



COMPILED AND CIRCULATED BY BANGAMOTI HANSDA, ASSISTANT PROFESSOR,
DEPARTMENT OF BOTANY, NARAJOLE RAJ COLLEGE

BIOFERTILIZERS

BY

BANGAMOTI HANSDA

ASSISTANT PROFESSOR

DEPARTMENT OF BOTANY

NARAJOLE RAJ COLLEGE



1. What is Biofertilizer ?

Biofertilizers are the substances that consists of microbe's living and latent cells which increases essential nutrients when applied to the seeds, seedlings or soils by colonizing the rhizosphere of the host plant. Biofertilizers are more effective than chemical fertilizers.

2. Give some example of microorganism used as biofertilizer.

Following are the examples of biofertilizer:

Phosphate solubilizing bacteria – *Pseudomonas sp.*

Nitrogen fixing lue green algae- *Nostoc sp.*, *Anabaena sp.*

Nitrogen fixing bacteria- *Rhizobium*, *Azotobacter*

VAM, *Azolla rubra*, BGA etc.

3. Why biofertilizer is so important?

Over the years, farmers used the chemical fertilizer to increase their crop production to meet the increasing demand. However, the highly use of these chemical fertilizer causes very dreadful effect. Because it is responsible fore air and water pollution and also deplete minerals from the soil. Therefore now it is necessary to switch to the organic farming which involve the use of biofertilizer or microorganism.

It comprises blue green algae, micorhizal fungi and bacteria which helps to increase organic substances into soil or can rise nitrogen by nitrogen fixation property. *Pseudomonas* can hydrolyze inorganic phosphorus into soluble form and made available to the plant fore their growth promotion.

4. Write the advantages of Biofertilizers

- a. It increases essential nutrition in the soil.
- b. Can improve soil texture.



- c. Helps to increase the yield of plants.
- d. Biofertilizers are natural fertilizer and they protect the environment from pollutants.
- e. They are cost effective and eco-friendly.
- f. They protect the plants from harmful pathogen.
- g. They also destroy poisonous or harmful substances in the soil that can cause diseases to the plant.

5. Write the disadvantages of Biofertilizers

- a. Because they are alive, biofertilizers require special care.
- b. Biofertilizers loss their effectiveness if they are contaminated by other microbial strain
- c. Store it in cool and dry place away from direct sunlight
- d. Use biofertilizers with right combination.
- e. Never used it in too hot or dry soil.
- f. Do not mixed with chemical fertilizers.

6. What are the applications of biofertilizers

a. Seedling root dip

Seedling roots are treated in a solution of biofertilizer for half an hour before transplantation in the field. One acre of seedlings requires approx 2-2.5 kg biofertilizers.

b. Seed treatment

After soaking the seeds into the mixture of nitrogen and phosphorus fertilizers, they are placed in another container for drying. These seeds are then sown as soon as possible.



c. Soil treatment

Biofertilizers are mixed with compost manure and kept for one night. Then spread it on the soil where the seeds are to be sown.

7. Different types of Biofertilizers and its example.

Biofertilizers							
Bacterial				Cyanobacterial		Fungal	
Nitrogen fixers			Phosphate solubilizer	Nitrogen fixers		Phosphate solubilizers	
Symbiotic	Associative	Nonsymbiotic	Non symbiotic	symbiotic	nonsymbiotic	Mycorrhizal	Non Mycorrhizal
<i>Rhizobium sp.</i>	<i>Azospirillum sp.</i>	<i>Azotobacter sp.</i>	<i>Pseudomonas sp.</i>	<i>Anabaena</i>	<i>Nostoc</i>	<i>Gigaspora sp.</i>	<i>Aspergillus sp.</i>

8. What is bio-compost?

Bio-compost is the form of compost which comprises of plant matter that has been decomposed or recycled as a fertilizer or organic compost manure. Addition of micro organisms or blue green algae or fungi helps in the process of decomposition.

9. Why nitrogen is important for plants?

- a. It is major component of chlorophyll in plants, which is used in photosynthesis.
- b. It is also an important part of cell component or processes such as amino acids, the critical element of protein backbone.

10. What is nitrogen fixation?

Nitrogen fixation is a process by which nitrogen is converted to a nitrogenous compound (such as ammonia) by either non biological or biological process.

11. What is non biological nitrogen fixation?

In case of non biological nitrogen fixation, lightning converts nitrogen gas to nitric oxides (2NO) by allowing nitrogen to react with oxygen. Then it converted into 2NO₂ by



oxidation process. These compounds may react with nitric acid or nitrate, which is usable for plants.

12. What is biological nitrogen fixation?

When nitrogen fixation carried out by microorganisms or blue green algae is called biological nitrogen fixation. e.g. *Azotobacter*, *Azospirillum*, *Rhizobium*, *Nostoc*, *Anabaena* etc.

13. What is symbiotic nitrogen fixation?

Symbiotic nitrogen fixation is the nitrogen fixation process which carried out by symbiotic organisms in association with leguminous plants. *Rhizobium* forms a symbiotic relationship with pea plants.

14. What is non symbiotic nitrogen fixation?

It includes Nitrogen fixation by non symbiotic or free living organisms such as blue green algae or *Azotobacter* are able to reduce atmospheric dinitrogen and can fix it into the soil without forming symbiotic association with plants.

15. What are the precautions in the use of biofertilizers?

- a. Specific inoculants should be used for specific crops.
 - b. Biofertilizers should be store in cool place and keep away from direct sunlight.
 - c. It should not contact with pesticides or chemical fertilizers during storage and application.
 - d. Biofertilizers should be used before date of expirations.
-