



Koneru Lakshmaiah Education Foundation

(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

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KL COLLEGE OF AGRICULTURE-BIOFERTILIZERS CLUB-VISIT TO BIOFERTILIZER PRODUCTION

Name of the Visit	Visit to Biofertilizers Production Unit
Courses covered under the activity	AGSE 001
Date	31.10.2025
Venue	Agricultural Research Station (ARS), Amaravati
Number of Students Participated	72
In-charge	Dr. D. Harikarthik (9456)

Objective of the Event:

Awareness on the production aspects of biofertilizers such as Media Preparation, Inoculation, Fermentation, Bottling, Carriers, Packaging and Storing.

Description of the Event:

Biofertilizers contain living, beneficial microorganisms that, when applied to seeds, plant surfaces, or soil, colonize the rhizosphere (root zone) and promote growth. Different types of Biofertilizers are present such as, Nitrogen Fixing- *Rhizobium* (Symbiotic), *Azospirillum* (Associative), *Azotobacter* (Free Living); Phosphate Solubilizing bacteria- *Pseudomonas*; Phosphorous Mobilizers – Vascular Arbuscular Mycorrhiza (VAM), Potassium Solubilizing bacteria-*Bacillus ssp* were mass multiplied in fermenters and mixed with carrier material (Lignite) and supplied to farmers in Solid and liquid form.

Dr. Ravindra Reddy, Principal Scientist, addressed the students that Agricultural Research Station (ARS) in Guntur, part of ANGRAU (Acharya N.G. Ranga Agricultural University) is a significant biofertilizer producer in the state, with an annual capacity of 20-25 metric tons aiming to reduce reliance on chemical fertilizers by improving soil fertility and sustainability.

The Industrial production of biofertilizers involves a standardized, multistep process to ensure a high quality, viable product through strain selection and inoculum preparation. The pure culture is maintained and then scaled up through several stages to produce the initial broth culture (inoculum) required for mass production.

The fermentation medium (broth) provides all necessary nutrients for the selected microorganism to multiply rapidly. Key components of broth is water, carbon, mineral elements

and some vitamins. The medium must be cost-effective, readily available, and formulated to maximize the yield of the target microbial biomass. It must be sterilized at 121 °C, 15 Lbs, for 15 Min to eliminate all contaminants.

Process of growing the microorganisms on a large scale occurs in a fermenter (bioreactor). Both Submerged Fermentation (SmF), where microbes grow in a liquid medium, and Solid-State Fermentation (SSF) are used. Critical parameters like temperature, pH, and aeration (supply of sterile air for aerobic microbes like *Azotobacter*) are continuously monitored and controlled to optimize microbial growth and activity. Cultivation continues until the microbial population reaches a required minimum count, typically 10^8 cells per milliliter of broth.

After fermentation, the concentrated microbial broth is mixed with a carrier material to create the final biofertilizer product (liquid or solid). The carrier is crucial as it:

- Protects the microbes from environmental stress.
- Facilitates easy application and storage.
- Maintains high microbial viability (shelf life).

Farmers can apply the biofertilizers liquid form (500 ml of NPK per Acre) and 5 kg of VAM is mixed with 200 kg of cowdung and applied to root zone or broad casted in the field.

Photograph:



Group photo with Dr. Ravindra Reddy (Principal Scientist) along with Biofertilizer Club Students



Dr. Ravindra Reddy, Principal Scientist, ARS addressing students regarding production aspects and importance of Biofertilizers



Dr. Ravindra Reddy, Principal Scientist explaining about fermenters (Bioreactors) and its operational Mechanism to the students



Dr. Ravindra Reddy, Principal Scientist, explaining about mass multiplication of VAM