



# Agronomic Spotlight

## Soybean Seed Treatments Provide Protection at Planting

- Slow germination and establishment of soybean seeds in cool, wet soils can make them more susceptible to attack by soil-borne seed and seedling pathogens.
- Early-season insect pests may also damage soybean seeds and seedlings.
- Soybean seed treatment products can reduce disease infections and protect seeds from insects for up to 30 days after planting, resulting in more uniform plant stands, less incidence of replant situations, better yield potential, and ultimately increased return on investment.

### Soybean Seed and Seedling Diseases

Early planting, reduced tillage, and narrow row spacing are key practices recommended for high-yield soybean production. However, soybean yield potential can be compromised by environmental stresses, insect feeding, and a complex of soil-borne pathogens early in the season, which negatively affect root health and seedling vigor. While germination and emergence are rapid at temperatures above 77°F, seeds can also germinate at lower temperatures. Cool (less than 60°F) and moist soil conditions can slow germination and establishment of soybean seeds, making them more susceptible to soil-borne seed and seedling pathogens such as Pythium, Phytophthora, and Fusarium. Warm, moist soil environments favor the pathogen Rhizoctonia. These pathogens can invade plant roots causing tissue decay, pre-emergence damping off, and early post-emergence seedling death (Figure 1).

Pythium species can infect seeds before germination or shortly thereafter. Infected seeds and seedlings may become soft and rotten and may die. Phytophthora sojae also causes a wet, soft rot of the seed or seedling tissue. Symptoms of Rhizoctonia solani infection appear on seedlings as dry, dark reddish-brown lesions just above the soil surface.



Figure 1. (Top) Pythium damping-off, (middle) Phytophthora infection, (bottom) Rhizoctonia infection.

### Acceleron® Seed Applied Solutions Products for Soybean

Seed treatments can minimize the effects of unfavorable early-season planting conditions. Acceleron Seed Applied Solutions products for soybean contain multiple modes of action to provide broad spectrum control of diseases and insects and promote improved plant health through more rapid and increased emergence of seedlings under suboptimal soil conditions. Acceleron Seed Applied Solutions products for soybean can protect soybean seeds and seedlings from certain diseases and insects for up to 30 days after planting. This protection is a good tactic to prevent the viral diseases soybean mosaic virus and bean pod mottle virus that can be transmitted by soybean aphids and bean leaf beetles. Seed treatments provide the greatest benefit in early planting situations, reduced tillage, poorly drained or high clay content soils in fields with tight crop rotations, or in fields with a history of disease. Three tiers of seed treatment products are available:

**Acceleron® Seed Applied Solutions BASIC** for soybeans contains an exclusive fungicide combination featuring fluxapyroxad, pyraclostrobin, and metalaxyl, which provide excellent control of Rhizoctonia, Pythium, Fusarium, and early-season Phytophthora. Fluxapyroxad adds an additional fungicide mode of action for more complete, consistent protection from Rhizoctonia and Fusarium.

**Acceleron® Seed Applied Solutions STANDARD** for soybeans contains the fungicide combination plus the insecticide imidacloprid for protection from early-season diseases plus protection from early-season soybean aphids and bean leaf beetle.

**Acceleron® Seed Applied Solutions ELITE** for soybeans contains the fungicide combination plus Poncho®/VOTIVO®. This product offers protection from the early-season diseases and insects mentioned above plus additional insect protection and protection against soybean cyst nematodes (SCN) and other nematodes (Figure 2).

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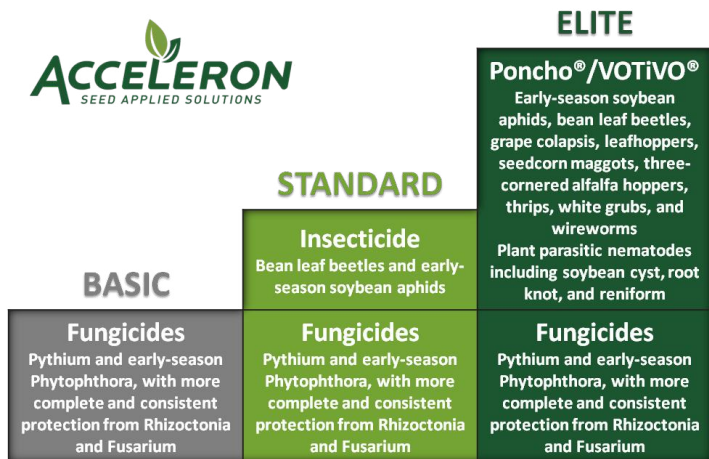


Figure 2. Insect and disease protection provided by Acceleron® Seed Applied Solutions products for soybean.

Acceleron Seed Applied Solutions products for soybean have been selected to maximize the performance of Genuity® Roundup Ready 2 Yield® soybeans, but can be used with other soybean products to help protect soybean seeds and seedlings from disease and insect damage.

## Management Options for Sudden Death Syndrome

Acceleron® Seed Applied Solutions products for soybeans can be paired with **ILeVO®** to help provide additional protection from sudden death syndrome (SDS) (Figure 3) and includes a biological mode of action for SCN, root-knot, and reniform nematodes. ILeVO can be used with SCN-resistant and other soybean products to manage nematodes in newly infested fields or fields with established infestations. ILeVO is the only seed treatment that provides early-season SDS control (both the root rot and foliar phases) and a true nematicide that kills nematodes in the seed zone.



Figure 3. Control (left) showing SDS symptoms (treated with commercial seed-applied fungicides plus Poncho®/VOTIVO®) versus soybeans treated with ILeVO® Seed Treatment plus the control treatments (right).

## Additional Offerings

**Acceleron® E-007 SAT** is a dry seed finisher that allows for faster drying of treated seeds and reduces the stickiness of treated seeds, thereby improving seed flow through seed handling and planting equipment.

**Acceleron® B-200 SAT** is a biological product for soybeans that contains plant-derived flavonoids. Flavonoids attract and stimulate the growth of beneficial microbes in the soil, which promotes their colonization on soybean roots, nodule formation, and nitrogen fixation. This results in enhanced nutrient availability and uptake, which can lead to a healthier crop and increased yield potential.

## Monsanto Research Trials

Monsanto Technology Development trials conducted throughout the soybean production area with diverse pest and environmental conditions test the effectiveness of Acceleron Seed Applied Solutions products. Average yields over a four-year trial period showed that Acceleron Seed Applied Solutions products for soybean provided a significant yield advantage over the untreated control (Figure 4).

### 4-Year Seed Treatment Yield Advantage

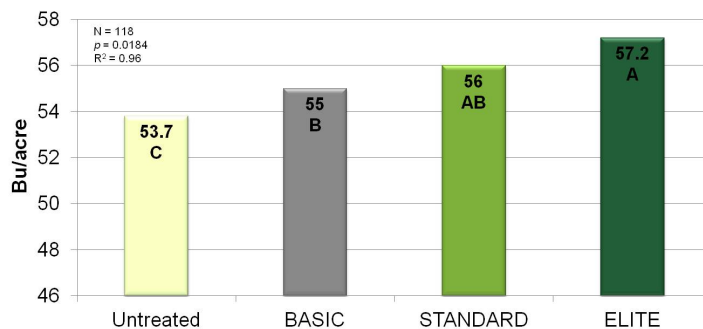


Figure 4. Four-year study showing the yield advantage with Acceleron® Seed Applied Solutions products for soybean. Source: 2011-2014 Internal Monsanto Technology Development Trials. Means followed by the same letter are not significantly different.

### Sources

Hartman, G.L., Sinclair, J.B., and Rupe, J.C. (editors). 1999. Compendium of Soybean Diseases, 4th edition, American Phytopathological Society. St. Paul, MN. 140421060204

For additional agronomic information, please contact your local seed representative. Developed in partnership with Technology Development & Agronomy by Monsanto.

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