production capability.

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Poster

Natural alternatives against drug resistant Dermatophytes

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Abstract:

Treatment of fungal infections becomes difficult because of emergence of resistant strains. Drug resistance of dermatophytic fungi is gaining importance. To rescue the human population from the dermatophytic infections, medicinal support was really needed. By time it is being observed that synthetic compounds are losing their effective nature over infectious organisms. To adopt new climatic conditions, mutation in the causal organisms has been noticed. Compound like terbinafine and inositol, etc. shows less effect over infectious organisms such as *Trichophyton, Candida*, etc. With the repeated use of same drug, the causal organism mutated for self-existence and gets resisted towards the synthetic drugs. In other hand synthetic drug application can result other side effects to human body. Hence, research is needed for development of natural alternative of synthetic dermatophytic compounds. Traditional knowledge in using the medicinal plants for their antimicrobial activity and certain microbes in showing the antagonistic effects on dermatophytic infections will be helpful. Pongamia *pinnata, Madhuca longifolia, Cassia occidentalis and Solanum nigericans* show activity against skin infections. Application of plant metabolites can protect from dermatophytic infections. However, a new way to treat dermatophytic infections naturally can be developed without harmful side effects.

Keywords: Cassia, climatic conditions, Madhuca, natural alternatives, traditional knowledge

Biography:

Monalisha is a Ph.D. Scholar, Department of Botany, School of Applied Sciences, Centurion University of Technology and Management, Odisha, India.

Research Interest: Antimicrobial activity, Novel drug discovery, Phytochemical analyses

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Poster

Integrated Farming- An alternative for climate change mitigation

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Abstract:

Reduced land and production area for agricultural activity in order to feed the large growing population has become a great challenge for farmers as well as for the agricultural scientist. To insure the food availability in an environment friendly manner by keeping minimum waste residues left over could only be possible by following Integrated Farming Methods (IFM). The IFM is a sustainable agriculture system in which many cultivation techniques along with modern tools and technologies are combined so that the whole system gets benefited from each other , thus enhancing the productivity and strengthening the financial status of a farmer. Integrated farming system has proved to be one of the alternatives for climate change and global warming mitigation as it is able to lower the rate of greenhouse gases produced in the farm such as CO2 and methane, which if increases above a certain limit , greatly contribute to global warming. This farming system combines elements such as crop, livestock, fish in such a way that the byproduct of one component is of great use for the other one. These techniques have maximum efficiency in recycling resources (e.g. waste into biogas) creates a system with minimum environment impact, and lowers operating costs . However it requires substantial knowledge and potentially upfront investments. Thus it is very necessary that the integrated farming method should be accepted globally because it is not only an environment friendly technique but it also increases the economic strength of a farmer in particular and of the nation in general.

Keywords: Integrated Farming Methods(IFM), global warming, climate change, environment friendly, economic strength.

Biography:

Sayantika Bhowmick, student of Centurion University of Technology and management , Paralakhemundi ,Odisha . I have completed my matriculation from ST. Xavier's English School , Chakradharpur, Jharkhand and my intermediate from S.J.DAV Public School, Chaibasa, Jharkhand. I am now pursuing my Bsc agriculture degree from Centurion University as it provides us a platform to prove our excellence in a particular field. After my Bsc degree I want to go for further studies.

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Poster

Crop Production

Aaheli Mazumdar
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Abstract:

India is the largest producer of agriculture production in the world. Crop production is the process of growing crops for domestic and commercial purposes. Some of the crops produced on a large scale include rice, wheat , jute , maize. Agronomic crops provide the food, feed grain, oil and fiber for domestic consumption and are a major component of US export.

Methods and design of crop production:

- Ploughing, sowing, adding manures , irrigation, harvesting and storage.
- Randomised complete block design is the most commonly used design in agricultural field research.
- Crops are primarily source of food for all human beings. With an increasing population the demand for food is also on the rise. Several crop production, management strategies and methods are implemented in the agricultural field to increase output level.

Conclusion:

- Agriculture is an integral part of smart growth. The ability to feed one's own population is critical to the independence of any state.
- Crop production supports the huge population of a country. All individuals depend on the crops for their food . It also provides employment to a large number of people.

Biography:

Aaheli Mazumdar from West Bengal, Kolkata, currently studying Bsc (Ag) from MS Swaminathan school of Agriculture, Centurion University. She has completed her12th from Sri Chaitanya Junior College, Vijaywada and my 10th from Auxilium Convent School, Bandel.

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Poster

Utilizing metabolomics to improve heat stress tolerance in tomato

Mir Mujtoba Siraj Ali
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Abstract:

Inducible tolerance mechanisms in plants increase the temperature range at which they can survive under severe temperature stress. Several metabolites were previously thought to functionally support induced stress tolerance. Recent research has brought the "temperature- stress metabolome" back into the spotlight, showing that changes in gene expression brought on by temperature-stress-activated signaling and stress-related transcription factors drive the metabolome's active reconfiguration in part. The substantial role of central carbohydrate metabolism, which tends to be a key component of the reprogramming of the metabolome during temperature stress, is an attribute of metabolism that is constant across all of the temperature-stress metabolomic studies conducted to date. In this study, we are utilizing the tomato plant's (Solanum lycopersicum) HsfB1 gene's capacity to improve thermotolerance.

Under non-stressful circumstances, HsFB1 promotes the accumulation of metabolites such as HS-related proteins. Increased amounts of HsfB1 in plants result in abnormal growth and development, but also increased thermotolerance. Prior to stress, HsfB1 suppression has no discernible impact. Due to the enhanced activity of other HS-induced Hsfs, HsfB1 suppression greatly increases the induction of heat shock proteins upon HS, increasing thermotolerance in comparison to wild-type. The leaves of plants with HsfB1 knockdown show an accumulation of metabolites such as the sugars, sucrose and glucose and the polyamine putrescine with a positive effect on thermotolerance. This accumulation is caused by manipulation of HsfB1, either by suppression or overexpression (OE), which results in enhanced thermotolerance.

Keywords: Metabolomics, heat stress, tolerance, HsfB1, Hsfs, Heat shock protein

Biography:

Mir Mujtoba Siraj Ali, now enrolled in Centurion University of Technology and Management's second year of Bsc. Agriculture programme. He has attended Sri Narayan Vidyavabhan for my secondary and higher secondary schooling, Paschim Medinipur.

Research Interest: Plant Biotechnology, Genetics

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Poster

Detoxifying soil and water through the use of phytoremediation

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Abstract:

Solid waste disposal has increased as a result of urbanization and industrialization, which has raised concerns around the world. Leachate leakage from landfills contaminates soil and groundwater, which can have a negative impact on agricultural and public health. Heavy Metals (Cd, Ba, Hg, Pb) and Toxic Metals (Cr, Mn, Cu, and As) in soil and water can have a detrimental effect on people's health. But according to current agricultural knowledge, there is a technique to employ plants to absorb, degrade, or volatilize pollutants. The plant-based approach, which involves the use of plants to extract and remove elemental pollutants or lower their bioavailability in soil is known as phytoremediation, and it has gained popularity over the past ten years as a less expensive, non-invasive substitute or supplementary technology for engineering-based remediation methods. Through their root systems, plants are capable of absorbing ionic substances from the soil, even at low concentrations. The ability of four aquatic plants to remove mercury from wastewater was tested, including water hyacinth (*Eichornia crassipes*), water lettuce (P. *stratiotes*), zebra surge (*Scirpus tabernaemontani*), and taro (*Colocasia esculenta*). Water lettuce and water hyacinth are particularly effective at absorbing nitrate, orthophosphate, nitrite, and ammoniacal nitrogen. Brassica juncea, Alyssum murale, Agrotis tenuis, and Thlaspi caerulescens absorb lead, while *Brassica juncea, Silense vulgaris, Brassica oleracea, and Sedum alfredii* absorb nickel. On the other hand, plants that absorb zinc include *Thlaspi caerulescens, Silense vulgaris, Brassica oleracea, and Sedum alfredii*.

Keywords: Heavy metal, phytoremediation, toxic metal, pollutants.

Biography:

Priyabrata Roy currently studying in my second year of my Bsc. Agriculture course in Centurion university of technology and management. He has completed my secondary and higher secondary education from Chandrakona Jirat High School, Paschim Medinipur.

Research Interest: Plant genomics

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Poster

Genetic Diversity studies in cucumber (*Cucumis sativus* L.). for morphological, molecular and quality traits

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Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

Cucumber is a diversely cultivated around the world for various purposes. Till date several breeding programmes have been introduced to improve production of cucumber. These breeding programmes were introduced mostly based on quantitative traits irrespective of morphological and physiological traits. In this research we try to improve the genetic diversity of cucumber focused on qualitative, morphological and molecular characteristics, for this research 96 varieties of cucumber are being grown. After one month of growth, each variety will be analysed molecularly and morphologically and in mean while qualitative characters are also recorded.

For each variety total 35 observations have to be taken, starting from seeding stage to harvesting stage. In molecular analysis, the DNA will be extracted from each variety and we run the gel in order to find out the purity and impurities in the crop. Finally, to get the proper data we go for statistical analysis by following some methods like population structure, Principle component analysis, Cluster analysis by using some softwares like Darwin. By these experiments we tend to conclude some varieties which are morphologically, molecularly and qualitatively better than the other varieties.

Keywords: Cucumber (Cucumis sativus L.), Genetic Diversity, Morphological, Molecular, Quantitative characteristics, Statistical Analysis

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Poster

Differential regulation of rice microRNAs under compatible and incompatible rice-brown planthopper interactions

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Abstract:

Nilaparvata lugens Stal, commonly known as BPH poses a great threat to global rice production by being a monophagous feeder of it. Several studies on rice-BPH interactions are going on to understand the underlying interaction mechanisms. MicroRNAs (miRNAs) have played instrumental roles in regulating rice defenses against different pathogen and insect attacks. However, the role of miRNAs in rice-BPH interactions is explored to a limited extent. Therefore, the identification of rice miRNAs involved in rice-BPH interactions will help unravel the complex mechanisms. In this work, two different BPH populations with contrasting levels of virulence were infested onto the IR56 rice carrying the Bph3 gene. The interaction between the TN1-BPH population and IR56 rice, and the IR56-BPH population and IR56 rice were considered to be incompatible and compatible interactions, respectively. A small RNA sequencing method was adopted to investigate the involvement of rice miRNAs in these rice-BPH interactions. The miRNAome analysis revealed 218 known and 28 novel miRNAs from 54 miRNA families in rice. About 138 and 140 differentially expressed (DE) miRNAs were identified during the compatible and incompatible interaction, respectively. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) enrichment analysis suggested key target candidates gene of the miRNAs (osa-miR2871a-3p, osa-miR172a, osa-miR166a-5p, osa-miR2120, and osa-miR1859) that might regulate the IR56 defense responses. On the other hand, osa-miR530-5p, osa-miR812s, osa-miR2118g, osa-miR156l-5p, osa-miR435, novel_16, and novel_52 might supress the IR56 rice defense during BPH infestation. These results were further validated by the expressional analysis to map the IR56 rice defense regulatory network. The findings from the study add further insights into the molecular mechanisms of rice-BPH interactions and will be helpful for future research.

Keywords: Rice, MiRNA, Brown planthopper, rice protection

Biography:

Ms. Priyadarshini Rout is a Ph.D. Scholar at the Department of Biotechnology, Centurion University of Technology and Management (CUTM). She is working as a Project Associate in a SERB project at the Plant Molecular Laboratory, CUTM, Paralakhemundi. Her research area is focused on Insect Genomics and Plant Protection. Some of her findings are already published in reputed SCI journals.

Research Interest: Plant Protection, Insect Genomics, Insect Ecology

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Poster

Effect of nutrient omission on the growth and productivity of Maize (*Zea mays* L.)

Shaik Rishitha, P. Prasanth Kumar, Tanmoy Shankar and Sagar Maitra
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

The application of nutrients is one of the most effective means to improve the productivity of maize. So, to find the effect of different macronutrients on the growth and productivity of maize, an experiment with the nutrient omission plot technique was laid out during the rabi season of 2021 at PG Experimental Farm, Centurion University of Technology and Management, Odisha. The soil of the research plot was slightly acidic with a pH of 6.3 and the texture of the soil was sandy clay loam. The experiment was laid out in a randomized complete block design with eight treatments and three replications. The treatments of the experiment were: T1:N100P100K100 (ample dose), T2:N0P100K100, T3:N100P0K100, T4:N100P100K0, T5:N100P0K0, T6:N0P100K0, T7:N0P0K100 and T8:N0P0K0 (control). The maize hybrid used in this experiment was "Sharp" sown at a spacing of 60 cm × 25 cm. The omission of two or three major nutrients i.e., T5:N100P0K0, T6:N0P100K0, T7:N0P0K100 and T8:N0P0K0 resulted in the least performance in all growth parameters and yield of maize. The growth and yield enhancement in the omission treatments showed a trend like NPK>NP>NK>PK>N>P>K> control. Hence, the study revealed that the presence of ample dose of primary nutrients influenced growth and productivity of maize and facilitated the crop to produce higher yield.

Keywords: Growth, maize, nitrogen, omission plot, phosphorous, potassium, yield

Biography:

Shaik Rishitha is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management. Rishitha does research in agronomy. Shaik Rishitha's current research areas are nutrient management, soil science, and water management.

Research Interest: Agronomy, Irrigation and Water Management and Soil Science

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Poster

Influence of urea and nano-urea foliar application on maize

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Abstract:

Globally, to meet the increased food demand due to the rapidly expanding population, overuse of nitrogen-based fertilizers is escalating. The unprecedented use of nitrogen besides polluting the environment, it brings about amplified susceptibility to biotic and abiotic stresses. Maize is the predominant cereal crop of Southern Odisha after rice. Hence, there is a need to optimize the use of nitrogen-based fertilizers using nanotechnology. Keeping this in view, a field experiment on the comparative performance of urea and nano-urea foliar application on maize (*Zea mays* L.) was conducted during the rabi season of 2021-22 at PG Experimental Farm, Centurion University of Technology and Management, Odisha under sandy clay loam soil conditions. The results showed that all the growth and yield data evaluated in this study were significantly influenced by foliar application of nano-urea. The maximum plant height, leaf area index and yield were recorded with 100% Recommended dose of nitrogen (RDN) + foilar spray of nano urea (FSNU) @ 4 ml/L which were statistically at par with 100% RDN+FSNU @ 2ml/L and 3ml/L applied at knee height and tasseling stage. However, the adoption of 100% RDN + foliar spray of nano-urea @ 4ml/L could be an ideal technological alternative to achieve sustainability in irrigated *rabi* maize cultivated under Southern Odisha conditions.

Keywords: Maize, Foliar spray, nano-urea, nitrogen, urea

Biography:

Akash Kumar Tudu is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management. Akash does research in agronomy. Akash Kumar Tudu current research areas are nutrient management, soil science, and water management.

Research Interest: Agronomy, Irrigation and Water Management and Soil Science.

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Poster

Impact of the omission plot technique on the performance of Rabi Rice (*Oryza sativa* L.)

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Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

Rice (*Oryza sativa* L.) is one of the most important staple food crops in both India and the world. To ensure food security it is essential to scale up its productivity. Nutrient application is one of the most effective ways to increase rice productivity. However, the information available of relative impact of different macronutrients and micronutrients on rabi rice in southern Odisha is meagre. Therefore, an experiment with nutrient omission plot technique was laid out during the rabi season of 2021 in PG Experimental Farm, Centurion University of Technology and Management, Odisha. The soil of the research plot was moderately acidic with a pH of 5.3, and the texture of the soil is sandy clay loam. The experiment was designed in a randomised block design with seven treatments such as T1: N120P60K60Zn05S25, T2: N0P60K60Zn05S25, T3: N120P0K60Zn05S25, T4: N120P60K0Zn0S25, T5: N120P60K60Zn0S25, T6: N120P60K60Zn05S0 and T7: absolute control, which were replicated thrice. The results showed a significant effect on growth and yield parameters like plant height, dry matter, LAI, number of tillers, grain yield, and straw yield. The treatment N120P60K60Zn05S25 (T1) with 100% recommended dose of fertilizer (RDF) resulted in maximum plant height, dry matter accumulation (g/m2), leaf area index and yield. The treatments N120P60K60Zn0S25 (T5) and N120P60K60Zn05S0 (T6) also registered similar growth and yield, and they were statistically at par with T1: N120P60K60Zn05S25 (i.e., 100% RDF).

Keywords: Growth, Rice, Nutrient, Omission plot, Yield

Biography:

Sitabhra Majumder is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management. Sitabhra does research in agronomy. Sitabhra Majumder's current research areas are nutrient management, soil science, and water management.

Research Interest: Agronomy, Irrigation and Water Management and Soil Science

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Poster

Effect of herbicides on weed dynamics, growth and yield of transplanted rice

Suman Dey and Ashirbachan Mahapatra
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Abstract:

Rice is a key source of food and dietary energy in the world. Weed infestation is a major threat for low productivity of rice. Among various weed management, timely application of appropriate herbicide can be considered as an effective measure. Considering the above, a field experiment was conducted at PG Experimental Farm of Centurion University of Technology and Management, Odisha during kharif season(2022) to examine the effects of pre- and post-emergence herbicides on rice. The experiment was laid out in Randomized Block Design (RBD) with eight treatments, namely T1: weedy check, T2: weed free, T3: two hand weeding at 20 and 40 DAT, T4: Pretilachlor 6.0% + Pyrazosulfuron-ethyl 0.15% @ 615 g/ha at 2 DAT, T5: Bispyribac -sodium 10 SC @ 25 g/ha at 20 DAT, T6: Pretilachlor 6.0% + Pyrazosulfuron-ethyl 0.15% @ 615 g/ha at 2 DAT + hand weeding at 30 DAT, T7: Bispyribac-sodium 10 SC @ 25 g/ha at 20 DAT+ hand weeding at 40 DAT, T8: Pretilachlor 6.0% + Pyrazosulfuron-ethyl 0.15% @ 615 g/ha at 2 DAT + Bispyribac-sodium 10 SC @ 25 g/ha at 30 DAT. Significant variations were observed on the mixed weed flora as well as on performance of rice under the different treatments. Pretilachlor 6.0% + Pyrazosulfuron-ethyl 0.15% @ 615 g/ha + hand weeding was shown to be effective, with the lowest weed population and weed dry weight, as well as the maximum weed control effectiveness and rice grain yield. Weedy check plots had the lowest grain production and the largest weed density.

Keywords: Maize, Legume, Intercropping, Growth, Yield

Biography:

Suman Dey is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management. Souvik does research in agronomy. Suman Dey's current research area is weed management in transplanted rice

Research Interest: Agronomy, Soil Science and Water management.

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Poster

Effect of nitrogen and potassium levels on growth and yield of low glycemic index rice variety RNR 15048 during summer season

M. Prince Frederick, A. Sivasankar, M. Devender Reddy and Tanmoy Shankar
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

A field experiment was conducted to investigate the effect of four levels of nitrogen (0, 50, 100 and 150 kg N ha-1) and three levels of potassium (0, 30 and 60 kg K ha-1) on the growth and yield of low glycemic index rice variety RNR 15048 during summer season at Post graduate Research Farm, M S Swaminathan School of Agriculture, Centurion University of Technology and Management, Paralakhemundi, Odisha in split plot design with three replications. At 60 and 90 days after transplanting (DAT) and harvest, the plant height and dry matter increased significantly with the increase in levels of nitrogen from 0 to 50, 100 and 150 kg ha-1 and potassium from 0 to 30 and 60 kg ha-1. The grain yield of RNR 15048 variety increased significantly with increase in nitrogen levels which was 36%, 64% and 74% respectively at 50, 100 and 150 kg N ha-1 over no nitrogen. The increase in grain yield due to potassium levels was 4% and 8% respectively at 30 and 60 kg K2O ha-1 over no potassium. These findings indicate that the low glycemic index rice variety RNR 15048 gives higher yield with application of 150 kg N and 60 kg K2O along with 60 kg P2O5 ha-1 in Southern Odisha.

Keywords: Rice, Growth, Nitrogen, Potassium, RNR 15048 rice variety

Biography:

Manukonda Prince Frederick is from Narasannapeta of Srikakulam District, Andhra Pradesh completed my B.Sc., Agriculture from M S Swaminathan school of Agriculture, Centurion University of Technology and Management, present pursuing my M.Sc., Agriculture (agronomy) in M S Swaminathan school of Agriculture, Centurion University of Technology and Management.

Research Interest: Nutrient Management

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Poster

Effect of nitrogen and phosphorous on growth and yield of low glycemic rice variety RNR 15048 during summer season

S Sai Sivani, A Sivasankar, M Devender Reddy, and Sagar Maitra
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

An experiment on effect of different levels of nitrogen and phosphorus on growth and yield of low glycemic index rice variety RNR 15048 was conducted during summer season of 2022 at PG research farm of M.S.Swaminathan School of Agriculture, Parlakhemundi, Odisha. The experiment was conducted in split plot design with four levels of nitrogen (0, 50, 100 and 150 kg ha -1) in main plot and three levels of phosphorus (0, 30,60 kg P2O5 ha-1) in subplots with three replications. The plant height and dry matter at different stages (30,60 and 90 days after transplanting (DAT) and harvest) and grain yield differed significantly due to nitrogen and phosphorus levels. These parameters significantly increased with increase in nitrogen levels from 0 to 50,100 and 150 kg N ha-1. Further significant increase in plant height and dry matter was also observed with increase in phosphorus levels from 0 to 60 kg ha-1. The grain yield increase was 14% ,59% and 77% respectively at 50,100 and 150 kg ha-1 over no nitrogen. The increase in grain yield with increase in phosphorus levels was 5% and 11% at 30 and 60 kg ha-1 over without phosphorus application. These results suggest that for low glycemic index rice variety RNR 15048, application of 150 kg N ha-1 and 60 kg P2O5 ha-1 along with 60 kg K2O ha-1 gives higher yield in southern Odisha during summer season.

Keywords: Nitrogen, Phosphorus, Low glycemic rice, Rice variety 15048, Summer season

Biography:

Sapparapu Sai Sivani has completed her B.Sc. Agriculture in centurion university of technology and management. Now she is pursuing her M.Sc. Agriculture in centurion university of technology and management, M. S. Swaminathan School of Agriculture.

Research Interest: Nutrient Management

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Poster

Effect of row spacing and nitrogen levels on growth and productivity of summer sesame

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Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

To ensure self-sufficiency in oilseeds production, India needs to enhance production and productivity through adoption of improved technologies. Among different edible oilseeds, sesame (*Sesamum indicum* L.) grows well during different seasons under various cropping systems and the productivity can be increased by efficient nutrient management and plant stand. Based on the above facts, a field trial was conducted during summer season of 2021 at PG experimental Farm of Centurion University of Technology and Management, Odisha by adopting split plot design comprising of three main plot treatments as spacing (30 cm × 15 cm, 40 cm × 15 cm and 50 cm × 15 cm) and four subplot treatments as nitrogen levels (0, 30, 60 and 90 kg N/ha). All the yield attributes of sesame were observed to be maximum with wider spacing of 50 × 15 cm and it was closely followed by 40 cm × 15 cm and, both the treatments were significantly superior to a closer spacing of 30 cm × 15 cm. However, the maximum seed, stover and biological yields of sesame were realized with a spacing of 40 cm × 15 cm. Among different nitrogen levels, 90 kg N/ha resulted in superior performance in expression of various growth and yield attributes and seed (525 kg/ha), stover (2372 kg/ha) and biological yields (2898 kg/ha) than other levels. The experiment concluded that to obtain higher growth and productivity of sesame, the spacing of 40 cm × 15 cm can be adopted along with 90 kg N/ha.

Keywords: Sesame, Growth, Nitrogen, Spacing, Yield

Biography:

Karthika Vishnu Priya.kathula is currently pursuing a M.Sc. (Agri.) Agronomy at the Centurion University of Technology and Management, Odisha.

Research Interest: Crop Production and Nutrient Management

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Poster

Development of immunoboosting chocolates using cardamom, fennel, and coffee extract

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Abstract:

Cardamom, Fennel And Coffee are widely used for many medicare and treatment based on huge demand of their extract because of its beneficial property. White chocolate boost immunity and is a rich source of antioxidants, posses good amount of calcium. Reduces artery clogging and improves skin health. Cardamom helps in digestion problems including heartburn, intestinal spasms, irritable bowel syndrome, intestinal gas, constipation, liver and gall bladder complaints, and loss of appetite. It is also used for common cold, cough, bronchitis, sore mouth and throat, and tendency toward infection. Cardamom contains chemicals that might kill some bacteria, reduce swelling, and help the immune system. Coffee boosts energy levels. May be linked to a lower risk of type 2 diabetes, promote weight management. It is linked to a lower risk of depression. Could protect against liver conditions. Supports heart health and increase longevity. Coffee is a potent source of healthful antioxidants. Caffeine provides a short-term memory boost. Coffee may help protect against cognitive decline. Coffee may help curb certain cancers. Fennel is used for various digestive problems including heartburn, intestinal gas, bloating, loss of appetite, curing upper respiratory tract infections, coughs, bronchitis, cholera, backache, bedwetting, and visual problems. Reduces the formation of blood clots. Increases milk secretion and supports the female reproductive system. Fennel acts as an antioxidant and have antibacterial, antifungal, and anti-inflammatory properties. Fennel is also an anti-diabetic. Having in count of these numerous health benefits and having them in the form of chocobites proves to be a good idea.

Keywords: Cardamom, coffee, fennel, nutraceutical, immunity, antioxidants, health

Biography:

Somnath Ghosh, BSc (Hons.) Agriculture, M. S. Swaminathan School of Agriculture, Centurion University Technology and Management, Paralakhemundi, Odisha. I am native to Jamshedpur, Jharkhand. I am also interested in Phytopharmaceutical analysis of endangered and unidentified plants. I have done projects on several nutraceutical products like immunoboosting chocolates, organic lipsticks. I have done internship as New Product Development Team at Nutrify Today, Bengaluru. I have also published my Poetry book- "Twig Of Heart".

Research Interest: Nutraceuticals, Biotechnology, Microbiology, Malnutrition, Plant tissue culture

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Poster

Integrated farming

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Abstract:

Integrated farming systems is one of the eco-friendly approach, whole farm management system which focuses on conveying more sustainable agriculture. It is the production of Crops and Animals on the same farm permitting wider crop rotation by reducing the reliance on chemicals, by allowing Diversification for better risk management. Integration of modern tools and technologies with traditional practices by engaging many cultivation techniques in small growing area. Also, incorporation of Azolla, a non-chemical fertilizer used as an alternate fodder which is protein rich assists in reducing the production cost. Use of synthetic fertilizer has brought many disadvantages that can be overcome by operating integrated farming with use of livestock residues, panchakavya and fodder crops to minimize the disease incidence and promoting growth. It aids in improving the soil condition, fertility and enhancing the water use efficiency, ultimately increasing the yields. Wielding of integrated farming system can make efficient use of resources in which waste of one enterprise can become the input of other enterprise. It is bound to sustainable development also social, economic, and environmental protection. Integrated farming system improves the condition of small and Marginal farmers also enhancing their education. Reduced use of chemicals have provided chemical free healthy food to the society.

Keywords: sustainable agriculture, diversification

Biography:

P Tejeswini is pursuing MSc Agronomy in Centurion University of Management and Technology and completed my graduation from Sri Kinjarappu Yerran Naidu College of agricultural sciences Affiliated to Acharya NG Ranga Agricultural University

Research Interest: Effect of Phosphorus and Sulphur fertilization on growth and productivity

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Poster

Influence of inorganic and biofertilizer on growth attributes, yield and economics of Summer Groundnut (*Arachis hypogea* L.)

Avhani Sahu, Rajesh Shriram Kalasare, Manish K Yadav
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

A field experiment was conducted at PG experimental farm, Bagusala, M.S. Swaminathan School of Agriculture, Paralakhemundi, Gajapati District, Odisha under sandy clayey loam soil to investigate the effect of inorganic and biofertilizer on the growth and yield of groundnut on sandy loam soil during the summer season of 2022-23. The Factorial Randomized Block Design (FRBD) with 3 replications and 12 treatments was utilized for the experiment. The treatments were in combination of 4 inorganic fertilizer levels F1: 0% RDF, F2: 50% RDF, F3:100% RDF, & F4: 150% RDF and 3 biofertilizer levels viz B1: Control, B2: rhizobium seed inoculation, & B3: rhizobium soil application. The treatments were T1:(Control), T2:(0% RDF + seed inoculation), T3: (0% RDF + soil application), T4: (50% RDF + Control), T5: (50% RDF + seed inoculation), T6: (50% RDF + soil application), T7: (100% RDF + Control), T8: (100% RDF + seed inoculation), T9: (100% RDF + soil application), T10: (150% RDF + Control), T11: (150% RDF + seed inoculation), T12: (150% RDF + soil application). Among all the tested treatments, T11 resulted in maximum plant height, leaf area index, dry matter accumulation, pod yield and were statistically at par with T8 (100%RDF+seed inoculation). However, the adoption of fertilizer application along with rhizobium seed inoculation could be an ideal technology to achieve sustainability and higher net profit in summer groundnut cultivated under Southern Odisha conditions.

Keywords: Groundnut, biofertilizer, inorganic fertilizer, growth, yield

Biography:

Avhani Sahu is currently pursuing master of science in agriculture at the Centurion University of Technology and Management. I am doing my research in agronomy. Her current research area is nutrient management

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Poster

Studies on efficacy and economics of herbicide mixtures in wet direct - seeded rice

Mandala Kalyanbabu, Rajesh Shriram Kalasare and Ashirbachan Mahapatra
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

Paddy is being cultivated in many countries since centuries as a major staple food. Wet-rice cultivation is the most prevalent method of farming in the Far East, where it feeds the majority of the rural population. Depending on the strain of rice, it can contain decent amount of fibre, protein, vitamin B, iron and manganese. This means it can play a vital role against on malnutrition. The present field experiment was conducted at PG experimental farm, Bagusala , M.S. Swaminathan School of Agriculture, Paralakhemundi, Gajapati District, Odisha under sandy clayey loam soil to investigate the efficacy and economics of herbicide mixture in wet direct seeded rice during the Kharif season of 2022. The experiment was conducted in randomized block design (RBD) with 3 replications and 8 treatments. The treatments were like T1: Triafamone+Ethoxysulfuran67.5g/ha) at 12-14 DAS. T2: Fenoxaprop ethyl + Ethoxysulfuran (50+15g/ha) at 17-18 DAS.T3: Metsufuron–methyl+ chlorimuron–ethyl Bispyribac–sodium (4+25g/ha) at 12-14 DAS. T4: Bispyribac-Na+Ethoxysulfuran (25+15g/ha) at 10-12 DAS. T5: Pretilachlor + Bensulfuron-methyl (660g/ha) at 4-5 DAS. T6: Bispyribac-Na(30g/ha) at 8-10 DAS. T7: Weed free (HW at 20, 40 and 60 DAS), T8: Weedy check. The best results were obtained in weed free plot. The weed density and biomass had decreased and recorded with high yield and straw. At the same time that followed among the all herbicide mixtures with the application of Triafamone + Ethoxysulfuran (67.5g/ha) at 12-14 DAS where it was observed weed density decreased and higher yield, which is at par with the application of Bispyribac-Na+Ethoxysulfuran (25+15g/ha) at 10-12 DAS.

Keywords: Biomass, density, yield, straw, crop, paddy.

Biography:

Mandala Kalyanbabu is from Pathapatnam of Srikakulam District, Andhra Pradesh, completed his B.Sc., Agriculture from Hemwati Nandan Bahuguna Garhwal University, currently he is pursuing my M.Sc., Agriculture in M S Swaminathan School of Agriculture, Centurion University of Technology and Management.

Research Interest: Weed Management

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Poster

Optimization of nitrogen split application in sweet corn (*Zea mays Saccharata* L.)

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Abstract:

A field experiment was conducted on sandy loam soil at PG experimental farm of Centurion University of Technology and Management to investigate the effect of optimization of nitrogen split application in sweet corn during the rabi season, 2022. The experiment was laid out in randomized block design with 10 treatments viz., T1(75% at knee high stage + 25% at tasseling stage), T2(100% RDN at knee high stage), T3(25% Basal RDN + 50% RDN at knee high stage + 25% RDN at tasseling stage), T4(25% Basal RDN + 75% RDN at knee high stage), T5(33% Basal RDN + 33% RDN at knee high stage + 33% RDN at tasseling stage), T6 (50% Basal RDN + 25% RDN at knee high stage + 25% RDN at tasseling stage), T7(50% Basal RDN + 50% RDN at knee high stage), T8(75% Basal RDN + 25% RDN at knee high stage), T9(75% Basal RDN + 25% RDN at tasseling stage), T10(100% basal RDN) which were replicated thrice. The maximum growth and yield was observed with the application of 25% Basal RDN + 50% RDN at knee high stage + 25% RDN at tasseling stage. Therefore, it could be adopted by farmers to improve maize productivity in southern Odisha.

Keywords: Sweet Corn, Growth, Nitrogen, Yield, Split application

Biography:

Landa Yasasri is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management. Yasasri does research in agronomy. Landa Yasasri's current research area is nitrogen management

Research Interest: Agronomy, Soil Science and Water management.

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Poster

Role of Indian honeybees (*Apis cerana indica* F.) on yield attributes of Sunflower (*Helianthus annus* L.)

Deepayan Padhy, Chitta Ranjan Satapathy & Shimantini Borkataki
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

The Sunflower plant (*Helianthus annus* L.) belonging to family Asteraceae is an important oilseed crop. The present investigation is conducted to study about the role of Indian honeybees i.e. Apis cerana indica L. in improving the crop yield attributes of Sunflower at the Experimental Plots of Department of Entomology, M.S. Swaminathan School of Agriculture, Paralakhemundi under Centurion University of Technology and Management, Odisha. For the corresponding investigation, three treatments like Open pollination, Indian Honeybee pollination & Pollination exclusion were used each having seven replications. It can be inferred from the present investigation that the effect of the pollinators along with Indian honeybees brings significant improvement in the height (cm), disc diameter (cm), numbers of seeds per capitulum, 1000 Seed Weight (g), Yield of 10 Plants (g), Total Yield (g/plot), oil content (ml) and germination percentage (%). Statistically, in case of all the parameters, there is a significant increase in Open pollination and Bee pollination over pollination exclusion treatments except oil content and germination percentage. In case of oil content and germination percentage, though there is a significant difference in between open pollination and pollination exclusion treatment but no significant difference has been found in bee pollination treatment over the pollination exclusion one. The detailed information's are depicted in Table No. 1. From the present research activities it can be concluded that, there is definitely a higher contribution of different pollinators along with Indian honeybees in crop improvement program of the sunflower crop.

Keywords: Sunflower, Pollinators, Indian honeybees, Increase crop yield

Biography:

Mr. Deepayan Padhy presently is a Ph.D Scholar in the Department of Entomology, M. S. Swaminathan School of Agriculture, Paralakhemundi, Centurion University of Technology and Management, Odisha. His research area is on Apiculture – Beekeeping & Insect pest management. I am associated with teaching B.Sc. Ag students, management of Indian honeybee colonies, research on apiculture and digital content creation over last four years. His career motive is to help the farmers in increasing their income through farming and allied activities by dissemination of knowledge either by farmers visit or by digital contents and to strengthen Apiculture around my working place.

Research Interest: Apiculture, Entomology, Integrated pest management

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Poster

Effect of summer Pearl millet - Groundnut intercropping system on growth, productivity, and competitive ability of the crops

Shanthi Priya G, Sagar Maitra, Tanmoy Shankar and Rahul Adhikary
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

Pearl millet is a coarse grain crop that is often referred to as poor man's meal and drought tolerant crop and it offers enough scope for intercropping. Pearl millet and groundnut can be intercropped for maximization of resource use and enhancement of total productivity from unit area. Hence, a field trial was carried out in the summer of 2022 to study the effect of summer pearl millet + groundnut intercropping system on growth, productivity, and competitive ability of the crops. The trial was laid out in Completely Randomized Block Design (CRBD) with three replications. There were nine treatments, namely, T1: sole pearl millet (45cm x10cm), T2: sole groundnut (30cm x 20cm), T3: pearl millet (45cm x 10cm) + Groundnut (1:1), T4: pearl millet (45cm x 10cm) + groundnut (2:2), T5: pearl millet (30cm x 10cm) + groundnut (1:1), T6: pearl millet (30cm x 10cm) + groundnut (2:2) , T7: pearl millet (60cm x 10cm) + groundnut (1:1), T8: pearl millet (60cm x 10cm) + groundnut (1:2) and T9: pearl millet (60cm x 10cm) + groundnut (1:3). The treatment consisting of pearl millet (60cm x 10cm) + groundnut (1:1) row proportion resulted in significantly higher dry matter production and grain yield pearl millet. Moreover, the treatment resulted in a greater combined yield from unit area. Therefore, the study concluded that pearl millet (60cm x 10cm) can be intercropped with groundnut (1:1) to obtain higher productivity from unit area in south Odisha.

Keywords: Intercropping, pearl millet, groundnut, Leaf area index, dry matter accumulation, yield.

Biography:

Shanthi Priya G is currently pursuing M.Sc. (Agri) Agronomy at the Centurion University of Technology and Management and does research in agronomy. Shanthi Priya G's current research areas are intercropping.

Research Interest: Agronomy, Irrigation and Water Management and Soil Science

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Poster

Effect of need-based nitrogen scheduling on the growth and productivity of pearl millet (*Pennisetum glaucum* L.)

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Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

Pearl millet is the fourth most important grain crop next to rice, wheat and sorghum. It is also known as poor man's food. Recent studies showed a wide scope to improve the productivity of pearl millet with proper nitrogen management. However, nitrogen is highly mobile and subjected to loss in soil. The recommended dose of nitrogen (RDN) can be applied in splits, even considering the sufficiency index (SI). To maximize the nitrogen use efficiency (NUE), a field experiment was conducted on sandy loam soil at PG Experimental Farm of Centurion University of Technology and Management, Odisha for investigating the effect of need-based nitrogen scheduling on the growth and productivity of pearl millet during kharif, 2022. The experiment was laid out in randomized block design with 3 replications and 9 treatments. The treatments were T1 (control), T2 (50% basal RDN), T3 (100% basal RDN), T4(50% basal RDN + 50% at 30 DAS), T5(50% basal RDN + 25% at 30 DAS and 45 DAS), T6(50% basal RDN + topdressing@ 10 kg at SI < 95%), T7(50% basal RDN + Top dressing@ 10 kg/ha at SI< 90%), T8(50% basal RDN + Top dressing @ 10 kg/ha at SI < 85%), T9(50% basal RDN + Top dressing@ 10 kg/ha at SI < 80%). The maximum growth and yield were observed with the application of 50% Basal RDN + topdressing @ 10 kg at SI < 95% and the finding could be recommended for farmers of southern Odisha to improve NUE in pearl millet cultivation.

Keywords: Pearl millet, Growth, Nitrogen, Yield

Biography:

Subhrajyoti Dalal is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management. Subhrajyoti does research in agronomy. Subhrajyoti Dalal's current research area is nitrogen management.

Research Interest: Agronomy, Soil Science and Water management.

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Poster

Response of sesame (*Sesamum indicum* L.) cultivars to sulphur application in sandy loam soils of southern Odisha

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Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

Sesame is an oldest crop belongs to family of Pedaliaceae. It is an important oilseed crop cultivated from ancient times in our country. Sesamum oil is considered as poor man's ghee because of its rich quality. The average productivity of sesame in India is low and that can be increased by choosing the most adaptable and fertilizer responsve variety for a given agro-climatic region. Based on the above facts, a field trial was conducted during summer season of 2022 at PG Experimental Farm of Centurion University of Technology and Management, Odisha. The experiment was laid out in a factorial randomized block design (FRBD) with two factors comprising of three varieties (YLM-11, Gowri and YLM-66) and four levels of sulphur (0, 20, 40, 60 kg S/ha), replicated thrice. The results obtained from this study revealed that among the varieties, Gowri showed significant superiority on growth and yield of sesame over YLM-11 and YLM-66. While, among different levels of sulphur, application of 60 kg sulphur per hectare registered its superiorly in terms of growth and productivity to other sulphur levels under comparison. Therefore, adoption of Gowri variety of sesame can be chosen with the application of 60 kg sulphur per hectare could be beneficial to farmers of southern Odisha.

Keywords: Sesame, Sulphur, Growth, Yield, Variety

Biography:

Parimi Venkata Sai Krishna from Rajahmundry of East Godavari district, Andhra Pradesh completed his B.Sc., Agriculture from School of Agriculture, Singhania university. Presently, pursuing his M.Sc. (Agri.) Agronomy in M S Swaminathan school of Agriculture, Centurion University of Technology and Management.

Research Interest: Nutrient management

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Poster

Effects of crop establishment methods on performance of different finger millet (*Eleusine coracana* L.) varieties

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Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

Finger millet is one of the important small millets having potential to produce considerable quantity of nutritious food grains under suboptimal resource and management condition. Finger millet has the pride of place in having highest productivity among millets. It is also known as ragi and an important staple food crop in part of eastern and central Africa and India. A field experiment was conducted on sandy loam soil at PG experimental farm of Centurion University of Technology and Management, Odisha to investigate the effects of crop establishment methods on performance of different finger millet (*Eleusine coracana* L.) varieties under southern Odisha conditions during the kharif season of 2022. The experiment was laid out in strip plot design with 3 replications and 12 treatment combination. The horizontal plot treatments were four varieties namely Arjun, Bhairabi, Chaitanya, VL Mandua 352 and the vertical plot treatments were comprised three crop establishment methods, viz., direct sowing (25cm ×10cm), transplanting of 21 days old seedling (25cm ×10cm) and system of crop intensification (SCI) method of 15 days old seedlings (25cm × 25cm). The results revealed that the yield of VL Mandua 352 was significantly higher over the other three varieties. Among establishment methods, the SCI method of finger millet produced significantly higher growth and yield over rest of the two establishment methods, viz., transplanting and direct sowing. Henceforth, the study concluded that the crop establishment methods had significant importance on the performance finger millet varieties in south Odisha.

Keywords: Finger millet, Crop establishment method, Growth, Yield

Biography:

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Poster

Growth and Yield of Rabi Maize as Influenced by Intercropping System in South Odisha

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Abstract:

Intercropping has multifaceted benefits such as yield enhancement, resource conservation, soil health improvement, crop diversification, and agricultural sustainability. Maize (Zea mays L.) is one of the most versatile crops known as 'Queen as Cereals'. Since maize is widely spaced crop, it offers an ample scope to accommodate short-statured legumes spatially and temporally. Maize-legume intercropping system is an important intercropping system recognized globally. Considering the above facts, a field experiment on intercropping of maize with chickpea (Cicer arietinum) and field pea (Pisum sativum) was conducted at PG experimental Farm of Centurion University of Technology and Management in Odisha during the rabi season of 2021. The experiment was carried out in Randomized Block Design (RBD) comprising of 12 treatments, namely, T1: maize sole (uniform row, UR), T2: maize sole (paired row, PR), T3: chickpea sole , T4: field pea sole, T5: maize UR + chickpea (1:1), T6: maize UR + chickpea (1:2), T7: maize UR + field pea (1:1), T8: maize UR + field pea (1:2),T9: maize PR + chickpea (2:2), T10: maize PR + chickpea (2:3), T11: maize PR + field pea (2:2) and T12: maize PR + field pea (2:3). The study revealed that intercropping legumes, namely, chickpea and field pea in hybrid maize in additive series was more profitable than pure stand of maize. However, the pure stand of maize had higher productivity of maize. The results concluded that intercropping maize + chickpea and maize + field pea should be chosen for higher productivity and profitability.

Keywords: Maize, chick pea, field pea, intercropping, productivity, competition function

Biography:

Souvik Sain is currently pursuing a Master of Science (AGRI) Agronomy at the Centurion University of Technology and Management. Souvik does research on cropping system and intercropping.

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Poster

Effect of nutrient management on growth and productivity of sunflower (*Helianthus annuus* L.)

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Abstract:

Among all the oilseed crops sunflower is one of the fastest-growing oilseed is a rich source of vegetable oil. field experiment was conducted on sandy loam soil at of Centurion University of Technology and Management to investigate the effect of nutrients on growth yield and quality of sunflower under southern Odisha conditions during the rabi season of 2021-22. The experiment was conducted in randomized block design with three replications and ten treatments. The treatments was comprised of T1:(N100P100K100S100), T2:(N0P100K100S100), T3:(N100P0K100S100), T4:(N100P100K0S100), T5:(N100P100K100S0), T6:(N100P0K0S0), T7:(N0P100K0S0), T8:(N0P0K100S0), T9:(N0P0K0S100), T10:(Control). data clearly showed that the application of 80, 60, 40, 25 kg/ha N:P2O5:K2O:S (T1) registered superior performance in terms of growth and yield sunflower. The maximum plant height, leaf area Index and yield were obtained in N100P100K100S100(T1) which was statistically at par with N100P0K100S100 (T3), and N100P100K0S100 (T4) and remained significantly higher among all the treatments. The primary and secondary nutrients showed an important role to influence the growth and productivity of sunflower in south Odisha conditions.

Keywords: Sunflower, Growth, Yield, Nutrient Management.

Biography:

.Rudresh Mourya is currently pursuing a Master of Science in (AGRI) Agronomy at the Centurion University of Technology and Management. His current research areas are crop husbandry and nutrient management.

Research Interest: Nutrient management and Water management

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Poster

Efficacy of herbicide mixtures under puddled summer Rice in North Eastern Ghat zone of Odisha

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Abstract:

More than 60% of the world's population consume rice (Oryza sativa L.), which holds the distinction of being the crop that is most widely cultivated worldwide. With the introduction of high yielding varieties recently, rice output has improved, but because of improper weed management, their maximum yield potential has not been fully achieved. A higher agricultural yield can be attained by managing weeds effectively. To maximize rice yield, effective weed management is very crucial. The present investigation was conducted to examine the effects of pre-emergence and post-emergence herbicides on growth and yield of high yielding variety CR Dhan 206 (Gopinath) during rabi season (November to April) of 2021-2022 in the PG Experimental Farm of M. S. Swaminathan School of Agriculture, CUTM, Paralakhemundi, Odisha in split plot design with two main plots and five subplots allocated in three replications. In the main plots two crop establishment methods viz.transplanted rice and wet direct-sown rice were adopted. Whereas in the subplot treatment, five weed control treatment were adopted i.e.fenoxaprop-p-ethyl + ethoxysulfuron, trifamone + ethoxysulfuron, pretilachlor + bensulfuron-methyl, weed free check and weedy check. The major weed found in the experiment field were Cynodondactylon, Echinochloacolona, Cyanotis,Physalis minima and Cyperusiria. It was clearly revealed that in both the crop establishment methods of rice, the application of trifamone + ethoxysulfuron resulted significantly over the other herbicide mixtures showing at par yield with the weed free check and the highest weed control efficiency among the herbicide mixtures.This result concludes that the herbicide mixture performed best irrespective of the crop establishment methods among the herbicide mixtures used in this experiment.

Keywords: Rice, Weed management, Herbicides mixtures, Crop establishment methods

Biography:

Nongmaithem Alena is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management. My current research areas are weed management, herbicides mixtures.

Research Interest: Agronomy, Weed management, herbicides mixtures.

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Poster

Biology of lesser grain borer *Rhyzopertha dominica* Fabricius (Coleoptera: Bostrichidae) in cereals

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Abstract:

Lesser grain borer *Rhyzopertha dominica* (F.) is a destructive insect pest of stored grains, attacks a wide range of stored cereals such as barley, paddy, wheat, maize and sorghum. It also infests various other commodities including pulses and dried cassava root. With the help of strong jaws it can also damage any part of wooden structure to tide over unfavourable conditions. The biology of lesser grain borer varies in cereals, highest fecundity observed in wheat306.8±16.36, followed by 247.6± 13.12 in paddy,233.23±13.90 in sorghum lowest in maize128.73±11.70, whereas larval and pupal period days varies 39±3.19, 43.85±1.45,35.8± 2.78,35.35±1.95in paddy, maize, wheat, sorghum respectively and developmental period highest in maize50.77±1.14days followed by 49.8± 4.26days in paddy, 47.2±3.01days in wheat, 41.63±2.17in sorghum. Longevity of male: female observed as follow in days 29.1±2.88: 34.9±2.07 in paddy, 28.9±2.68: 32.75±2.82 in wheat, 37.13±2.61:37.97±2.66 in maize, 46.13±3.09:48.47±2.84 in sorghum.

Keywords: Lesser grain borer, fecundity, cereals

Biography:

Mrs. V. Ramalakshmi joined as Ph.D Scholar in the Department of Entomology, M. S. Swaminathan School of Agriculture, Paralakhemundi, Centurion University of Technology and Management, Odisha. Her research area is on Stored grain pests & Insect pest management. She is associated with teaching B.Sc. Ag students and insect pest management over last 8 years. Her career motive is to help the farmers in increasing their income and inest pest management.

Research Interest: .Stored grain pests and Integrated pest management

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Poster

Performance of urea and nano-urea at different nitrogen levels on growth and productivity of finger millet [*Eleusine coracana* (L.) gaertn]

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Abstract:

Finger Millet (*Eleusine coracana)* commonly known as ragi, is one of the important millet crops grown in India. Finger millet contains about 8% protein, 65–75% carbohydrates, 15–20% fiber and 2.5–3.5% minerals and is also known for its highest amount of calcium (344mg /100g grain), zinc, iron and essential amino acids. A field experiment conducted during the rabi season of 2021-22 at the PG Experimental Farm Bagusala, Centurion University of Technology and Management, Paralakhemundi, Odisha. The treatments probed under this investigation were namely, 0 kg N/ha, 20 kg N/ha, 40 kg N/ha, 20 kg N/ha+2 sprays of 1% urea, 20 kg N/ha+2 sprays of 2% urea, 20 kg N/ha+2 sprays of nano urea @ 2ml/L, 20 kg N/ha+2 sprays of nano urea @ 3 ml/L, 20 kg N/ha+2 sprays of nano urea @ 4 ml/L, 40 kg N/ha+2 sprays of nano urea @ 2 ml/L, 40 kg N/ha+2 sprays of nano urea @ 3 ml/L, 40 kg N/ha+2 sprays of nano urea @ 4 ml/L. The experiment was laid out in randomized completely block design with three replications. The present study clearly revealed that application of 40 kg N/ha+2 sprays of nano urea @ 4 ml/L performed the best in registering growth parameters and yields of finger millet cultivation. Hence, from the study revealed that for cultivation of rabi finger millet with an additional supplementation of nano-urea @ 4ml/L to recommended dose of nitrogen at tillering and pre-flowering stage could be recommended for adoption by farmers for the enhancement in productivity of finger millet in north eastern ghat zone of Odisha.

Keywords: Finger millet, Nano urea, Nitrogen, Urea foliar spray

Biography:

Akash Mohanty is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management. Akash does research in agronomy. Akash Mohanty's current research area is cropping geometry and varietal performance.

Research Interest: Agronomy, Soil Science and Water management.

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Poster

Effect of Paddy Straw Mulching and Phosphorus on Growth and Productivity of Summer Groundnut (*Arachis hypogaea* L.)

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Abstract:

Groundnut is an important oilseed crop globally as well as in India and rich source of protein, which is cited as king of oilseeds. Mulching in crop field with paddy straw has tremendous advantages such as soil moisture conservation, regulating temperature, lowering salinity, suppressing weeds, and improving soil structure. A field experiment was conducted on sandy loam soil at PG experimental farm of Centurion University of Technology and Management, Paralakhemundi to investigate the effect of paddy straw mulching and doses of phosphorus on growth and productivity of summer groundnut (Arachis hypogaea L.) during the summer season of 2022. The experiment was laid out in split plot design with 3 main plots (paddy straw mulch) and 4 sub-plots (levels of phosphorus) with total 12 treatment combinations and each treatment combination replicated thrice. The treatments of main plot were M1: no mulch, M2: paddy straw mulch 2.5 t ha-1, M3: paddy straw mulch 5 t ha-1 and subplot were P1: P2O5 @ 0 kg ha-1, P2: P2O5 @ 20 kg ha-1, P3: P2O5 @ 40 kg ha-1, P4: P2O5 @ 60 kg ha-1 and the recommended dose of fertilizer was 20 kg N, 40 kg P2O5 and 40 kg K2O per ha. The results revealed that growth attributes viz., plant height and dry matter accumulation and yield attributes viz., number of pods plant-1 and seed index and pod yield of groundnut were significantly influenced with paddy straw mulching and levels of phosphorus. However, the maximum value for the above growth and yield attributes and yield recorded from the treatment combination M3P4: paddy straw mulch 5 t ha-1 + P2O5 @ 60 kg ha-1.

Keywords: Groundnut, Growth, Paddy Straw Mulching, Phosphorus and Yield

Biography:

Sanabam Tarunibala Devi is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management. Tarunibala does research in agronomy. Sanabam Tarunibala Devi's current research areas are nutrient management.

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Poster

Plant tissue culture and plant varieties development- Future prospect

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Abstract:

Plant tissue culture has been widely employed in area of agriculture, horticulture, forestry and plant breeding. It techniques are the most widely used biotechnological tools for both fundamental and practical purposes, including research into plant developmental processes, functional gene studies, commercial plant micropropagation, generation of transgenic plants with specific industrial and agronomical traits, plant breeding and crop improvement, virus removal from infected materials to produce high-quality, healthy plant material, preservation and conservation of germplasm of vegetative propagated plant crops and rescue of threatened or endangered plant species. For the purpose of producing secondary metabolites of industrial and pharmaceutical, plant cell and organ cultures are of interest. Plant tissue culture has recently been used to preserve endangered plant species by cryopreservation, also known as long-term conservation, and short- and medium-term conservation, also known as slow growth. These methods had been successfully used to conserve plant species with recalcitrant seeds or dormant seeds and showed greater advantage over the conventional methods of conservation.

Plant tissue culture technology is being widely used for large scale plant multiplication and development of new variety. It is also considered as one of the efficient technologies for crop improvement by the production of somaclonal and gametoclonal. There are some methods that are utilized to obtained new varieties viz., seed culture, meristem culture, embryo culture, callus culture, anther culture, somatic embryogenesis, protoplast culture etc. Future development of the in vitro technology aims at the conservation of plant genetic resources, restoring the balance between research studies related to genetic transformation of plants with the aim of providing sufficient, quality and safety foods for the world population.

Keywords: plant tissue culture, endangered plant species, secondary metabolites, pharmaceutical, cryopreservation

Biography:

Maibam Meeneca Devi is currently pursuing a master of science in agriculture at the Centurion University of Technology and Management.

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Poster

Influence of integrated nitrogen management in growth and yield of summer sweet corn

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Abstract:

Sweet corn is one of the important commercial crops grown in various states of India. Being a C4 plant, it is exhaustive in nature. This leads in taking up all the available nutrients in soil which may have an adverse effect on overall soil health in long run causing a decline in yield through the years. Also, among all the major essential elements, applied nitrogen plays a crucial in growth of the plant. So, keeping in mind the sustainability and socio-economic conditions, it is important to integrate various inorganic fertilizers, organic manures and bio fertilizers. This research was conducted in 2021-2022 in agriculture experimental farm, Baghusala, Centurion university of technology and management consists of three replications and thirteen treatments i.e., T1-0% RDN (control); T2-100% RDN (N120:P60: K60); T3-100% RDN + seed inoculation with Azospirillum; T4-100% RDN + seed inoculation with Pseudomonas; T5-100% RDN + seed inoculation with Azospirillum + Pseudomonas; T6-75% RDN + 25% RDN (Vermicompost @ 2 t ha-1); T7-75% RDN + 25% RDN (Vermicompost @ 2 t ha-1) + seed inoculation with Azospirillum; T8-75%RDN + 25% RDN (Vermicompost @ 2 t ha-1) + seed inoculation with Pseudomonas; T9-75% RDN+ 25%RDN (Vermicompost @ 2 t ha-1) + seed inoculation with Azospirillum + Pseudomonas; T10-50% RDN + 50% RDN (Vermicompost @ 4 t ha-1); T11-50% RDN + 50% RDN (Vermicompost @ 4 t ha-1) + seed inoculation with Azospirillum ; T12-50% RDN + 50% RDN (Vermicompost @ 4 t ha-1) + seed inoculation with Pseudomonas; T13-50% RDN + 50% RDN (Vermicompost @ 4 t ha-1) + seed inoculation with Azospirillum + Pseudomonas. The inorganic-N, P, K fertilizer was applied in split doses whereas the vermicompost was given as basal dose. Among all applied treatments, T5-100% RDN + seed inoculation with Azospirillum + Pseudomonas; recorded highest growth and yield parameters which was at par with T3-100% RDN + seed inoculation with Azospirillum; and T9-75% RDN+ 25%RDN (Vermicompost @ 2 t ha-1) + seed inoculation with Azospirillum + Pseudomonas; treatments, whereas T1-0% RDN (control); recorded the lowest growth as well as yield parameters.

Keywords: Bio fertilizers, inorganic fertilizers, RDN (recommended dose of nitrogen), vermicompost

Biography:

Swetha Marrapu is currently pursuing Master of science in Agriculture, specialization in Agronomy at Centurion University of Technology and Management. My current research areas are nutrient management, soil science and sustainable agriculture.

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Poster

Impact of decision support tools in improving nutrient use efficiency of *rabi* rice

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Abstract:

Rice (*Oryza sativa* L.) is the staple food for more than half of the world's population. Globally, about 90 per cent of the world's rice is grown and produced in Asia. In recent years, the potential to mitigate climate change by improving nutrient use efficiency (NUE) in croplands has received considerable attention in the agricultural research and policy agendas. Among various methods, optimizing nutrient inputs considering plant needs and indigenous supply from soil according to their variation in time and space is one of the most sustainable ways to improve NUE. Keeping this in view, a field experiment was conducted by using various decision support tools viz., Chlorophyll Meter, Leaf Color Chart, Nutrient Expert and Rice Crop Manager in scheduling the dosage and application time of nitrogen, phosphorus and potassium fertilizers to rice during rabi season at PG experimental farm, M.S.Swaminathan School of Agriculture, Centurion University of Technology and Management, Odisha. The results revealed that sufficiency index based application at a threshold <95% significantly improved the nutrient use efficiency. Therefore, adoption of sufficiency index based nitrogen management in rabi rice cultivation could be a most sustainable approach to farmers in southern Odisha

Keywords: Rice, Leaf colour chart, Sufficiency Index, Nutrient Expert, Rice Crop Manager

Biography:

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Poster

Impact of smart nutrient management on growth and productivity of *Rabi* Maize

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Abstract:

Nutrient management has played a crucial role in maximizing food grain production. Precision nutrient management (PNM) sustains high grain yield with optimum nutrient application and thus, may help to reduce the applied nutrient loss. During recent time, PNM uses various tools such as leaf colour chart (LCC), chlorophyll content meter (CCM) and decision support system like Nutrient expert. Based on the above facts, a field experiment was carried out on rabi maize during 2021-2022 at PG Research Farm, Centurion University of Technology and Management consisting of 14 treatments such as T1 - Well fertilized N (200% RDN-60-60), T2-RDF (120-60-60 kg/ha) ,T3-125% RDF (150-75-75) , T4-75% RDF (90-45-45 kg/ha), T5-150% RDF (180-90-90 kg/ha), T6- RDF + Nano urea, T7-75% RDF + Nano urea, T8-Leaf color chart 4 (N-60-60) , T9-Leaf color chart 5 (N-60-60), T10-Sufficiency index-based N management (N-40-40) at SI 85-90%, T11-Sufficiency index based N management (N-60-60) at SI 90-95%, T12-Nutrient Expert based nutrient recommendation-IPNI (N-P-K) for targeted yield of 7 t/ha, T13-Nutrient Expert based nutrient recommendation-IPNI (N-P-K) for targeted yield of 9 t/ha, T14-Unfertilized (0-0-0 kg/ha). The data revealed that significantly higher plant height and dry matter accumulation (DMA) of maize were obtained in T11 and it was significantly at par with T13, T5, T3 and T9. The maximum grain and stover yield was obtained in T11 and the lowest was obtained in control. The findings clearly shows that nutrient management through sufficiency index and Nutrient expert can be recommended for higher productivity of maize in southern Odisha.

Keywords: Precision nutrient management, LCC, Sufficiency index, CCM, Nutrient expert

Biography:

Masina Sairam is working as a research scholar in department of Agronomy, Centurion University of Technology and Management. He carried out researches related to integrated nutrient management. Currently, he is working on difference plant based nutrient sensors for nutrient optimization in major cereals.

Research Interest: Nutrient management, cropping system and intercropping

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Poster

Tissue culture and it's application in plant breeding

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Abstract:

Plant tissue culture involves in vitro cultivation of excised plant parts on nutrient media under aseptic conditions. There are numerous uses for plant tissue culture. Typically, these applications are divided into three categories: fundamental research, environmental concerns, and commercial applications. While environmental application discusses conservation measures to keep the most valuable germplasms around for a longer period of time, basic application covers concepts in understanding physiology taking into account molecular pathways in plant cells. Plant tissue culture research is currently heavily focused on commercial applications such as crop improvement, secondary metabolite production, and various methods for inducing genetic interference. Micropropagation is an effective method for clonally propagating large numbers of newly created plants for the commercial market after they have been developed. Without using in vitro plant tissue culture regeneration techniques, genetic engineering would not be possible. Recently, cryopreservation, also known as long-term conservation, and short- and medium-term conservation, also known as slow growth, have both been utilized to conserve endangered plant species.

Keywords: Tissue Culture, In Vitro, Micropropagation.

Biography:

Arnab Adhikary is currently pursuing a Master of Science in Agriculture (Department of Genetics and Plant Breeding) from Centurion University of Technology and Management.

Research Interest: Genetics and Plant Breeding

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Poster

Genetics resources and germplasm conservations: Strategies and future prospect

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Abstract:

Conservation and sustainable use of genetic resources is essential to meet the future food and security by capturing natural and existing crop diversity and developing new crops for agriculture. According to the food and agriculture organization (FOA), plant genetic resources are defined as the entire generative and vegetative reproductive material of species with economical value and /or social value, especially for the agriculture of the present and the future, with special emphasis on nutritional plants. As more plants have become endangered or unusual, protecting their genetic resources has become more crucial. The traditional storage techniques failed to stop losses for a number of reasons.

The major advantages of this techniques are storage of germplasm free from diseases, insects, pathogens etc. and can store over long period of time and small space is enough for the storage. There are two approaches for germplasm conservation: in-situ conservation and ex-situ conservation. In-situ approaches is the conservation of germplasm in its natural habitat or in area where it grows naturally. Biosphere reservation, National Park and Gene Sanctuary are included in in-situ. Ex-situ conservation is carried out outside their habitat. In ex-situ seed Gene bank, Pollen bank, Tissue culture, Repository, DNA library, Cryo bank approaches are included. Germplasm collection helps to achieve knowledge on plant diversity, environment, and farmers socio-economic and cultural aspects. It contributes towards global efforts to ensure food security in the future by retrieving natural diversity and springing up crop diversity for cultivating agricultural crops.

Keywords: Germplasm, plant genetic resources, conservation, gene bank, cryo bank, repository

Biography:

Joshna Angom is currently pursuing a master of science in agriculture at the Centrion University of Technology and Management. Joshna Angom's current research area is genetic diversity.

Research Interest: Agronomy, Soil Science, Weed management

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Poster

Cooperative initiatives for mobilizing rural investments

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Abstract:

A co-operative is a type of business that is quite common in developing nations like India and has a lot of potential as a tool for rural development. The cooperatives are important types of organisations, and emphasises the significant role they play in India's rural economy. It looks at how they contribute to rural development, which is characterised generically as a set of desired societal objectives such an increase in real per capita income, improved income distribution, and equal access to opportunities for work, education, and healthcare. Additionally, it lists some current problems with cooperative management, briefly discusses them, and suggests solutions. From the different studies, authors claim that the majority of co-operatives struggle while being extremely significant to India's rural economy and also found list several major obstacles to the growth and development of co-operatives as a business enterprise, including a lack of professionalism in management, an outdated co-operative law, excessive government interference, a lack of competent elected leadership, a small business's inability to achieve financial viability, a lack of performance-based reward systems, and an internal work environment that is not supportive of such growth and development. This makes the case that in order for rural cooperatives to thrive in the new era of deregulation, privatisation and globalisation, they must be managed professionally, democratically governed by boards of directors chosen by their members in good standing, freed from the restrictions of antiquated cooperative laws, and managed without the interference of pointless government regulations. Cooperatives greatly contribute to poverty reduction by offering an inclusive and democratic avenue for economic growth. Cooperatives are key economic players for improving food security.

Keywords: Cooperatives, economy, management, growth, development

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Poster

Application of remote sensing in agriculture

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Abstract:

Remote sensing (RS) technologies provide a diagnostic tool that can act as an early warning system, allowing the agricultural community to intervene early to counter potential problems before they spread and negatively impact crop productivity. With recent advancements in sensor technologies, data management and data analytics, the agricultural community now has a variety of RS options. However, due to knowledge gaps regarding their sufficiency, appropriateness and techno-economic feasibility, the agricultural sector has yet to fully implement RS technologies. From many study reviewed the literature from 2000 to 2019 on the application of RS technologies in production agriculture, ranging from field preparation, planting and in-season applications to harvesting, with the goal of contributing to scientific understanding of the potential for RS technologies to support decision-making at various production stages. Over the last 20 years, we discovered an increasing trend in the use of RS technologies in agricultural production, with a sharp increase in the applications of unmanned aerial systems (UASs) after 2015. Soil moisture and in-season crop health monitoring have received the most attention in previous RS studies, with less attention paid to soil compaction, subsurface drainage, and crop grain quality monitoring. In conclusion, the literature demonstrated that RS technologies can be used to support site-specific management decisions at various stages of crop production, assisting in crop production optimization while also addressing environmental quality, profitability, and sustainability.

Keywords: Remote sensing, knowledge gaps, Soil moisture, data management, crop production

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Poster

Robotics in Agriculture

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Abstract:

The word agriculture brings an image of small & marginal farmer with scruffy clothes and slaving under the blazing sun while ploughing the field. In reality this image has different face where technology has highly advanced and agriculture robots are been introduced to potentially solve problem as old farming itself. According to UN predictions, the world's population will reach 10 billion by the end of 2050, and robotics will assist farmers in meeting their goal more effectively than human labor. In 1920, cotton gin is the first ever agricultural robot is invented. The future of agriculture lies in ROBOTICS because manpower will soon be replaced with robots to a significant extent. These robots and automations used in precise farming utilizes contemporary technologies mostly carried out for farm management. In terms of sowing, irrigation, weeding, spraying, crop monitoring, harvesting, pruning, yield estimation, monitoring livestock and other tasks, the Agricultural robots are highly beneficial. They also automate all these farming practices with the help of specialized manipulators, grippers, and effectors built into mechanical robotic arms, enabling farmers to focus on raising overall yield so precisely, inexpensively and quickly. The majority of inventions of robotics trail are at early stages and in development stage. The leading automation and robotics business ecorobotix is situated in Switzerland and it creates automation weeding robots for modern agriculture to assist farmers in producing healthy crops. There are various types of agricultural robots like aerial imaging robots, AMRs for nurseries, orchards and greenhouses, seeding and spraying robots, weeding robot etcetera. These agriculture robots will demonstrate how human will be completely depended on AI.

Keywords: Agriculture, Small farmers, Robotics, Yield and AI

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Poster

Climate Smart Agriculture

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Abstract:

Farmer's livelihoods are inherently insecure since they depend so heavily on a changing environment that they are ill-equipped to grasp without access to modern farming methods or equipment's, let alone science-based climate and weather data. Farmer's livelihoods are drastically changing as a result of climate change. Smallholder farmers are facing difficulty challenges all over the world, but particularly in the tropics where people are more dependent on natural resources. Climate-smart agriculture (CSA) is an approach to farming that aims to address the challenges of food security, climate change, and sustainable development. As the name implies, it is a way of farming that is "smart" about the climate. With the increasing global population and the changing climate, the world's food system is facing several challenges. These challenges include increasing temperatures, extreme weather events, and changing precipitation patterns. In order to protect and even enhance their livelihoods, farmers can use climate-smart agriculture strategies to adapt and to get ready for consequences.

Climate smart agriculture (CSA) is a holistic approach to manage and adopt agriculture systems to the impact of climate smart change. It aims to increase productivity and resilience while reducing greenhouse gases emission. Through new policies, practices, and finance, climate-smart agriculture (CSA) seeks to assist agricultural systems all over the world by simultaneously addressing three issue areas: enhanced adaptation to climate change, mitigation of climate change, and guaranteeing global food security. CSA practices include conservation agriculture, agroforestry, water management, and integrated pest management. CSA also involves the use of improved crop varieties and livestock breeds that are more tolerant to climate change. Additionally, CSA promotes sustainable land use and the use of renewable energy sources. CSA is a way to ensure food security and adaptation to climate change while mitigation its effects.

Key words: Climate smart agriculture, Small hold farmers, Greenhouse gases, integrated pest management, Mitigation.

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Poster

Drones in Agriculture

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Abstract:

Agriculture plays important role in economy growth and its development. It helps to increase the national income and also generates employment. Due to rapid development of technology, the usage of new technologies occurred in agriculture to make the work of the agriculture more easily and effectively. For example, using of drones in agriculture. Usage of drones in agriculture is increasing day by day. Some special features & facilities are attached to drones such as cameras, GPS, tracker, smart sensors etc., to increase the drone functions. To overcome the challenges faced by the farmers and to increase their productivity these drones will be helpful. Drones are used for various purposes like crop monitoring, spraying of fertilizers, mapping, inspecting of damaged crops or diseased crops, aerial surveillance, irrigation, livestock management, crop planting. Drones save the time and water saving etc. drone technology is rarely used technology and is very useful for agriculture. Drones are used for identifying the conditions of the plants whether they are suitable for the harvesting or not and drones are safety and health improvement of farmers without direct contact fertilizers and cost effective. Drones saves the excess use of pesticides, and herbicides, maintains the soil fertility, improves quality of the agriculture. In future the size of drones in the agriculture will reach to billions of dollars in next few years. Agriculture drones provides fast seed sowing, reducing the work time. Some of the sensors of the drones are hyperspectral, thermal and LiDAR. These sensors used for solving the problems like weed detection, water stress, nitrogen content etc.

Keywords: Agriculture, Drones, Precision farming & effective monitoring

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Poster

Fortified cookies with macro and micronutrients along with Ashwagandha benefits

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Abstract:

It is a given that cookies are loaded with sugar and unhealthy fats. However, what if there was a way to make them healthier and even more nutrient-rich? This is where fortified cookies come in. Fortified cookies are made with added macro and micronutrients, as well as Ashwagandha, an herbal supplement with numerous benefits. One of the core principles of ayurveda is the use of natural ingredients to promote health and well-being, boost immunity and fight off disease. There are many benefits to incorporating Ashwagandha into your diet, including reducing stress and anxiety levels, boosting energy levels, improving brain function, fighting inflammation, and improving cognitive function. Adding this adaptogenic herb to cookies not only fortifies them with macro and micronutrients but also provides the body with additional benefits that can help improve overall health. Tulsi is one of the most popular herbs used in ayurvedic medicine. It has many benefits, including reducing stress, promoting digestion, and fighting off cold, flu, and Covid19. Almonds are good source of vitamins, minerals, and healthy fats. They offer several health benefits, including improved heart health and blood sugar control. Additionally, almonds are a good source of antioxidants that can help protect cells from damage. Fortified cookies can help improve overall health by providing the body with essential nutrients. They can also help reduce stress and anxiety levels, as well as boost energy levels. If you are looking for a nutritious snack that also tastes great, look no further than fortified cookies. The Herbal and nutrition cookies, fortified with macro and micronutrients, prove to be a great product for achieving good nutritive social status, especially for children in particular.

Keywords: Cookies, Fortified, COVID-19, Ashwagandha, Sunflower Seeds

Biography:

Sunil Kumar is from Sitamarhi, Bihar. He has completed his matriculation from S Mathura High School Sitamarhi and intermediate from Sitamarhi Inter +2 College, Dumra, Sitamarhi. Currently, He is studying BTech in Phytopharmaceuticals at School of Agriculture and Bio-Engineering, Centurion University of Technology and Management, Paralakhemundi, Odisha. He is interested in web design and blogging.

Research Interest: Molecular Docking

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Poster

The development of herbal soap encompassing coffee extract

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Abstract:

Developing an effective and excellent skin protection herbal soap using coffee extract including fine cocoa powder, aloe powder, Satavari root extract, Neem oil, Star anies oil, Olive oil, and Virgin coconut oil which has very beneficial properties for the skin due to the presence of active constituents such as caffeine, Trigonelline, melanoidin, tannin, caffeic acid, hydroxycinnamic acids, hypolipidemic, etc. Because of these botanical compounds, it has rich source of antioxidant, Anti-inflammatory, antimicrobial activity, sedative, antibacterial, antiviral, and anti-tumor activities, UV protection and possesses exfoliation property, calming and whitening effect, also reduces skin irritation and enhance skin brightness and help in purification and suppression of acne and maintain the over secretion of oils from sebaceous glands as well as it also provides robust skin. It prevents aging signs and dark spots. Aloe powder is very beneficial for the sleeker discoloration of blemishes. The saponin in Satavari root and cocoa powder helps in reducing the free radical skin damage that is the major cause of wrinkles and prevents the breakdown of collagen while Neem oil can help wound treating and also assist wound healing and minimize warts or moles reduce scars. It's all about improving skin condition and providing beautiful youth and glow-shining skin. There are chances that some companies may make claims regarding ingredients that are in their products that are simply not true. But the above collective ingredients are all organic.

Keywords: soap, anti- ageing, tannin, caffeine, hydroxycinnamic, exfoliation, blemishes, wrinkles

Biography:

Md Sajid, B. Tech in Phytopharmaceuticals from School of Agriculture and Bio-engineering, Centurion University technology and management, Paralakhemundi, Odisha. He is native to the Vaishali district of Bihar. His field of interest is Ayurvedic and herbal products. He has done projects on several nutraceutical products like immunoboosting chocolates, organic lipsticks. He has done an internship in the Research and Development department of Emami Limited, Kolkata. He is also interested in the Phytopharmaceutical analysis of endangered and unidentified plants.

Research Interest: Formulations development of Nutraceuticals products, molecular biology

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Poster

Joint pain relief supplement

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Abstract:

The joint pain relief supplement contains a combination of natural ingredients like hydrolyzed eggshell membrane powder composed of fibrous protein such as collagen-I and glycosaminoglycans(GAGs) to support cartilage tissues, turmeric extract, and Ashwagandha powder, which helps to maintain joint health, muscles strength, and bone composition, to keep you 'Fit From Inside'. Joint pain and connective or cartilage tissue disorders (Osteoarthritis) continue to grow in an aging population, it can be felt in multiple parts of the body, and it is common discomfort usually felt in the hands, feet, hips, knees, and spine. there can be many factors having joint pain, Osteoarthritis is a major clinical problem at younger ages particularly have inflammatory diseases such as rheumatoid arthritis (RA) occurs when the body's immune system attacks its own organs(joints, bones internal organs) whereas elder peoples mainly suffer from pain due to osteoarthritis, it is mostly due to the breakdown of cartilage in the joints and other medical conditions can be all factors of joint pain such as Previous injuries, minerals deficiency in our body, cartilage is a strong, flexible connective tissue which protects our joints and bones, reduces friction and prevents rubbing together when we use your joints. It is also the main tissue in some parts of our body and gives them their structure and shape. This nutraceutical supplement will reduce joint pain and stiffness in the affected joint and improve quality of life by providing physical and cognitive function.

Keywords: Osteoarthritis, collagen-I, glycosaminoglycans(GAGs), rheumatoid, eggshell membrane

Biography:

Anam Nawaz, Currently, pursuing BTech in Phytopharmaceuticals at School of Agriculture and Bio-Engineering, Centurion University of Technology and Management, Paralakhemundi, Odisha.

Research Interest: Drug discovery, Bioinformatics, and Nutraceuticals

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Poster

Utilization of aonla pomace for the development of fibre and vitamin C enriched curd

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Abstract:

Aonla is known as the wonder fruit for health. Due to its therapeutic properties, there is a great demand for aonla. It is one of the richest sources of Vitamin C as well. Aonla juice is extracted and commercially sold as a healthy food product. However, the pomace obtained after juice extraction is usually discarded as a waste product. In this study, utilization of aonla pomace as a functional ingredient has been attempted. Aonla pomace was dried in hot air tray dryer at three different temperatures (40, 50, and 60 °C) to study its drying behaviour under different conditions and to study the Vitamin C degradation kinetics in pomace. The aonla pomace powder (APP) was used with milk powder (MP) in different ratios (1:14, 2:13, and 3:12) for preparation of Vitamin C and fibre rich curd. The findings of the study indicated that drying rate for aonla pomace varied from 0.01 – 0.07 g.g-1.min. The desirable drying temperature was found to be 50 °C with respect to drying time and vitamin C retention. The sensory analysis of the aonla pomace enriched curd indicated overall acceptability similar to that of control.

Keywords: Aonla pomace, drying kinetics, fibre, vitamin C, curd

Biography:

Kalyani Mahanta is pursuing B.Tech in Agricultural Engineering from the Centurion University of Technology and Management. She is presently in the 3rd year of her degree.

Research Interest: Agro-waste utilization, product development

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Poster

Effect of growing media on early seedling growth of Pakchoi in hydroponics

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Abstract:

Hydroponics has become one of the most popular approaches in today's agricultural production. In modern hydroponic, substrates have contributed significantly to the popularity and progress of hydroponic cultivations worldwide. Present study was conducted at Hydroponics Unit, M.S. Swaminathan School of Agriculture, Centurion University and Technology and Management, Odisha. Study was aimed to investigate the impact of different growing media on the early seedling growth performance of pakchoi in hydroponics under protected condition. Growing media constituents such as cococoins, river sand, oasis cubes and potting mix were used in present study. Data were recorded on the parameters like germination percentage, number of leaves, leaf length, leaf width, leaf area and root length. Results revealed that highest plant growth were recorded in coco coins and was at per with the oasis cubes. Least crop growth was recorded in the river sand.

Keywords: Hydroponics, Pak choi, Growing media, Seedling growth.

Biography:

V. Dhanasri, a final year student of B.Sc. Agriculture, has worked on different hydroponics techniques during her under graduation and developed an expertise on crop management in hydroponics.

Research Interest: Hydroponics, Pak choi, Growing media, Seedling growth.

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Poster

Effect of different level of chitin on growth and survival of Amur Carp fry, *Cyprinus carpio*

Sagarika Swain, Pallabi Panda, Subal Kumar Ghosh, Hauzoukim
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Abstract:

Feeding experiment was conducted to evaluate the growth performance of amur carp, *Cyprinus carpio* with different level of chitin incorporated diets. Experimental diets containing chitin at different level @ 5, 10, 15 % of feed were fed to the fry of amur carp and the control group was fed without incorporating chitin powder in the diet. Fishes were fed @ 10% of their body weight twice daily. Growth performance was evaluated on the basis of weight gain (%), feed conversion ratio (FCR) and specific growth rate (SGR) at the end of experimental duration of 45 days. Results showed that the fishes fed with 10 % chitin incorporated diet had a significant increase in weight gain, FCR and SGR.

Keywords: Chitin, growth rate, FCR

Biography:

Hauzoukim is a Research Scholar at Centurion University of Technology and Management, Paralakhemundi Campus, Odisha, India

Research Interest: Fish value addition, waste utilization

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Poster

Position of robotics in indian farm mechanisation role

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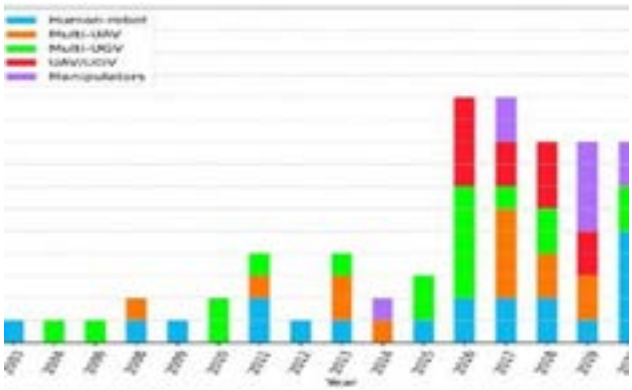
Abstract:

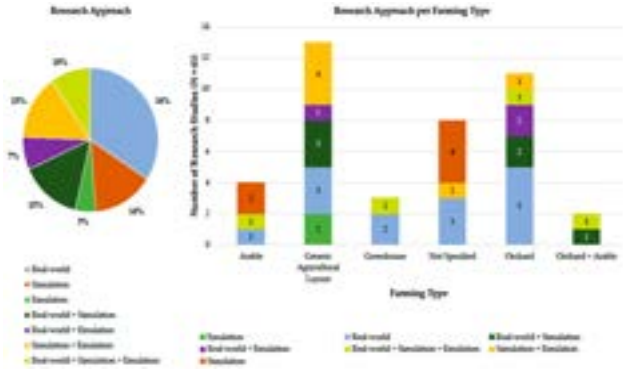
The use of robotics in agriculture, also known as agrobotics, has the potential to revolutionize Indian farming. Due to the increase in population and demand in food, people are making innovative ways by practicing agrobotics. But there are any many small farmers in india so the government is providing some innovative schemes like The national policy for farmers (2007), The national agriculture policy (2000) these both schemes provide the importance of farm mechanization by these there will increase in productivity and decrease in labour cost.

Currently the use of robotics in indian farm mechanisation are in early stages, now our government are developing some projects on agrobotics robotics can reduce cost by replacing labour for example if we take drone as an example, it replaces the the labour and saves the labour cost and works efficiently.

But there is a lack of skilled workers to handle those machinery by finding challenges. The government should concentrate on research and development and the government wants to make sure that people can adopt the new technologies, and implement training programmes to build skills among farmers.

Keywords: precise farming, Crop management, labour shortage, field efficiency





Biography:

Kuralla sree ram Nithin sai currently studying in my second year of Ag. BTech. Agricultural Engineering course in Centurion university of technology and management. He has completed his secondary and higher secondary education from FIITJEE School, vijaywada which is of BIEAP. He has a particular interest in solving problems related to agricultural engineering where robots take a part in changing agricultural applications and that is why he choose to study agricultural engineering.

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Poster

Robotic arm in planting machinery

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Abstract:

In today's world, robots and humans are working hand-in-hand for completion of their assigned task. Robots can replace humans to perform different tasks. The pick and place robot is a type of robot which picks the desired item from identified location and place them at another desired co-ordinate . This action is pre-programmed in the robot. To overcome this problem an experiment was conducted at Centurion University of Technology and management (CUTM), PKD campus. A robitic arm which drops the seedlings from the tray to the hoppers with disered time and spacing. The robotic arm was designed with four degrees of freedom (4°) and programmed to accomplish accurately. The robotic arm is equipped with 4 servo motors to link the parts and bring arm movement. Raspberypi4 with 8GB RAM with 64gb micro sdcard, 4 Servo motors (towerpro MG996R) with high torque 180° rotation and Bluetooth module (HC-05) with 3mbps and software is applied to control the robotic arm by driving servo motors to be capable to modify the position. Wireless control was done by using a smart phone with serial bluetooth terminal app with the Bluetooth module.Total power required for operating 4 servo motors (0.5Amp), bluetooth module(20mAp) and raspberypi (3.3v) we need a battery of 6V12AMP. The angle of rotation of 4 servo motor is from 0-180 degree when pulse width range in micro controller was set from 0 and 2400 micro seconds, in order to pick the seedlings from the tray and place in the desired hopper. Then sketch was compiled and was executed successfully.

Keywords: robotic arm, servo motor, raspberypi, bluetooth module, 4 dof.

Biography:

Jyotirmyee Patnaik currently studying in third year of my Ag. BTech. Agricultural Engineering course in Centurion university of technology and management. She has completed secondary and higher secondary education from Centurion University School, paralakhumundi which is of CBSE board. She has a particular interest in solving problems related to agricultural engineering where robots take a part in changing agricultural applications and that is why she choose to study agricultural engineering.

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Poster

Role of robotics in Horticulture

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Abstract:

Horticulture is the science and art of cultivating plants for food, medicine, and other uses. This industry plays a vital role in providing food and other resources to the global population. However, the horticulture industry is facing several challenges such as labour shortage, high labour costs, and environmental issues. Robotics is a technology that has the potential to address these challenges and revolutionize the horticulture industry. A robot is an automatic device that performs functions normally ascribed to humans or simply a machine in the form of human. The first robotic arm was invented in the 1950's by George Devol. As labour is a major cost for horticulture where nearly 50% of production costs for fruit is only for hired labour, intensive horticultural crops require much more skilled labour than broad scale agriculture. Hence, there is a need for efficient utilization of robots in the field of horticulture. Some of the types of robots used in horticulture are Demeter, robot for weed control, fruit picking robots, drones, forester robot, robot suit and vitirover solar robot. These robots are used in horticulture for weeding, crop scouting, micro spraying, irrigation, selective harvesting, sorting and packing, parks and golf courts, polyhouses etc. Robotics can play a significant role in horticulture, from planting and harvesting to monitoring and analyzing crops. Robotics can help increase efficiency and productivity, reduce labour costs, and improve crop yields. For example, robots can be used for precision planting, which can increase the accuracy and speed of planting. Robotics can help improve the productivity and profitability of horticultural operations.

Keywords: Horticulture, Robotics, Polyhouse, Irrigation, Global population

Biography:

Ghanta Sri Venkata Srinivas currently studying in my third year of my Ag. BTech. Agricultural Engineering course in Centurion university of technology and management. He has completed her secondary and higher secondary education from Vidya Vikas High School, Gudivada which is of Andhra Pradesh state board. He has a particular interest in solving problems related to agricultural engineering where robots take a part in changing agricultural applications and that is why he has choosen to study agricultural engineering.

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Poster

Artificial Intelligence in farm mechanization

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Abstract:

Artificial intelligence (AI) in farm mechanization refers to the use of AI-powered technologies to improve the efficiency, productivity, and profitability of farming operations. This can include using AI algorithms to optimize crop growth, monitor crop health, and automate tasks such as planting and harvesting. Precision agriculture is one of the main applications of AI in farm mechanization. Precision agriculture uses sensor data and machine learning algorithms to optimize crop growth and reduce waste. For example, by using soil moisture sensors, farmers can monitor the water levels in their fields and use this information to optimize irrigation. Additionally, precision agriculture can be used to improve the efficiency of fertilization, by using sensors to determine the nutrient levels in the soil, and adjusting the amount of fertilizer accordingly. Crop monitoring systems use cameras and other sensors to monitor the health of crops, detect pests and diseases, and predict crop yields. .By using these systems, farmers can take action to address problems early, before they have a chance to cause significant damage Automation of tasks such as planting and harvesting can be done using robots or drones, which can be controlled by AI algorithms. Automation can also be used to reduce labour costs by replacing human workers with machines. AI in farm mechanization has the potential to improve the efficiency, productivity, and profitability of farming operations, but it is important to consider ethical considerations such as privacy and data security.

Keywords: Artificial intelligence, AI algorithms to optimize crop growth, monitor crop health, planting and harvesting

Biography:

Valla Rahul is currently studying in my third year of my Ag. BTech. Agricultural Engineering course in Centurion university of technology and management. He has completed her secondary and higher secondary education from Sri chaitanya junior college, Marikavalasa which is of APIEB board. She has a particular interest in solving problems related to agricultural engineering where robots take a part in changing agricultural applications and that is why I choose to study agricultural engineering.

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Poster

Mechanisation in polyhouse through robot

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Abstract:

Polyhouse farming is a method of cultivation that involves growing crops in a controlled environment, typically using plastic or glass structures to protect the plants from the elements. This method of farming has become increasingly popular in recent years, as it allows for year-round crop production and can increase yields. However, one of the major challenges of polyhouse /eddcs,cdsDOF), Four Degrees of Freedom (4-DOF) are designed to improve efficiency and reduce labor costs, while also increasing crop yields. They can be programmed to perform specific tasks, such as planting seedlings at precise intervals, and can also be equipped with sensors to monitor crop growth and soil conditions. Additionally, robots can be used to perform tasks that are hazardous to human workers, such as pesticide application. A multi-purpose low-cost robot prototype, designed and built according to such characteristics, is then presented together with the results of some preliminary experimentation with it. Although more research is needed, the results prove to be promising and show some advantages that can be achieved with robotic automation. In particular, precision spraying and precision fertilisation applications have been developed and tested. Although the productivity of the prototype is quite low (in the range of 400–500 plant/h), experiments conducted continuously for several hours show that the robot can perform tasks unaffordable by human operators. This technology has the potential to revolutionize the way that polyhouse farming is done, making it more efficient and profitable.

Keywords: Polyhouse, Degrees of Freedom, Robots, Human workers, Planting, Harvesting, Monitoring crop growth

Biography:

P. Deepjoel and currently studying in my second year of my Ag. BTech. Agricultural Engineering course in Centurion university of technology and management. He has completed his secondary and higher secondary education from BITS School, which is of An Acharya N.G. Ranga Agricultural University board. She has a particular interest in solving problems related to agricultural engineering where robots take a part in changing agricultural applications and that is why he has choosen to study agricultural engineering.

Research Interest: Agricultural Engineering & new innovations for traditional and smart agriculture

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Poster

Application of molecular biology for development of drought resistant paddy

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Abstract:

As we recall the past drought occurrences in 2018 and 2015, drought is the main cause of agricultural loss worldwide and poses a serious danger to food security in Odisha. This study investigates the strategies for genetically modifying crops to increase their tolerance to drought, especially paddy, which suffered the highest loss during the drought in Odisha. The conventional breeding method, which requires identifying genetic variability to drought among crop varieties or sexually compatible species and introducing this tolerance into lines with suitable agronomic characteristics, is the first approach that can be taken to instil drought tolerance in rice. Although conventional breeding for drought resistance has had some results and still does, the process is sluggish and is constrained by the lack of breeding-ready genes.

However, modern science allows for a second approach to drought resistance in crops via genetic engineering, which requires the expression of specific stress-related genes and the introduction of these genes into crops. Molecular tools aid in the identification and genomic location of genes controlling drought tolerance traits via quantitative trait loci (QTL) analysis.

Extraction of valuable genes from upland japonica varieties with extensive root systems or indica subspecies with short growth duration and tissue-level tolerance capacity for drought avoidance via a targeted approach and transfer for biosynthesis of different metabolites, similar to the shotgun approach used to transfer the barley hva1 gene, which is responsible for late embryogenesis abundant (LEA) proteins, to rice in order to produce drought-resistant transgenics.

Keywords: drought, tolerance, genetic engineering, quantitative trait loci, genes, rice

Biography:

Junaid Hasemi is currently studying in my second year his Bsc. Agriculture course in Centurion university of technology and management. He has completed her secondary and higher secondary education from East West Model School, Burdwan which is of ICSE board. He has a particular interest in solving problems related to agriculture like the sustainability of crops in this changing environment and that is why he choose to study agricultural science.

Research Interest: Plant genomics, plant biotechnology and new variety development.

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Poster

Genetic resources and germplasm conservation: Strategies and future

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Abstract:

Plant genetic resources serve as a foundation for agricultural growth and a storehouse of genetic flexibility that serves as a defense against environmental change. These resources have been thrust into the center of international talks on the environment and sustainable development due to the threat of declining plant genetic variety and rising demands on them. It became clear that concerted efforts were required to gather and protect these vulnerable resources after the Green Revolution's 1960s triumphs and the ensuing losses of major food crop landraces, particularly in poor nations.

Genetic material, or the total number of genes passed down from one generation to the next through germ cells, is known as Germplasm. Breeders use germplasm as their starting point when creating different crop varieties. Therefore, maintaining genetic diversity is crucial to all breeding operations. In addition to saving plant species that are in danger of going extinct, germplasm protection measures work to maintain all vital plants, which are necessary for the existence of all creatures. Genetic resources must be carefully gathered, stored, analyzed, documented, and exchanged in order to be used effectively. Some methods for conserving germplasm include slow growth cultures, cryopreservation, pollen and DNA banks, botanical gardens, genetic reserves, and farmer's fields.

Keywords: Landraces, germplasm, cryopreservation, pollen and DNA banks, botanical gardens, genetic reserves

Biography:

Archishman Pal is currently in 2nd year of B.Sc. Agriculture in Centurion University of Technology and Management (CUTM). He has completed his secondary education in Julien Day School, ICSE board and his higher secondary education in Kalyani Central Model School, CBSE board (2019). He has a keen interest in how the Plant physiological activities take action and how scientist work to increase the production of the crop varieties and that is why he has choosen agricultural science.

Research Interest: .Plant Biotechnology, Plant science

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Poster

Effect of crude extract of *Bipolaris maydis* race O on maize leaf

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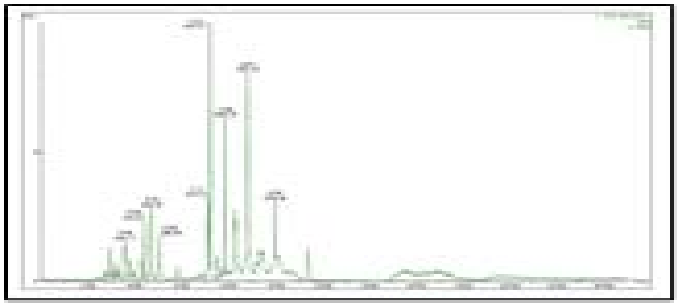
Abstract:

Inoculated geographically different *Bipolaris maydis* isolates on genetically diverse maize genotypes viz., cytoplasmic male sterile maize lines CMS S, CMS T, CMS C and normal cytoplasmic maize. Based on the reaction of different maize lines to B. maydis, identified the predominant race in India was race "O". Crude extract was isolated from race O of *B. maydis* and analyzed using Fourier Transform Infrared Spectroscopy (FTIR) and liquid chromatography mass spectrometry (LCMS). In FTIR analysis, peak formed at 1742.01 cm-1 corresponds to C=O stretching of esters in the IR spectrum. It indicated that ketone (C=O) functional group is present in this toxin compound. The UPLC-QTOF-MS chromatogram showed several peaks corresponding to various secondary metabolites such as Versiconol acetate, Bipolaramide, 2,5-Diketopiperazine, *Bipolarilide, Averufanin, Bipolarin*, Xanthone derivative, *Paecilin B, Spirostaphylotrichin U,* Curvulinic acid etc. The crude extract of *B. maydis* race O showed necrotic spots even at 10 ppm on susceptibe CM 119 maize genotype. This indicated toxic compounds play an important role in pathogenicity and symptoms production

Keywords: Maize, Bipolaris maydis, Race, FTIR, LCMS, Toxin



Biography:

Completed both BSc. Ag and MSc.ag (Plant pathology) from ANGRAU, Hyderabad. He has done his Ph.D in the division of Plant Pathology at IARI, New Delhi. Currently he is working as an Assistant Professor, Dept. of Plant Patholoy, MSSSoA, CUTM, Paralakhemundi, Odisha. He secured All India second rank in ICAR (SRF) Plant Pathology, 2014. He wrote more than five research articles and five book chapters. He was experimentally proved the predominant race of Bipolaris maydis is race O in India. He has one chemoprofiling of Bipolaris maydis race O.

Research Interest: Fungal Patholgy

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Poster

Mathematical models and its uses in agricultural sciences

Guntamukkala Sekhar
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Abstract:

Agriculture's production and marketing systems are complex and diverse. Understanding the fundamental interconnections of the soil-plant-atmosphere system and defining research goals can both benefit from modelling approaches used in agriculture. Recently, models have been developed to investigate specific issues such as the effects of climate change, climate variability, and assisting third-world countries in improving farm gate production. A researcher can determine which parameters are most beneficial by using a model to quantify their significance and impact. Before starting his work the researcher should specify his goals and build a model that achieves those goals.

Keywords: Agriculture, mathematical model, Food security, Climate change.

Biography:

Guntamukkala Sekhar, working as Assistant Professor in Department of Agronomy, M.S. Swaminathan School of Agriculture, Centurion University of Technology and Management, R. Sitapur, Odisha. He has previously worked as SRF in ICAR-CRIDA (Central Research Institute for Dryland Agriculture, Hyderabad.

Research Interest: Nutrient management, Biofertilizers and Carbon sequestration etc

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Poster

Enhancement of shelf- life for vegetable crops through value addition

Anindita Roy[1], M Viswanath[2] and Ghanshyam Thakur[3]
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[2]Dr.Y.S.R.Horticultural University , Kovour, India
[3]Bihar Agricultural University , Sabour, India

Abstract:

Shelf life refers to the systematic handling of agricultural commodities after harvest. On an average the extent of post harvest losses is 40% in developing countries and 70% in developed countries. Different vegetable value-added product includes dehydrated product, frozen chips, tomato based processed products, pickles, juice, jams, jellies, powders oils etc. Post-harvest loss in vegetables can be minimized by proper and pre and post- harvest treatments. Interrupted supply of water causes cracking in various vegetables Similarly heavy application of nitrogenous fertilizers causes faster tissue deterioration in fruits and vegetables, while essential supply of potassic fertilizers improves the keeping quality of fruits and vegetables. Postharvest losses in the production of vegetables are caused by metabolic, developmental and mechanical factors, as well as environmental factors. The essence of storage is to retain the fresh state of the product. Strategies aimed at achieving value addition in vegetables include fermentation, drying, blanching and storage. It has been concluded that the post-harvest management and value addition of vegetables crops are in underdeveloped stage in country and there is an urgent need to look into the aspects of post-harvest management by minimization of wastage and ensuring more return to the farmers.

Keywords: Shelf-Life, Storage, Quality, Products

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Poster

Dry matter accumulation, yield and economics of Maize cultivation as influenced by mixed stands of Maize + Vegetable Legumes

Souvik Nandi, Masina Sairam, Monalisha Panda, Upasana Sahoo*, Tanmoy Shankar and Sagar Maitra
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

Maize (*Zea mays* L.), the queen of cereals, has a versatile use as food, feed and industrial purpose and the area under maize is increasing in India during recent times. As a widely spaced crop, it offers the provision of adoption for the intercropping system without reducing the optimum plant stand with an appropriate arrangement of planting geometry in additive series. Based on the above facts, a field experiment was conducted during the summer season of 2021 on intercropping maize with vegetable legumes at the Experimental Farm of Centurion University of Technology and Management, Odisha. The experiment was carried out in Randomized Block Design (RBD) comprising nine treatments, replicated thrice. The results revealed that the dry matter accumulation (g/ m2) of maize and legumes was significantly affected at different growth stages. In the case of biological yield, the higher value was obtained in sole maize and it was statistically at par with maize + cluster bean (2:3). In Terms of Land Equivalent Ratio (LER) and Area Time Equivalent Ratio (ATER), the values obtained in all the intercropped treatments were greater than unity. The highest cost of cultivation was recorded in maize + cluster bean (2:3). However, in the case of a gross return, net return and B:C ratio, the higher value was noted in maize+cowpea (2:3) followed by sole cowpea and maize + cluster bean (2:3). The study clearly indicated that intercropping 2:3 row proportion of maize + vegetable legumes was advantageous over a pure stand of maize.

Keywords: Maize, intercropping system, biomass production, competitive indices, economics

Biography:

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Research Interest: Intercropping, Weed Management in Maize, precision nutrient management

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Poster

Life Cycle of Green Lace Wing Chrysoperla zastrowi sillemi (*Esben–Peterson*) (*Neuroptera: Chrysopidae*) on different host

Sunil Sunil and Goutam B. Hosamani
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

The green lace wing, *Chrysoperla zastrowi* sillemi (Esben–Peterson) is the most common, belonging to the order Neuroptera. Its agricultural importance lies in its carnivorous habits, their larvae are all predators and commonly known as aphid lions. It has been used in different crop ecosystem for protection from aphids and other soft bodied insects. Eggs are stalked and green in colour. The eggs are laid singly or in clusters. The life cycle of lace wing varies when it feed on different host like aphid, Corcyra eggs, mealybug and whiteflies. The study revealed that the larval period (8 ± 1.89 days), pupal period (9.13 ± 0.0072 days) was relatively shorter and larval weight (0.00871 g) of C. *zastrowii* was relatively highest when reared on *Corcyra* eggs than on aphids, whiteflies or mealybugs. This implies that Corcyra eggs were the better laboratory host for rearing *Chrysoperla zastrowii* larvae than aphids, whiteflies or mealybugs.

Keywords: Chrysoperla zastrowii, Biology, Survival, Host, Food sources

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Poster

Solar operated Maize planter: An approach of tractor-less sowing

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Abstract:

Sowing is a low power-consuming operation as it is done in the pulverized soil. Despite tractor is commonly used as a prime mover. In the tractor engine, diesel burns, which emits air pollutants. Also, the continuous noise of tractor engine effects audibility of operator. Because of low power requirement in sowing it was intended to develop this power using transportable solar panel. Accordingly, the solar operated self-propelled planter was developed. It was a five-row planter consisted of 3 kg seed and fertilizer box, cell feed metering unit, delivery tubes, inverted-t type furrow opener, ground wheel, chain-sprocket transmission, DC geared motor, battery, solar panel, charge controller and associated frame. The solar-operated planter was developed for maize sowing and tested by following standard methods. The row spacing, plant spacing and depth of operation were fixed as 45, 30 and 6 cm, respectively. The testing was carried out at 3 levels of forward speed and mean soil clod diameter i.e. 0.8, 1.2 and 1.6 km h-1 and 15.56, 24.40 and 35.96 mm, respectively. The optimized speed and soil clod diameter were 1.2 km h-1 and 15.56 mm, respectively. The power consumption, effective field capacity and field efficiency were, 276 W, 0.21 ha h-1 and 78%, respectively. The total draft force was 826.5 N. Compared to tractor operated planter the vibration was low, which improves seed fill efficiency of metering unit.

Keywords: Solar planter, seed uniformity, soil clod diameter, metering unit and field efficiency

Biography:

The author was born in 6th July 1989. He has completed his graduation in agricultural engineering in 2011 from Jawaharlal Nehru Krishi Vishva Vidhyalaya, Jabalpur Madhya Pradesh. He pursued post-graduation in farm machinery and power engineering in the year of 2013 from JNKVV. He achieved his PhD degree from Indian Institute of Technology Kharagpur (WB) in 2021. He has published one patent in stripper grain harvester during PhD. At present he is working as assistant professor in Centurion University of Technology and management praralakhemundi, Odisha

Research Interest: . Farm Mechanization

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Poster

Development and testing of tractor mounted inter cum intra row weeder

Sharmistha Sahu, Shekhar Kumar Sahu, Biswajeet Jena, Archana Muduli, Pratik Das, Rajesh Balabanta, Himanshu Shekhar Behera.
Centurion University of Technology and Management, Parlakhemundi, India

Abstract:

Weeds are non-native species of plants that restrict the quality of crop production in agriculture. In the row crops, the field is invaded by inter and intra-row weeds. Weeds in the intra-row zone reduce crop yield up to 33% or more. Weed control in the intra-row zone is still a huge challenge. Therefore, the advanced level of technology is used for cleaning up the weeds in between the rows (inter-row) as well as within the rows (intra-row). The existing weeders are less efficient due to incomplete intra-row weeding and require more labor and time. The developed weeder was capable of inter-row and intra-row weeding. It has sweeps to cut the weeds of inter-row. The blades were fixed circularly over the ring, which rotates about the vertical axis and cut the intra-row weeds. This rotor was capable in shifting right and left from the mean position. Initially, it rotates between the rows and gets shifted within the row when receives the signal from the microprocessor. The microprocessor gives the signal to the servo motor when the vacant space comes between two consecutive plants. The microprocessor receives signals from the camera and Arduino board. It was tested in the field of okra crop (45×30 cm spacing) at three different levels of tractor and rotor speed and a fixed depth of 5 cm. The optimized speed of the tractor and rotor were 2.5 km h^{-1} and 1.76 m s^{-1} (280 rpm), respectively. At these speeds, the weeding efficiency, effective field capacity, and fuel consumption were 96%, 0.34 ha h^{-1}, and 4.6 l h^{-1}, respectively.

Keywords: Intra-row, Sweep, Rotor, Servo motor and Microprocessor

Biography:

The author was born on 15th July 1994 at Angul Odisha. She completed her B tech and M Tech from College of Agricultural Engineering and Technology, OUAT Bhubaneswar with Farm Machinery and Power Engineering specialization. She is working as an assistant professor in Department of Agricultural Engineering, SoABE from 24th Dec 2018. Author has published six research journals, two book chapters and two conference proceeding in NAAS rated journals till date.

Research Interest: Farm Mechanization

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Poster

Socio-economic and livelihood status of Rushikulya river basin fishers of Odisha, India

Pritam Tripathy
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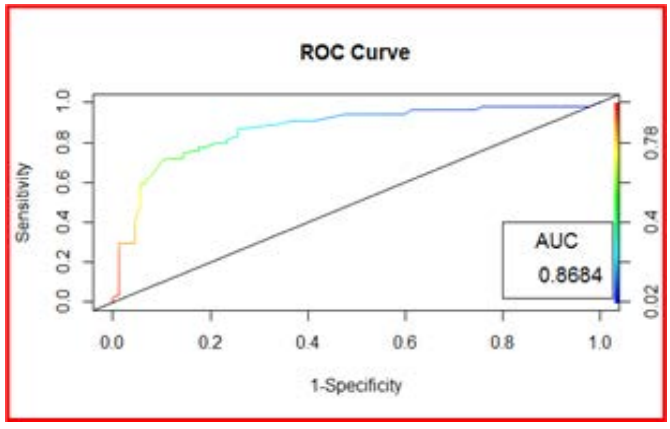
Abstract:

The Rushikulya river mouth is situated on the south Odisha coast of Ganjam district with Lat. 19°22' N and Lon. 85°02' E. The nearby resident fishers whose primary occupation is fishing are adversely affected during the breeding season of Olive ridley turtles. The Government of Odisha has banned all kinds of nets operating in the nearshore waters of Rushikulya during November-May, which coincides with this period. The study has been undertaken to understand the socio-economic and livelihood status of the Rushikulya river basin fishers. So, information on the socio-economic and livelihood status of fishers was collected with the help of a pre-tested interview schedule. The descriptive statistics to understand the current condition and the logistic regression model were fitted to know the influence of socio-economic variables upon the accessing of alternative livelihoods by the fishers' households. The AUC for the fitted model revealed that the accuracy of the prediction of the model is 86.84 per cent. This study will help the policymakers to develop suitable programmes for the benefit of the Rushikulya river basin fishers.

Keywords: Alternative livelihoods, Logistic regression (LR) modelling, Socioeconomics, Sustainable management, Traditional fishers



Biography:

The author is working as an Assistant Professor in the School of Fisheries, Centurion Institute of Technology and Management, Paralakhemundi, Odisha.

Research Interest: Socioeconomic, Environmental economics and Developmental economics

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Poster

Optimizing cultivation of edible mushrooms and evaluation of their biological properties *in vitro*

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GITAM University, Visakhapatnam, India

Abstract:

Mushrooms, the fruiting body of fungi, have long been consumed in many cultures throughout the world. Mushrooms are defined as the macroscopic spore-bearing reproductive tissue of fungi, including members of both higher basidiomycetes and ascomycetes. Edible mushrooms are typically consumed for their rich flavor and nutritional value, but also, less commonly, for their purported health promoting effects. Edible mushrooms are increasingly popular among consumers because of their purported health-promoting properties, including reports of antitumor, immunomodulatory, antioxidant, radical scavenging, anti-hypercholesterolemia and antidiabetic activities. Mushrooms fruiting body and mycelium are sources of nutrients with highly desirable flavors and aroma. Mushrooms have been successfully proved to be a food supplement for cardiac patients, and low concentration of sodium and high percentage of potassium can reduce blood pressure . In this study edible mushrooms like *Cordyceps militaris, Pleurotus ostreatus, Agaricus bisporus* are cultivated at Eastern Ghats of Visakhapatnam, Alluri District, Paderu.

Paderu soils are sandy loams where fruits like Strawberries, Blackberries, and Blueberries can grow. This soil has a strong granular arrangement promoted by a high content of organic matter. This pretty loam soil must be preferable topsoil with sufficient organic matter to hold adequate moisture and nutrients to support mushroom growth. Mushrooms need growing medium like organic substance with loads of natural sugars and nitrogen. To this soil, compost like straw and horse manure is added as it is moistened and nutrient rich. The best mushroom substrate is a mix of wheat straw, gypsum, and horse manure or chicken manure where mushroom compost is the natural substrate.

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Poster

Combined effect of submergence and salinity stress on growth in corelation to carbohydrate reserve in rice genotypes

Manasi Mondal*, Narottam Dey
Visva-Bharati University, Shantiniketan, India

Abstract:

In lowland costal saline belt, rice faces either individual or combination of salinity and submergence stress. When plants are completely submerged with saline water, no or less photosynthesis occurs and due to anoxia carbohydrates are broken down via fermentative pathways. On the other hand, salinity affects on plant growth. Here we have studied combined stress tolerance response among five different Indica rice [Oryza sativa (L.)] cv under stimulated salinity (EC 12 dS m-1), submergence in normal water and submergence in saline (EC 12 dS m-1) water for 7 and 14 days in respect to control for quantitative estimation of total soluble and insoluble sugar content together with fermentative enzyme pyruvate decarboxylase (PDC) and alcohol dehydrogenase (ADH). Our study revealed that combined stress induced greater growth reduction in rice seedlings in compare to individual stress. Anoxia tolerance was associated with reduction of underwater growth to conserve carbohydrates and changes in fermentative enzymes. It was observed that under combined stress, FR13A showed higher soluble sugar in 7 days stress induction but comparatively drop the soluble sugar content after 14 days of stress induction. But in both 7 and 14 days of combined stress induction FR13A showed lower PDC activity along with higher insoluble sugar and ADH activity. Nonabokra showed higher soluble sugar content and PDC activity but lower insoluble sugar and ADH activity in both 7 and 14 days of induced combined stress. Among the landraces cv Kaggabat showed more retention of soluble and insoluble sugar in combined condition in compare to the submergence but PDC and ADH activity more in 7 days induced combined condition which is gradually decreases by increasing the periods of stress induction. The result conveys that greater activity of ADH along with lower activity of PDC might facilitate greater accumulation of carbohydrates reserve in tolerant rice cultivars.

Keywords: Combined stress tolerance, carbohydrate reserve, growth, fermentative enzyme, rice.

Biography:

Manasi Mondal, Research Scholar of Department of Biotechnology, Visva-Bharati under the supervision of Dr. Narottam Dey.

Research Interest: Stress biology in term of biochemical and molecular level.

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Poster

Studies on persistency of milk yield in HF×Gir halfbreds

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[2]College of Agriculture, Pune, India

Abstract:

The records pertaining to 903 lactations of 347, H.F.×Gir halfbreds maintained at Research Cum Development Project on Cattle, MPKV, Rahuri over a period of 40 years from 1977-2013 and above were used for research work. The least squares means of milk production traits and persistency of milk yield were estimated considering the effect of period of calving, season of calving, order of lactation, age at first calving and peak milk yield. The data were first adjusted for the significant effect of non-genetic factors considered in this study and then stepwise regression analysis was carried out. Persistency of milk yield was significantly affected by period of calving, order of Lactation order, Age at first calving and Peak milk yield, while season of calving had non-significant effect. The lactational milk yield can be (R2-78.8%) predicted from persistency index P6 lactation length and peak milk yield by using following equation Y=-2104.59+5.03PI+4.98LL+ 157.

Keywords: HF×Gir halfbreds, Persistency, Peak milk yield, Cattle

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Poster

Medical properties of *Bacopa monnieri* (Brahmi): the herb of grace

Laxmipriya Nayak, Bikash Ranjan Sahu and Yashaswi Nayak
Centurion University of Technology and Management, Bhubaneswar, India

Abstract:

Bacopa monnieri, popularly known as Brahmi is a creeping plant, mainly grows in wet, damp and in marshy areas. According to ayurveda, Indian system of medicine, Brahmi has been used since many centuries in treatment of disease and shown many beneficial results Bacopa Monnieri is used to cure aliments such as neurological disorder, cardiovascular disease, cancer and diabetes. We discussed the mode of action of this plant species in curing few important diseases. Attention Deficient Hyperactivity Disorder (ADHD) pprimarily affects children. The disease is symptomized as lack of concentration, less attention and more indulged in hyper activities. Bacopa monnieri can cure the disease due to its nootropic effect. Brahmi basically acts as rejuvenating tonic, that nourishes the nervous system, and helps to calm down the brain .Further, it restores our memory power and improves the concentration level. Brahmi can be used as neuroprotector for the treatment of Alzheimer's disease. The plant basically cures this disease by managing the cognitive decline that comes with age, and helps regenerate neural tissues. Many types of cancers are cured by Bacopa monnieri. Prior research work has suggested that, Brahmi shows anti-cancer effect by increasing anti-oxidant count and reducing markers of tumour progression. The leaves of bacopa contain a bioactive component known as bacoposide, which is the active element showing anticancer property. It recognises the signal for cancer induction, promotes cell cycle arrest and apoptosis. Besides treatment of these complicated diseases, Brahmi also shows antioxidant properties.Being acting as a free radical scavenger , it helps to manage the disease caused by oxidative stress and reactive oxygen species. Finally, Brahmi also acts as an anti-inflammatory agent by preventing inflammation due to reduction in secretion of anti-inflammatory cytokines and thus nourish our body. Due to these properties, Bacopa monnieri is popularly termed as the herb of grace.

Keywords: Alzheimer's, Anti-inflammatory, Bacopa Monnieri, Cancers, Deficient Hyperactivity Disorder (ADHD)

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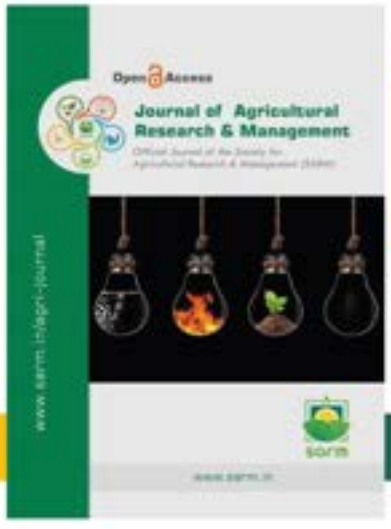

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Oral

High-Throughput qPCR for plant and animal genomic applications

Ganesh Babu
Standard BioTools, Singapore

Abstract:

Population growth, together with climate change and rapid urbanization, is contributing to an ever-changing agricultural landscape. In order to improve animal well-being and productivity with environmentally sustainable practices, scientists worldwide are moving to adopt advanced genomics tools.

The difficulty in implementing solutions such as genotyping, genotyping by high-marker-density analysis at scale has been in finding platforms that are cost-effective, easy to implement and scalable and that provide flexible panel design so they can be used for any species or application type.

Standard BioTools™, with its X9™ Real-Time PCR System, offers a cost-effective, high-throughput, automated solution for all aspects of the Agri Genomics workflow, from pathogen detection to marker-assisted breeding practices and microbiome research.

Biography:

Dr. Ganesh is the Senior Field Application Specialist (FAS), based in Singapore, supporting Standard Biotools' High throughput Genomics and single cell analysis products in Asia Pacific region. Dr Ganesh has over 20 years of experience in Genomics, Next Generation Sequencing, Immunology and Cancer Biology. After earning his PhD in Biotechnology, Dr Ganesh worked in research as a postdoctoral research scientist for more than 5 years with top-tier research institutes, Singapore Immunology Network, Bioprocessing Research Bioprocessing Technology Institute and Cancer Science Institute of Singapore (National University of Singapore), before moving into industry as an experienced Senior Application Scientist with leading global companies.

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Oral

Analysis of production constraints and mitigation strategies for enhancing yield of Sikkim Mandarin (*Citrus reticulata*)

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[1]**Department of Horticulture, Sikkim, India**

Abstract:

The Sikkim Mandarin (*Citrus reticulata*) is one of the most important fruit crops of Sikkim since ages. The valleys of the Tista and Rangeet rivers and their tributaries of Sikkim and the adjoining Darjeeling district of West Bengal offer an ideal Himalayan climate for the cultivation of Sikkim Mandarin. Analysis shows that during 2020-21 Sikkim produced 26.65 MT of mandarin from 13.26 thousand hectares of land with productivity of 2.01MT /ha. It was seen that there had been an increase of 1.68 thousand hectare area on 2020-21 from 2014-15 producing additional 7.66MT. However, while area and production have increased, the productivity has actually plummeted by 38.69 per cent over the period from 2014-15 to 2020-21. Poor returns from the citrus orchards due to multiple reasons has ushered unwillingness among the farmers to invest on mandarin. The constraints like declining soil productivity and non-adherence to soil amelioration measures, incidence of pest and diseases like fruit fly , citrus die back, lack of marketing channels and proper storage as well as preservation units are a few to name. This emphasizes a huge need of increasing productivity to maintain the glory of the species. The major strategy/approach would be to manage the basic problem which is nutritional management of the cropping area. Taking other appropriate measures to control pest and diseases should be the next important strategy. Finding the loop holes in storage and marketing of Sikkim Mandarin and defining appropriate strategies to mitigate those remain major scope of this study.

Biography:

Dr.BijaylakhmiGoswami did her M.Sc(Agri) with specialization in Soil Science from Assam Agricultural University, Jorhat, and Ph D(Biotech) from Gauhati University. She also holds a Post Graduate Diploma in Environmental Science. For last 25 years she has been working on organic farming, farm planning, vermiculture, soil fertility, green house management, IoT in Agriculture and areas of Precision Farming. She has worked in different capacities in various organizations in Agriculture and for last few years in the Agritech sector. In 2019 She co-founded Agrithink Services, an Agritech Company which has developed innovative solutions on Soil Fertility Management and has Patented a smart Micro-climate management system.

Research Interest: Technology innovations in Agri and Allied Sectors; Organic Farming; Vermitechnology

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Oral

Sarvathobhadram-Organic Farmers' cooperative unites people and environment to promote food and nutrient security as well as improved livelihood and income

Dr. Sreeni K.R.
Sarvathobhadram-Organic Society, Avanangattil Kalari

Abstract:

Sarvathobhadram-Organic–Farmers Cooperative was helpful in supporting small and marginal farmers in customizing, adapting, and tailoring the system to their specific requirements. The Farmers Club, which has 50 members, was founded in May 2020 to create additional cash while also encouraging farmers to shift to organic farming using System of Rice Intensification (SRI). The club's mission is to ensure food security, livelihood, and entrepreneurship in the Anthikad Block Panchayat. The project addressed climate change and resilience, collaborating with government departments and utilizing convergence to maximize the schemes accessible to farmers in panchayath. The transformation was sluggish initially, but it accelerated over time, indicating that farmers have variable levels of satisfaction based on a variety of circumstances. Very young rice seedlings are planted singly in a grid pattern in the System of Rice Intensification (SRI), a management strategy for irrigated rice production. Throughout the whole growth season, the soil is kept moist but well drained. Rice cultivation in the wetland starts with dewatering low-lying fields. In most places, permanent bunds have been constructed around fields. A network of barrages across the canal and at estuarine mouths has stopped saltwater to move inwards into their fields. A pumping operation system (in and outflow) has locally developed to pump out water surplus and at the time of shortage, water pumped into the canal and then into the field from the river. If saltwater from the estuaries enters the field water pumped using modern pump-sets, to channels around through bunds. In order to minimize the risks and calamities brought on by climate change, the farmers' organisations are aiming to fulfil SDG13 on climate action, which calls for enhanced resilience and the capacity to adapt local solutions. The satisfaction was reported with regard to increasing cropping intensity, reducing cost of cultivation, ease in marketing of farm produce, selection of quality seeds and preparation of Organic manures and pesticides . Farmers sell their paddy to Supplyco [The Kerala State Civil Supplies Corporation] at a rate of 28 per kilogram, which was set as an MSP [minimum support price] by the Kerala government, but is currently sold at Rs 70 per kilogram due to organic practice.

Water Management:

Dewatered waters from the padavu were kept in canals/drainage networks between these padavu and utilised subsequently for irrigation. Temporary bunds were built around each plot (padavu) in this Kayal(canal) area and used for cultivation from December to May. The government under the project Rebuild Kerala built three sluices along a 5 km long canal at the request of a Farmers' Group. The regulators along this network of canals can be used to control the flow of fields, canals, and rivers. This procedure makes sure that the water is recycled for use in agricultural. 100 acres are first dewatered, and farming is carried out. The canal is used to hold the water that is pumped out. We return this water to the fields after around 15 days so that it can be reused. Throughout the cycle, the water is continuously recycled rather than being drained into the ocean. Pumping is done with lifting equipment like a motor and pump. Field dewatering is accomplished by axial flow pumps. 1 kg of rice requires 2800 liters of water from land preparation to harvesting. Therefore, on average, 44,80,000 liters (avg 1600kg/Acre *2800lt), or 1183491 gallons, of water were needed for one acre. Therefore, by pumping water inside, dewatering it, and storing it in a cannel, and reusing it an farmers can save 2200 000 liters or 581 179 gallons of water per acres.

Highlight of the project

- Supporting small and marginal farmers in Thanniyam panchayath, Thrissur, Kerala, to modify, adapt, and adjust the system to their unique needs.
- A strategy was created to rebuild the community's agriculture from the ground up, bring in more money, and entice farmers to switch to organic farming after realising the dire circumstances of the paddy farmers.
- After 17 years, the majority of farmers renewed their operations after leaving behind hundreds of hectares of "cultivable wasteland."
- It's the most difficult task. The wetlands are low-lying areas that are flooded for around six months out of the year, 0.5 to 1 m below mean sea level. Dewatering low-lying fields is the first step in rice farming in a wetland. It is connected to the sea by ponds and canals that are a component of the natural drainage system.
- At the Krishi Unnati Mela, an agricultural exhibition organised to inform farmers about the most recent technology advancements in agriculture, Rishaba Yagam, a flagship initiative, was introduced.
- The farmers' produce were very valuable as it came during the COVID-19 pandemic.
- By providing SHG groups with 50,000 saplings, seeds, and organic fertilisers to begin their kitchen gardens, the effective model was reproduced in several wards of the block.
- Sarvathobhadram-Organic helped by identifying direct bulk buyers at the big markets thus eliminating the need for middlemen.
- Through kitchen gardening in the block, the project helped 6,500 households by securing food supply and nutrition. The effort was scaled out to cover 25 hectares of wetlands and transform 13 hectares of fallow land into organic vegetable and paddy fields.
- Farmers sell their paddy to Supplyco [The Kerala State Civil Supplies Corporation] at a rate of 28 per kilogram, which was set as an MSP [minimum support price] by the Kerala government, but is currently sold at Rs 70 per kilogram due to organic practice.
- Branded the Product under Palakkadan Matta (Joythi Rice with 30% bran and 70% bran and Flake) under Sarvathobhadram-Organic.
- Therefore, by pumping water inside, dewatering it, and storing it in a cannel, and reusing it an farmers can save 2200 000 liters or 581 179 gallons of water per acres.
- After Success of project it became clear that organic farming using SRI is a more sustainable future for the group.

Biography:

Dr. Sreeni K.R. is the project manager at payAgri Innovation IITM Research Park, Taramani, Chennai, which provides farmers with comprehensive support through market, financial, input, and technological linkages. He is closely working with farmers as part of the NABARD Project to translate cutting edge technologies into farmer solutions, market the farmers' produce, and promote sustainable farming while also improving their quality of life. He is monitoring and analysing Farmer Producer Companies as well. In my former position, working at Amrita SeRVe as a Program Manager, a project being carried out by Amrita Deemed University. The Mata Amritanandamayi Math (MAM) has selected 101 villages in India for the Amrita SeRVe program in an effort to help them become self-sufficient role models for the country.

Gaumaya Paints

A smart choice

Gaumaya Paints is an eco friendly Product from Gaumaya Agro Private Limited. Gaumaya Agro Private Limited is India's first Company to manufacture cow Dung based Emulsion Paint and distemper with a wide range of Colours. Gaumaya Agro Private Limited is founded on the belief of "Health is the wholeness and integrity of living systems". In a time where humans are taking away the goodness of nature, we strive to turn the wheel full circle by preserving it. Our philosophy is based on the principles of health, ecology, fairness, and care. We are making an effort towards a sustainable heavy metals free society that ensures soil, air and water conservation and reduce pollution. **Mrs. Durga Priyadarshini**, the Managing Director of Gaumaya Agro Private Limited is a young and energetic businesswoman. Being, a nature lover she was highly upset by the destruction of nature and rising diseases in our Society. On closed indepth study, **Mrs. Durga** realised that many Paints in market contains heavy metals and these heavy metals are not only polluting air, water & Soil but also resulting in various diseases among common people. She wanted to find a solution of this problem and founded Green Feel Paints in 2021 and started manufacturing India's first Cow dung paint in Odisha. This initiative was highly appreciated by the people in Odisha. Keeping in view the overwhelming support of the people of Odisha, she decided to spread this awareness in all states of India. Hence, She formed Gaumaya Agro Private Limited with **Mr. Jai Prakash Yadav**. Mr. **Jai Prakash Yadav**, the director of Gaumaya Agro Private Limited and also the founder of Indian Ocean Paints (J.P. Traders) is a renowned farmer and a social worker in Rajasthan. In addition to Social services like helping poor girls' marriage, encouraging usage of eco friendly solutions, helping bright poor students, Plantation, etc Mr. Yadav has wide experience in various businesses like sprinkler systems, transportation, and solar systems. He believes, that in today's world people only work for money without looking for its adverse impact on the society & nature. Now its high time that all of us should act responsibly and its our duty to provide eco friendly solutions to the society and save nature.

ABOUT GAUMAYA PAINTS

MISSION

To provide an eco friendly non toxic products to the Society, Save Cows from going to Salughterhouse and boost Rural economy by increasing farmers income.

VISION

To be the leading brand of Eco friendly Product in India.

To give back to the environment and advance on a path to sustainability.

To make consumers aware of the benefits of Eco friendly Paint & other Products.

To create a big movement that would lead people to switch to Eco friendly Product and take up a healthier lifestyle just like it used to be hundreds of years ago, when Heavy metals were not introduced and everything we used was natural and chemical free.

Mrs. Durga Priyadarshini
Managing Director
Gaumaya Agro Private Limited

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Oral

Animal nutrition, feeds and feeding

Sudhansu Ranjan
Founder, The Farm Enterprise, Cuttack,

Abstract:

Animal nutrition plays a vital role in the growth of animals as well as economic growth of a farmer. Animal growth depends upon the quality and quantity of nutrients provided in the feeds of animals. Any animal husbandry like Goatery, Dairy, Pigery, Fishery or Poultry requires a deep knowledge and guidance in order to fulfil the nutrition requirement of any animal through the feeding of locally available materials or crops or crop residues for a sustainable development. Vital nutrients which required for the growth and better productivity of animals are:

- Carbohydrates
- Protein
- Fat
- Fibre
- Minerals
- Vitamins

A day's protein plays a very important role in an animal growth. But as far as animal husbandry concerned growth of animal is always elevated through providing a balance nutrition through feeding and supplements and also good feeding practices. We have seen many commercial farms are running behind for extracting more from animals from a short period of time. For which the life span of animals and quality of the product decreases. In order to get better productivity with added nutrition, the animals are to be fed with adequate amount of feed enriched with all balanced nutrition. Which will increase the productivity of the animal. The commercial feeds are prepared according to some particular data of a company. But the animals living in different climatic conditions needs different types of feeding depending upon their bodily functions and conditions. Just like breeding animals are to be fed accordingly to get healthy kids and growing animals to be fed as per the requirement of their growth. So as lactating animals to be fed to produce more milk along with their own body maintenance. For all of this cropping pattern plays a vital role in animal feed formulation. Multiple cropping pattern like paddy, lentils (legumes) and oil crops must be cultivated in such a way that Animal feeds can be formulated sustainably with all balanced available nutrition.

Along with this, good feeding practice also plays a major role in growth of animals. The balance feeds are as follows for dairy, meat animals and laying birds.

- Green fodder
- Dry fodder
- Concentrated feed
- (Pelleted feed/Granulated feed)
- Crop residues
- Tree leaves

Feeding practices like -
Rotational Grazing system, semi-intensive system of growing animals and lastly intensive way of growing animals. Which is being preferred more since green and white revolution to increase the productivity of animals. In intensive feeding system the Animals are kept in such a way that animals can be grown in a systematic way with high productivity. All the feeding, feeds and the nutrition in the feed are monitored systematically. The health, feed, nutrition all are monitored in fingertips for which minimal human intervention or error is established, where contamination and loss of productivity is minimised to zero.

These days animal husbandry and poultry is mostly depending upon the commercial feed availability in the market. Which is a very good source of providing balance diet with added nutritional value for maximising profitability. But the cost of the feed skyrocketed for which the animals are not being fed sufficiently according to their need for the growth of animals. So as to tackle the situation scientists have developed fodder crops like Napier Grass varieties being hybridises with different cereal crops like Bajra, Jowar, sorghum Maize etc with different names like Bajra Napier Hybrid to tackle the situation of feed cost, animal health and productivity of animals to be sustained through green fodder production and feeding.

Selection of crops plays a major role in animals health, nutrition and feeding practices. Like leguminous crops like cowpeas, black gram, green gram and toor provides better nutrition for human and animals. The residue of above crops makes a great difference in animal health and full fills all the required nutrition for the growth of animals and longer the productivity of animals.

Crops residues are the major feed component for all kinds of ruminants in a intensive animal husbandry practice. We often see that the crop residue of legumes and cereals are applied fire in the crop land, believing that it will fertile the land for next crop. As a lack of knowledge among farmers and also lack of storing facilities, feeding habits made these highly nutritious feeds go on waste. Instead of wasting that these can be fed to the ruminants for better growth, hug productivity, more income generation and tackle the feed and fodder shortage at the time of harsh climate or any difficult times. These crop residues could play a life changing material as fodder for ruminants a s stable source of feed for animals to be fed to the animals.

Intensive green fodder cultivation for animals.

Multiple fodder cropping system. Maize + cowpea + red napier

Inter cropping in guava plantation.Cofs31 fodder grass intercropped with cowpea for nitrogen fixation and unnecessary weed control.

Green fodder for animals to reduce feed cost and increase productivity of the naimals by feeding them this lush green grasses.

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Oral

Biography

Sushree Sangita Priyadarshini
Ph.D. Scholar, Artist
Founder, Kagaja Phula, Bhubaneswar

KAAGAJAPHULA
ARTS
kaagaja.phula_art

I am Sushree S. Priyadarshini, a woman of Science and Arts. I work as a Senior Research Fellow, currently pursuing my Ph.D. in Nanobiotechnology at CSIR-IMMT, Bhubaneswar. When I am not running experiments in the lab, I run pen and brushes on paper and canvas. I have always had an inquisitive mind fuelled by my passion for science. Through the intricate diagrams of biology, I realized my love for drawing. I enjoy the process irrespective of the final product. Science and art have walked parallel with me throughout my life.

I was born in the port city of Balasore and brought up in different cities across Odisha, thanks to my father's service to the state. From early childhood, I have been exposed to Odisha's richness in the form of the flamboyant tribal culture of Kandhamal, the elegance of the Royals of Mayurbhanj, the rooted traditions of Sambalpur, and the scenic lush greens of Gajapati. While I have lived almost my entire life in the state, I spent a brief time pursuing my Master's degree outside it. It was then that I became aware of how unaware my peers and colleagues are of my state. No one knew Odisha beyond its annual struggles with cyclones and its poverty. While it broke my heart, it also inspired me to use my art for a better cause: to showcase Odisha's glory and its richness in art and culture.

Since then, most of my artworks have focused on promoting Odisha, its art and craft through various traditional and folk art forms, its architecture through graceful temples and monuments, and its immense biodiversity. My favorite medium is pen on paper, which allows me to imitate the delicate intricacies of Odia art and architecture. To bring out the multiple hues of Odia traditions, I also work with gouache and watercolor mediums. I have showcased my artworks at some state- and national-level exhibitions. Currently, I have two pupils who help me translate my vision onto paper and canvas. Collectively, we are called "Kaagajaphula", a dream that took shape in 2019. We are active on Instagram and Facebook under the username "**kaagaja.phula_art**".

I want my art to be a medium for Odisha's art and culture to reach the heights of its bedazzling glory, where it has always deserved to be.

Biography

Baishakhee Jena
Founder, Flowra
Chandikhole, Jajpur, Odisha, India
M: +91 98861 39585
E: baishakhee.jena@gmail.com

In today's time, women's are still having many confusions regarding menstrual hygiene and care. Due to improper menstrual hygiene, women from rural India have been prey of many infectious diseases. When the country is celebrating "Azadi Ka Amrit Mahotsav" a larger portion of women of rural India are still ignorant of sanitary pads and have been following the traditional methods.

Baishakhee Jena, a resident of Jajpur has been accorded the "Pad Girl" title for making sanitary pads and spreading awareness on menstrual hygiene among local women. The Odisha woman has been scripting history with her initiative on women's menstrual hygiene.

A Biotech graduate from Vellore University, she was well settled with a job in Bengaluru. Even though she was earning a six figure salary, however she felt incomplete as she had an aim to become self sustainable and bring a change in the society. During the pandemic, she left her job and returned home with the hopes of doing something better for her home town. She has utilized the pandemic as a an opportunity to show the rays of hope for the people who lost everything of their life.

Subsequently, Baishakhee commences Sanitary Pad business to ensure there is no scarcity of menstrual pads for the females in the village. Beside providing pads, at pocket friendly cost, she also ensured to spread awareness about menstrual hygiene among the young girls and women in her village. This laudable attempt of the 27 year old has led to the formation of a Self Help group (SHG) which has provided job opportunities to several women like her.

Baishakhee identified the scope in establishing and enterprise for manufacturing sanitary pads and napkins which will not only address to bring reformation by educating women of rural India regarding menstrual hygiene, but also pave a path for employment generation to the local youth and housewives.

Now she has been able to set presence of her brand not just in Odisha but, also different parts of India. Self confidence, dedication, patience, and perseverance can lead someone to achieve impossible. This has been successfully reflected by Baishakhee which not only helped her to achieve her dreams, but also set an example for many other women who are looking to start their own venture.

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Indo Israel Avocado

I am pioneering sustainable avocado cultivation in India using Israeli technology. My nursery's aim is to enable Indian farmers to command a premium price while providing high quality avocados to average Indian customers. The expensive imported avocados are accessible only to the elites of our country, we are going to undercut them with locally grown produce.

Avocado is one of the fastest growing horticulture commodities in India and the lack of good quality locally grown produce led me to set up my company. I provide commercially viable avocado plants that were bred in Israel, to Indian farmers. I disseminate knowledge about Israeli drip irrigation and avocado cultivation practices through my YouTube channel which enables Indian farmers to minimise water usage and grow high quality avocados. I did my apprenticeship in Israel at the age of 21 where I worked at the avocado farms of Kibbutz Ma'agan. I am following an open innovation model by building clusters of multiple small holder avocado farmers in different regions of the country with an emphasis on North East India and involve different stakeholders across the supply chain to benefit from the trade. I have turnover of over 1 crore rupees within 15 months.

Currently I am importing small saplings from Israel and growing the plants in India. My plan is to start producing plants in India with the mother plants I have within the next 3 years and scale it to a production capacity of 100,000 plants per year in the next 5 years. I am interviewing avocado experts from across the world on my youtube channel, my aim is to make it a video library to educate Indian farmers about sustainable avocado farming and its supply chain management. I have reached 3million + farmers online and educated 150+ female students on site at my farm. In the coming years, I plan to make an online course about avocado farming. I am also planning to diversify into blueberries and raspberries. I am in talks with experts and suppliers from Chile regarding the same. Lastly, I plan to build satellite avocado nurseries in North East India and grow my plants there for regional distribution.

Regards

Harshit Godha
Indo Israel Avocado
https://www.youtube.com/indoisraelavocado
www.indoisraelavocado.com

MRS. RASHMI SAHOO
DIRECTOR

BORN
17th July, 1984
Ranihat, Cuttack, Odisha

SPOUSE
Mr. Prakash Kumar Sahoo

ABOUT

Heads the technical & research wing which primarily deals with hygienic food processing and effective preservation of the same in Om Oil & Flour Mills Limited.

Groomed in a family of industrialists she is an expert in international and Indian cuisines. She has been using this talent of her's in enhancing and maintaining the tasty Ready-To-Eat products.

Her knowledge in Nutritional Science has contributed a lot towards maintaining and enhancing the nutritional value of Frozen Ready to Eat food stuff.

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admin.frozit@ruchifoodline.com

EDUCATIONAL QUALIFICATION
Graduate with Sociology (Hons.)
Course in Diet & Nutrition from DDCE

PROFESSIONAL QUALIFICATION
Resource Management in Food Industries at CFTRI, Mysore (2004).

TECHNIQUES
Trained in Food Processing & Packaging from *Switzerland* & *Italy*.

FAST FOOD PROCESSING
Research in Indian & Continental Cuisine, Frozen Food, Packed Foods.

EXPOS

Represented the company in the following domestic and international expos:

DOMESTIC EXPOS

- 2009 *(Bhubaneswar)* **International Food Fair**
- 2010 *(Bhubaneswar)* **Mega Trade Fair**
- 2012 *(Bhubaneswar)* **Indian Science Congress**
- 2013 *(Bangalore)* **Aahar International Food & Hospitality Fair**
- 2013 - 16 *(Mumbai)* **Annapoorna – World of Food India Trade Fair**
- 2014 & 16 *(New Delhi)* **Aahar International Food & Hospitality Fair**
- 2017 *(New Delhi)* **World Food India**
- 2018 *(New Delhi & Chennai)* **Aahar International Food & Hospitality Fair**
- 2019 *(New Delhi)* **SIAL - Inspire Food Business 2019**
- 2021 *(Greater Noida)* **IndusFood Expo 2021**
- 2022 *(Greater Noida)* **SIAL - Inspire Food Business 2022**

INTERNATIONAL EXPOS

- 2005 **Food & Hotel Korea - International Fair** *(As delegate of Spices Board of India)*
- 2005 **ANUGA Food Fair** *(Cologne, Germany)*
- 2010 **International Food Fair, SIAL** *(Paris)*
- 2012 **Indian Science Congress** *(Bhubaneswar)*
- 2013 **Hong Kong Trade Fair** *(China)*
- 2019 **OSUK 2019** *(United Kingdom)*

THE ORIGIN

It was the year 1976, with a mere investment and determination, a small enterprise by the name of Om Oil & Flour Mills was started in a rented premises in Industrial Estate, Cuttack. After long 43 years of sweat and toil, today Om Oil & Flour Mills Ltd., now popularly known by the brand name "RUCHI" has made a name in every Village & City of Odisha. It has made a landmark in the history of Odisha Industries as a leading quality food processing Unit. The seed of Om Oil and Flour Mills Ltd., which was sown on the barren land of industrially backward Odisha in the year 1976, has culminated into a full-grown tree spreading the aroma of the Ruchi Spices to different parts of the globe.

The stamp of Ruchi Brand Spices is clearly impressed not only in Odisha, or India but on the entire world map of Spices market. The secret behind the name & success of Ruchi Products is simply its quality and hard work of the management for the last so many years. The man behind the success of the company is none other than Dr Sarat Kumar Sahoo, the Managing Director.

RFCI - THE SEED TO NEW A BEGINNING

RUCHI started an Innovative self help Employment Scheme for Women by the name of RUCHI Food Craft Institute (RFCI), a women self-help group involved in Research & Development of RTS (Ready- to-Serve) & RTE (Ready-to-Eat) food and Non-CSD beverages. With very few employees and automated packaging pilot machines, this unit grew fast in achieving new heights. It also got acclamation and appreciation from the state government.

The moto was to promote self-help employment for women, providing golden chances for young ladies and unemployed women. During this age of women empowerment, RFCI has trained most modern cooking techniques and recipes to the women under Self-Help Group scheme.

Training was provided in upkeep of frozen foods, preservation & enhancement of their shelf life, safety methods in preparation and preservation of foods, their packing techniques etc., Specialists, Technicians and teachers from Hotel Management institutions trained the women in modern techniques of cookery & cuisines - helping them in securing self employment, at RFCI.

FROZIT - THE BEGINNING

Contaminated food and water is the root cause of all diseases. In western countries, the Government has specified certain norms and standards for quality food. Food manufacturers have to adhere to the quality norms in their food production department. Only after passing numerous quality tests, the food and beverages are launched in market.

A comparative study of food habits revealed that most Indians are ignorant and unaware about quality and purity of foods available in the market. It is well known that meat, chicken and vegetables sold in Indian market are stored in unhealthy and polluted atmosphere. If the preparation source is unhealthy and polluted, then food coming from such place must be harmful for the body.

In view of the above facts and following the foot steps of her father, Mrs. Rashmi Sahoo, an expert in international and Indian cuisines, used her talent in enhancing and maintaining the tasty Ready- To-Eat products manufactured in RFCI. She believed that the healthy food manufactured & supplied to limited local regions from RFCI should be made available to every consumer in India. It all started with this belief of providing everyone healthy, nutritious and pure food easily and conveniently. A great challenge that she generously accepted.

With proper information & analysis and considering the need of good quality food, RUCHI established the frozen food division - FROZIT, lead by it's Director Mrs. Rashmi Sahoo. The food processing unit - FROZIT produces healthier, pure and bacteria free foods and is committed to provide convenient and nutritious foods to Indians. The frozen food foundation says that "frozen foods are more nutritious and fresh".

The food is cooked first and then kept in an ultra modern cold storage system at below

FROZIT has been recognized at International level. It has made its mark in various food expos across the globe, such as International Food Fair, SIAL (Paris), ANUGA Food Fair (Cologne, Germany), China Bakery Fair 2019 (China).

Excellent quality with delicious taste, FROZIT produces foods that are being enjoyed by all the age groups irrespective of being present at work or at home. Sticking up to its words, "Time Ki Bachat, Eat Fresh Fatafat" FROZIT got no limitations for its market.

From preparation to packaging all stages are observed, inspected and examined by experts with scientific standards. The production department is run with an affiliated international know-how body followed by a leading advisory group. FROZIT applies internationally recognized HACCP (Hazard Analysis and Critical Control Point) system to ensure food safety with in-line packaging system, along with internationally recognized Good Manufacturing Practices (GMP) to further ensure quality and food safety.

FROZIT has been recognized at International level. It has made its mark in various food expos across the globe, such as International Food Fair, SIAL (Paris), ANUGA Food Fair (Cologne, Germany), China Bakery Fair 2019 (China). Excellent quality with delicious taste, FROZIT produces foods that are being enjoyed by all the age groups irrespective of being present at work or at home. Sticking up to its words, "Time Ki Bachat, Eat Fresh Fatafat" FROZIT got no limitations for its market.

FARRMB™ - SOLUTION TO A HEALTHY BREAKFAST

Breakfast is often called 'the most important meal of the day', because it breaks the overnight fasting period. Our breakfast should not be just some food to ease the hunger, but it should be healthy, nutritious and fulfilling. In the fast-paced life we live in, preparing healthy breakfast has become a challenging task. In order to simplify things, we introduce FarrmB™ - our new golden wing comprising of a variety of healthy Breakfast Cereals that are suitable for every lifestyle. Health has always been our priority.The entire range of breakfast cereals has the highest quality ingredients for our customers to get the best value for their money. We are constantly working hard to develop new range of healthy and nutritious products that are convenient and affordable in order to accomplish our vision of a healthier India

CERTIFICATION

Accredited by FSMS (Food Safety Management Systems) & ISO: 22000:2005.

Quality

Following the foot prints of Utkal Gaurav Madhusudan Das, we prefer loss to profit - without ever compromising with the desirable quality from all points of view. We make use of the modern quality assessment methods & techniques for our processed foods as per International Standards.

THE VISION

Winning over the heart and confidence of numerous customers through genuine products and exemplary quality is its motto. Through our innovation & passion we will make our hygienic food which is "Too good for your palate & Not too bad for your pocket" available at every home.

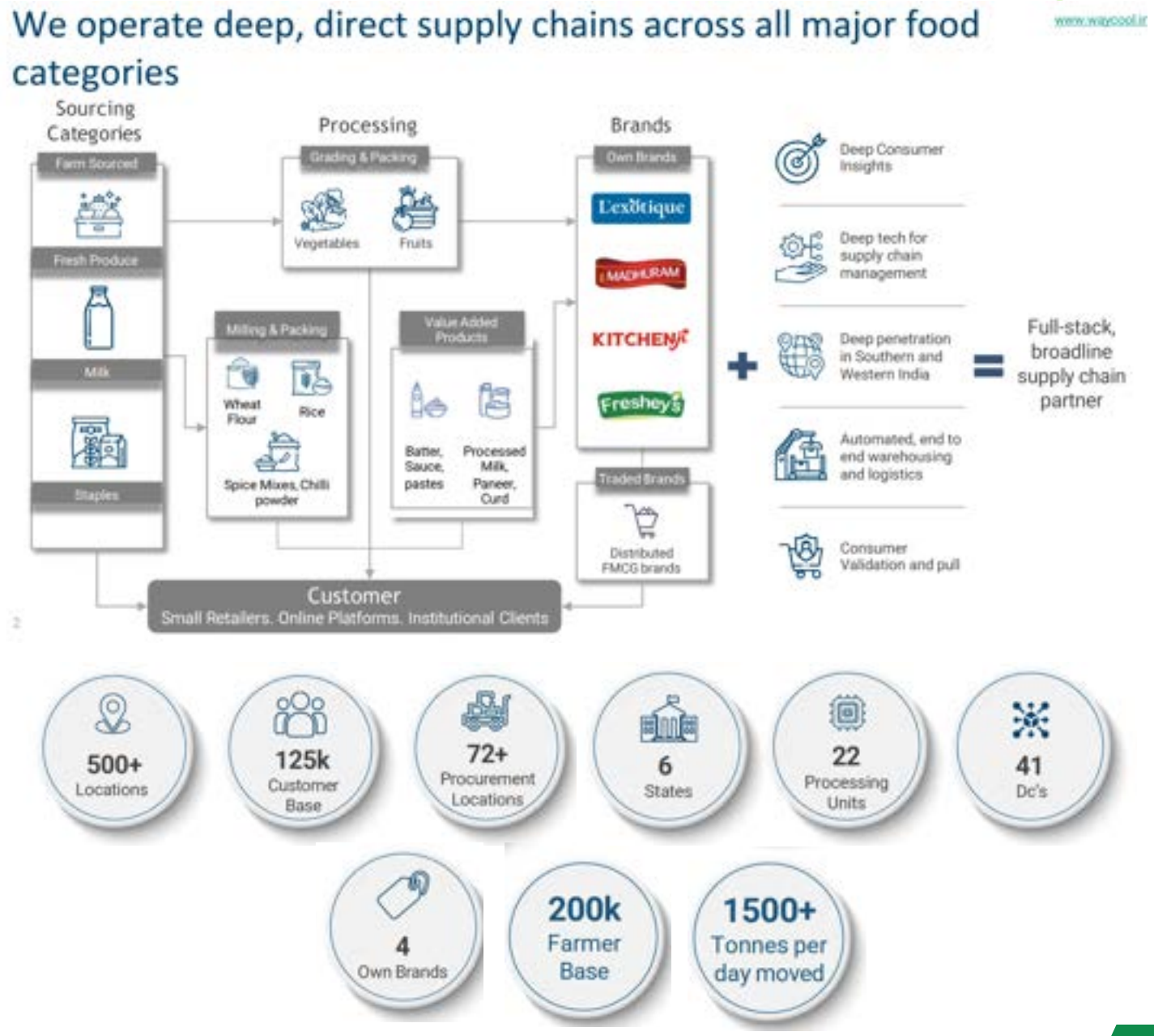
Continuity Towards the Society

FROZIT — A UNIT OF RUCHI FOODLINE Since 1978 — FarrmB — RAYS FOUNDATION

waycool

About WayCool:

Founded in 2015, WayCool Foods is India's leading food and agri-tech platform, focused on integrating innovative technology and impact to scale and operate a complex supply chain from "soil to sale". Through our farmer engagement program "Outgrow", the company operates in deep and direct supply chains across major food categories like Fresh produce, Staples and Dairy.



NOTES

Society for Agricultural Research & Management

कृषि अनुसंधान और प्रबंधन संस्थान

sarm

Host University

Centurion University

Shaping Lives... Empowering Communities...

Knowledge Partner

NISER

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