

## ***Frogeye Leaf Spot of Soybean***

Travis Faske and Terry Kirkpatrick  
Plant Pathologist

Frogeye leaf spot is a common fungal disease in Arkansas. If not managed properly severe yield losses can occur on a susceptible cultivar when conditions favor disease development.

Leaf spots are circular to angular in shape and range from 1/32 to 6/32 in. in diameter (Fig. 1). Leaf symptoms begin as dark brown, water-soaked spots and mature into lesions with tan or brown centers and a narrow reddish-brown to purple margin. Older lesions are translucent and have whitish centers containing black dots (stromata). In severely infected plants, several lesions may coalesce into larger irregular shaped spots. When leaves are heavy infected (>30% severity) they may wither quickly and prematurely shed, a condition called blighting.



Figure 1. Frogeye leaf spot lesions on a soybean leaf.

Stem and pod symptoms are less common, but may appear late in the growing season with prolonged conditions that favor disease development. Stem lesions are elongated whereas pod lesions are circular. Mature lesions are slightly sunken with light gray centers and brown borders. The fungus can grow through the pod into the seed. Infected seeds may be gray to brown in color.

The causal agent is a fungal pathogen, *Cercospora sojina*, which overwinters on soybean residue and seed. Conidia (spores) produced on crop residue are dispersed by splashing rain or wind onto soybean plants. Warm (81-85 °F), wet weather (e.g. heavy dew) conditions favor infection and disease development. Symptoms become visible 7 to 14 days after infection. Infection can occur at any stage of development, but young leaves are more susceptible than older leaves. Five known races of this pathogen have been reported in the U.S., and in the south, races at any location may change dramatically from year to year. Reaction of cultivars varies from highly resistant to susceptible.

Host resistance is the most effective and economical management practice for frogeye leaf spot. Single dominant genes *Rcs1*, *Rcs2*, and *Rcs3* confer resistance to races, 1, 2, and 2 + 5, respectively. *Rcs3* is the only gene with multi race resistance and it confers resistance to all races that are known to occur in the U.S. Fungicides can be effective in managing the disease, and are most effective when applied preventatively to protect new growth when condition favors disease development. The most favorable environmental conditions often occur from full bloom to beginning seed (R2 to R5) in Arkansas. Strobilurin resistant populations of *C. sojae* were confirmed in 2012 in several Arkansas counties, thus all strobilurin fungicides (FRAC 11) are not effective on these resistant populations of Frogeye leaf spot. Triazole fungicides (FRAC 3) are effective on the strobilurin-resistant strains of *C. sojae*. Cultural management practices consist of planting high quality disease-free seed and implementing tillage practices that improve crop residue decomposition.