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Extension Folder

Biocapsule

ICAR- Indian Institute of Spices Research
Kozhikode - 673012, Kerala

What is biocapsule ?

A gelatin based capsule in which, beneficial microorganisms are packed in high concentration is called a biocpasule. The technology for this encapsulation method was developed at ICAR- Indian Institute of Spices Research, Kozhikode. Reduced cost of application, easy handling and transport and long shelf life are some of the advantages of this technology. Each capsule filled with the encapsulated formulation weights about one gram and will have up to 10^{12} colony forming units of microorganisms. Biocapsules can be used for promoting plant growth, providing resistance against diseases and enhancing availability of nutrients.

Points to remember while using biocapsule

- The capsule containing correct strain of beneficial microorganism suited for a particular crop should be selected.
- Since there is a difference in the method of application between biocap sules containing beneficial bacteria and beneficial fungi, it is important to know the type of beneficial microorganism encapsulated inside the biocapsule.
- The solution prepared from beneficial fungal biocapsule should be used within 2 hours.
- In case of biocapsule with beneficial bacteria (*eg. Bacillus, Azoto bacter*), one capsule is mixed with one litre of sterile water (water which has been boiled and then cooled to room temperature).to prepapre the stock solution. The solution is then incubated for 6- 8 hours with inter mittent stirring (2-3 times) to ensure uniform growth of the beneficial bacteria.
- After incubation, this stock solution is diluted with 200 litres of normal water.
- There should be sufficient organic content and moisture in the soil at the time of application.
- It should not be mixed with any kind of chemical fertilizers, pesticides, wood ash and lime.
- It must be used before the expiry date.




Biocapsules available at ICAR-IISR

Name of the microbial agent	Purpose
Trichoderma asperellum	Used in management of foot rot in black pepper, rhizome rot in ginger & turmeric, and damping off disease in cardamom
Bacillus amyloliquefaciens	For growth promotion and control of rhizome rot in ginger & turmeric
Bacillus licheniformis	Management of bacterial wilt in ginger
Bacillus safensis	Used as a zinc & phosphorus solubilizer, Used for the management of rhizome rot in ginger & turmeric
Bacterial consortia for Black pepper	Growth promotion, especially in nurseries and young vines

Using the encapsulation technology of ICAR-IISR, several firms have developed biocapsules with various beneficial microorganisms. These capsules are available in the market either directly from the manufacturers or through their marketing partners.

When to apply

The timing of use depends on the crop and the beneficial microorganism. One example is given below.

Use of GRB 35, Biocapsule containing *Bacillus amyloliquefaciens*

GRB 35 is a biocapsule that enhance growth of ginger and also helps in control of rhizome rot. The solution prepared from the capsule can be applied in the beds before sowing the ginger seeds. Thereafter, it should be applied 45, 60 and 90 days after planting. Approximately, 5 litres of solution is required for a standard ginger bed (3 m x 1 m). Ginger seeds can be soaked in the prepared solution of GRB 35 as a seed treatment . About 25 kg ginger seeds can be soaked in 50 litres of prepared solution for 30 minutes, dried in shadow and planted in pits. The solution prepared for seed treatment can be used again for two more batches of seeds before making fresh solution.

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