Government of Sikkim

BIO- FERTILIZER

For Nutrient Management In Organic Farming
Production of Crops

Extension & Training
Food Security & Agri. Dev. Department
Krishi Bhavan, Tadong, Gangtok

BIOFERTILIZERS

Plants need about sixteen elements as nutrients which are known as essential elements. Out of these Nitrogen, Phosphorus and Potash are required in more quantity and hence are termed as major nutrients. Our atmosphere contains almost 79% of Nitrogen in gaseous form. Certain soil micro-organisms have ability to convert the atmospheric Nitrogen into ammonia which is readily available to plants. These strains include azetobactor, Rhizobium, Blue green algae, Azospirillium, etc. Besides there are certain micro-organisms producing organic acids which solublises Phosphate and make available to plants.

I. Benefits of using Bio-fertilizers

1. It increases crop yield by 20-30%
2. It fulfils 25%of Nitrogen requirement.
3. It activates the soil biologically and increases soil fertility.
4. It helps in stimulating plant growth in general and root in particular.
5. It is more economical than chemical fertilizers, less bulky and easy to apply.
6. It is eco-friendly and does not have any chemical effect.

II. Method of using Bio-fertilizers

There are different methods of application of Bio-fertilizers such as (i) seed inoculation (ii) seedling dipping (iii) soil treatment and (iv) mixing with organic manure. But among these, seed inoculation and seedling dipping are most effective and economical.

(1) Seed Treatment

Suspend 200 gms of Azetobactor/Rhizobium/Azospirillium in 300ml of water and mix thoroughly. Pour this slurry into 10 kgs of seed and mix with hand till all seeds are uniformly coated. Dry the coated seeds in shade and sow immediately.

(2) Seedling Dipping

Suspend 1 Kg Azospirrilium/Azetobactor in about 5.0 lts of water and dip the roots of seedlings to be transplanted in the suspension for about 8-10 hours in tub or pit. In case of paddy, as there will be sufficient moisture, the seedling bundles after treatment can be kept overnight in shade in a dry place. However, the seedling after treatment should be protected from excess water/rain, otherwise the micro-organisms will be washed away and there will not be any effect of the treatment. At the time of transplantation the seedling has to be held by three fingers at the root zone to avoid contact of seedling roots with flooded water.

III. Soil Treatment

The Bio-fertilizer culture can be applied in soil in furrow (line sowing) or drilled with seeds and mixed with soil.

IV. Mixing with Organic Manure

Mix 4-5 kgs of Azetobactor/ Azospirrilium/Rhizobium/PSB with 150-200 kgs of compost or FYM. Mix thoroughly and leave it overnight. Apply this mixture in furrows or broadcast in the field before planting of seed.

Precautions

1. Ensure usage of biofertilizer before expiry date as specified on each

packet.

2. Store biofertilizers in cool and dry place, protect it from heat and direct sunlight.
3. Do not mix biofertilizer with pesticides and chemical fertilizers.
4. Use double the quantity of biofertilizer than instructed on seeds treated with mercurial compound.
5. Use stream water if the tap water is treated with bleaching powder or any chemicals.