



DIRECTIONS FOR USE

1. Add 30g Gum Arabic (or two tablespoonfuls of sugar) to 300ml of clean luke warm water in a soda bottle and shake well to dissolve.
2. Fill a debe can, or any other container used for weighing, with 15kg of large sized legume seeds e.g. beans, cowpeas or 10Kg of small sized seeds e.g. Lucerne, desmodium or green grams.
3. Pour the 15kg legume seeds from the debe or any other container that will accommodate the seeds.
4. Pour Gum Arabic/Sugar solution onto the legume seeds in the basin/ container.
5. Mix the legume seeds with the Gum Arabic/sugar solution until all the seeds are wet.
6. Using the right type of BIOFIX for the legume seeds, pour the contents of the packet onto the wet seeds in the basin/ container.
7. Mix the legume seeds and the inoculant thoroughly until all the seeds are uniformly covered with the inoculant.
8. Protect the inoculated seeds from direct sunlight by covering the basin with paper, cloth or gunny bag and keep under shade until planted.
9. Plant the inoculated seeds as soon as possible in well prepared moist bed.

BIOFIX
Legume Inoculant
Manufactured & Distributed by MEA Ltd.
 under licence from the University of Nairobi



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BIOFIX[®]
Legume Inoculant





WHAT IS INOCULATION?

Inoculation is bringing the appropriate rhizobia into contact with legume seeds or roots. Most farmers have been inoculating their legume seeds for centuries by collecting soil from fields that produce well-nodulated crops and transporting it to other fields where they plant legumes. This method is difficult and time consuming because a great deal of soil needs to be transported, and it is not always very effective.

Modern inoculants contain live rhizobia that are grown in a laboratory and transported to the farmer as a liquid or solid substance. These have millions of rhizobia per gram, specifically selected to stimulate Biological Nitrogen Fixation (BNF) in a particular legume crop. In 300 grams of a high-quality modern inoculant there are about the same number of rhizobia as in a 4-ton truckload of soil from a field with a successfully nodulated legume crop. These modern inoculants are applied as seed coatings or incorporated into the soil like granular fertilizer. They may contain single or multiple strains of rhizobia. Inoculation is a fairly simple procedure. It is also generally much cheaper than fertilizer application and, unlike fertilizers; rhizobial inoculants have no negative side effects even when used in large quantities.

WHY SHOULD A FARMER INOCULATE?

- **Fertilizer savings:**
Inoculated legume crops reduces or totally eliminates the need for nitrogenous fertilizers. Seventy-nine percent of the air is made up of nitrogen and inoculated legumes are able to convert and use this 'free' nitrogen.

- **Increased yields:**
All legumes average more kilograms per acre when properly nodulated, which increases total crop production and income. For example, in Mwea region yields of French beans (*Phaseoli vulgaris*) have been increased up to 50%
- **Added nitrogen to the soil:**
Properly nodulated legumes add 90 to 200 Kg of nitrogen per acre to soil. The exact amount depends on effectiveness of the nitrogen fixation process, type of legume, length of time grown, soil nutrient levels, and the nitrogen already available.
- **Economical and safe:**
Inoculation is a low cost way to ensure nodulation with the proper strain of nitrogen-fixing rhizobia bacteria for increased yield in an environmentally safe manner. Inoculants are considered as bio-fertilizers which are organic and environment friendly.
- **Improved soil conditions:**
Legume plants decompose rapidly, leaving organic matter in the soil; this improves its physical, chemical and biological condition.

Important points to note:

- Most of sub-Saharan soils are depleted of N and lack P which is necessary for plant and root development. This makes it necessary to inoculate legume crops to obtain maximum yields
- A proper and the right inoculant strain must be used with each legume



- Inoculant contains living organisms that must be protected from heat and sun
- Inoculant loses its effectiveness if not stored properly

SEED INOCULATION

Farmers should coat their seed with inoculant just before planting so that large numbers of rhizobia will be ready to start the infection process when the legume roots emerge. These rhizobia can then quickly infect the roots and start the process of nodulation.

Biofix is an organic fertilizer tailored to meet the specific needs of most legume crops.

- Simple to use
- Environmental friendly
- Suitable for our soils
- Low labour requirement
- Easy to carry and transport