

# Overcoming Pest Challenges to Increase Soybean Yields

High soybean commodity prices have made the goal of increasing yields a common theme among growers. One obstacle to top soybean yields is the persistent challenge of soybean pests such as soybean cyst nematode (SCN), sudden death syndrome, brown stem rot, white mold, soybean aphid, bean leaf beetle and Japanese beetle. This article will discuss overcoming challenges from SCN, diseases and insects, in order to achieve top soybean yields and profits.

## Soybean Cyst Nematode (SCN)

SCN has long been the chief nemesis of soybean production in the US. A combination of strategies is needed for effective control – soil testing to monitor SCN numbers or races, crop rotation, and most importantly, use of appropriate resistant soybean varieties. In addition to directly managing SCN, any practice promoting good soybean health and growth also helps minimize yield losses from SCN.



**Severe SCN damage in a drought-stressed field.**

If a single genetic source of SCN resistance is used repeatedly, race shifts can occur in a field. For this reason, nematologists recommended rotating sources of resistance, in addition to crop rotation and other management practices. DuPont Pioneer offers varieties with the Peking source of resistance, which can be rotated with the common PI 88788 source used in over 90% of soybean varieties currently available in the US and Canada.

Using the latest breeding tools, including Accelerated Yield Technology (AYT) and marker-assisted selection (MAS), allows DuPont Pioneer researchers to develop top-yielding varieties while incorporating genes for SCN resistance. These tools greatly improve the efficiency of selection and increase the rate of new product development.

## Diseases Increasing in Soybean Production

Soybean diseases are one of the most significant obstacles to achieving maximum soybean yields. Even worse, several diseases like sudden death syndrome and white mold appear to be spreading in major soybean states. When conditions favor disease development, impact on crop yield can be significant, so diseases must be successfully managed to maximize soybean yields. Variety selection, crop rotation, seed treatments and foliar fungicides are the best tools to counter most disease threats.

**Sudden Death Syndrome (SDS):** Sudden death syndrome (SDS) has spread northward from the southern US, with most Midwest states now affected. SDS develops under cool, wet soil conditions and often appears first in low, poorly drained or compacted areas of the field. Soil temperatures below 60°F. are ideal for SDS infection in the spring. Management options for SDS include selecting tolerant varieties, avoiding early planting, improving field drainage, reducing compaction, evaluating tillage systems, and reducing other crop stresses.

**Other Diseases:** In addition to SDS, soybeans face a number of other serious disease risks, including Phytophthora root rot (PRR), brown stem rot (BSR), white mold and frogeye leaf spot. Geographic location, seasonal growing conditions and soil type determine the presence and severity of these diseases.



## Disease Management

**Variety selection** is usually the best defense against soybean diseases. For variety selection to be successful, growers must be aware of which diseases may severely impact their fields and the degree of resistance or tolerance in available products. DuPont Pioneer product literature shows variety ratings for resistance or tolerance to SDS, Phytophthora, brown stem rot, white mold and frogeye leaf spot. Your local DuPont Pioneer sales professional can help you select varieties with appropriate disease resistance ratings and other important traits for each field.

**Seed Treatments:** Because of earlier planting and higher levels of crop residue on fields, soils are generally colder and wetter at planting, and seedling diseases have increased as a result. Consequently, more growers are seeing an advantage for fungicide seed treatments. Adding an insecticide to the treatment helps prevent insect feeding that provides an entry port for disease infection. Pioneer offers several fungicide, insecticide and biological seed treatment choices to help meet specific local needs for stand protection.

Fungicide choices include 1) Allegiance® for *Pythium* and *Phytophthora* control, and 2) EverGol™ Energy (new for 2013), a next-generation technology with multiple modes of action for enhanced protection against a broad spectrum of early-season disease pathogens, including *Rhizoctonia*, *Fusarium* and *Pythium*.

Insecticide choices include 1) Gaucho® for protection from seedcorn maggot and reduction of feeding from soybean aphids and overwintering bean leaf beetles, and 2) Poncho®/VOTIVO®, an insecticide/nematicide that helps protect against early-season insects and all significant nematode types, including soybean cyst nematode.

PPST 2030 is a biological + polymer for improved nodulation and enhanced nitrogen availability. PPST 120+ is a Rhizobia inoculant and extender that helps prolong rhizobia life.

**Foliar Fungicides:** Between 2007 and 2011, Pioneer researchers conducted a total of 148 trials comparing yield of untreated soybeans to soybeans treated with a foliar fungicide, as well as 52 trials that included an insecticide in the treatment. Trials were located in 11 states and two Canadian provinces. Across all of these trials, the average yield response to a foliar fungicide application was 2.5 bu/acre, with a positive yield response in 82% of the trials (Figure 1). When an insecticide was included, the average response increased to 5.3 bu/acre, and a positive yield response was observed in 94% of the trials. These results show the benefit of foliar fungicides and insecticides in helping protect soybean yield.

## Insect Management

In recent years, soybean insect pests have increased the management requirements for soybeans. Soybean aphid has

