Residue Placement to Improve Yields of No-Tillage Winter Wheat Following Corn

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Research Objective:

Determine whether redistribution of corn residues, relative to the planted wheat row, will improve wheat yields.

Method:

Location	Fayette County/Spindletop
Soil Type and Drainage	Maury silt loam - well drained
Previous Crop	Corn
Tillage	No-Tillage (Lilliston 9680)
Cultivar	Pioneer 2552
Planting Date/Rate	Oct. 23, 1997; 28 seed/sq. ft
Harvest Date	June 26, 1998
Fertilizer:	Nitrogen - 40 lb N/ac as 34-0-0 on 11/4/97
	40 lb N/ac as 34-0-0 on 3/15/98
	80 lb N/ac as 34-0-0 on 4/13/98
Herbicide:	Harmony - 0.6 oz/ac on 3/19/98
Fungicides:	Bayleton 50WP - 4 oz/ac on 4/24/98
	Tilt 3.2EC - 4 fl oz/ac on 5/11/98
Results:	Average of 4 reps.

Table 1. Effect of Corn Residue Placement on Wheat Yield

Residue Placement Treatment	Wheat Yield (bu/ac)
random coverage	73.8 b
moved 0.25 inches away	75.4 b
moved 0.50 inches away	73.1 b
moved 0.75 inches away	75.0 b
moved 1.25 inches away	72.0 b
bare (no residue)	81.9 a

Conclusions:
We removed corn residues prior to seeding the wheat, then returned residues, at a rate of 6300 lb/ac (equal to about 150 bu/ac corn crop), in specific "placements" to each plot. We removed residues prior to seeding to take out any effect of residue on the drill's ability to establish the crop. In our "placement" treatments, we had one where the full rate of residue was randomly scattered over the entire plot area, four treatments where the residue was placed a set distance (0.25, 0.50, 0.75, and 1.25 inches) away from either side of the row, and a control treatment (bare) where none of the residue was returned. The row spacing was 7 inches.

Yields were not influenced by residue placement treatments; only complete residue removal had a positive effect on yield (Table 1). Measurements of soil and air temperatures during the fall emergence and tillering period showed that residues tended to "buffer" against quick temperature changes. This keeps the soil warmer during cooling trends, and cooler during warming trends, and causes greater differences in temperature between the soil and air at such times. This greater "shear" between air and root zone temperatures might be contributing to stress during shoot development.