

Hardin County Extension News Release

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Foliar Products on Soybean

Hardin County - The R3 soybean growth stage is a common time to consider foliar application of fungicide, insecticide, and fertilizer. Before we jump into the potential yield outcomes of these products, let's define the R3 growth stage. A soybean plant is at the R3 growth stage when there is a pod at least 3/16 inch long, but less than 3/4 inch long at one of the four uppermost nodes on the main stem with a fully developed trifoliolate leaf. A leaf is fully developed, and the node is counted when the trifoliolate leaf at the node immediately above it is open. Soybean plants within a field may be at different growth stages. Over half of the plants need to be at a certain growth stage for the whole field to be considered that growth stage.

First, consider the disease triangle. For a disease to develop, there must be a host. Is your soybean variety resistant or susceptible? Is there a history of a certain disease in your field? Do you see any visual symptoms of disease? Most foliar diseases, such as brown leaf spot and frogeye leaf spot, are favored by wet conditions.

In the OSU soybean agronomic trials, brown leaf spot and frogeye leaf spot tend to be the two most common soybean diseases. In these trials, we've measured a yield response to foliar fungicide applied at R3 in 9 out of 28 environments, ranging from 4 to 8 bushels per acre. At the responsive locations, which tended to be in central and southern Ohio, there was foliar disease present (brown spot and frogeye leaf spot). Additionally, these positive yield responses occurred in years with greater precipitation. Very little to no yield response occurred in dry years and in years when soybeans were flooded. If you have visual symptoms of disease, a conducive environment, and susceptible variety, R3 is a good time to spray a foliar fungicide.

Often, if a farmer plans on spraying a foliar fungicide, they will tank-mix a foliar insecticide. It is very rare that we reach economic levels of defoliation here in Ohio. Over the past several years, OSU tested foliar insecticide in 28 Ohio environments. Out of those 28 environments, we've only measured a yield response of +5 bushels per acre to foliar insecticide applied at R3 one time. In the other 27 environments, soybean yield was unaffected by foliar insecticide with defoliation levels in the mid- to upper canopy at <15%. Treatment is advised when defoliation

levels reach 40% in pre-bloom stages, 15% in bloom, and 25% during pod fill to harvest.

In Ohio, the most common micronutrient deficiency is manganese. However, even then, OSU only measured a yield response to manganese foliar fertilizer in two out of 20 Ohio environments. Soybeans are most likely to respond to foliar fertilizer when there are visual symptoms of deficiency. Interveinal chlorosis is a visual symptom of manganese deficiency. Manganese deficiency tends to occur in fields with high pH or high organic matter such as muck soils, especially if soils are droughty. In dry soil, manganese is converted to a form that is unavailable for plant uptake.

Recently, soybean agronomists across the U.S. evaluated foliar fertilizers in 46 environments and found no soybean yield increase when the products were applied with no visual deficiency symptoms.

When soybean plants are yellow due to saturated soil conditions, it can be tempting to apply foliar products to help the plants 'recover'. These fields often already have a lower yield potential and are unlikely to respond to foliar products in the absence of disease, insects, and nutrient deficiency.

Multiple trials in Ohio and across the U.S. have shown that prophylactic applications of foliar fungicide, insecticide, and fertilizer provide no yield benefit. Before applying these products, it's important to scout your fields for disease, insects, and nutrient deficiencies.

Article written by Laura Lindsey, OSU Extension-Ag Crops Team and edited by Mark Badertscher, OSU Extension-Hardin County.