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Virginia Polytechnic Institute, Blacksburg. Agricultural Extension Service  
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### INOCULATE LEGUME SEED

SPECIAL  
COLLECTION

It has long been known that legumes cannot take nitrogen from the air without root nodules; but when inoculated with the right kind of bacteria, they are able to get large amounts of nitrogen from the air.

Many farmers make the mistake of planting legume seed without inoculation, because legumes have previously been grown in the field. The old nodule bacteria that may be carried over from the previous crop may die out when the particular legume to which they are adapted is not present. It is also important to remember that the legume bacteria are highly selective, and that most legumes require a specific strain of bacteria to provide maximum benefits.

Legume bacteria are small, one-celled plants which have many characteristics of larger plants. They reproduce by simply dividing. They are very sensitive to high soil acidity, heat, and drought. Not enough survive from one year to another to provide sufficient inoculation. Even if they do survive, they may lose much of their efficiency and hence be of little or no benefit to the plant. When a legume plant is inoculated with the proper bacterial culture, the plant supplies food for the bacteria, and in return the bacteria furnish nitrogen for the plant.

Even when nodules are produced by the organisms already present in the soil, a striking improvement in growth is frequently obtained by inoculating the seed with a pure culture. The main reason for this is that many of the bacteria carried over in the soil from the previous crop may have been killed by sun, rain, drought, starvation, and soil acids. Then, too, it may be that there is a "scrub" type of nodule organism present in the soil--one that is of very little value in fixing nitrogen or in some cases actually injurious to the plants.

How to Inoculate Legume Seeds With Bacterial Cultures: First, buy a legume culture produced by a reputable company, prepared for the specific legume on which it is to be used. Be sure to check the "expiration date" to be certain that the culture is not too old. Then, to make the treatment, follow the directions given on the container. Here are general recommendations for applying the culture: Place the seed on a canvas or in a tub or other container that can be used for mixing. Mix a culture with specified amounts of water, as instructed on the container. Stir this mixture well and pour over the seed, then mix the seed and culture thoroughly until the individual seeds are well covered with the culture. The important thing to remember is to get a uniform distribution of the culture on all seeds. Let the seeds dry in a shady place for a few minutes, then plant immediately. Exposure to direct sunlight is injurious to the nodule bacteria.

Precautions: 1. Every seed should be coated with bacteria. 2. Inoculated seed should be sown as soon as possible after inoculation. 3. Inoculated seed should not be exposed to sunshine or drying winds. 4. Inoculated seed should not be sown in dry soils or left exposed on the surface of a seed bed without covering or cultipacking. 5. Inoculated seed held for more than 24 to 48 hours should be re-inoculated before sowing.

Legume bacterial cultures are compatible with certain seed disinfectants such as arasan and spergon, provided the treated seed are inoculated just before planting and are planted in soil with adequate moisture for germination. Inoculated, chemically-treated seed should be planted within two hours after inoculation. If not planted within two hours after the inoculation, the seed should be re-inoculated.

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S. B. Fenne  
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