



Centre for Agriculture Production

Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

Centre for Agriculture Production 2020-2023



Version 1/2023

Message from the CEO



Center for Agriculture Production is a small scale-based Production Center for learning and production platform for students and others. This has been developed with several units which the agriculture students can do practical and the same products can go for market so that the production Center has its own identity in the research field. The production Center has the several units with the production capacities. This Center is also providing certificate and Skill courses in different units so that farmers or any entrepreneurs can be beneficial. This center also focuses on Skill based learning platforms to the local farmers under several schemes from the State Govt. and Govt. of India.

A handwritten signature in blue ink that reads "Kalyan Chakravarthy". The signature is written in a cursive style and is positioned above a horizontal line.

Dr. Parle Kalyan Chakravarthy
Centre for Agriculture Production

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1. THE RESEARCH UNIT

1.1. Introduction to CAP

The Center for Agriculture Production is mainly focuses on production and technology adaption of various research units. It also aims at investigating factors responsible for high yields and utilization of various agricultural inputs in increasing production. The center has 15 research units with strength of 31 faculties from different branches of Agriculture Sciences. The center aims to provide learning platforms for students in different units and also adds support for startups in different units by introducing certificate/skill courses. The research units in this Research center are Mushroom, Bio-Fertilizer, Bio-Pesticides, Spawn, Vermicomposting, Seed Processing, Seed Production, Lemon Grass, Dairy, Bee-keeping and Honey Production, Marigold Production, Commercial Nursery, Mentha, and Fodder Production. This research Center is also producing Paddy rice of RNR 15043 variety, which is called DaiFit Rice with low GI index of 51.6, good for

diabetic patients. The Products from this research center are Milk, Panneer, Khova, Curd, Bakery Cakes and Biscuits, paddy straw mushrooms, Oyster mushrooms, vermicompost, liquid bio-fertilizer like Azotobacter, Rhizobium, PSB, KMB and Azospirillum, Vegetable seed like Tomato, Brinjal, Mentha and Marigold flowers for extraction of oil with CO₂ extraction, lemon grass etc.

1.2. Mission Statement

The mission of this unit is to provide the learning platform for the Agriculture students to achieve self-sufficiency in food production, increase the income of farmers/labors by providing the guidance to optimize the resources, to promote the sustainable use of natural resources such as land and water, and also to promote the Soil Health Management and Integrated Nutrient Management



1.3. Vision Statement

The Vision of the Research Center is to create a

UNITS & FACULTY

Faculty Member Team of Center for Agriculture Production

Overall In charge

- Dr. S P Nanda ,Dean Admin, MSSSoA
- Prof Anil J , Associate Dean, MSSSoA

CAP Team

- Dr. Durga Prasad Padhi
- Dr. M Subba Rao
- Dr. P Kalyan Chakravarthy
- Dr. Siddharth Das
- Dr. Praveen Boddana
- Dr. I Venkatesh
- Dr. T Arvind
- Dr. Ritesh Kumar
- Dr. Saurav Barman
- Dr. Nilanjana Dutta
- Dr. AnanatTamang
- Dr. Ajay Kumar Prusty
- Dr. Aninda Chakraborty
- Dr. Smaranika Mohanty
- Dr. Vinay Kumar
- Dr. Sanghamitra Rout
- Dr. S Deepthi
- Dr. Manish Kumar Yadav
- Prof. Deepayan Padhy
- Prof. Dwiti Sundar Rout
- Prof. Rama Lakshmi
- Prof. Prashant Kalal
- Prof. E Ramesh
- Dr.Prashant Choudhury
- Dr. Sunita Satpathy
- Dr. P Anusha
- Dr. K Prasanthi
- Dr. Subrajyoti Chaterjee
- Dr. Krishnam Raju
- Dr. Sunil
- Dr. S Ashok Kumar

Units under Research Center for Agriculture Production

- Seed Processing Unit
- Hybrid Seed Production Unit
- Mushroom Unit
- Spawn Unit
- Bio-Fertilizer Unit
- Bio-Pesticides Unit
- Marigold Production & Commercial Nursery Unit
- Honey Production & Bee Keeping Unit
- Vermicompost Unit
- Tulsi & Mentha Production Unit
- Dragon Fruit Unit
- Lemon Grass Production Unit
- Live Stock Unit
- Horticulture Unit
- Dairy Unit

3. UNITS & ACHIEVEMENTS OF CAP

3.1. Livestock Unit

Centurion University has well-managed institutional dairy and poultry farm at Paralakhemundi campus, where students are being trained for different skills associated with farm management and production. The institutional dairy farm has 24 cows (HF and Jersey cross bred) and 17 buffalo (Murrah) and institutional poultry farm has 29 Kadaknath birds. The farms have standard SOP to manage time and cleanliness. The milk is being marketed by mini-processing unit, where along with milk different milk-biproducts are also being produced. The vision of these farms is to achieve clean production at farm level through different scientific procedures and practices.

Achievements

- The prevailing repeat breeding problem was solved following treatment protocol.
- A total of fourteen cows conceived through natural services.
- Regular monitoring of health of animal led to partial disease-free environment.
- Optimization of milk productivity was achieved through balanced feeding strategies and mastitis control program.
- Two patches of Hybrid Napier were cultivated for student demonstration purposes.
- Rearing of Giriraja birds was standardized at farm level and received a huge demand at market.
- New batch of Kadaknath bird was reared and being maintained for egg purposes
- Agarbati made from cow dung was popularized at UtkalKrishimela and received a good demand from visitors.

Animals in Livestock Unit

Cows.....

Milking cows: 5

Pregnant cows: 8

Heifer (repeat): 3

Heifer (Fresh): 4

Bulls: 4

Female calves: 3

Total: 27

Buffaloes.....

Milking buffalos: 1

Pregnant buffalo: 5
Buffalo heifer: 2
Bull: 1
Aged: 1
Calves: 7 (2 Male+5 Female)
Total buffalo: 17

Total: 44

Poultry: Kadaknath & Giriraja Birds



3.2. Mushroom Unit

Mushroom unit encircled with the production of different types of mushroom, its spawn production and making post-harvest products. Newly initiated button mushroom is to be introduced (under button mushroom project) in the Mushroom Unit. Infrastructure and composting work are ongoing as a new initiative from the unit.

The Four Types of Mushrooms are cultivating insie the Unit , Button Mushrooms, Paddystraw mushrooms, Milky mushrooms and Oyster Mushrooms based on the suitable weather / seasonal conditions.



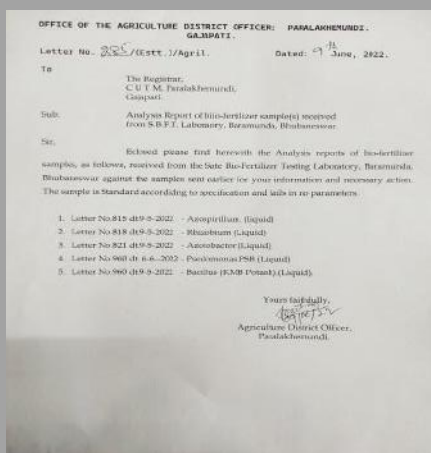
3.3. Bio-Fertilizer Unit

- Azotobacter (certified by State Bio fertilizer testing lab, Govt. of Odisha)
- Rhizobium (certified by State Bio fertilizer testing lab, Govt. of Odisha)
- Azospirillum (certified by State Bio fertilizer testing lab, Govt. of Odisha)
- Pseudomonas (certified by State Bio fertilizer testing lab, Govt. of Odisha)
- Bacillus (certified by State Bio fertilizer testing lab, Govt. of Odisha)
- Waste Decomposer

Facilities available: Autoclave, Hot air oven, pH meter, Digital balance, colony counter, Compound microscope, laminar air flow unit, Incubator shaker of 25 liters capacity, cooling centrifuge, Deep freezer, Refrigerator.

Activities:

1. July-Dec 21:- The unit has produced 75 liters of Bio fertilizer with the help of AELP Students. These products were utilized for research purpose by different departments of agriculture.
2. Jan- June 22:- The unit has produced 55 liters of Bio fertilizer with the help of AELP Students. These products were utilized for research purpose by different departments of agriculture, horticultural nurseries, hybrid seed production etc.
3. Between May-June 22 all the five Bio fertilizer strains (*Azotobacter*, *Rhizobium*, *Bacillus*, *Pseudomonas* and *Azospirillum*) have cleared the quality analysis test by State Bio fertilizer lab Bhubaneswar ,Govt. of Odisha and were certified.
4. Training given to FCRI students on June 8-9th 2022 at Biofertilizer unit, Paralakhemundi
5. The products were exhibited in the road show at FCRI Hyderabad on June 25th 2022.
6. 8 students are undergoing summer internship in Bio fertilizer production technology and market analysis



Quality Analysis Certificate the State Govt. of Odisha to certify the products from Bio-Fertilizer lab of Centurion University of Technology and Management, Paralakhemundi campus. The certified products by the State Government Bio-Fertilizer Testing laboratory are Azotobacter, Rhizobium, Azospirillum, Pseudomonas, and Bacillus.



3.4. Bio-Pesticides Unit

Bio pesticidelab has *Trichoderma* (Talcum powder formulation) under production and screening, which is isolated from different parts of Odisha and confirmed by microscopy. Collection of rhizospheric soil samples of different crops and land used system for the isolation of *Trichoderma*.

Facilities available:

Equipment like Autoclave, Hot air oven, Laminar air flow unit, Incubator and Refrigerator

3.5. Dragon Fruit Research Block

Developed to find out the best organic nutrient management practice, study the efficacy of Bio fertilizers (N, P, K)

Outcome: Fruit yield: 1000 kg + No.of cuttings: 1260

Total value (1st year)-Rs.3, 63,800/-

3.6. Mentha Production Unit

Introduction of Mentha, Mentha arvensis to New Climate Conditions. Area is about 1.3 acres. Cultivar is Golden Punjab (Goldy)



3.7 Apiculture Unit (Honey Production & Bee keeping)

- Harvested 65 kg of honey in 3 years (2019-22)
- Harvested 3 kg of sunflower oil in 4 month (2022)
- One Day Workshop at FCRI Hyderabad on 25.06.2022

3.8 Vermicompost Unit

Vermicompost is generally produced by epigeic earthworms that remain in the litter layer and in the first centimeters of soil and feed on fresh organic matter. *Eiseniafetida*, is the most common species used for vermicomposting because they have high litter ingestion and reproduction rates. The capacity of Vermicompost production under the unit of School of Agriculture, Centurion University, and Paralakhemundi is 2258 c.ft. The unit contains 20 tanks with dimension of 21.55ft length, 4ft width, and 2.62ft height of each tank. Vermiwash is a liquid nutrient product obtained during vermicomposting, that has significant influence on plant growth and yield attributes. It can use as a foliar spray. Vermiwash has lot of potential because it has microbes, natural plant nutrients and hormones. Vermiwash can be used for a period of 3months

Price of Vermicompost: 15 Rs. /Kg

Price of Vermiwash: 10 Rs. /Kg

The Total Production capacity is 180 Ton per Year

The Total Stock as of today is 1150 Kgs



3.9 Lemon Grass Unit

Lemongrass is currently cultivated on 3.5 acres of land at Gandahathi farm. The harvested grasses were taken for oil extraction at a Steam distillation unit operated by BREDS, Pathpatanam near Raiwada

3.10 Spawn Unit

This unit was commenced for commercial spawn production and also for academic aim to initiate AELP program on spawn production to develop entrepreneurship among the students. In M.S. Swaminathan School of Agriculture, CUTM, Paralakhemundi campus spawn production unit has been established near ANIMAL CELL CULTURE LAB. Spawn Production unit aims at production of Pure Culture, Mother Spawn and Commercially viable spawn of different edible mushroom species.

Production Procedure

Pure Culture- It is the growth of a single strain of mycelium over Potato Dextrose Agar medium. One pure culture can be used to inoculate 10 bottles of Mother Spawn.

Mother Spawn- It is also known as F1 generation spawn, it is prepared from inoculation of pure culture. It can be directly used in mushroom beds or can be inoculated to prepare commercially viable spawn.

Commercially viable spawn- It is also known as F2 generation spawns, it is prepared from inoculation of mother spawn.

The Facilities/machinery available in the Spawn Unit are Autoclave , Laminar air flow, Refrigerator, Furniture, Weighing balance, Chula with Cylinder, Glass wares and chemicals , Wide mouth saline bottles , Culture tubes , Spirit lamp, Measuring cylinder, Inoculation needle, Plastic basket, Dextrose, Agar-agar , Formaldehyde, Rectified spirit , Calcium carbonate , Wheat , Non-absorbent cotton, Butter paper and rubber band, Glass marking pencil

3.11 Horticulture Unit

Department of Horticulture had its genesis since 2013 under M.S. Swaminathan School of Agriculture for the furtherance of the development and advancement of Horticultural Education - research - Extension. Currently the department is running with 3 laboratories i.e. B.Sc., M.Sc. and Post-harvest laboratory.

The Objective is to Provide quality education in Horticulture (Under graduate Post graduate and PhD), and undertake basic, applied and adaptive research to inscription of prevailing challenges and trends. The Outcomes are

- Standardize the management methodology options relevant to the suitable agro climatic and socio-economic situations.
- Publications in National and International Journals that can provide feed for educators, researchers and farmers.

3.12 Commercial Nursery

Horticulture nursery plays a pivotal role for nurturing the plants by providing them optimum growing conditions to ensure germination. Nursery saves considerable time for the raising of the next crop. Among flower crops, majority of the annuals are propagated by seeds and require a nursery for raising the seedlings.

Outcome in terms of research and products are

- Develop innovative agro- techniques to enhance the production and productivity of horticultural crops.
- Establishment of models nurseries in rural areas for availability of quality planting materials.
- Knowledge of nursery management, nursery establishment and nursery rules and regulation.

3.13 Marigold Production

For the production of marigold, the nursery land has been allotted at Bagushala Research Farm, 300 m² land has been utilized for the preparation of nursery beds and transplanting has been done in 3-4 acres at Bagushala Research farm and in front of Registrar residence at Campus (CUTM, Paralakhemundi). Project

Started on Nov 20, 2021 and completed the harvesting part on April 2022. The Production has been sent for Oil Extraction

4. CORE PRODUCTION AREAS

Maize, Paddy and Okra Hybrid seed production is being carried out at CUTM in collaboration with ProFarm Pvt. Ltd., Telangana. Completed the following till date for commercial cultivation in Kharif season. The main objective is to escalate and promote hybrid seed production by CUTM. The marketing of F1 hybrid seeds will be done at Andhra Pradesh, Odisha and Telangana states. No money generation till date as the unit is started in July 2022. The Unit is maintained by AELP students of seed production unit and students under domain: Seed production using Manual and Molecular methods.

4.1 Maize

30 acres at R. Sitapur

4.2 Paddy

Paddy- 12 acres (Hybrid M1011) at Gandahathi

Paddy- 18 acres at Ranadevi

Paddy- 20 acres at R. Sitapur

Total 48 Acres of Hybrid Paddy

RNR 15048

8.5 Acres at R Seetapur

4.5 Acres at Bagusola

1 Acre at Patikota

7 Acres at Ranadevi

Total 21 Acres of RNR Rice

4.3 Okra

Okra hybrid seed production- 1 acre at R.Sitapur by CUTM in collaboration with ICAR- IIVR, Varanasi. *In Rabi season, Maize and Paddy Hybrid seed production will be started in 20 and 10 acres respectively at R. Sitapur

Project Coordinator are Prof. M. SubbaRao

- Team members for Maize:, DrSanghamitra Rout.Dr. Ashok Kumar
- Team members for Paddy: Dr. AnindaChakraborty,.
- Team members for Okra: Dr. Vinay Kumar, Dr. Smaranika

4.4 Mini Dairy Unit

Milk Processing: The dairy plant has been set up in the premises of CUTM Paralakhemundi to process milk to increase its shelf-life and convert it into various value-added products such as Khoa, Ghee, Paneer, cream, curd etc. The objective of this unit is to provide hands-on training on dairy products processing to the students and thus promoting entrepreneurship development. Also, it is regularly operated and maintained by skilled personnel to ensure functional and commercial viability of the plant.

Pasteurization unit: Pasteurization inactivates some undesirable enzymes and reduces number of many spoilage bacteria resulting in increase in shelf life of the milk up to 2 – 16 days depending upon the processing condition, type of packaging and storage conditions. A continuous plate pasteurizer based on high temperature short-time (HTST) method is used for pasteurization. Other than this, storage tank, boiler, chiller and homogenizer are part of the whole pasteurization assembly.

Cream Separator: One of the first unit operations in the processing of fluid milk is the separation of cream from skim. Separation essentially produces a fraction of the aqueous phase devoid of fat globules (skim) and a fraction of the aqueous phase enriched in fat globules (cream). A centrifugal separator has been installed in the dairy unit for cream separation from the milk. The separated cream is further used for ghee preparation.

Khoa making machine: A batch type mechanically agitated khoa making machine having a capacity of 120 Litres is installed in the unit for rabadi/khoa preparation. Continuous stirring prevents charring of the milk.

Form-Fill-Seal packaging machine:Liquid milk packaging machine based on form-fill-seal technology is installed in the dairy unit for packing of pasteurized milk. It has a capacity of packing 250 Liters milk per hour.

Spray Dryer: Spray drying unit is also installed as a part of dairy unit for production of milk powder from liquid milk. It is a



quick drying process
atomized liquid droplets.



utilizing hot air for drying of



5. PUBLICATION DETAILS

Name	Articles Published	Articles Accepted	Book Chapters	Conference Proceedings	Abstracts / Popular Articles
Dr. Vinay Kumar	6		3		
Dr. Smaranika Mohanta	7		2	2	
Dr. AnindaChakraborty	4	2	1	1	
Dr. T Arvind	3		2	2	
Prof. Chandrasekhar	6				
Dr. Manish Kumar Yadav	8	3	3	1	2
Dr. S Deepthi	6	1	1	2	
Dr. Ajay Prusty	32	4	10	7	6
Dr. Ritesh Kumar	6		2	2	1
Dr. I Venkatesh	2		1	1	
DR. Sanghamitra Rout	7	3	1		
Dr. AnantTamang	13	2	1	1	
Dr. B Praveen	18		2	1	

Prof. Deepayan Padhy	12		2		
Dr. Siddharth Das	13		11	1	2
Prof. Ramalakshmi	9		3		
Dr. P Kalyan Chakravarthy	28	1	1	2	
Mrs.SunitaSatpathy	35	1			
TOTAL	215	17	46	23	11

6. PATENT DETAILS

Dr. Sunita Satpathy Published two patents in this Research Center. The Details of the Patents are as follows

1. Soil fertility in vermin composting prediction utilizing WCA based deep CNN-MODEL for the agricultural-domain on dated 09/06/2021.
2. A system and a method of improved SCA-ELM based DENSENET121 for classification of fruit diseases on dated 11/05/20/22.

Dr. Ajay Kumar Prusty has published

1. Artificial Intelligence Based Animal Detection and Identification System For Protection of Field Crops
2. A method to measure the air pollution impact on terrestrial and natural vegetation in urban locations
3. Prevention of food harmfulness from production to customer for centralized kitchen facility using IoT
4. Technique To GIS Modelling of Water Bodies By Mapping Riparian Vegetation Along The Shore
5. Eclipta Alba Based Composition For Haemorrhoids and Its Preparation Method Thereof
6. Herbal Cake Composition For Gastritis and Preparation Method For The Same



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