

Modified Relay Intercropping Wheat Nitrogen Evaluation

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Objective

To determine if the timing of spring nitrogen application to wheat influences wheat 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; K 316 lbs./A	Harvest Date:	Soybeans: June 20, 1997
Fertilizer Applied:	300# 7-28-28 pre-plant		Wheat: July 21, 1997
			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 Wheat Yield (bu/a)					
Treatment	Rep 1	Rep 2	Rep 3	Rep 4	Average
Single N	69.3	58.7	60.7	62.0	62.7
Split N	76.3	78.0	77.7	73.0	76.3

F value 27.72, significant at .05 level, LSD 6.31 bu/a, CV = 5.25; design was completely randomized

MRI Wheat Yield Results (Three-Year Average)		
Year	Single N Application	Split N Application
1994	61.5	68.2
1995	71.5	73.0
1997	62.7	76.3
3-Year Average	65.2	72.5

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 = 68.9 bu/ac.

Summary and Notes

Wheat yield in split-applied nitrogen plots has not been significantly different from wheat yield where only a single rate of nitrogen has been applied. However, seven bushels of wheat (average difference over three years) would easily cover the costs of a split-nitrogen application and leave \$10 or more per acre as added profit in recent growing seasons. This must be balanced with the always lower soybean yield following wheat with a split nitrogen application. The research in 1998 shall be redesigned to reflect a smaller nitrogen split-nitrogen rate in an attempt to maximize wheat and soybean yield. Finally, when looking at gross revenue generated, the MRI system has been very favorable where compared to single crops of either 80-bushel wheat or 55-bushel soybeans. Using \$3.50 wheat and \$6.50 soybeans, the three-year average of the MRI system averaged \$445 gross revenue per acre. Eighty-bushel wheat would generate \$280 per acre (no straw sales), and 55-bushel soybeans would calculate to \$358 per acre.

For additional information, contact:

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