Renwood Farms Inc.

2020 Soybean Update: Root Rots

by P. Bodenstine, agronomist

We have recently observed soybean fields with root rots with either untreated seed or seeds not treated with ***RenPro***™. According to the pathology report, the root rot fungi were identified as fusarium and/or rhizoctonia. Both fungal pathogens can infect soybean plants during hot weather and cause root rots which lowers yields.

Part of the confusion about fungal pathogens is that when we say "fusarium" or "rhizoctonia", we think of one specific pathogen causing one specific disease with one specific symptom. That is not how it works. There are nine different fusarium species found just on soybean seed that can infect soybeans before you even plant! One fusarium carried on the seed is the same one that causes scab in wheat.

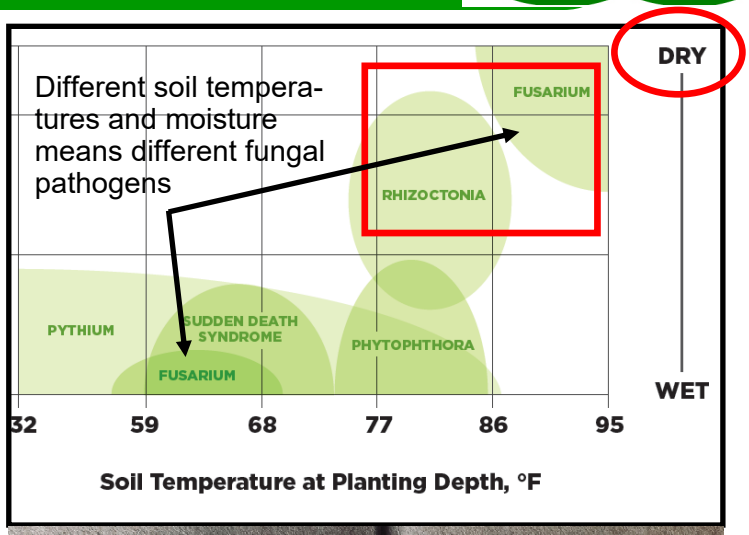
There are 22 different soil fusarium species with four species being the most common pathogens infecting soybeans. With rhizoctonia, there are 14 different "groups", most with sub-groups, that can contribute to disease. We have identified four groups in VA/NC.

Another source of confusion is that if a seed-treatment chemical controls just one species of fusarium, it can claim "fusarium" on its label. It may not control your fusarium but it can be labeled. The key to selecting a seed treatment is to find out what species of pathogen is hurting your soybeans on your farm then select the chemical and rate that works for you.

The chart at top right shows that there are fusarium fungi that do indeed impact roots at cool soil temperatures with wet conditions ***but*** there are other species of fusarium that cause root rots in hot and dry soil conditions similar to dry rot.

Fusarium infections usually cause roots turn dark brown to black. There are no red lesions on stems like rhizoctonia. **Cotyledon leaves become yellow and drop off**. Fusarium species are worst when soybeans are planted under warm/hot conditions in moderately acidic sandy soils. Nematodes can increase pressure by wounding roots to open pathways for infections.

According to the Univ. of Illinois, rhizoctonia infections are "*favored by moist weather at planting, which allows the seed to germinate. But when the weather turns hot and dry at emergence, it delays root development. Soils that were warm and moist at planting but changed after planting to very hot and dry create a favorable environment for the fungal pathogen*".



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Unfortunately, there is little that can be done to correct these issues. According to the *Compendium of Soybean Diseases* (APS Press, 2015), fusarium can cause yield losses of up to 64% and rhizoctonia has caused yield losses up to 48%. While too late for 2020, Renwood Farms offers effective solutions for to limit the damage from these diseases going forward.

In 2007, Renwood Farms started submitting samples to Purdue University Plant Disease Lab to identify soybean pathogens from VA/NC soybeans. By 2009, Renwood Farms introduced the ***RenPro***™ family of soybean seed treatments. Advancements continued until 2015 as new chemistry was released and old chemistry rediscovered and the final formulation was decided. Today***, RenPro***™ provides your soybean seedlings with:

- Protection from fungal pathogens carried on the seed
- Protection from fungal pathogens in the soil
- Nutrients that stimulate soil microbes plus regulate nitrogen uptake and utilization
- Biological microbes to stimulate plant growth and provide plant protection

There are fungal pathogens that are carried on the seed at harvest then transmitted to the new crop ***if the seed is not "scrubbed" clean***. If not cleaned, this seed-born damage can impact yields anywhere from emergence until harvest. ***RenPro***™ contains three seed cleaners with two different modes of action.

RenPro™ contains four fungicides to reduce soil-born pathogens in cool and damp soils, in warm and damp soils and in warm/ hot and dry soils, especially lighter, sandier soils and in ***double-cropped situations***.

Other seed treatments use Maxim® (fludioxonil) and a strobi fungicide to control fusarium. But research from Iowa State demonstrated that ipconazole, a key ingredient in ***RenPro***™, is the only material effective on key species of fusarium. Ipconazole also gave the best rhizoctonia protection in separate plots.

RenPro™ contains molybdenum***.*** Moly is essential for nitrogen-producing bacteria nutrition and for plant nitrogen utilization.

Molybdenum is required for plants to help fight infections from fungal pathogens. As a nutrient, plants with low moly levels have fewer pods and fewer three-bean pods.

Renwood Farms recommends **rizNate**® seed inoculant. This inoculant provides nitrogen-fixing bacteria plus several other beneficial microbes. One of these microbes is *Bacillus subtilis* which reduces damage from fusarium root rot. Growers can either order as a seed treatment or buy separately to apply in-furrow at planting to help reduce all root rots and nematodes.

Where nematodes and soil pathogens are yield-limiting, Renwood recommends ***RenPro Plus*** seed treatment, an in-furrow application of rizNate coupled with an EDDHA iron solution. The microbes colonize the roots to reduce infection by exclusion. Soybeans are poor at securing available iron from the soil so the iron in-furrow "jump-starts" the process. Iron and molybdenum are critical components of disease protection.

While Renwood Farms produces high quality and strong performing USG soybean varieties, we realize that some growers have favorite brands. To help all growers, Renwood Farms treats other brands of soybeans seed. Simply order your seed to be delivered to Renwood Farms. Renwood will treat, repackaged and deliver your seed back to your shop.