

Evaluation of Glyphosate Tolerant Soybeans in a Modified Relay Intercrop System

Objective

Compare the yield of two selected glyphosate tolerant soybeans in a Modified Relay Intercrop (MRI) system.

Background (2004)

Test Site:	Brewer Farm	Soil test:	pH 5.6, P 15 ppm,
County:	Crawford		K 113 ppm
Soil type:	Blount silt loam	Fertilizer:	120-80-105 actual NPK applied
Tillage:	no-tillage		per acre
Previous crop:	Soybeans	Wheat Planting date:	10/3/03
Wheat Variety:	Agri 962	Planting rate:	120 lb/A
		Wheat Harvest date:	7/1/04
		Soybean planting date:	6/3/04
		Soybean seeding rate:	250,000 seeds/acre
		Row width:	10 inch
		Wheat Herbicide:	2,4-D 1 pt/A
		Soybean Herbicide:	.3 oz First Rate, 6 oz Select
		Soybean harvest date:	10/30/04

Methods

A completely randomized design with three replications in large plots was used to evaluate glyphosate tolerant soybean varieties in a MRI system. Treatments were 10-inch row wheat interseeded with Renwick and Pioneer 93B36 soybeans. Wheat and soybeans were both planted with a 15 foot Great Plains Drill. Wheat and soybean harvest was completed with an Ag Leader Yield Monitor equipped 9500 John Deere combine that had been calibrated.

Results

Table 1. Glyphosate Tolerant Soybean Variety Response to Interseeding (6/3/04)

Soybean Variety	Intercropped (bu/A)	F-test
Renwick	48.5	
Pioneer 93B36	45.3	
Average	46.9	1.98 NS

Summary

There was no significant difference in yield between the soybean varieties. The average of the MRI glyphosate tolerant soybean plot at nearly 47 bushel per acre following 65 bushel wheat was the highest soybean yield achieved in Crawford county MRI system plot work to date. Ideal weather with adequate rainfall (14.3 inches from June 1 to September 15) was the primary reason for the excellent soybean yields. The average of intercropped soybeans over six years of plot work in Crawford county previous to 2004 was 30 bu/acre and this difference when compared to Crawford county average soybean yield over the same period of 45 bushel per acre is about 33 percent. The year to year difference between Crawford county average yields and MRI plot yields varied from 9 to 89 percent thus monoculture system soybeans would always be expected to yield more than MRI system soybeans.

MRI Research Results (All Plots in Crawford County.)		
6-Year Average Yields in MRI System		
Year	Soft Red Winter Wheat Yields*	Soybean Yields*
1994	65 bu/acre	41 bu/acre
1995	72 bu/acre	27 bu/acre
1997	70 bu/acre	28 bu/acre
1998	73 bu/acre	41 bu/acre
1999	83 bu/acre	5 bu/acre
2000	76 bu/acre	37 bu/acre
Average	73 bu/acre	30 bu/acre
* Yields represent Grand Mean for the year over all treatments. (Prochaska, 2001)		

Finally, looking at a simple gross income per acre comparison between a monoculture soybean enterprise and a MRI enterprise. Monoculture soybeans* at 64 bushel/acre would generate 397 dollars per acre** and MRI at 65 bushel/acre for wheat and 46.9 bushel/ acre for soybean would generate 502 dollars per acre**. There are added costs of production in an MRI system. However, long term average yields of soybeans and wheat indicate that MRI can be a profitable cropping system for north central Ohio farmers in years of adequate rainfall.

* 64 bushels per acre was mean yield of glyphosate tolerant soybean varieties in the 2004 Ohio Soybean Performance Test for the 2 northern Ohio locations.

** 6.20/bushel price used for soybeans and 3.25/bushel price used for wheat

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