Welcome everyone, This module is for program Bachelor of Science subject Botany. Third year semester 6 course code is BOD104. Course title is Biofertilizers. Title of the unit is- Free living nitrogen-fixing microbes.Module name is- Algalization technology. Myself, Ashish Venkatesh Prabhugaonkar, Assistant Professor at DCT's Dhempe college of Arts and Science, Miramar, Panaji Goa. In this module we will get introduced to Algalization technology which uses blue green algae as biofertilizer.

At the end of this module, we should be able to describe blue green algae as biofertilizer.

Blue Green Algae biofertilizers technology

Refined BGA biofertilizertechnology developed in the recent past has immense market potential considering that 43 million ha area under rice cultivation in India alone. Based on the natural ecology of cyanobacteria in rice field ecosystems, a cost-effective and easily adoptable biofertilizers technology was developed by Venkataraman (1978) at IARI, New Delhi, India. This basic method involves mass production of a mixture of cyanobacteria constituting nitrogen fixing species of Anabaena, Nostoc, Plectonema, Tolypothrix and Aulosirain shallow trays or cemented tanks in open air using soil as the carrier material. These organisms have been screened as better in terms of growth rate and nitrogen-fixing capacity in experiments at IARI.During the crop growth cycle, the algae grow, multiply, fix atmospheric nitrogen and make it available to the crop by way of excretion and autolysis.Algalization of rice crop has been found to supplement nitrogenous fertilizers to the extent of 30-40 kg N/ha/season.Significance of algal biofertilizer lies in the fact that unlike the chemical fertilizers, these are not directly utilized by the crop.Only the products of their activity are used. Successful establishment of desired algae in the rice fields has been found to form a source of slow release of nitrogen for the crop plants.They have also been found to protect a part of the applied fertilizer nitrogen from being lost. Advantage of the technology is that farmers, after getting the soil-based culture from IARI or any of the recognized cyanobacteriamultiplication centres, can produce these biofertilizers on their own as per the requirement with minimum easily available inputs. For mass culture in the trays and tanks, for each square meter 2 kg of soil and 100 g of single superphosphate are added. Tothis, 5 mL of Malathion or 25 mg of Furadon granule (Carbofuran, 3%) is used to prevent breeding of mosquitoes and other insects. Contents are thoroughly mixed and allowed to settle. Cyanobacteria culture containing all the strains is sprinkled on the surface.

These organisms multiply in the tanks when exposed to direct sunlight and form a thick mat over the surface in 10 to 12 days. The contents are allowed to dry and the dried flakes are collected, packed, and used to inoculate at the rate of 10 kg/ha in the rice fields after transplantation. Tank method, pit method (making pits of variable size with a polythene lining at the base), and field method or nursery cum field production method (cultivated in levelled fields covering large areas (Venkataraman, 1981) are some more techniques which are proposed.

Limitation of Algalization technology

Climatic conditions such as low temperatures in winters and by washing out of the organisms in rainy season.open-airtank culture method is quickly and easily contaminated by other organisms that may outgrow the desired ones.

Infestation by insects and other predators often results in a product during such cultivation practices that does not contain desired organisms inan appropriate quantity

The way forward

Upgrading the Technology for inoculum production and subsequent commercialisation should be pursued.For an extension of the technology, farmers in the rural areas need to be educated through extensive demonstration trials on the use of biofertilizers.

These are the references for this module.

Thank you.