

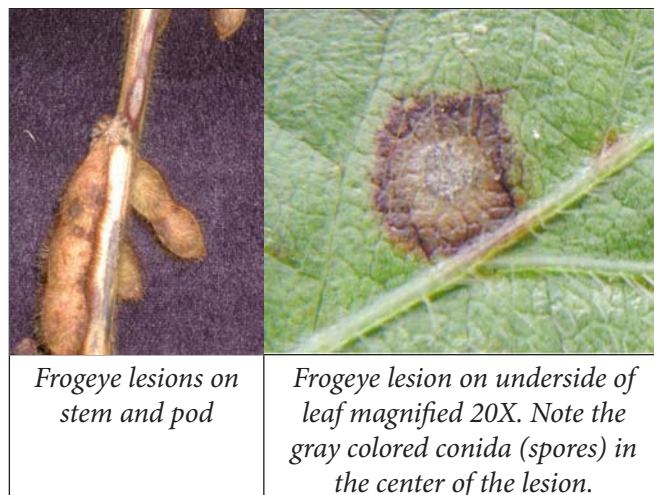
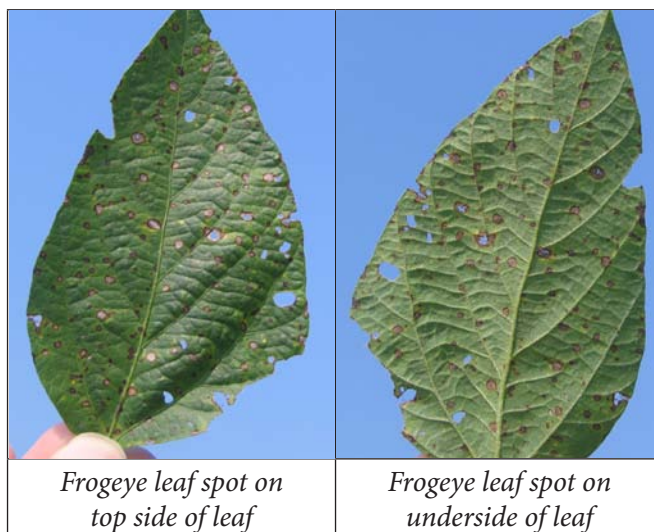
Frogeye Leaf Spot of Soybean

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Frogeye leaf spot of soybeans has been occasionally diagnosed in Ohio but its occurrence and severity have increased in the last five years. On an annual basis, it is more prevalent in the southern United States in regions with warm, humid environments. Yield reductions from this disease have occurred in Ohio and this disease can also reduce seed quality in food grade varieties and seed production fields.

Symptoms

Lesions are small, gray spots with reddish-brown to purple borders. On the underside of the leaf, the lesion appears brown with tiny dark “hairs.” These hairs are the long conidia of the fungus. Young leaves are extremely susceptible while older leaves are more resistant. Smaller lesions may coalesce to form larger, irregular spots on leaves. In severe cases frogeye leaf spot can cause premature leaf drop and if rainfall and humidity persist stems and pods may also become infected. Lesions on pods are reddish brown, may appear shrunken, and are circular to elongate in shape. Older lesions on pods become brown to dark gray, usually with a narrow, dark brown border.



Disease Cycle

Frogeye leaf spot is caused by the fungus, *Cercospora sojina*, and will survive on crop residue left on the soil surface. Extended periods of wet weather during the growing season will favor disease development. Rain splashing on the residue will carry spores to young leaves. It takes 7 to 12 days after inoculation for symptom development depending on the temperature. From these lesions, more conidia develop which are readily spread to other areas on the plant or are carried in storms to surrounding fields. Hurricane Dennis in 2005 is believed to have brought this fungus to Ohio based on sentinel plot observations that year. This is a polycyclic disease, in which infection, symptom development and production of conidia are repeated throughout the growing season. If the first symptoms of this disease are detected late in the season (at or after growth stage R5) there is very little impact on the plant. However, if this cycle begins prior to or at flowering, then substantial amounts of disease can develop on plants that will impact yield.

Previously, this disease was believed to a problem in Southern states due to the amount of inoculum that survived each winter. Residue from two soybean fields which were heavily infected with frogeye leaf spot was monitored throughout the winter for conidia development in Ohio. However, conidia of this fungus were recovered throughout the winter and more importantly into the spring from both locations. Thus, this fungus can overwinter here in Ohio and heavily infested residue can serve as a primary source of inoculum each year.

Management

1. Plant varieties which are resistant to Frogeye leaf spot. This disease is effectively managed via single genes (*Rcs* genes), in which *Rcs3* is still effective against all U.S. populations, including Ohio.
2. Scout susceptible varieties for the presence of frogeye leafspot. Use the scale on the next page to estimate the percent leaf area affected. When 1 or 2 lesions were found every 25 feet of row at soybean growth stage R2 during 2008 fungicides were highly effective and economical.
3. When frogeye lesions are found on plants prior to soybean growth stage R3, fungicide applications may be warranted on highly susceptible varieties. This is entirely dependent on the occurrence of weather conditions that continue to favor infection and lesion development.
4. In fields, where very high levels of disease develop, burying residue and/or crop rotation become very important. *C. sojina* can overwinter in Ohio and planting soybeans back into infested residue increases the chance of an epidemic occurring the following season. Residue should be fully buried. If residue cannot be buried then crop rotation becomes cultural. We do not have data on survival over years, but soybeans should not be planted for at least one year followed by planting resistant variety.

Additional information is available from:

The Ohio State University Plant Pathology field crops website

www.oardc.ohio-state.edu/ohiofieldcropdisease

The Plant Health Initiative

www.planthealth.info/frogeye.basics.htm

Diagrammatic Scale of Frogeye Leaf Spot (*Cercospora sojina*) Severity

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1%



6%



9%



10%



15%



26%

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