

## **Soybean Inoculation**

Soybeans have a symbiotic relationship with a bacteria called *bradyrhizobium japonicum*. In this symbiotic relationship, the soybean provides carbohydrates and other nutrients to the bacteria, and the bacteria turns nitrogen from the air into ammonium-N. Ammonium-N is a form of nitrogen that is useable to plants. Because of this process, we do not have to fertilize our soybeans with nitrogen. Another benefit of this symbiotic relationship is that a nitrogen credit can be applied to the crop planted after soybeans in a rotation. Also, it is much better for a soybean plant to produce nitrogen on their own rather than be fertilized with commercial nitrogen fertilizers since there is a correlation between increased iron chlorosis deficiencies and excess soil nitrogen.

In order to make sure that this bacteria is available to infect the soybean plant, sometimes farmers inoculate their soybeans. This process puts a commercial grade of the *bradyrhizobium japonicum* onto soybean seed so that it is readily available when the seed is growing. Situations where inoculation is especially important are long rotations between soybean crops, soils that are flooded for an extended period of time, or soils that have high soil N rates.

The inoculant is not a chemical, but a living organism. In order for seed inoculation to be successful, the inoculated seed needs to get planted immediately in order to ensure survival of the bacteria. When inoculants first came into the marketplace, many of them were products that only last on the seed for a couple of hours. Now, there are many options available to growers. These products generally last from 24 hours to 120 days on the seed prior to being planted. These products also have different tolerances to soybean fungicide and insecticide treatments. It is important to find the inoculants that work best for your farming operation. If you are planting into cool, wet soils, you may want to use a seed treatment in addition to inoculant. If that is the case, make sure that the inoculant has good survival to fungicides and insecticides. If there is rain coming, and you are worried that you may not get all your seed planted within 24 hours, perhaps using an inoculant with an extender would be helpful for that application. Stop by and visit with your HEC Agronomist about inoculants to find one that will fit with your operation.

Below are a couple of links to some additional information about soybean inoculation.

<http://www.ag.ndsu.edu/pubs/plantsci/soilfert/sf1164w.htm>

<http://web1.msue.msu.edu/soybean2010/Soybean%20Seed%20Applied%20Innocation.pdf>