

Bio-fertilizers

Total Lectures : 33 Credits : 3 (Theory -2, practical -1)

THEORY:

Unit 1: General account about the microbes used as biofertilizer - Rhizobium - isolation, identification, Biological nitrogen fixation and Actinorrhizal symbiosis. (4 lectures)

Unit 2: *Azospirillum*: isolation and mass multiplication - carrier based inoculant, *Azotobacter*: classification, characteristics - crop response to *Azotobacter* inoculum, maintenance and mass multiplication. (4 lectures)

Unit 3: Cyanobacteria (blue green algae), *Azolla* and *Anabaena azollae* association, nitrogen fixation, factors affecting growth, blue green algae and *Azolla* in rice cultivation (4 lectures)

Unit 4: Mycorrhizal association and types, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield - colonization of VAM and its influence on growth and yield of crop plants. (5 lectures)

Unit 5 : Organic farming - Green manuring and organic fertilizers, Recycling of bio-degradable municipal, agricultural and Industrial wastes, biocompost making methods, vermicomposting - field Application. (5 lectures)

PRACTICAL:

1. Isolation of root nodule bacteria from leguminous plants. Gram staining. (3 lectures)
2. Isolation and inoculum production of VAM, (3 lectures)
3. Preparation of vermicompost and field application.. (5 lectures)

Suggested Readings

1. Dubey, R.C., 2005. A Text book of Biotechnology S.Chand & Co, New Delhi.
2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.
3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay Publication, New Delhi.
4. Sathe, T.V. 2004. Vermiculture and Organic Farming. Daya publishers.
5. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New Delhi.
6. Vayas,S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic Farming Akta , Prakashan, Nadiad