



Soybean Inoculants Supply Nitrogen More Effectively



Jim Beuerlein's research shows that inoculants are an effective and profitable alternative method of providing soybean plants with nitrogen.

Inoculants are an effective and profitable alternative method of providing soybean plants with nitrogen, according to Ohio State University Extension research.

Based on 64 Ohio field trials, the average yield increase from soybean inoculants is 1.94 bushels per acre and produces a profit of about 300 percent when beans average \$6 per bushel and when inoculation materials cost \$3 per acre.

"We've been testing inoculation products since 1995. Last year we tested over 30 commercial and experimental products. If you take a look at all of the work we've done over a period of about 10 years, what the data says is that over the long haul, someone who uses inoculum continuously year after year should pick up a minimum of two bushels per acre," said Jim Beuerlein an Ohio State University Extension agronomist. "It usually only takes about a half bushel yield increase to break even and a two to seven bushel per acre yield increase is not uncommon if the seed is inoculated properly and planted in a timely manner."



The round structures on the soybean root are the nodules where the bacteria live and fix nitrogen for the plant.

Inoculants contain legume bacteria, or rhizobia, which, added to the seeds prior to planting, enable the soybean plants to fix nitrogen from the air.

"Depending on the protein content, a bushel of soybeans will contain between three and four pounds of nitrogen. The production of a 60-bushel per acre crop requires in excess of 300 pounds of nitrogen, and with nitrogen running about 50 cents a pound right now, that's about \$150 out of a farmer's pocket," said Beuerlein, a professor in the Horticulture & Crop Science Department who

holds a partial research appointment with the Ohio Agricultural Research and Development Center. "The bacteria, which will cost a grower \$3-\$4, will give that nitrogen to you for practically nothing."

Inoculants come in two forms, dry or liquid, and a wide range of inoculant products are available to growers, from materials that improve production over a wider range of environmental conditions to extenders that allow application to seed 30 days, 60 days or even 90 days prior to planting without loss of productivity.



"Inoculants combined with seed fungicide treatments make for an effective soybean package," said Beuerlein. "Many fungicide treatments can be mixed with inoculation materials and applied at the same time."

Fungicide treatments applied to seed before planting are designed to protect the plants from root rot diseases, such as Phytophthora, as well as improve plant stands and provide a healthier root system.

"Fungicide seed treatments are extremely important and over the long haul will generate good profit for the grower," said Beuerlein. "We test fungicide seed treatments and get on the average about a bushel and a half per acre yield increase. Many growers, however, can get four to six times that amount."

It's estimated that the loss of soybean productivity from diseases averages over \$150 million a year in Ohio. Producers lose anywhere from five to eight bushels per acre a year. By the time symptoms of a particular disease appear, the yield loss has already reached seven to 10 percent, and there are significant yield losses when no disease symptoms are evident.

Additionally, in cases of replanting due to disease loss, it costs a producer between \$80 and \$100 per acre due to extra costs and lost yield.

Beuerlein.

"The take-home message is use fungicide-treated soybean seed when planting this spring," said

Watch a narrated slideshow of this story with additional photos here: [Soybean Inoculants Supply Nitrogen More Effectively Slideshow](#). Quicktime software is required to view the slideshow.

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