



Extension FactSheet

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Phomopsis Seed Rot of Soybeans

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Phomopsis seed rot occurs when harvest is delayed due to rainy, wet weather. Seed infection may reduce seed quality, vigor, and viability. Severely diseased seeds appear moldy and may be graded lower, which leads to dockage at the elevator. Planting diseased, poor-quality beans will result in reduced stands that may reduce yields. Pod and stem blight also occurs when soybeans mature during wet weather and harvest is delayed. These soybean diseases may be caused by a number of different fungi in the *Diaporthe-Phomopsis* complex.

Symptoms

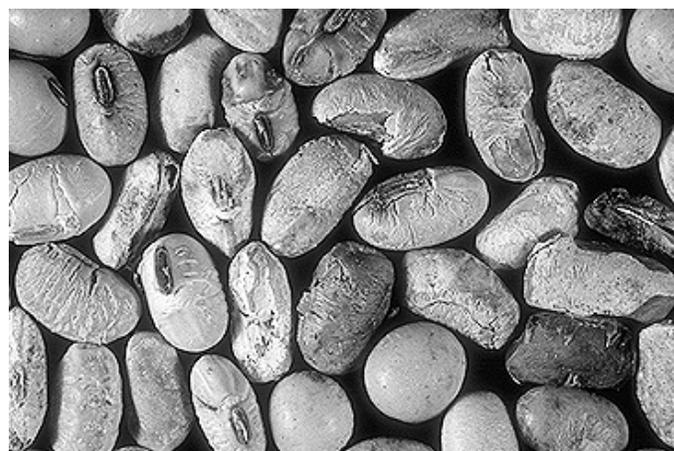
Symptoms of *Phomopsis* seed rot, pod and stem blight are readily apparent after the plants reach physiological maturity. Dead petioles, stems, and pods may be covered with small black specks, which

are the fruiting bodies of the fungus (pycnidia). The pycnidia are usually arranged in parallel rows along the stem. During less favorable weather conditions, pycnidia may be confined to small areas of the stem near the soil surface or around the lower nodes of the stem. Pycnidia are also found scattered on discolored, poorly developed pods.

Seeds that are infected have a range of symptoms from none to severe. Affected seed are usually cracked, shriveled, and covered with white mold. These severely infected seeds rarely germinate when planted. Less severely infected seed may germinate, but seedlings may show signs of seedling blight. Seedlings developing from moldy seed may have brown to reddish colored lesions on the cotyledons, or reddish-brown streaks may develop on the stem at or below the soil surface.



Phomopsis pod and stem blight—note black pycnidia speckled over stem and pod surface.



Phomopsis seed decay—note moldy seed with cracked seed coats.



Green stem syndrome, pod blight and bean leaf beetle scar.

Causal Organisms

Phomopsis seed rot and pod and stem blight are caused by a complex of three different fungi including *Diaporthe phaseolorum* var. *sojae*, *Diaporthe phaseolorum* var. *caulivora*, and *Phomopsis longicolla*. All of these fungi overwinter on infested soybean straw in the field or may be seed-borne. In Ohio, the *Phomopsis* spp. appears to be more prevalent on soybean residues and seed than either *Diaporthe* species.

Disease Cycle

Phomopsis-Diaporthe fungi overwinter as pycnidia on soybean residues that were infected the previous season. In the spring, spores ooze from the pycnidia and are splashed by rain onto the plants where they infect stems and developing pods. When infected seeds are planted, poor emergence and stands result from seedling death. Higher soil temperature favors the development of seed rot and seedling blight phase.

Pods may become infected at any time during their development, but most seed infection occurs after the yellow pod stage (R7). Prolonged wet periods after flowering and pod set favor the infection and

development of pod and stem blight. As pods mature, the fungus grows from the wall of the pod to the seed. Seed infection is greatly increased if harvesting of the crop is delayed during warm wet weather. Excessive lodging in dense stands of soybeans may increase the incidence of seed infection. The percentage of seeds infected with Phomopsis significantly declines after a year or more in storage. This indicates that fungus cannot survive long dry conditions in storage.

Management of Seedling Blight and Seed Rot

Plant high-quality, disease-free seed with at least 80% germination or better. If soybean seed with 70–80% germination must be planted, a seed treatment fungicide is recommended. Proper seed-treatment fungicides will increase germination of poor-quality seed if the low quality is the result of fungal infection, but any seed treatment will not increase germination more than 20%. Do not plant seed from lots with less than 70% germination. See Bulletin 639A-01, *Seed Treatment of Agronomic Crops*, for current seed treatment recommendations. (http://ohioline.ag.ohio-state.edu/b639/b639_17.html)

Management of Pod and Stem Blight

To produce high quality seed and reduce seed infections:

1. Harvest when seed reaches 13%–16% moisture regardless of stem conditions.
2. Rotation with wheat or corn reduces the survival of the fungus in the field on old soybean straw residue.
3. Tillage. Fields with high incidence of Phomopsis seed rot, pod and stem blight should bury soybean straw residue to promote decay.
4. Fungicides applied to pods at midflowering to late pod stage may reduce incidence of Phomopsis seed rot, however yield is rarely increased. This would only be economical for seed or food grade producers.

Additional information is available from your local Extension office or The Ohio State University Plant Pathology website (www.oardc.ohio-state.edu/ohiofieldcropdisease).

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