Pythium: What you should know about this growing threat to yield

With the potential to damage seed as quickly as 90 minutes after planting,[1] Pythium is becoming more prevalent and economically significant for farms across the U.S. In this article, we'll explore how Pythium attacks corn and soybeans and how seed treatments can help your customers mount an effective defense.

As farmers are looking to maximize yields, early planting is becoming more popular for both corn and soybeans. But even when a favorable planting window appears in early spring, it may be followed by several days of cooler, damp weather. These conditions, plus the fact that earlier planting means slower seedling emergence, make fields a perfect host for multiple damping-off diseases, including Pythium, which is the number-one early corn disease.

At least 14 different species of Pythium that cause root rot and seedling damage have been identified, and researchers have discovered even more species in recent seasons. Pythium thrives in very wet soils at temperatures of 50-59° F. This disease is especially insidious, because it can live in soil for multiple years, surviving as thick-walled oospores just waiting for the right conditions to "wake up." When the temperature and moisture are right, and corn or soybean seedlings are present, the oospores germinate and produce zoospores that swim in the soil water. These zoospores are drawn to the amino acids, carbohydrates and metabolites produced by seeds and roots, and infection can then take hold.[2] Pythium affects plants multiple ways—rotting seedlings before they emerge, preventing plants from establishing strong roots or causing death shortly after emergence.[1] Pythium is tough to diagnose and the damage isn't usually apparent until the farmer finds bare spots in the field where seedlings either died or failed to emerge.

Preventing Pythium infection

Right now, there is no seed available with resistance to Pythium. But growers can reduce the risks of Pythium infection and subsequent stand loss through certain management practices. Improving drainage and avoiding soil compaction can help. Ensuring that seeds are not planted too deep, which can further delay germination, is also helpful. Experts also recommend planting high-quality seed and rotating crops when possible. Perhaps the simplest option is to just wait for warmer temperatures to begin planting, but this leaves farmers stuck choosing whether to risk parts of their stands to Pythium or miss out on the yield bump early planting can provide.

Seed treatments: an extra line of defense

Effective seed treatments help farmers do both—take advantage of early planting windows and protect against damping-off diseases like Pythium.

In soybeans, metalaxyl seed treatments help protect against Pythium. This can be combined with ethaboxam and picoxystrobin to provide enhanced protection against a range of fungal pathogens, including Phytophthora. Even seed treatments that are not effective against Pythium specifically can help seedlings be more resilient against this disease by providing general protection to the seed before and during germination,

Pythium

Lumiante™ fungicide seed treatment from Corteva Agriscience provides an additional mode of action against Pythium when used with metalaxyl.

Lumiante™

FUNGICIDE SEED TREATMENT

encouraging healthy root development and making plants more vigorous.

In corn, Lumiante™ fungicide seed treatment from Corteva Agriscience offers enhanced protection against Pythium, with better protection of the seed, mesocotyl and roots. When used with metalaxyl, Lumiante provides an additional mode of action against Pythium. This combination is a smart approach for integrated disease management and it can help capture certain Pythium species that are developing resistance to metalaxyl. In studies, **Lumiante demonstrated a 2.9 bu/A average yield advantage versus standard IST/FST seed treatments.***

By understanding the conditions where Pythium is most likely to thrive and controlling risks through both management practices and seed treatment options, your customers can leverage early planting windows and produce full, healthy stands of your high-quality corn and soybeans.

* Data is based on replicated research trials from 2013-2015 at 50 locations comparing standard IST/FST seed treatment recipe with Lumiante fungicide seed treatment to recipe without.

[1] "The Real Threat to Soybean Yields: Phytophthora and Pythium." Farm Progress, December 8, 2018. https://www.farmprogress.com/soybean/real-threat-soybean-yields-phytophthora-and-pythium.

[2] "Pythium—an Early Season Pain in Corn and Soybeans." Illinois Field Crop Disease Hub. Accessed February 28, 2022. http://cropdisease.cropsciences.illinois.edu/?p=1071.

Know your enemy: Pythium

- Can damage seed as quickly as 90 minutes after planting[1]
- Affects corn, soybeans and other grain crops
- Can live in soil for multiple seasons
- Thrives in wet soils at temperatures of 50-59° F
- Reduces stands by:[1]
  - Rotting seedlings before emergence
  - Weakening roots
  - Killing plants shortly after emergence

Quick tips for Pythium management

- Plant high-quality seed
- Improve drainage in fields that are overly wet
- Avoid soil compaction
- Check planting depth to avoid delayed germination
- Rotate crops when possible
- Monitor soil temperatures before planting
- Utilize high-quality seed treatments:
  - In corn, Lumiante™ fungicide seed treatment protects against Pythium. Combine with metalaxyl for an additional MOA.
  - In soybeans, look for treatments with metalaxyl, ethaboxam, pricoxystrobin and other ingredients that provide overall protection of seed, germination and root health for more resilient seedlings.
  - Practice integrated disease management and use additional MOAs whenever possible.

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