MAKING NO-TILL WHEAT PRODUCTION PROFITABLE: ON-FARM TESTING

Larry Grabau, John Grove, and Colleen Steele - Department of Agronomy - University of KY
Phil Needham (Opti-Crop); and Scott Jones (Wheat Tech)

In 1997, the KySGGA established the goal of having 75% of the state's wheat acreage managed using no-till methods by the year 2005. Before that dramatic change can occur, producers must be convinced that they will not have to sacrifice short-term economic viability in order to gain the long-term benefits of topsoil conservation attainable using no-till methods. Hence, this project's goal was to compare some tillage (ST) and no-tillage (NT) wheat production systems, both under intensive management, for profitability.

Table 1 compares the two tillage systems. Yields, on average across the 7 tests, were 3.0 bushels/A higher for ST, resulting in $8.60 greater value per acre. Tillage and stalk chopping cost an average of $25/A for ST, while extra seed, herbicide, and N fertility cost an average of $14.80/A for NT. On the whole, this resulted in a slight economic advantage ($1.60/A) for NT methods.

The attached footnotes for Table 1 discuss some assumptions made in this analysis. Most importantly, no dollar benefit was assigned to the topsoil saved by NT methods. Of course, another year's data could dramatically change the above profit comparison. Market price changes could help to some extent; for example, if the market price had been $4.00/bu across the 1998 and 1999 seasons, the comparison would have shown a $1.80 advantage for ST.

We plan to repeat this study at 4 locations in the 1999-2000 growing season, in order to assess this tillage comparison under different environmental conditions. To this point, our results appear to provide some incentive for growers to consider moving toward a no-till system. However, we do note this caution: The previously funded on-farm tillage comparisons in the 1996-97 growing season resulted in an average of 65 bushels/A for ST and 58 bushels/A for NT. These grower-managed tests produced 12% less grain under NT management, while our 1997-

99 consultant (or researcher) managed tests only produced 4% less grain under NT management. It appears that no-till may respond to more careful management than some growers have been willing to implement.

Based on our work to this point, it looks like the slight yield loss for NT wheat production is more than covered by the savings producers would have in tillage costs. We are planning to continue this work for the 1999-2000 wheat production season.

TABLE 1. ECONOMIC SUMMARY OF ON-FARM TILLAGE COMPARISONS FUNDED BY KySGGA/KySGPB IN 1997 THROUGH 1999

		ST advantage		Additional ST costs			Additional NT costs		
Test	Managed by:	Yield	Value	Residue Mgmt	Tillage	Seed	Herbicide	Nitrogen	Net ST Benefit
		(Bu/ac)		$/Acre					
'98 Daviess	OC	+0.2	+0.6	6	22	0.9	15	0	-11.5
'98 Fayette	UK	+4.9	+14.2	0	22	9.1	0	5.6	+6.9
'98 Logan	WT	+6.1	+17.7	0	22	10.7	0	0	+6.4
'99 Caldwell	UK	+5.6	+15.7	6	25	4.4	0	3.2	-7.7
'99 Daviess	OC	-3.7	-10.4	6	22	5.8	15	0	-17.6
'99 Fayette	UK	+1.5	+4.2	0	22	7.1	2.2	4.2	-4.3
'99 Logan	WT	+6.4	+17.9	0	22	12.4	7.9	0	+16.2
Means	UK/OC/WT	+3.0	+8.6	2.6	22.4	7.2	5.7	1.9	-1.6

NOTES AND ASSUMPTIONS FOR TABLE 1

1. Abbreviations: ST, some tillage; NT, no-tillage; OC, Miles Opti-Crop; UK, University of Kentucky; and WT, Wheat Tech.

2. Expenses which were in common were not considered in this analysis, as the goal of the project was to compare economic advantages of the two tillage systems.

3. No economic credit was given for the long-term economic advantage likely to result from use of no-tillage methods (through the conservation of topsoil).

4. No economic credit was given for the potential benefits of no-tillage methods to rotated corn and soybean crops.

5. We assumed that neither test weight nor harvest moisture were influenced by tillage system.

6. Both ST and NT were managed to optimize their profitability rather than to obtain the highest possible yields.

7. Specific practices employed (i.e., the type and number of tillage passes) are shown in detail in the attached summaries of individual test locations.

8. Each location included two varieties and two replications. Calculated yield differences between tillage systems are assumed to represent real differences.

9. In five of the above tests, the later maturing variety produced higher yields than did the earlier maturing variety (within a given location). Rather than picking the better variety to paint this economic collage, we averaged across the two (to make our conclusions more supportable).

10. This data should be interpreted with some caution, as environmental conditions in coming seasons could clearly affect the outcomes of the two tillage systems. (However, some management considerations may have already helped buffer NT wheat from winterkill; for example, none of these 7 tests were planted in early October, and that may have helped account for the similar survival of most NT tillers in the face of a severe spring freeze in early March, 1998.)

11. In 1998, we used a market price of $2.90/bushel. The income deficiency payment for 1999 tests brought the value of the 1999 crop to $2.80/bushel.

12. No adjustments were made for differing speed of operations; for example, ST was not penalized for slightly slower combining, nor was NT penalized for slower speeds while drilling the crop.