

MESSENGER-INQUIRER



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Phytophthora Sojae in Soybean

Whether they or not they grow or ever grew tobacco, most farmers in this area are very aware of the destructive disease black shank, caused by phytophthora parasitica. There are two races of black shank common to our soils and fortunately, resistance to the disease has been bred into many of the popular tobacco varieties grown today. Plants grow well at the beginning of the season but upon infection will yellow, wilt, and eventually die or yield very little.

Soybeans may also become infected with a species of phytophthora, phytophthora sojae. While the phytophthora that infects soybeans doesn't have a clever name like black shank, it too is a root and stem disease which can infect the plant at any time during the growing season, and symptoms are initially expressed as wilting plants which will eventually die. Phytophthora doesn't occur often in soybeans but can be very destructive when it does. Infection soon after emergence can lead to seedling death, requiring replanting while infection later in the season can cause significant stand loss in plants up to R3 stage. Phytophthora root and stem rot can infect plants at any stage and results in wilting, root rot, and stem rot. Like black shank in tobacco, plants will have a dark lesion that begins at the roots and moves up the stem.

Most soybeans have some resistance but conditions such as frequent rains and subsequent ponding caused by poor internal drainage are where you may have problems. Phytophthora

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doesn't always read its management guide. I visited a tiled, well drained Newark sand loam field last July with a significant area dead from phytophthora sojae. The farmer said the field looked excellent at the post emergence herbicide application timing, but when returning for the R3 fungicide application he found a large area of wilted or already dead soybeans. He recalled the area yielding poorly in 2020 as well but didn't put much thought into it at that time. 2022 revealed the cause of the problem.

Management of phytophthora is obtainable. As mentioned, nearly all commercial soybean varieties have some level of resistance. There are two different types of resistance. The first is partial resistance, sometimes called "field tolerance", which varies from variety to variety. It will usually be shown with a numerical rating from the seed companies. This type of resistance is not complete, but it works against all strains of phytophthora sojae. The other type of resistance are individual genes known as Rps genes. This type of resistance is complete resistance but only against certain races. If the Rps gene in the chosen soybean variety for that field does not control the race present in the field, then that variety is essentially susceptible to phytophthora in that field. There are 14 different Rps genes, currently the most widely used Rps genes present in varieties adapted to Kentucky are Rps1a, Rps1c and Rps1k. Unfortunately, recent research funded by the Kentucky Soybean Promotion Board, conducted jointly by the University of Kentucky and Ohio State University found that those genes are no longer very effective against the phytophthora sojae races present in Kentucky.

If you have fields that are poorly drained or have fields that were confirmed to have soybean loss due to phytophthora sojae, take time to revisit the varieties you have chosen to plant

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this year. Selecting varieties with Rps genes that are more effective against phytophthora sojae such as Rps3 and Rps 4, will be very beneficial.

Seed treatments are also very effective in suppressing phytophthora for up to a few weeks after planting, especially when combined with highly resistant soybeans. Fungicide seed treatments with the active ingredients metalaxyl, mefenoxam, oxathiapiprolin or ethaboxam are labeled for suppression of phytophthora root and stem rot.

Based on the results of the survey mentioned earlier, fields with phytophthora root and stem rot history should be planted in varieties with a high rating for partial resistance. Otherwise called “field tolerance” in some seed company guides. Also, use an effective seed treatment. Planting varieties with Rps genes that are more effective against phytophthora sojae races in Kentucky will also help manage the disease.

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