Early season foliar diseases of soybeans

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July normally is the time to see some early season foliar diseases, especially in fields with soybeans at advanced vegetative growth stages. When scouting, you may find bacterial blight or brown spot, or symptoms that appear to be some type of foliar disease. Bacterial blight and brown spot appear as leaf spots and occur in almost every soybean field every season. Both diseases often occur in the same fields, even the same plants, and symptoms are difficult to separate. Other leaf spots may not be caused by pathogens but are simply signs of stress or other factors.

Bacterial blight is caused by *Pseudomonas syringae pv glycinea*. New lesions are small, angular, and appear as yellow-to-brown spots on leaves. The centers soon dry out, turn reddish-brown-to-black, and are surrounded by a water-soaked margin that is bordered by a yellowish- green halo (see image). Young leaves are most susceptible to the bacterial infection, therefore, the disease is first noticeable on the top of plants. The angular lesions enlarge in cool, rainy weather and merge to produce large, irregular dead areas. The centers of old lesions sometimes drop out or tear away, resulting in a ragged appearance of infected leaves. Severe bacterial blight may affect seed quality.

Brown spot is a fungal disease caused by *Septoria glycines*. The fungus normally infects older leaves in the lower portion of plants. Symptoms of the disease are many irregular, dark-brown spots on both upper and lower leaf surfaces see image.

Brown spot (left) and bacterial blight (right). 

The image above compares the symptoms of brown spot (left) and bacterial blight (right). In the early stage, lesions of bacterial blight have a yellow halo but brown spot does not. Brown spot lesions are chocolate-brown to blackish-brown in color.

Bacterial blight and brown spot pathogens survive in crop residues and can be seedborne, too. You may find bacterial blight and brown spot more often in the following situations:

1. continuous soybean fields;
2. no-till soybean fields (research shows that no-till fields have a higher level of brown spot than fields with conventional tillage); and
3. fields planted with seeds from infected soybeans.

Both diseases are dispersed by splashing rain. In a wet season, the pathogens are dispersed from the soil to soybean plants. Normally, infection causes no significant yield losses unless premature defoliation occurs. However, if rainfall is frequent in the summer, the diseases may progress quickly from lower leaves to upper leaves. In severe cases, the diseases can cause premature defoliation over a large area. So far this season in Iowa, no special attention has been needed for the two diseases.

Other leaf spots. Many other factors also can cause leaf spot symptoms. Last week we saw foliar symptoms associated with *Rhizoctonia* root rot. Several reports as well as samples were submitted to the ISU Plant Disease

Clinic that showed these symptoms. All samples had poor root systems, so be sure to examine the entire plant when you find leaf spots that do not seem to be either bacterial blight or brown spot. These types of spots may be caused by stress on the root, plus heat, and affected plants will be scattered in fields. In our experimental plots, plants infected with sudden death syndrome pathogens (*Fusarium solani*) also started to show symptoms. Sometimes, herbicide drift can cause leaf spots, too.

In normal years, none of these diseases cause significant damage to soybeans. However, if you find severe bacterial blight or brown spot, you can take measures to reduce the diseases next season. To do this, rotate soybean with corn, and cover soybean residues after harvest by tillage, if possible. There are no varieties available that are resistant to these diseases. If you find severe infections of bacterial blight this year, do not use the seeds next year because this disease can be seedborne. Always use seeds free of bacterial blight.

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