

Effect of Chloropyrifos Applied on R3 Soybeans in a Modified Relay Intercrop System

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Objective

To evaluate grain yield response of modified relay intercropped (MRI) soybeans to Yuma (chloripyrifos) insecticide applied at soybean growth stage R3.

Background

Crop Year:	2013	Row width:	10 inches
Location:	OSU Unger Farm	Fertilizer (lbs N-P-K):	95-58-78
County/Town:	Crawford	Soybean Planting Date:	June 5, 2013
Soil Type:	Blount/Pewamo	Soybean Variety:	Pioneer P93Y24
Drainage:	Systematic	Seeding Rate:	225,000 seeds/acre
Previous Crop:	Wheat	Herbicide (Post):	1 qt glyphosate (7/22)
Tillage:	No – tillage	Treatment Dates:	August 14, 2013
Soil Test:	pH 6.2, P 34 ppm, K 152 ppm	Date of Harvest:	October 29, 2013
SCN Count:	(MRI area):1160 eggs/100cc	Rain fall:	25.57 inches (5/16-10/2)

Methods

Soybeans were interseeded into standing wheat with 10 inch row spacing on June 5, 2103 with a Great Plains 2010P precision drill mounted on a 3 point hitch with lift assist wheels. Pioneer P93Y24 were planted at a rate of 225,000 seeds per acre. Wheat was harvested on July12, 2013. Wheat averaged 70 bushel per acre in the field. An application of 1 quart of glyphosate was applied on July 22.

This study used a randomized complete block design with two treatments replicated four times to compare the treatment yield effect of chloropyrifos at 1pt/acre and a control (no insecticide). A second trial with the treatment being chloropyrifos at 1pt/acre + lambda-cyhalothrin at 3.2ounces/acre and a control was also conducted. Both trials were treated on August 14, 2013 when soybeans were in the R3 growth stage. Insects present in low numbers at time of application included: grasshoppers, Japanese beetles and bean leaf beetles. Leaf defoliation estimated at less than 3% and not any pod feeding. Each plot was sprayed with a CO2 small plot sprayer calibrated to deliver 15 gallons per acre at 40 PSI. Plot size was 10 feet wide by 40 feet long. Plots were trimmed to 35 feet in length. Plots were harvested on October 29, 2013 using a Kincaid 8-XP small plot combine harvesting the center five feet of each plot.

Treatment 1

- 1) Yuma (Chloropyrifos) at 1 pint/acre
- 2) Control (no insecticide)

Treatment 2

- 1) Yuma (Chloropyrifos) at 1 pint/acre + Warrior (lambda-cyhalothrin) at 3.2 ounces/acre
- 2) Control (no insecticide)

Results

Table 1. MRI soybean yield (adj. to 13% moisture) from application of Yuma

<u>Treatment</u>	<u>Mean yield (bu/acre)</u>
chloropyrifos	53.0
Control	57.7

F=3.66, NS; CV =5.62

Table 2. MRI soybean yield (adj. to 13% moisture) from application of Yuma + Warrior

<u>Treatment</u>	<u>Mean yield (bu/acre)</u>
chloropyrifos +lambda-cyhalothrin	57.8
Control	54.0

F=2.57, NS; CV =6

Summary

This study was conducted at OSU Unger Farm in north central Ohio where Modified Relay Intercropping (MRI) is practiced. However, a perceived problem of intercrop soybeans has been bean leaf beetle, Japanese beetle or grasshopper feeding on soybean pods. In 2013 there was no significant difference in soybean yield between the insecticide treatment and control over the treatments. The cost of Yuma was \$4.27 per acre with a \$10/acre charge for application the total cost would be 14.27 per acre. If soybeans were 12.87/bushel (price of soybeans at harvest of the plots) it would take a yield increase of 1.1 bushels per acre to break even. Furthermore, in 2 years of previous work of insecticide applications in MRI soybeans (different products), there have not been significant yield differences observed over insecticide treatments and control.

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