

# UNIVERSITY OF KENTUCKY WHEAT SCIENCE NEWS

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### **SMALL GRAIN VARIETY PERFORMANCE UPDATE**

Bill Bruening—Small Grain Variety Testing Research Specialist

The 2005 wheat growing season ended with Kentucky farmers harvesting 300,000 acres of soft red winter wheat with an average of 70 bushels per acre. A recent survey from the Kentucky field office of the National Agriculture Statistics Service indicated that the most commonly seeded varieties in Kentucky were top performers in the University of Kentucky's wheat variety performance tests during the preceding two years.

The objective of the Kentucky small grain variety performance tests is to evaluate varieties of wheat and barley that are commercially available or may soon be available to Kentucky farmers. New varieties are continually being developed by universities and commercial firms. Annual variety evaluation provides farmers, seed producers and other agricultural workers with current information to help select varieties best adapted to their locality and individual requirements.

Because environmental factors may alter varietal performance between locations and years, nine tests (five conventional tillage and four no-till) were conducted across the state in 2005. Additionally, two and three year performance data are also published in the annual variety performance bulletin. At nine tests per year, Kentucky has the most rigorous soft red winter wheat evaluation program in the country, with most states conducting six tests. Kentucky is also only one of three programs in the country evaluating varieties under both conventional and no-tillage.

Tests are conducted using intensive management practices. Varieties are annually evaluated for differences in yield, test weight, height, heading date, lodging, winter survival and disease reaction. For growers that are interested in wheat as a forage crop, future evaluations may include a forage test. Likewise, because straw is a valuable commodity in certain parts of the state, varietal differences in straw production may also be evaluated.

When interpreting results in the variety performance bulletin, it is important to note that the yield of a variety is relative and should be compared with the yields of other varieties in the same test or within the same analysis across locations. The overall summary compares varietal performance across locations, tillage systems, and years. It provides the best estimate of varietal performance, particularly the 2 and 3 year averages. When selecting a variety to plant, growers should first look at the overall summary, then look at data from regional tests and determine which top varieties from the overall analysis also did the best in their region. Finally, comparing the conventional test summary with the no-till test summary, may fine tune variety selection based on the tillage system to be used. The University of Kentucky small grain variety performance program provides free, unbiased information to help increase the profitability of wheat production in Kentucky. The annual bulletin is available in county extension offices and available online at [www.uky.edu/ag/Wheat/Variety/Test](http://www.uky.edu/ag/Wheat/Variety/Test).

## **EFFECT OF TILLAGE ON CROP YIELDS**

Lloyd Murdock, Jim Herbek, John James and Dottie Call

The difference in crop yields due to different types of tillage is usually small. So the reason for the type of tillage that we choose will probably be overshadowed by considerations of costs, time, labor and long-term erosion.

Two exceptions to this statement would be tillage that causes or corrects compaction and no-tillage on poorly drained soils.

For us in Kentucky, erosion control is still the biggest reason to do residue tillage. More yield is lost due to eroded soils over a period of years than any other way.

### **LONG-TERM YIELDS**

A trial that has been run continuously for 13 years comparing tilled and no-tilled wheat followed by no-till double-cropped soybeans and no-till corn. A 3-crop in 2-year system. The last 4 years an additional treatment was included which used tillage for planting of wheat and corn and no-tillage for double-cropped soybeans.

#### **WHEAT YIELDS (BU/AC)**

YEAR	NO-TILL	TILLED (1/2)	TILLED (2/2)
1992-00	89.2	93.5	---
2001-05	105.9	100.2	102.5

1/2 - Tillage for wheat, but corn and double-cropped soybeans are no-tilled. 2/2 – Tillage for wheat and corn, but double-cropped soybeans are no-tilled.

The yields have favored tilled wheat by as much as 15 bu/ac. one year and no-tillage by as much as 13 bu/ac. another year. The tillage favored seemed to be controlled by environmental conditions. Making a decision on one or two years of results can be misleading. Over the long haul (freezes, droughts, head scab and monsoons), the results are very similar.

#### **SOYBEAN YIELDS (BU/AC)**

YEAR	NO-TILL	TILLED (1/2)	TILLED (2/2)
1994-00	35.8	34.5	---
2001-05	48.6	44.5	44.7

1/2 - Tillage for wheat, but corn and double-cropped soybeans are no-tilled. 2/2 – Tillage for wheat and corn, but double-cropped soybeans are no-tilled.

The results on soybean yields in this trial are similar to wheat in the fact that the differences are small, but they tend to favor no-tillage. The last 4 years have shown a significant advantage to no-tillage, but it is probably due to environmental conditions over these years that tend to be more favorable to no-tillage.

#### **CORN YIELDS (BU/AC)**

YEAR	NO-TILL	TILLED (1/2)	TILLED (2/2)
1994-00	195.5	182.5	---
2001-04	183.3	184.9	192.4

1/2 - Tillage for wheat, but corn and double-cropped soybeans are no-tilled. 2/2 – Tillage for wheat and corn, but double-cropped soybeans are no-tilled.

The yield results for corn vary from year to year as much as the wheat yields. Some years there are large differences in yields and other years they produce similar yields. The first 7 years of the trial, yields significantly favored no-tillage. This was probably due to environmental conditions during these growing seasons. The last four years seem to favor tillage before planting corn. The new treatment of tillage for planting corn was begun on a treatment that had been no-tilled for many years. So it is not clear at this time if the increased yields on this treatment are due to disturbing a high organic matter area such as you would have with an old sod field or if the tillage before planting is beneficial other ways. The trial will continue for several years and the answer should become clear.

### **SOIL CHANGES**

Soil measurements show soil changes with time on the different tillage treatments. Soil drainage is better when the soil is not disturbed and a little more water can also be held. However, for these soil differences to effect yields, the environmental conditions must be just a certain way.

### **CONCLUSIONS**

The results of this trial show that crop yields due to different types of tillage change significantly from year to year and are probably due in a large part to the environmental conditions during the growing season. When considered over many years, the differences in yields due to tillage is small and the choice of tillage will probably be largely determined by other factors such as costs, time, labor, erosion control, compaction, etc.

### **THANKS**

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