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Inoculation is the process of introducing commercially-prepared *Rhizobium* species bacteria to legume seed. Inoculants stimulate the formation of nitrogen-producing nodules on the roots, which dramatically increase the ability of legumes to convert atmospheric nitrogen to ammonia, a nitrogen compound. Atmospheric nitrogen is plentiful, but unavailable for use by plants; ammonia is readily used by growing plants.

BENEFITS

- **Fertilizer savings:** Properly inoculated legumes are able to convert and use "free" atmospheric nitrogen from the air, eliminating the need for supplemental nitrogen fertilization. Inoculated legumes, once tilled in, have the potential of adding 55–300 pounds of nitrogen per acre to the soil for the subsequent growing season.
- **Higher yields:** Legume harvests average more pounds per acre when properly inoculated, which increases total production and, therefore, income.
- **Improved soil conditions:** When mature legumes are tilled in, they decompose rapidly and increase organic matter in the soil, thus improving a soil's physical, chemical, and biological condition.

INOCULANT EFFECTIVENESS

Inoculants and *Rhizobium* lose their nitrogen-fixing and soil-building capabilities over time. To ensure maximum effectiveness, periodically examine the legume roots. Use a garden spade or fork to dig up a maturing plant and look closely at its root structure; rinse away excess soil, if necessary. Slice a few nodules open with a sharp knife and check the color. Nodules that are actively fixing and converting free nitrogen to ammonia are pink or reddish brown; white nodules are either underdeveloped or are ineffective; and soft, green nodules are past their prime and have already contributed to the plant's nitrogen economy.

It is suggested that fresh inoculant be added at planting time every 2–3 seasons, and *always* when planting ground that has not previously been inoculated. Continuous use of fresh *Rhizobium* maximizes yield benefits as the "fresh" *Rhizobium* will out-compete the indigenous nodule-forming bacteria.

INOCULANTS OFFERED BY JOHNNY'S

The correct inoculant to match the legume being grown is critical to proper nitrogen fixation; the various strains of *Rhizobium* are specific to each legume. Please see the catalog or our website for more information.

- **Garden Combination.** For snap, dry, and lima beans, as well as peas. (*Rhizobium leguminosarum viceae* & *phaseoli* & *Bradyrhizobium biovar* sp.)
- **Soybeans.** (*Bradyrhizobium japonicum*)
- **Peas, Lentils, Vetch.** (*Rhizobium leguminosarum biovar viceae*)
- **Alfalfa/True Clover Combination.** (*Sinorhizobium meliloti* & *Rhizobium leguminosarum biovar trifolii*)

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