

CERTIFICATE COURSE IN BIO-FERTILIZER PRODUCTION

Organized and conducted by:

Department of Botany,
North Gauhati College,
Guwahati – 31.

Course Duration: 3 months.

Mode: Part-time.

Module 1: Introduction to Biofertilizers.

- Concept and history of biofertilizers.
- Status, scope, and importance of biofertilizers.
- Role of biofertilizers in sustainable agriculture.
- Classification, types, and composition of biofertilizers.
- Nitrogen fixation.

Module 2: Account of micro-organisms involved in the production of bio-fertilizers.

- Types, structure, and characteristic features of bacterial bio-fertilizers:
 - a) *Azospirillum*.
 - b) *Azotobacter*.
 - c) *Bacillus*.
 - d) *Pseudomonas*.
 - e) *Rhizobium*.
 - f) *Frankia*.
- Types, structure, and characteristic features of cyanobacterial bio-fertilizers:
 - a) *Anabaena*.
 - b) *Nostoc*.
 - c) *Hapalosiphon*.
- Fungal bio-fertilizers:
 - a) Arbuscular mycorrhiza.
 - b) Ectomycorrhiza.

Module 3: Production Technology.

- Equipments.
- Isolation.
- Sterilization.
- Strain Selection.
- Culture maintenance.
- Inoculum preparation.
- Growth and fermentation.
- Mass production of carrier based and liquid bio-fertilizers.
- Storage and shelf-life of biofertilizers.
- Specifications, quality control and marketing of biofertilizers.

Module 4: Application Technology.

- Methods of application to seeds, seedlings, tubers, etc.
- Factors influencing efficacy of bio-fertilizers.
- Advantages and disadvantages of using biofertilizers.
- Regulatory and safety aspects of biofertilizer production.

Module 5: Biopesticides.

- Introductory concept on biopesticides.
- *Bacillus thuringiensis*.
- *Trichoderma viride*.
- Biosafety.

Module 6: Practical.

- Hands on training on equipment used in biofertilizer unit.
- Isolation and purification of *Rhizobium*.
- Isolation and purification of *Azospirillum*.
- Isolation and purification of *Azotobacter*.
- Isolation and purification of phosphate solubilizers.
- Isolation of AM fungi- wet sieving method and sucrose gradient method.
- Mass multiplication of biofertilizers.

Structure of classes and time allotted:

CERTIFICATE COURSE IN BIO-FERTILIZER PRODUCTION

Organized and conducted by:
Department of Botany,
North Gauhati College,
Guwahati – 31.

Course Duration: 3 months.
Mode: Part-time.

Course Duration: 38 hours.

Requirements:

1. Laminar Air Flow.
2. Hot Air Oven.
3. Autoclave.
4. Incubator.
5. Measuring Cylinder.
6. Beaker.
7. Conical Flasks.
8. Inoculating Loops.
9. Petri plates.
10. Glass Slides.
11. Cover Slips.
12. Alcohol.
13. Cotton rolls.
14. Forceps.
15. Needles.

Number of seats: 30.

Target group of students: UG students.

Learning Objectives: To demonstrate the low-cost media preparation and impart training of eco-friendly agricultural inputs in biofertilizer production. To promote organic farming in the region through technical capacity building of all stake holders.

To impart training to develop skill, handling, cultivation and propagation of quality microbial inoculants.

To make students ready for industry as entrepreneurs.

To improve the professional competencies and upgrade the knowledge and develop technical skills of biofertilizer production.

Learning Outcomes: Ability to distinguish the types of biofertilizers and methods of application in farmers field.

Development of integrated management for best results using nitrogenous and phosphate biofertilizers.

Evaluation: Oral test and report submission.



(Mrs. Ruby Doley)
Head, Department of Botany
North Gauhati College
Guwahati-781031

Course Co-ordinator:

Ipsita Bhattacharjee.

(Dr. Ipsita Bhattacharjee)
Assistant Professor,
Department of Botany,
North Gauhati College,
Guwahati-781031.