

Effect of Foliar Fungicide, Foliar Insecticide, and Wheel Traffic on Soybean Yield

Wm. Bruce Clevenger, Ohio State University Extension Educator, Defiance County

Don Hammersmith, Ohio State University Extension, Program Assistant, Defiance County

Published: August 18, 2023

Objective

To evaluate the effect of foliar fungicide, foliar insecticide, combination foliar fungicide & insecticide, and wheel traffic on soybean yield.

Background

Crop Year: 2022	Tillage: None
Location: ACRE Farm	Soil Test (M3):OM 2.1%, P 30ppm, K 73ppm
County/Town: Defiance/Defiance Ohio	Planting Date: 5/20/2022
Soil Type: Rawson sandy loam, Mermill/Haskins loam	Seeding Rate: 180,000 seed per acre Variety: Wellman 6131 E
Drainage: Random	Harvest Date: 10/11/2022
Previous Crop: Soybean	

Methods

This study was designed as a randomized complete block with five treatments, each with four replications. Treatments were foliar fungicide (F), foliar insecticide (I), foliar fungicide/insecticide (F/I), wheel traffic only (WTO), and a control (C). The fungicide used was Delaro (active ingredients: Prothioconazole and Trifloxystrobin) at 8 oz per acre and the insecticide used was Kendo (active ingredient: Lambda-cyhalothrin) at 1.8 oz per acre. Each plot was 30 feet wide with varying lengths. Equal rates of fertilizer and herbicides were applied to all plots. Soybeans were no-till drilled with a row spacing of 7.5 inches. Target seeding rate was 180,000 seeds per acre. Seed depth was adjusted to reach adequate soil moisture resulting in a depth of 1.25 inch. Plant population data was collected June 30 at soybean growth stage V2-V3 by randomly placing a hoop ring, calibrated to 1/10,000 of an acre, at three locations within each plot and counting the number of plants within the hoop. The three plant population data points were averaged for each plot. All treatments were completed on 7/29/2022 with ground equipment. Soybean growth stage was R3-R4. The treatment applications were made with a 30-foot wide, three-point rear mounted liquid sprayer. The WTO treatment used the same tractor with no product applied. The entirety of each plot was harvested with a 30-foot grain head for the length of the plot. Grain samples from each plot were collected and combined by treatment then tested for moisture and test weight at the local grain elevator. Harvested grain was weighted with a calibrated weigh wagon and weights adjusted to 13% moisture to determine final plot yield.



Results

	Plants/acre
Control	128,000 A
Wheel Traffic Only	130,666 A
Insecticide	133,000 A
Fungicide/Insecticide	158,000 C
Fungicide	160,000 C
	LSD (0.10) 19,404

Note: results with different letters are statistically significant.

	Yield (bushels/acre)
Wheel Traffic Only	64.8 A
Control	65.8 A
Insecticide	65.8 A
Fungicide/Insecticide	69.0 AB
Fungicide	69.8 B
	LSD (0.10) 3.5

Note: results with different letters are statistically significant.

Summary

Throughout May, June, and July the plots were scouted for levels of insect and disease incidents. No significant levels of defoliation or infection were found to warrant treatment actions. On September 15, 2022, all plots were scouted by county and pathology lab staff with no significant disease or insect levels associated with the treated versus non-treated plots. However, pockets of white mold were detected randomly among replications one through three in the lower lying, thick soybean canopy areas of the field. The fungicide used in this trial was not selected for suppression or control of White mold, a.k.a. *Sclerotinia stem rot (Sclerotinia sclerotiorum)*, but rather to manage Frogeye leaf spot (*Cercospora sojina*) and other foliar soybean diseases.

Grain yields in this study were highest for the F treatment but were not significantly different from the F/I combination treatment. The F/I combination, I only, and the WTO treatments were



not significantly different than the control. The WTO treatment yield tended to be the lowest in the plot but was not significantly different from the control. Fungicide and insecticide material costs per acre were \$14.99 per acre and \$2.11 per acre, respectively. Application cost per acre was \$8.00 per acre. The at-harvest soybean price was \$13.88 per bushel. The gross revenue per acre minus treatment cost per acre in this study for each treatment was: WTO \$891.42, I \$903.19, C \$913.30, F/I \$932.62, and F \$961.83.

Acknowledgements

The author expresses appreciation to the Defiance County Board of Commissioners for providing the Defiance County ACRE (Agriculture, Conservation, Research and Education) Farm for this research. The ACRE Farm is operated by the OSU Extension and the Defiance Soil and Water Conservation District staff to conduct applied research used to support an annual producer field day.

For more information, contact:
Wm. Bruce Clevenger
OSU Extension Defiance County
06879 Evansport Road, Suite B
Defiance, Ohio 43512
clevenger.10@osu.edu

