

BECK'S Soybean Seed Treatment Study – 2004

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|----------------------|--------------------|-----------------------|----------------------------------|
| Location: | D2, D3 plot | Seeding Rate: | 170,000 seeds/A. |
| Planted: | April 9, 2004 | Previous Crop: | Corn |
| Harvested: | September 20, 2004 | Tillage: | V-Rip / S-tine |
| Rows: | 15" rows | Herbicide: | Various Glyphosate type products |
| Replications: | Two (averaged) | | |

| RAINFALL | |
|----------|----------|
| April | 1.2 in. |
| May | 5.2 in. |
| June | 7.4 in. |
| July | 2.8 in. |
| August | 3.5 in. |
| Total | 20.1 in. |

Purpose: In this study we compare untreated seed to several types of seed enhancements including traditional and biological fungicides, insecticides, inoculants, and plant growth stimulants.

| Treatment Applied to Beck 375NRR | Bushels Per Acre* |
|----------------------------------|-------------------|
| Sure Gro + Myco Seed Treatment | 69.4 |
| Sure Gro + Myconate | 65.6 |
| Sure Gro + Apex Pro | 65.0 |
| Sure Gro | 63.6 |
| Sure Gro + Seednique | 63.3 |
| Sure Gro | 63.3 |
| Untreated | 62.5 |
| Sure Gro + Cruiser | 61.8 |
| Sure Gro + T22 | 61.6 |
| Sure Gro + Gaucho | 61.2 |
| Sure Gro + Optimize | 60.9 |
| Sure Gro + America's Best | 59.7 |
| Trilex + Allegience + Topsin | 57.3 |
| AVERAGE | 62.7 |

Sure Gro Summary:

Replications using
Sure Gro = 63.2 Bu./A.

Replications without
Sure Gro = 59.9 Bu./A.

Sure Gro  contains  and 

*Bushels per acre corrected to 13% moisture.

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| Sure Gro: | Beck's exclusive fungicide coating which contains Maxim, Apron XL (a systemic fungicides from Syngenta Crop Protection), thiram, PCNB, red colorant, polymer coating, and brightener. |
| Trilex - Allegience - Topsin: | Broad spectrum fungicide package from Gustafson (Bayer) utilizing three different compounds. |
| Gaucho and Cruiser: | Insecticides applied to the seed to reduce bean leaf beetle feeding which is a vector for bean pod mottle virus. Not yet labeled for soybeans. |
| America's Best: Inoculant | A unique blend of effective rhizobia that performs under a wide variety of soils for effective root nodulation. |
| Optimize: | A soybean growth promoter that uses a natural biological compound to improve early season vigor, soybean stand and yields. Its carrier mechanism is the Cell-Tech inoculant. |
| Apex Pro: | A common strain of inoculant (<i>Bradyrhizobium japonicum</i>) with a unique formulation that extends the life of the bacteria on the seed. |
| Seednique: | Biological seed treatment and inoculant from Hal Brown, Biogenesis Systems, Inc., Rossville, IN. Contents: Plant proteins, carbohydrates, amino acids, and naturally occurring plant growth promoting substances, which enhance crop yields, quality and vigor. Specialized, preselected, adapted indigenous soil microbes, bio-organic catalysts and microbial growth stimulants. |
| Myco Seed Treatment: | A biological seed treatment by Agri Energy Resources that provides mycorrhizal fungi to aid in nutrient uptake, primarily phosphorus. The mycorrhizal fungi act like an extension of the root to funnel nutrients to the root. |

BECK'S Soybean Seed Treatment Study – Continued

- Myconate:** Myconate® is a synthesized form of the naturally-occurring isoflavanone- formononetin- that was originally isolated from plant roots. This chemical stimulates the activity and colonization of plant roots by beneficial vesicular-arbuscular mycorrhizal (VAM) fungi. VAM are the state of fine roots of nearly all plants growing in soils of natural plant ecosystems. VAM increase the ability of the plant to absorb water, nitrogen and essential minerals by significantly increasing the effective absorbing surface area of the root system. This improved water and nutrition aids the plant in managing stress, such as soil water and mineral deficiencies and salinity. Increased phosphorus absorption and utilization by mycorrhizal plants also increase nodulation of legumes by nitrogen-fixing bacteria. Plant Health Care, Inc. is the marketer of Myconate.
- T22:** T22 is a biofungicide developed by Cornell University that aids in the control of pythium, rhizoctonia, fusarium, and sclerotinia. The active ingredient is a beneficial fungus (*Trichoderma harzianum*) that colonizes on the roots to protect the plant from diseases caused by the destructive-type fungi previously listed.

Treatment Summary: While it is difficult to make an assessment of any individual product in this one test, it is noteworthy to compare all eleven times where we tested Sure Gro, compared to the two tests which did not contain Sure Gro. The eleven Sure Gro replications averaged 3.3 bushels per acre more than the non-Sure Gro replications. In 2003, the advantage for Sure Gro coated seed versus uncoated in this same test was 1.6 bushels per acre.

Both Myconate and Myco Seed Treatment provided the two top yields in this year's test. In addition, a laboratory evaluation of the Myconate treated seed revealed three times more colonization of the roots with the mycorrhizal fungi compared to untreated seed.

BECK'S Glyphosate Comparison – 2004

- Note:** We combined this Glyphosate Herbicide Comparison within our Seed Treatment Study listed on the previous page. See top of previous page for specific plot information.
- Purpose:** There are numerous sources and trade names for glyphosate. We know of at least eleven different glyphosate products. Past university research has demonstrated very similar efficacy and crop safety between the glyphosate products. There are cost savings with the generic products (Clearout 41 Plus) vs. branded products (Roundup WeatherMax). The cost savings can add additional risk as some generic products may not have respray programs or cover technology fee reimbursement if a replant is required. In 2004, we evaluated the yield of five glyphosate and surfactant combinations.

| Per Acre Rate (oz.) | Herbicide Brand | Glyphosate Company | Average Bu/A. |
|---------------------|----------------------------------|----------------------------|---------------|
| 32 oz. | Clearout 41 Plus | Chem Products Technologies | 64.4 |
| 32 oz. | Honcho Plus | Monsanto | 64.2 |
| 32 oz. | Roundup Ultra Max | Monsanto | 63.5 |
| 22 oz. | Roundup WeatherMax | Monsanto | 63.2 |
| 32 oz. | Touchdown IQ | Syngenta | 61.0 |
| 40 oz. | Check – Rescue with Touchdown IQ | Syngenta | 60.1 |

Summary: Our 2003 results mirrored the majority of university data comparing various glyphosate combinations. Little difference in efficacy, crop response and yield between treatments was observed. There was only a 1.5 bushels per acre difference between the different herbicide brands.

In 2004, we also saw minimal differences in yield, but slightly greater than in 2003 (3.4 bushels per acre).

In 2004, we left a portion of the plot without spray (check) until weeds were 30-42" tall, then did a rescue spray with 40 oz. of Touchdown IQ. The results showed less than one bushel yield reduction compared to Touchdown IQ sprayed at a more normal time. We expected to see a greater yield loss due to the high amount of weed pressure.

