YIELD OF NO-TILLAGE WINTER WHEAT AFTER REDISTRIBUTION OF THE PREVIOUS CORN CROP'S RESIDUES – MAURY SILT LOAM

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Research Objective:
Determine the impact of corn residue redistribution on the yield response of no-tillage wheat to fertilizer nitrogen.

Methods:
Location: Fayette County/Spindletop
Soil Type and Drainage:
Maury silt loam – well drained
Previous Crop: Corn
Tillage: No-Tillage (Lilliston 9680)
Aeration Tillage/No-Tillage
Cultivar: KY 93C-1238-17-1
Planting Date & Rate:
Oct. 17, 2007; 38 seed/sq. ft.
Harvest Date: July 1, 2008
Corn Residue Rates – redistributed as 0, 8000, and 16000 lb/ac on 10/18/07
Fertilizer: Nitrogen – 33 and 100% of N rate treatments as 46-0-0 on 4/2/08
67% of N rate treatments as 46-0-0 on 4/15/08
Herbicides:
Gramoxone – 1 quart/ac on 10/22/07
Harmony – 0.5 oz/ac on 4/16/08
Brominal ME4 – 0.75 pint/ac on 4/16/08
Fungicides:
Folicur – 8 fl oz/ac on 5/17/08

Results:
Average of 4 replications – see Table 1, next page.

Conclusions:
The previous corn crop yield averaged 171 bushels/acre, generating an average of about 8000 lb dry corn residues per acre. These were uniformly redistributed over appropriate random plot areas the day after wheat planting. In this way, the experiment is not a "drill performance" study. Wheat yields were above average, despite a prolonged wet spring. The crop's growth and development was delayed, and this delayed the first nitrogen (N) application. Basically, two yield responses were observed (Table 1). There was a negative response (-6 bushels/acre) to the highest rate of corn residue, and a positive response (+10 bushels/acre) to the higher rate of fertilizer N. Neither of these responses was unexpected, given previous observations on the impact of corn residue on no-till wheat yield and the impact of cold, wet weather on the optimal N rate for wheat. What was unexpected was the lack of interaction between fertilizer N management and corn residue rate on wheat yield. Greater benefit to the higher N rate, at the higher corn residue rate, was expected. Greater benefit to split N application, at the greater corn residue rate, was also expected. Neither

hypothesis was supported by the yield results. Seed size information (not shown) was inclusive, but there was a trend for reduced seed size as the corn residue rate increased. Changing fertilizer N management did not get around the negative impact of high levels of corn residue on wheat yield.

Table 1. No-Till Wheat Yield Response to Corn Residue Rate and Nitrogen Management

Early Fertilizer	Late Fertilizer	Total Fertilizer	Corn Residue Rate (lb DM*/acre)			Fertilizer N Management
N Rate	N Rate	N Rate	0	8000	16000	Average:
Lb N/acre			Wheat grain yield (bu/acre)			
35	70	105	71.9	72.3	66.3	70.2 b
50	100	150	80.6	85.0	78.3	81.3 a
105	0	105	78.8	76.1	69.0	74.6 b
150	0	150	87.5	81.1	79.1	82.6 a
Corn Residue Rate Average:			79.7 a	78.6 a	73.2 b	
*DM = dry matter						