

Results of the KENTUCKY SMALL GRAIN YIELD TRIALS - 1957

By V. C. FINKNER and R. RICHARDS



Breeders Seed Field of Todd Wheat,
Woodford County, 1957

Progress Report 58

AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF KENTUCKY
LEXINGTON

August 1957

YOUR EXPERIMENT STATION RECOMMENDS

FOR THE 1957-58 SEASON

Winter Wheat varieties: TODD, DUAL, KNOX, VERMILLION
and VIGO

(Plant only Kentucky certified seed or seed known to be relatively free of loose smut.)

Winter Barley varieties: KENBAR and DAYTON

Winter Oats varieties: DUBOIS, ATLANTIC, FORKEDEER
and BRONCO

(Seed supplies of Bronco not readily available for 1957 planting.)

Spring Oats varieties: ANDREW and MO. 0-205

Seed Source: Kentucky Certified Seed

Seed Treatment: Chemical seed treatment to control seed borne diseases.

Explanation of Terms used in this Report

1. Certified Seed; It is seed which has been grown in such a way as to maintain the identity of a variety. It also helps to maintain freedom from weed and other crop seed and, in some cases, freedom from diseases. The Experiment Station recommends that Kentucky certified seed be used whenever possible for growing commercial crops of small grains.
2. Chemical Seed Treatment: This treatment helps to control a number of small grain diseases. It is relatively inexpensive and should be used whenever small grains are planted. Be sure to follow manufacturer's instructions for use.
3. Hard Red Winter Wheat: This refers to a commercial class of wheat. Since the different classes of wheat are used for different purposes -- for example, hard red wheat for bread

flour, soft red wheat for pastry flour, white wheat for cracker flour -- commercial buyers prefer to buy wheat from areas producing only one class of wheat. Kentucky is primarily in the soft red winter wheat area and hard red winter wheats should not be grown here.

4. Heading Date: The date when the head emerges from the leaf sheath. It is important in determining the adaptation of a variety in a particular area. In general the early varieties have been superior in Kentucky.
5. Hessian Fly: An insect pest of small grain, particularly wheat. It has been controlled primarily by planting wheat after the average fly-free date. Susceptible varieties should continue to be sown after the fly-free date. Todd and Dual are the first varieties of soft red winter wheat to be resistant to the fly. These varieties may be planted earlier or later than the fly-free date.
6. Highest Yielding Group: The group of varieties whose yield was not significantly lower than the highest yielding variety in that test. This is determined by subtracting the L.S.D. figure from the highest yield figure. Any variety that yields as much as or more than that difference is considered in the highest yielding group.
7. L.S.D.: The abbreviation "L.S.D." means least significant difference. This is a statistical term used to estimate the precision of a test. Two varieties differing in yield by less than the L.S.D. cannot be said to differ in yield in that test if one wishes to be correct at least 95 percent of the time. As two or more tests are averaged and also over a period of years the L.S.D. becomes smaller and smaller. More reliance may be placed on small differences in average yields when the yields are averages of several test locations over several years.
8. Loose Smut: True loose smut occurs in wheat and barley. It is a serious disease in Kentucky. Methods for control are through the use of resistant varieties, the planting of disease free seed, or specialized water treatments. Chemical seed treatment will not control this disease. Smut in susceptible

varieties may be kept within reasonable control by use of Kentucky certified seed each year.

9. Mildew: A leaf disease which is important in wheat and barley production. The only control of this disease is resistant varieties.
10. Plant Height: This is important from the standpoint of how much straw or hay is produced. Usually the taller varieties produce more straw or hay.
11. Rusts: Leaf and stem rusts often cause damage to our small grains. The only control now known is through the use of resistant varieties. Support your agricultural experiment station in their effort to develop disease resistant varieties.
12. Septoria: Another disease which caused serious damage to wheat in 1957. No control method is now known. Chemical seed treatment helps.
13. Soft Red Winter Wheat: (See hard red winter wheat)
14. Straw Strength: An important characteristic, particularly with combine harvesting. If the grain is lodged (weak strawed) harvesting is made more difficult and quality is usually poor.
15. Victoria Blight: A disease important in spring oats. Controlled by growing varieties resistant to this disease. Recommended varieties are resistant.
16. Weight per Bushel: Weight per bushel or test weight is a measure of the quality of grain. Weight per bushel is one of the factors determining the grade that is assigned in commercial marketing of grain. A price differential usually exists for the different grades of grain. The higher the test weight the better the quality and the higher the market value unless the grain is down-graded by another quality factor.
17. White Wheat. Another class of wheat that should not be grown in Kentucky.

18. Winter hardiness: Winter hardiness refers to the ability of the plant to survive winters when fall planted under Kentucky conditions. Most varieties of winter wheat and rye are sufficiently winter hardy in Kentucky. Winter barley and winter oats often winter kill in Kentucky, therefore, winter hardiness is an important consideration. Winter barley is usually more winter hardy than winter oats.

THE 1956-57 TRIALS AND RESULTS

In 1956-57, 36 varieties of winter oats, 36 of winter wheat and 36 of winter barley were tested at the Experiment Station Farm, Lexington and the Experiment Substation at Princeton. Twenty-five varieties each of winter oats, winter wheat, and winter barley were tested in cooperation with the Pennyrite Grain Improvement Association on the farm of Mr. W. G. Duncan III near Hopkinsville, and in cooperation with Murray State College on its farm near Murray. Thirty-six varieties of spring planted oats were tested at Lexington.

These tests include varieties being grown in Kentucky and neighboring states, older varieties which have been produced commercially in Kentucky and other states and experimental varieties not yet named which were developed by Kentucky and neighboring state experiment stations. In this report only the named varieties and some Kentucky experimental varieties will be considered.

WINTER WHEAT

The season in general was not favorable for wheat production. Prolonged wet weather in May and June was ideal for build up of leaf rust, Septoria and scab, and interfered with the growth and development of the wheat as well as harvesting operations. Yields in the western part of the state were only about half as high as they were last year and the quality of the wheat also suffered.

The highest yielding named variety was Todd (see elsewhere in this publication for a description of Todd), a variety released to Kentucky certified seed growers in 1956. Todd was followed

closely in yield by other recommended varieties Knox, Vermillion, and Dual. All four of these newer recommended varieties appear to be higher yielding than Vigo.

The variety Triumph had a satisfactory yield record this year but should not be grown in Kentucky because it is classified as a hard red winter wheat. Its yield was not superior to most of the recommended soft red winter wheat varieties.

The variety Genesee has had a satisfactory but not superior yield record in Kentucky. This variety belongs to the white wheat class and should not be grown in Kentucky.

Two new varieties, Racine from Wisconsin and Lucas from Ohio, have had good yield records but do not seem to be superior to our recommended varieties.

The older varieties Clarkan and Trumbull were decidedly inferior to our recommended varieties.

Some of the Kentucky experimental varieties appear promising but need additional testing before any decision concerning them can be made.

In following tables are shown the yield data at the different test locations in 1957, and a period of years summary of yield and other important agronomic characteristics.

TODD WINTER WHEAT

Todd is a variety of soft red winter wheat. It is beardless, white-chaffed, stiff strawed, averages 6 to 8 inches taller than Knox and heads approximately at the same time as Dual. Todd is winter-hardy. It is intermediate in leaf rust resistance and susceptible to Septoria. In field tests it was highly resistant to mildew in the seedling and adult plant stages, and highly resistant to loose smut and soil-borne mosaic. Todd is somewhat low in test weight, averaging 2 pounds less than Knox, Vigo and Vermillion. It is resistant to hessian fly. It has had the highest average yield per acre over a period of years in Kentucky wheat variety tests.

Winter Wheat Varieties
Yield in Bushels per Acre, 1957

Variety	Locations				Av.
	Lexing- ton	Prince- ton	Hopkins- ville	Mur- ray	
Named Varieties					
TODD	31.5*	34.2*	20.6	20.8*	26.8
KNOX	28.6	30.5*	22.8	23.8*	26.4
VERMILLION	26.6	32.3*	21.7	24.5	26.3
Triumph	35.0*	29.6*	21.1	18.9	26.2
Genesee	34.5*	27.7	23.0	16.5	25.4
DUAL	33.0*	28.5*	21.0	18.4	25.2
Racine	34.9*	28.6*	19.0	16.9	24.8
Lucas	28.0	24.2	20.2	21.9*	23.6
VIGO	28.1	21.3	18.8	17.4	21.4
Clarkan	25.6	23.4	19.6	14.7	20.8
Trumbull	23.2	17.2	14.8	17.0	18.0
Ky. Experimental Varieties					
Tay. 54-8904	34.6*	31.8*	30.7*	25.5*	30.6
Ky. 55-283	26.3	30.6*	30.4*	26.2*	28.4
Ky. 55-241	31.4*	31.5*	24.2	22.4	27.4
Ky. 54-8699	30.0	28.1	20.8	25.3*	26.0
Ky. 54-8713	32.4*	30.9*	20.2	20.7*	26.0
Ky. 49-6879	32.8*	30.5*	21.1	12.8	24.3
Ky. 54-8473	29.0	26.4	21.9	13.8	22.8
Ky. 54-8701	28.8	23.5	22.1	15.6	22.5
Ky. 54-8793	30.0	18.8	18.0	13.1	20.0
Exp. Av.	30.3	26.6	22.5	19.4	24.7
L.S.D. .05	6.2	5.8	5.0	6.2	----
*Highest yielding group	30.1	28.4	25.7	20.0	----

(Recommended varieties are capitalized)

WINTER BARLEY

The winter barley crop developed nearly normally and reasonably good yields were obtained at all locations except at Murray. Poorly drained soil and excessive rainfall contributed to the low yields at that place. Leaf rust appeared early on barley and caused some damage. Excessive rainfall interfered with timely harvest and resulted in poor quality, weather-damaged barley. The outstanding performance of the recommended varieties Kenbar and Dayton is in the following tables. Kenbar and Dayton were in the highest yielding group at all locations.

The variety Kenate, recently released from Canada, was also outstanding. It is a variety similar to Kenbar under Kentucky conditions. Seed stocks of Kenate are not readily obtainable.

The variety Mo. B-475, recently released from Missouri, had a satisfactory yield performance but has been weakstrawed under Kentucky conditions.

The variety Hudson was lower in yield this year than might have been expected. This was probably due to the season being more favorable to the earlier maturing varieties.

The varieties Ky. 1, Meimi, and Tenn. Hooded appear to be definitely inferior to the recommended varieties Kenbar and Dayton under Kentucky conditions.

Some of the experimental varieties show promise of having superior performance but need additional testing.

Winter Barley Varieties
Yield in Bushels per Acre, 1957

Variety	Locations				Av.
	Lexing- ton	Prince- ton	Hopkins- ville	Mur- ray	

Named Varieties

KENBAR	54.7*	47.7*	49.0*	36.2*	46.9
Kenate	61.0*	44.8*	48.8*	32.8*	46.8
DAYTON	57.0*	44.6*	50.0*	29.6*	45.3
Mo. B-475	48.7	45.3*	46.9*	35.0*	44.0
Ky. 1	53.5	36.8	42.8*	25.6	39.7
Hudson	60.8*	32.3	35.7	26.8	38.9
Meimi	45.2	27.4	38.2	12.6	30.8
Tenn. Hooded	28.2	24.6	23.1	13.4	22.3

Kentucky Experimental Varieties

Ky. 55-63	64.4*	47.0*	47.9*	29.2*	47.1
Ky. 53-3903	59.7*	40.2*	41.2	33.4*	43.6
Ky. 51-5752	62.8*	33.4	44.7*	32.8*	43.4
Ky. 51-5321	62.1*	35.4	45.8*	24.0	41.8
Ky. 55-167	48.6	40.3*	47.8*	25.8*	41.3
Ky. 49-4925	55.0*	41.6*	43.8*	23.6	41.0
Ky. 55-105	63.0*	30.5	40.6	22.1	39.0
Ky. 50-5400	53.8	31.8	43.4*	23.3	38.1
Ky. 55-202	49.5	40.0*	41.0	21.9	38.1
Exp. Av.	50.4	36.0	42.1	25.0	38.4
L.S.D. .05	10.2	7.7	8.4	8.4	----

*Highest
yielding
group

	54.2	39.7	41.6	27.8	----
--	------	------	------	------	------

(Recommended varieties are capitalized.)

WINTER OATS

The winter oat varieties were injured severely by cold weather at Lexington where non-hardy varieties winter-killed completely. Very little winter killing occurred in the other experiments. Yields were relatively low at all locations again partially due to excessive wet weather. Crown rust came in early and also reduced yields. Very few varieties are commercially available that are winter hardy enough for Kentucky and some of those are not satisfactory agronomic types. The variety Bronco was the top yielding variety again this year. Bronco is a new variety released by the Texas Agricultural Experiment Station in 1956. Seed is being increased in Kentucky but will not be available before the 1958 planting.

The other recommended varieties Atlantic, Forkeddeer and Dubois performed well. Dubois was lower yielding this year probably because of rust damage. Usually crown rust is not a limiting factor in production of winter oats.

The variety LeConte performed as well as the recommended varieties but not superior to them. LeConte has been considered too winter tender for Kentucky conditions. Oat varieties that are used in the more southern states, such as Mustang, Arlington, Lee, Fulgrain, Victorgrain, Arkwin, Fulwood, should not be used in Kentucky because they are not winter-hardy enough for our conditions.

Of the experimental varieties Ky. 53-368 has been outstanding and is being increased for more complete testing.

Winter Oat Varieties
Yield in Bushels per Acre, 1957

Variety	Locations				Av.
	Lexing- ton	Prince- ton	Hopkins- ville	Mur- ray	
Named Varieties					
BRONCO	43.8*	52.7*	36.5	46.0*	44.8
ATLANTIC	34.2	54.3*	50.9*	33.5	42.8
LeConte	38.7*	54.7*	29.6	38.0	40.2
FORKEDEER	34.5	50.0*	34.2	37.2	39.0
DUBOIS	36.5	48.2*	30.2	40.0	38.7
Kentucky Experimental Varieties					
Ky. 53-368	44.9*	49.4*	34.7	41.9*	42.7
Ky. 54-490	29.7	43.6*	38.5*	58.8*	42.6
Ky. 54-773	32.2	41.6	40.6	54.8*	42.3
Ky. 54-1032	28.4	44.8	37.4	46.4*	39.2
Ky. 54-489	29.4	47.0*	40.6*	38.0	38.8
Ky. 53-820	35.2	54.9*	28.5	30.2	37.2
Ky. 54-829	29.6	44.7	30.8	26.8	32.3
Ky. 53-352	33.9	27.0	30.1	28.0	29.8
Exp. Av.	34.9	46.0	34.6	38.0	38.4
L.S.D. .05	12.0	9.0	9.0	18.0	----
*Highest yielding group	37.2	45.9	37.6	40.8	----
(Recommended varieties are capitalized)					

SPRING OATS

The spring oat variety test was planted at Lexington on March 4. Early sowing is very important when producing spring oats. Crown rust reduced yields considerably in this test. The recommended varieties Andrew and Mo. 0-205 are tolerant to crown rust but not highly resistant. The variety Osage is susceptible to Victoria blight. The winter varieties Dubois, Forkeddeer, Atlantic, and Bronco are not satisfactory as spring sown varieties.

Variety	Period of Years Summary									
	1957 Bu/A.	Bu./A.	No. of Tests	Lbs./ Bu.	No. of Tests	May Date Headed	No. of Tests	Plant Height	No. of Tests	
ANDREW	45.8*	46.9	7	32.0	7	33.1	6	31.6	6	
Clintland	33.7	38.8	4	31.9	4	36.0	3	31.2	3	
Mo. 0-205	32.0	46.3	7	33.0	7	33.6	6	32.9	6	
Newton	31.2	----	-	----	-	----	-	----	-	
Cherokee	31.4	40.3	7	32.5	7	34.0	6	29.1	6	
Clinton 59	29.5	41.6	4	31.0	4	35.9	3	29.3	3	
Nemaha	26.6	37.1	7	32.0	7	34.3	6	29.6	6	
Dupree	25.9	41.8	7	31.0	7	33.4	6	30.1	6	
Columbia	24.0	44.3	7	32.6	7	32.2	6	32.2	6	
Kanota	17.8	40.4	7	31.8	7	33.5	6	30.9	6	
Osage	3.2	23.2	7	30.9	5	33.9	6	25.2	6	
Dubois $\frac{1}{1}$	3.6	----	-	----	-	----	-	----	-	
Forkeddeer $\frac{1}{1}$	6.0	----	-	----	-	----	-	----	-	
Atlantic $\frac{1}{1}$	13.7	----	-	----	-	----	-	----	-	
Bronco $\frac{1}{1}$	9.5	----	-	----	-	----	-	----	-	
Exp. Av.	30.0	----	-	----	-	----	-	----	-	
L.S.D. .05	8.8	----	-	----	-	----	-	----	-	
*Highest yielding group	37.0	----	-	----	-	----	-	----	-	

(Recommended varieties are capitalized)

PERIOD OF YEARS' DATA

The following tables summarize the data obtained during the last 7 seven years pertaining to the varieties given. Since the tests were conducted at different locations and in different years and all varieties were not included in all tests, direct comparisons between varieties are not wholly valid. However, after 8-10 tests the relative performance of a variety can be fairly well evaluated particularly in characteristics other than yield. The relative importance of the different characteristics may differ for an individual and, therefore, these data are useful in helping a grower determine which varieties are best for him.

Winter Oat Varieties. Agronomic data. Period of years.

Variety	Yield Bu/A.	No. of Tests	Test-wt. Lbs./ Bu.	No. of Tests	Lodg- ing %	No. of Tests	May Date Headed	No. of Tests	Plant Height Inches	No. of Tests
Wintok	54.5	11	35.8	11	42.6	11	15.8	9	32.1	11
Lee	52.2	11	36.0	10	39.6	11	17.7	9	35.0	11
Forkedeer	55.9	19	35.5	19	55.0	19	15.4	15	35.9	14
Fulwin	56.9	17	34.5	17	64.2	17	14.5	16	39.2	14
Coy	54.9	11	34.0	10	29.0	11	16.3	9	35.2	11
Atlantic	56.2	19	35.2	19	43.5	19	12.4	16	38.1	14
Cimmaron	50.9	11	34.1	11	76.6	13	10.1	9	29.2	11
LeConte	55.4	19	35.0	19	27.5	19	16.7	11	36.6	13
Bronco	63.0	15	34.2	15	30.8	16	18.2	11	36.3	11
Dubois	61.0	16	36.8	13	41.1	16	15.1	13	34.6	13

Winter Barley Varieties. Agronomic Data. Period of Years.

Variety	Yield Bu./A.	No. of Tests	Test-wt. Lb/Bu	No. of Tests	Lodging %	No. of Tests	Date Headed #/	No. of Tests	Plant Height Inches	No. of Tests
Ky. 1	46.7	19	48.5	18	39.8	19	37.3	16	38.1	13
Kenbar	50.3	19	46.5	18	19.8	19	29.8	16	33.3	11
Mo. B-475	49.4	19	47.2	18	36.2	18	32.3	16	36.1	13
Hudson	48.9	17	47.9	16	13.0	14	33.3	13	34.7	12
Dayton	50.5	13	45.6	12	23.4	11	30.3	8	31.7	9
Kenate	49.0	9	45.2	8	26.0	9	30.8	7	31.5	7

* / Days after March 31

Winter Wheat Varieties. Agronomic Data. Period of Years.

Variety	Yield Bu./A.	No. of Tests	Test-wt. Lb/Bu	No. of Tests	Lodging %	No. of Tests	Date Headed May	No. of Tests	Plant Height Inches	No. of Tests
Clarkan	31.9	19	59.6	19	22.0	5	18.4	17	44.3	15
Trumbull	29.2	13	59.0	13	18.2	4	20.3	9	41.8	11
Vigo	30.9	19	58.3	19	14.5	5	18.7	17	43.9	15
Knox	32.6	19	58.7	18	18.5	5	8.1	16	35.3	15
Lucas	34.1	11	59.6	11	10.0	4	22.3	7	40.4	9
Todd	36.1	17	57.1	17	12.5	5	18.4	13	43.2	14
Dual	34.3	14	56.9	15	7.0	5	18.8	12	38.9	12
Genesee	33.9	12	57.3	12	7.5	3	21.5	10	39.4	10
Racine	31.7	9	58.5	9	6.9	4	23.6	5	40.4	7
Vermillion	34.0	17	58.3	15	7.5	4	10.4	12	36.6	11
Triumph	27.8	8	59.3	8	30.0	3	8.0	7	34.5	5

3M-9-57