

Bacteria inoculants for more nitrogen in soybean

Recognize the problem

Soybeans provide a cheap source of protein for humans and animals. However, yields in Zambia are low due to limited nitrogen in the soils. Nitrogen deficiency in the field causes yellowing of many leaves per plant and on many plants more or less equally over a field. In contrast, yellowing due to diseases would be clustered in a field. Nutrient deficiency leads to poor growth.

Background

Soybean is an important crop in almost all the provinces of Zambia. Bacteria called *Rhizobium* can help improving the nitrogen in poor soils, because the bacterium fixes nitrogen from the air into the soil. Increased nitrogen in the soil will improve soybean growth and yield. The bacteria can be applied via seed dressing. The bacteria inoculant can be in liquid or powder form put onto the seeds. After the crop has germinated, the inoculant penetrates the root hairs where it will begin to multiply. Root hairs with this bacterium will develop balloon like sacs called nodules. The inoculants only need to be applied to soil that is virgin, meaning that it has not been planted with soybean for 5 years, and that is acidic.

Management

- Buy certified soybean seed from any recognised outlet to assure disease free seeds.
- Buy the bacterial inoculant from recognised supplier such as from Mount Makulu Research Station, Private bag 7, Chilanga, Zambia
- Mix thoroughly 125 grams of inoculants with 50kg of seed (for 0.5ha)
- Mixing of the inoculant is done as follows;
 - Dissolve 1 tablespoon sugar in 250ml water
 - Mix 250 inoculant in 250g sugar solution (sugar acts as a sticker)
 - Sprinkle on 50kg soyabean seed and mix thoroughly
 - Plant inoculated seed within two days
 - Leftover seed should be stored in a cool place for a period of less than 3 days

Nitrogen deficiency in soyabean.
(Photo by Fabián G. Fernández)



Root hairs with this inoculum will develop balloon like sacs called nodules. (Photo by IITA, CC BY-NC)



Scientific name(s) > *Rhizobium spp.*

The recommendations in this factsheet are relevant to: Zambia



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