YIELD OF WINTER WHEAT IN A LONG TERM CONTINUOUS NO-TILLAGE ROTATION OF CORN, WHEAT, AND DOUBLE-CROP SOYBEAN

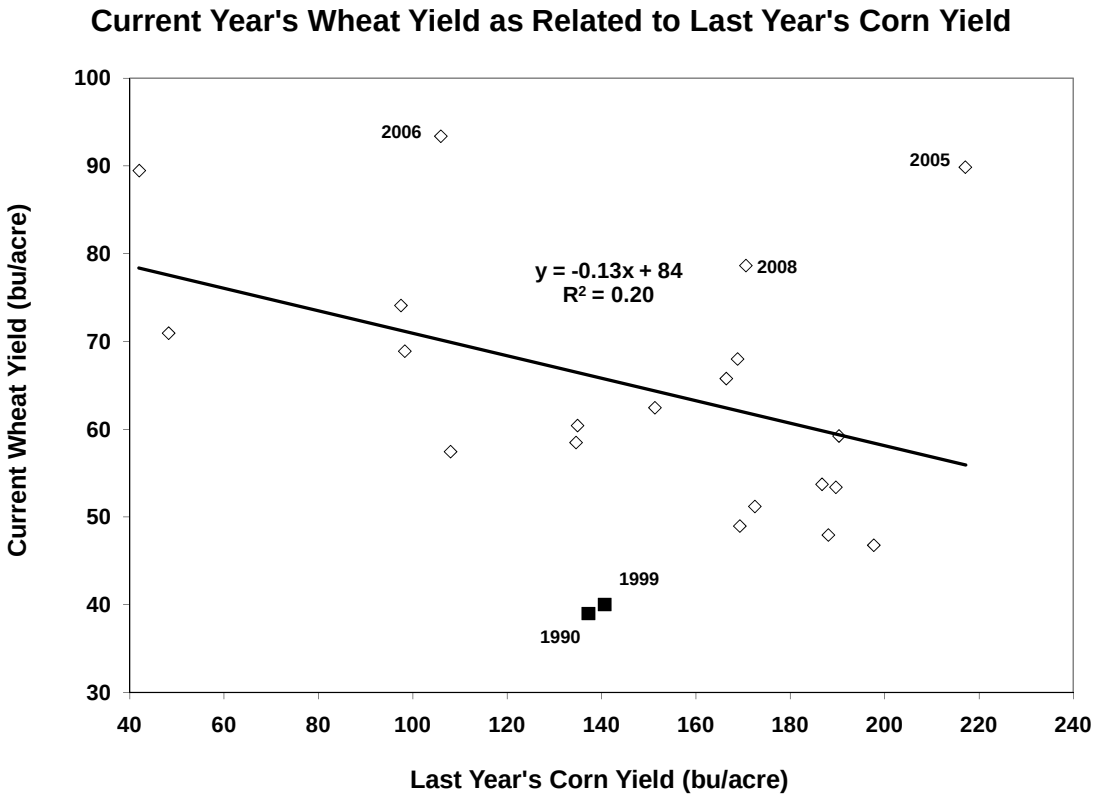
John H. Grove
Plant & Soil Sciences Department
University of Kentucky, Lexington, KY 40546
PH: (859) 257-3655; Email: jgrove@uky.edu

Research Objective:
Determine the economic contribution of wheat to the long-term productivity of the 3 crops/2 years rotation.

Methods:
Location: Fayette County/Spindletop
Soil Type and Drainage:
Maury silt loam – well drained
Previous Crop: Corn
Tillage: No-Tillage (Lilliston 9680)
Cultivar: KY 93C-1238-17-1
Planting Date & Rate:
Oct. 17, 2007; 38 seed/sq. ft.
Harvest Date: July 1, 2008
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 – 78.6 bu/acre.

Conclusions:
Yields were above average, despite a cool, wet spring that caused nitrogen losses from the soil. This year the previous corn crop's residues were redistributed by hand, as a part of a larger corn residue rate study. The yield reported here is the average, across the four nitrogen management treatments, at the 8000 lb corn residue per acre rate (the 1X rate). Historically, the yield of no-tillage wheat in these plots has been negatively related to the yield of the previous corn crop (see graph, next page). Though that is still generally true, the 2005, 2006 and 2008 results are a "break with the past". Greater attention to residue redistribution, whether with a hay tedder or by hand, seems to be playing a role in displacing the relationship to a higher plane. Average losses appear to be about 1.3 bushels/acre in wheat yield for every 10 bushels/acre in yield of the preceding corn crop. Annual corn yields have ranged between 90 and 200 bushels/acre and annual wheat yields have averaged between 45 and 90 bushels/acre. The poor wheat yields observed in 1990 and 1999 were excluded from the relationship because of excessive Fusarium head scab in those two years. The negative relationship probably exists because greater corn yields result in greater corn residue levels, which hinder no-till drill performance and wheat stand establishment and also delay the onset of wheat tiller development in the spring.


Current Year's Wheat Yield as Related to Last Year's Corn Yield
Current Wheat Yield (bu/acre)
Last Year's Corn Yield (bu/acre)
y = -0.13x + 84
R² = 0.20
2006
2005
2008
1999
1990
100
90
80
70
60
50
40
30
40
60
80
100
120
140
160
180
200
220
240