Title: Effect of Mid-Season Foliar Fungicide and Foliar Insecticide Applied Alone and In-Combination on Soybean Yield

Objectives: The objective of this study was to evaluate the effect of mid-season foliar fungicide and insecticide application on soybean grain yield, applied alone or in combination.

Background: A survey of soybean growers during 2014 through 2016 indicated approximately 33% of soybean fields in Ohio received a foliar fungicide application (Lindsey, unpublished). Among the 33% of fields sprayed with foliar fungicide, 65% of applications were tank-mixed with foliar insecticide. As a comparison, only 3% of soybean fields received foliar insecticide only. Growers tank-mix fungicide with insecticide due to the relatively low cost of insecticide which is estimated at $3.58/acre (anonymous industry source).

Methods: A field trial was conducted in Ohio at 12 site-years. Foliar treatments applied at the R3 soybean growth stage (beginning pod) included: 1.) non-treated control, 2.) fungicide, 3.) insecticide, 4.) fungicide + insecticide, 5.) fungicide + insecticide (applied separately), 6.) fungicide + crop oil, 7.) insecticide + crop oil, and 8.) fungicide + insecticide + crop oil. Data were collected for percent leaf area affected (LAA) by diseases (frogeye leaf spot and brown spot) and insect defoliation at the R6 soybean growth stage (full seed).

Summary of Results: Soybeans treated with fungicide + insecticide tank-mixed did not yield differently than soybeans treated with fungicide and fungicide + crop oil. Fungicide treatments increased soybean yield at 4 of 12 site-years, and at three of these locations, brown spot and frogeye leaf spot disease were ≥6.5% LAA. There was no yield response associated with insecticide application due to low insect defoliation levels at the time of insecticide application.

Conclusion: If insects or foliar diseases are not present at threshold numbers, applications of fungicide, insecticide alone or in tank-mix did not provide additional yield benefits.

Study outputs:

- One submitted manuscript to Crop, Forage, and Turfgrass Management journal.
- One graduate student completed thesis (Sin Joe Ng). Sin Joe is now working as a research associate in the Department of Plant Pathology in Wooster (Dr. Pierce Paul Lab).
- Data presented at five extension meetings.
- Research presented by graduate student at the American Society of Agronomy annual meeting. Student received third place in Applied Soybean Research section.