



Phytophthora in Soybeans

Scope of the Disease Throughout the United States

Soybean diseases continue to have increased prevalence and economic impact throughout the United States. Based on the average annual estimates from 2006–2009, soybean diseases accounted for a loss of 11.2 million metric tons, or 13 percent of the average total production during those 4 years.¹

Phytophthora sojae and *P. sansomeana* are the two species that infect soybeans, with *P. sojae* the more prevalent. The oospore stage of the fungus can persist for several years without a soybean host within organic matter or freely in the soil. Oospores germinate to zoospores when soil temperatures approach 60° F and swim in the soil water to find a root host.

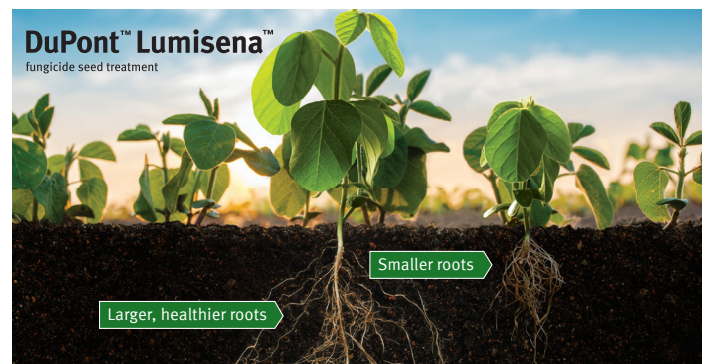
Phytophthora is an oomycete fungus that can cause stand loss from seed, root and stem rots early in the season.² Mid- to late-season plant death or injury also can occur if conditions are favorable. Early-season infection is favored in fields or field areas that are saturated for 24 to 48 hours, especially within seven to 10 days of planting. Sandy soil areas are typically not conducive environments for the disease unless saturation from prolonged rain exists.

Genetic resistance or partial resistance to phytophthora is commonly bred into today's modern soybean varieties. Five resistant gene options are being used but there are reports of virulent populations that have overcome the single gene resistance. Partial resistance through nonrace specific means is commonly called "field resistance" or "field tolerance." Combining single resistant to *phytophthora sojae*, or Rps, genes together with nonrace or "field tolerance" is common, while stacking Rps genes is less common.

Managing Phytophthora is typically done in a multi-faceted approach through crop rotation, genetic resistance and seed treatments. Keep in mind that soils with higher organic matter tend to favor the pathogen population. Saturated conditions at planting are most favorable to disease onset but later infection

can occur if saturated conditions arise. When irrigating soybeans, it is important to prevent prolonged soil saturation.

To help growers manage Phytophthora, a new seed treatment option is being introduced in 2018. **DuPont™ Lumisena™ fungicide seed treatment** is highly active against Phytophthora and offers better stand and yield protection than the current fungicide offerings. In 2017, across the top 10 soybean growing states, Lumisena™ provided a 1.0 bu/acre advantage over the current Phytophthora seed treatment standard (638 trial locations). Additionally, Lumisena™ provided a 4.0 bu/acre advantage averaged across 1/3 of those trials (212 trial locations).



Visit with your seed supplier to take advantage of this new seed treatment option.

Phytophthora seed, root and stem rot is the number one seedling disease in soybean production. Phytophthora is an oomycete fungus which can cause stand loss from seed, root and stem rots early-season. Early-season infection is favored in fields or field areas that are saturated for 24 to 48 hours especially within seven to 10 days of planting. A new seed treatment option for management is being offered for the 2018 season.

References:

1. Compendium of Soybean Diseases and Pests, Fifth Edition.
2. Phytophthora sojae: Diversity among and within Populations, A. Dorrance & N. Grunwald

Data is based on head-to-head comparisons between DuPont™ Lumisena™ fungicide seed treatment (0.568 fl oz/cwt) and metalaxyl (0.75 fl oz/cwt) in the top 10 soybean-producing states through Dec. 12, 2017. Plant stands increased 2,500 plants per acre under heavy Phytophthora pressure versus current FST/IST (including metalaxyl) standard treatment. Product performance is variable and subject to any number of environmental, disease and pest pressures. Individual results may vary and from year to year. No offer for sale, sale or use of these products are permitted prior to issuance of the required country, region or state registrations. Lumisena™ may not be registered for sale or use in all states. Contact your local DuPont retailer or representative for details and availability in your state.