FUNGICIDE RESISTANCE IN FIELD CROPS

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Herbicide resistant weeds have been in the news quite frequently lately, and rightfully so. Their existence is changing how farmers currently manage weeds in corn and soybean fields. But resistance to pesticides is not limited to weeds. Fungi that cause crop disease can also develop resistance to fungicides. This presentation will cover the basics of fungicide resistance and outline ways to avoid or delay fungicide resistance from occurring. Some of this research is funded through the soybean check off from Iowa Soybean Association and the United Soybean Board. We thank our sponsors for this support.

Fungicide resistance is when populations of a particular fungus that are not sensitive to a specific class of fungicides are selected for and become the predominant population. There are a few factors that can contribute to the risk of fungicide resistance developing – 1) the genetic diversity of the fungus and how quickly it can reproduce; 2) the class of fungicides being used and how frequently they are used. This presentation will unpack these two factors.

Fungicide resistant populations of some fungi have already been identified in field crops. This includes *Cercospora sojina*, the pathogen that causes frogeye leaf spot in soybean (Fig. 1). Managing frogeye leaf spot or other diseases with resistant pathogen populations will require farmers to consider fungicide resistance. This involves minimizing selection pressure, which can be accomplished by using resistant crop varieties and implementing appropriate cultural practices to manage the disease, as well as to rotate to fungicides with different active ingredients. Also, fungicides should only be applied when warranted, taking into consideration information gained from scouting and disease risk factors.

Because each fungicide may differ in their ability to manage a particular pathogen and each pathogen has a unique risk for developing resistance, it will be important to do your homework on each fungicide and target pathogen when using fungicides. These ideas will be explained further in the presentation.

Fungicide-resistant strains of field crop pathogens already exist in Iowa fields. The more we spray fungicides, the higher the risk of eventually selecting for these resistant populations. We can take steps to slow the selection for these pathogens but it will require knowledge of each disease or each field. This presentation will outline the basics of fungicide resistance and identify steps to manage fungicide resistance.

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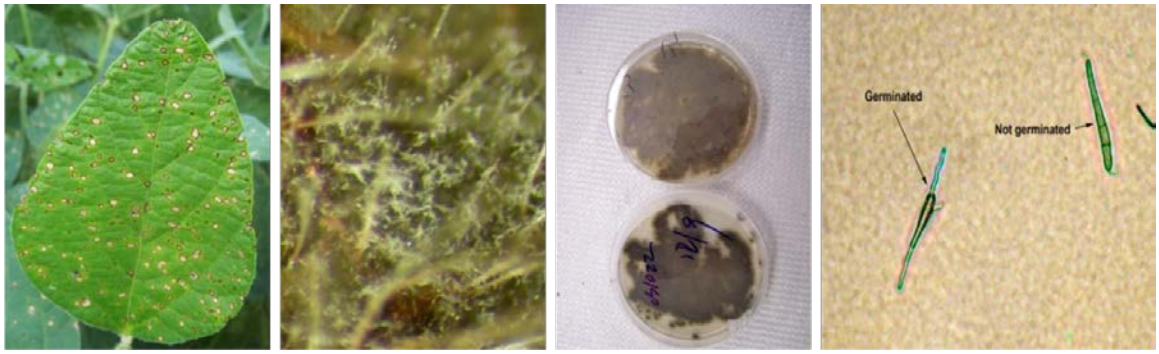

Figure 1. From left to right - Frogeye leaf spot on a soybean leaflet, close up of fungal growth in the lesion, *Cercospora sojina* growing on media in the lab, and *C. sojina* spores.