Modified Relay Intercropping Soybean Nitrogen Evaluation

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Objective

To determine if the timing of spring nitrogen application to wheat influences soybean yield in a modified relay intercropping system.

Background

Crop Year:	1997	Herbicide:	Trt. 1: 4/14/97: 2,4-D 0.5 pt.
Cooperator:	David Brewer		Trt. 2: 4/19/97: 2,4-D 1 pt.
County/Town:	Crawford/ Bucyrus	Variety:	Wheat: Patterson
Drainage:	Improved		Soybeans: Resnick
Major Soil Type:	Blount	Planting Rate:	Wheat: 120 lbs./A
Previous Crop:	Soybean		Soybeans: 90 lbs./A
Tillage:	None	Planting Date:	Wheat: October 4, 1996
Soil Test:	pH 7.2; P 126 lbs./A;		Soybeans: June 20,1997
	K 316 lbs./A	Harvest Date:	Wheat: July 21, 1997
Fertilizer Applied:	300# 7-28-28 pre-plant		Soybeans: October 21, 1997

Materials and Methods

Top-dress nitrogen was applied to wheat at two different times. Treatment 1 was a single application of 65 lbs. of 28% N applied on 3/24/97, and treatment 2 was a split application of 65 lbs. 28% N on 3/24/97 plus 60 lbs. of 28% N applied 4/16/97. Individual plot size was 0.35 acre with four replications of each treatment.

Results

1997 Modified Relay Intercropping Soybean Yield Data (bu/a)

Treatment	Rep 1	Rep 2	Rep 3	Rep 4	Average
Single N	28.6	34.8	27.8	35.1	31.6
Split N	24.7	25.5	26.1	24.5	25.2

F value 10.25, significant at .05 level, LSD 4.87 bu/a, CV = 9.92; design was completely randomized

MRI Soybean Yield Results (Three-Year Average)		
Year	**Single N Application**	**Split N Application**
1994	41.1	40.1
1995	28.9	25.2
1997	31.6	25.2
3-Year Average	33.9	30.2

No significant difference between three-year averages of nitrogen treatments.

1996 year not analyzed due to severe wheat winter kill. Overall average of all treatments = 32.1 bu/ac.

Summary and Notes

To address the issues of farm profitability and environmental protection, a modified relay intercropping (MRI) system has been studied. In this system, soybeans are planted into wheat at or past the heading stage of growth. A modified relay intercropping system can effectively utilize farm labor, time, and equipment, while at the same time reducing herbicide usage in the soybean crop. A descriptive study was conducted to measure the effects of variable wheat nitrogen fertilizer rates on soybean yield. The three-year soybean yield over all treatments in the MRI system average was 32.1 bushels per acre. The wheat three-year average over all treatments in the MRI system was 68.9 bushels. See the discussion under "MRI Wheat Nitrogen Research" results for a revenue analysis.

For additional information, contact:

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