Summer scouting in soybean: Top dieback and other diseases

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Abstract
This summer in Iowa, we have seen a mixed bag of soybean diseases during our scouting, probably because of climate patterns that have differed from other seasons and because of the very different weather that has occurred in various regions across the state. In eastern Iowa, Iowa State University field agronomists reported the occurrence of white mold, sudden death syndrome, frogeye leaf spot, and top dieback. In southern Iowa, downy mildew was reported. Bacterial blight and brown spot are common across most of the state.

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Summer scouting in soybean: Top dieback and other diseases

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This summer in Iowa, we have seen a mixed bag of soybean diseases during our scouting, probably because of climate patterns that have differed from other seasons and because of the very different weather that has occurred in various regions across the state. In eastern Iowa, Iowa State University field agronomists reported the occurrence of white mold, sudden death syndrome, frogeye leaf spot, and top dieback. In southern Iowa, downy mildew was reported. Bacterial blight and brown spot are common across most of the state.

Top dieback

Over the past couple of weeks, we have had several reports and soybean samples of top dieback (Figure 1). The last time we had a widespread outbreak of this disease in Iowa was from 1997-1999. This season, the disease has been found in eastern and central Iowa. Differences in susceptibility among varieties have been noticed. In addition, affected plants are often defined by rows, although patches of top dieback (Figure 2), not unlike those you would expect to see with soybean cyst nematode damage, also have been reported.
Top dieback symptoms are usually seen between late July to mid-August when most soybean plants are in the reproductive phase. Initial symptoms of tip blight are characterized by yellowing and death of leaves in the upper portion of the plant canopy followed by discoloration of internodes. Plants die prematurely when the disease is severe. An Ohio study showed that fungal species belonging to the genera *Phomopsis* and *Diaporthe*, a group of plant pathogens that cause various diseases in soybean, are associated with top dieback.
No systematic study has been carried out on this disease, and as a result, we do not know when this disease strikes or what factors contribute to its appearance. It has been speculated that potassium deficiency may be associated with top dieback symptoms because the symptoms somewhat resemble those of potassium deficiency (Figure 1). Several years ago, it was observed that the disease ceased in problem fields after an application of potassium in southern Iowa. Soybean cyst nematodes are also frequently found in these fields. In collaboration with Greg Tylka, who specializes in plant-parasitic nematodes, we will be collecting soil samples from affected and non-affected areas of a field showing top dieback symptoms to investigate if there may be a relationship between the two pathogens.

If top dieback is severe, consider changing soybean varieties for the next growing season. Do not save seeds from fields with severe top dieback because the pathogens causing top dieback can be seedborne. If necessary, soil and plant tissue analyses could be conducted to ascertain the involvement of potassium deficiency in symptomatic fields.

**White mold**

White mold is likely to be a problem for some growers in eastern Iowa this season. Fields planted late in narrow rows could be at a higher risk for disease. At this stage of the growing season, it is too late to spray chemicals because the soybean has passed the protective stage. (Ninety percent of infection by the white mold fungus occurs through the flowers.) For growers with problem fields, the severity of white mold needs to assessed so that management practices can be implemented to reduce the risk for future crops, e.g., no-till and rotate with corn, plant tolerant varieties, consider using the biocontrol Contans®. White mold has been a problem in even years, and not odd years, for most growers. We need to prevent it from becoming a problem every year.

**Other foliar diseases**

During scouting, diseases we are likely to see now are frogeye leaf spot, downy mildew, bacterial blight, and brown spot. These diseases are likely more prevalent in eastern Iowa this summer because more rains have been received there. These diseases will continue to build up for the rest of the season and could cause premature defoliation in parts of eastern Iowa where precipitation was high in late July. It will be worthy to take note of disease severity and defoliation for future use if fungicide applications have been made.

**Soybean rust**

So far, the disease is still found in the South with the most active areas in northeastern Texas, southwest Arkansas, and Oklahoma. These areas are in the storm pathway to Iowa, and soybean rust spores are easily carried to Iowa. Strong positive detections of soybean rust spores from rain traps in Iowa have been reported by a United Soybean Board-funded project led by USDA. Scouting has intensified in most soybean production regions, but no soybean rust has been found beyond Oklahoma. The risk of having an outbreak in Iowa remains low.

*X. B. Yang is a professor and Alison Robertson is an assistant professor in plant pathology with research and extension responsibilities in crop diseases.*

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