



THE SEED CONSULTANT

A QUARTERLY NEWSLETTER NEWS AND VIEWS FROM THE FIELD

POOR TIP FILL IN CORN

Several factors could be the cause

SCLEROTINIA WHITE MOLD IN SOYBEANS

A fungal disease that can attack hundreds of plant species

PHYTOPHTHORA ROOT AND STEM ROT

Facts, conditions, symptoms and management in soybeans

2024 SEED CONSULTANT TRIP

Join SCI in Cancun, January 20-26, 2024

POOR TIP FILL IN CORN

By Matt Hutcheson, CCA

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One common issue observed and discussed during the 2023 growing season is poor tip fill, or tip-back in corn ears. A lack of kernel development at the tip of the ear can be cause for concern among growers. Keep in mind that any stress right before and during pollination can significantly impact kernel development. If you have scouted your corn fields late in the growing season and have noticed tip back, there are several factors that could be the cause:

POLLINATION

If kernels did not develop at all near the tip of the ear, this is a sign of a pollination problem. The silks at the tip of the ear emerge last and stress at pollination can

significantly impact them. Heat and drought stress can cause a lack of viable pollen as well as delayed silk emergence, resulting in no kernel development at the tip of the ear. Insect clipping of silks can also impact pollination and kernel development at the tip of the ear.

KERNEL ABORTION

If it is evident that pollination was successful, but the ear developed small or shriveled kernels at the ear tip, kernels were aborted during the

grain fill process. Several factors can lead to kernel abortion, such as: nutrient deficiencies, drought, severe cases of foliar disease (GLS, NCLB, Tar Spot, etc.), and significant plant defoliation as a result



of hail damage. All these stressors ultimately impact the corn plant's ability to carry out photosynthesis and can result in aborted kernels.

In some cases, tip back may not be a result of a problem or stress and may not indicate low yields. As discussed often by agronomists, ear size is determined early in the season during the plant's vegetative growth period. If very favorable growing conditions exist during the V6 to V12 stage, the number of kernels per row may be unusually high. In this case, if the plant cannot fill out the entire length of the ear, some tip back may occur but there may still be high yields.



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PRODUCT USE GUIDE

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A close-up photograph of several soybean stems. The stems are covered in a thick, white, fuzzy growth, which is the white mold (Sclerotinia sclerotiorum). The background is blurred, showing more of the same stems and leaves.

SCLEROTINIA WHITE MOLD IN SOYBEANS

By Jordan Bassler

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White mold (*Sclerotinia sclerotiorum*) is a fungal disease that can attack hundreds of plant species. Also known as Sclerotinia stem rot, white mold was first observed on soybeans in central Illinois in 1948 and for many years was only a sporadic soybean disease in Minnesota, Wisconsin and Michigan. However, since the 1990s, it has become a more frequent threat to northern states from Minnesota to New York, as well as the northern areas of states bordering to the south.

The reason for the abrupt increase in the frequency and severity of white mold infection is not fully understood. However, changes in soybean management practices likely have played a role. Practices such as earlier planting, later maturing varieties, and narrow row spacing have been important in driving higher soybean yields. However, these practices also create a more favorable environment for white mold disease development by accelerating canopy closure during the season. Changes in genetic

resistance of commercial soybean varieties, as well as changes in the pathogen itself may also be factors. A successful management plan for white mold in soybeans needs to take variety selection, agronomic management, and any chemical control treatments into account.

White mold is a monocyclic disease, which means that it goes through one development cycle per crop cycle. White mold persists in soybean fields over time by survival structures called sclerotia. These dark, irregularly shaped bodies that resemble a mushroom are about a quarter to half an inch long and are formed within the white growth both inside and outside the stem. Sclerotia contain energy reserves and function much like seeds, surviving for years in the soil and eventually germinating, producing millions of spores beneath the plant canopy. In the most common form of germination, a sclerotium produces one or more germ tubes or stipes that grow upward from a depth of two inches or

less in the soil. When it reaches the soil surface, the germ tube is triggered by light to produce a small, flesh-colored structure much like a mushroom, called an apothecium. One sclerotium can produce numerous apothecia simultaneously or sequentially throughout the growing season. Each apothecium produces millions of spores beneath the plant canopy, which are periodically released and spread to the plants.

White mold spores are not able to invade plants directly but must colonize dead plant tissue before moving into the plant. Senescing flowers provide a ready source of dead tissue for colonization. Flowers start senescing as soon as they open. From these senescing flowers in the branch axils or stuck to developing pods, the fungus spreads to healthy tissue.

It takes around two to three weeks from initial infection for the fungus to colonize the plant and erupt. The first symptom of white mold infection appears as a water-soaked stem lesion originating from a node. If the lesion remains wet, it becomes overgrown with white mold. The disease can then spread directly from plant to plant by contact with this moldy tissue. Sclerotia are formed within the moldy growth and inside the stem to complete the disease cycle. The shape of the sclerotia can vary based on where they form. Those that form outside the plant will be more spherical, while those that form inside the plant stem will be more oblong. Plant damage occurs as tissue rot and formation of sclerotia inside the stem result in rapid wilting and death

of the upper part of the plant. As the disease progresses, premature death of the entire plant can occur.

Wet, cool conditions are required throughout the white mold diseases cycle. The cycle includes: germination of the sclerotia in the soil, spore release, infection of soybean flowers by spores, and spread of white mold from plant to plant. Early establishment of a dense soybean canopy increases the likelihood that the high-humidity conditions required for white mold development will occur. Early canopy closure is important for maximizing light interception and yield and is a goal for many soybean producers, especially in northern locations and growing environments where solar radiation may be limited.



Soybean management practices such as early planting and narrow rows can help achieve earlier canopy closure.

Unfortunately, these practices can also encourage white mold development.

WHAT CAN BE DONE TO AVOID OR MANAGE THIS DISEASE IN YOUR FIELDS?

- **Disease Avoidance:** Harvest infected fields last to avoid spreading the disease to other fields. White mold generally does not spread over long distances without some mechanical help. Spores move from field to field on harvest equipment and infected seed.

- **Variety Selection:** Even though all varieties have the potential to get white mold in severe cases, there is a clear difference in disease tolerance between varieties. Ratings reflect how

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SCLEROTINIA WHITE MOLD . . .

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quickly infection develops and the how much damage it causes to the plant.

- **No-Till:** This system is generally superior to other tillage systems in limiting development of white mold. No-till leaves the spores to deteriorate or rot on the soil surface. Spores deeper than two inches can remain dormant for more than five years. Deep tillage buries spores but may bring up more spores from previous years of infection.
- **Crop Rotation:** Susceptible crops include alfalfa, clover, potato, sunflowers, edible beans, and canola. Farmers may need to rotate away from one of these susceptible crops for more than one year depending upon variety tolerance and field history.
- **Planting Date:** Plant your soybeans later into the growing season to limit height, canopy growth, and time of infection. Be aware that yields may be reduced past mid-May, but the trade-off could be favorable if you had high white mold infection in previous years.

- **Row Spacing:** plant less population and wider rows. This allows more air flow through the canopy and hinder the germination of white mold spores.
- **Good Weed Control:** Many weeds are hosts for white mold and poor weed control can lead to denser canopies making favorable conditions.
- **Fungicide:** Fungicides will generally not provide complete control but can help reduce disease pressure. It is best to pair a variety with high tolerance and a fungicide application for the highest control.

Be sure to meet with your local Seed Consultants seedmen if you think you may be struggling with a white mold infection to ensure you are selecting and planting varieties with the highest tolerance. In the past, growers have been successful in battling white mold by understanding how plants are infected and having a plan to help mitigate disease pressure. Have a safe and successful harvest!



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Purchase & Approval Date	Fixed 0%	Fixed 0%
November 2023	2%	2%
December - January 10, 2024	0%	0%
January 2024	0%	0%
February 2024	0%	0%
March 2024	0%	0%
April 2024	0%	0%
May 2024	0%	0%
In Season	0%	0%

PHYTOPHTHORA ROOT AND STEM ROT

By Steve Butzen

Agronomy Information Consultant

DISEASE FACTS

- Caused by the soil-borne fungus *Phytophthora sojae* (also known as *Phytophthora megasperma* f. sp. *glycinea*).
- Pathogen has many races, and multiple races occur in each field.
- Disease is favored by extended wet field conditions.
- May attack soybeans at any time during the growing season.
- Displays seed rot, seedling blight and root/stem rot phases.
- Above-ground symptoms may not be evident for several weeks after initial infection.

IMPACT ON CROP

- The *Phytophthora* fungus can kill plants at all stages of growth.
- Stand reduction may result in replanting or yield loss.
- Replanting is common when early infection results in severe seed rot and damping off of seedlings.
- In some cases, infected stands survive but are less productive than healthy stands.
- Yield reductions can range from as little as 5% to more than 50% depending on severity.

CONDITIONS FAVORING DISEASE DEVELOPMENT

- Associated with wet soil conditions.
 - Commonly occurs on heavy, poorly drained or compacted soils.
 - May occur on any soil saturated for an extended period of time.
- The ideal temperature for infection is 60 to 80° F (15 to 27° C).
- Successive years of soybeans on the same fields may increase damage potential.
- Application of high levels of potash, manure or municipal sludge immediately before planting may increase disease severity.

DISEASE CYCLE

- Disease-causing fungus is a water mold, or Oomycete, characterized by oospores and zoospores.
- Oospores act as survival mechanism of the fungus.
 - May persist in soybean residue and soil for years.
- Zoospores are produced when oospores germinate in the



Figure 1. Soybean plants wilting due to *Phytophthora*



Figure 2. Wilted plants surrounded by healthy plants is often a symptom of *Phytophthora*.

presence of a soybean crop.

- Zoospores also produced from infected soybean tissue during the growing season.
 - Swim through films of water to the root.
 - Fungus infects root and grows into and among the root cells of the plant.
- Disease survives in soybean residue and in the soil.

PHYTOPHTHORA SYMPTOMS

- **Seed Rot Phase** – may begin at imbibition.
 - Infected seeds become dark brown and soft to mushy.
 - Complete deterioration of the seed may occur.
- **Seedling Blight Phase** – occurs at emergence or soon after.
 - “Damping off” – rapid decay, wilting and plant death.
 - Symptoms include a dark brown to black discoloration of the stem, usually beginning at the soil line.
 - Diseased tissues quickly become soft and water-soaked, and wilting and plant death may soon follow.
- **Root and Stem Rot Phase** – symptoms begin in the root.
 - Brown, discolored taproot and secondary roots and less root mass.
 - Nodulation is often minimal, leading to chlorotic, N-deficient plants.
 - Affected plants may be stunted, so fields have an uneven appearance.
- **Root and Stem Rot Phase** – symptoms may spread to the stem.
 - Brown discoloration develops at the soil line.
 - Dark-brown to red-brown lesion may progress up the stem (key diagnostic feature of the stem rot phase).



Figure 3. Top: Split stem shows brown discoloration due to phytophthora infection. Bottom: Healthy stem.

- Diseased tissues quickly become soft and water-soaked, and wilting and plant death may soon follow, especially during stress periods.

MANAGEMENT

- **Variety Selection and Seed Treatments** – most effective means of managing Phytophthora.
 - Corteva Agriscience researchers are developing varieties with resistance genes and field tolerance to Phytophthora.
 - Corteva Agriscience uses molecular breeding to develop varieties with race-specific resistance genes such as Rps 1C, Rps 1K, and Rps 3a.
 - Race-specific resistance provides complete resistance to specific races throughout the growing season.
 - Field tolerance provides partial protection against all races of Phytophthora.

- Field tolerance is not as effective in the seed and seedling growth stages, but provides benefit in-season.
- Varieties containing race-specific resistance and favorable field tolerance coupled with DuPont™ Lumisena™ fungicide seed treatment is the ideal combination because they provide multiple mechanisms to protect against Phytophthora.
- Soybean varieties are rated for tolerance and these ratings are provided to customers – ratings range from 2-9 (9=tolerant) with a majority of varieties scoring between 4 and 6.

- **Field Drainage and Soil Structure** – improve field drainage and remediate compaction and hardpan layers if possible.
- **Planting Date** – on heavy soils or in no-till systems, early planting may not be an option.

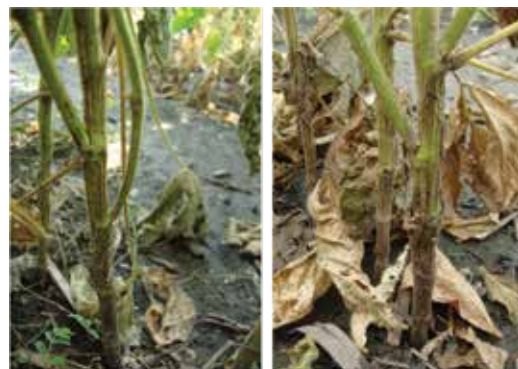


Figure 4. Note dark-brown lesion extending upward from soil line.

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JAN. 20-26, 2024
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HYATT ZIVA CANCUN

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- The Hyatt Ziva Cancun is the perfect vacation destination in the heart of Cancun, Mexico.

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- \$500 (per person) non-refundable deposit due after online registration and before air is booked.
- Full trip payment is due by Friday, November 17, 2023 and is non-refundable.

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and made payable to:
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10400 W. 103rd Street, Suite 10
Overland Park, KS 66214



LEADER UPDATE

By Daniel Call, CCA

General Manager
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Harvest is always an exciting time of year, and this year will be no different. Most of us look forward to each harvest with anticipation to see what bounty this year's crop will bring to fruition. The excitement of harvest is met each year with frustrations from equipment, weather, and lines at the elevator – all challenging our patience and temperament. Hopefully, everyone has the opportunity this fall to pause and take a moment to appreciate the culmination of another growing season in our careers.

Each year, it is exciting to watch yield results come in and see how the newly released products compare to our current top products. It's a little more exciting this year as some of the products we have watched over the past 2 seasons will finally be seen by our customers across a much larger area.

As is usually the case, there will be significant yield variability across our footprint. There are some areas which lacked the adequate moisture

needed to maximize yield potential during the 2nd half of the growing season. Other areas maintained adequate rainfall throughout the growing season and will harvest what may likely be one of the best crops ever in some of those areas. The flexibility of our hybrids and varieties should be on display this harvest season.

Our modern genetics, combined with world class seed treatments and traits should help bring the maximum yield opportunity to realization. We are excited about our 2024 new releases and anticipate you will be excited to see them on your own farm over the next couple of years. We thank you for allowing Seed Consultants to work with you over the past 33 years. We look forward to continuing to bring value and success to your operation for years to come.

Lastly, all of us at Seed Consultants pray for a safe and bountiful harvest to each of you. Please be careful and take your time during this extremely busy season.



Seed Consultants

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Don't miss a thing

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