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# ROGERS

# Winter

# Barley

by

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EXPERIMENT STATION  
AND U.S.D.A.

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**Agricultural Experiment Station  
DIVISION OF AGRICULTURE  
Oklahoma A&M College, Stillwater  
and  
Crops Research Branch  
AGRICULTURAL RESEARCH SERVICE  
United States Department of Agriculture**

# ROGERS WINTER BARLEY

by

A. M. Schlehuber, Roy M. Oswalt, B. C. Curtis, and Lavoy I. Croy\*

A new winter barley variety, named "Rogers" after Oklahoma's Will Rogers, soon will be available to Oklahoma growers. **It is high yielding, stiff strawed, and mildew resistant; and has a high test weight.**

Rogers was developed in the small-grain breeding program conducted cooperatively by the Oklahoma Agricultural Experiment Station and the United States Department of Agriculture.

## Seed Availability

Breeder's seed of Rogers barley was released to Oklahoma Foundation Seed Stocks, Inc., in the fall of 1956 for foundation seed production under contract. Foundation seed harvested in 1957 will be available through Foundation Seed Stocks for production of certified seed for the 1958 harvest. Thus certified seed will be available for general farm planting in the fall of 1958.

## Origin and History

Rogers (C. I.<sup>1</sup> 9174) winter barley originated as a reselection from Oklahoma 1005 which previously was selected from Composite Cross III, C. I. 5530. Seed of this cross was received in September, 1930, from Dr. H. V. Harlan, now deceased, who at the time was Principal Agronomist in charge of barley investigations for the Division of Cereal Crops and Diseases. A description of the nature and composition of this composite cross which included 13 different parent varieties, mostly of winter type, is given by Johnston and Schlehuber.<sup>2</sup> The final selection of the strain which has been named Rogers was made at Stillwater in 1947 from a single head-row.

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<sup>2</sup>Johnston, T. H. and Schlehuber, A. M. 1951. Harbine, a new combine barley. Okla. Agri. Exp. Sta. Bul. B-357.

<sup>1</sup>C. I. refers to accession number of the Cereal Crops Section of the Crops Research Division.

Rogers has been grown in yield trials and other tests in Oklahoma since 1949 under the designation first as Oklahoma 1005 Sel. and later as C. I. 9174. In addition, Rogers has been tested the past several years in certain Regional Uniform Nurseries throughout the winter barley region of the United States.

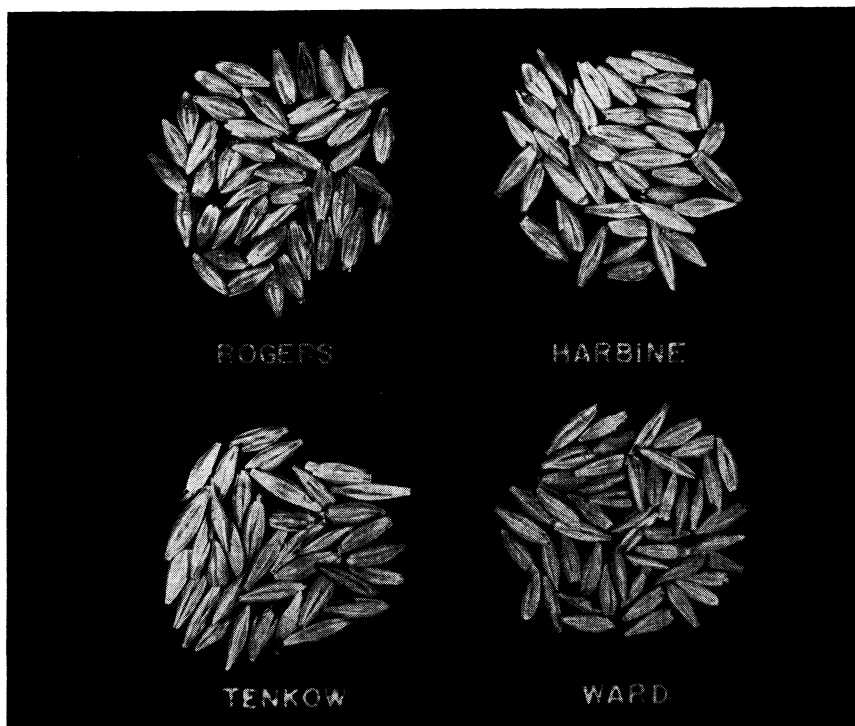


Fig. 1—Seed samples of the four winter barley varieties recommended for Oklahoma. Rogers has the highest test weight and Tenkow the lowest. Rogers seed, like Harbine, is short, plump, and smooth compared with long, slender, rough seed of Tenkow. Ward has the smallest seed.

## Description

Rogers is a 6-row strain with rough awns or beards. In this respect it is similar to Harbine C. I. 7524 which also originated from Composite Cross III, C. I. 5530. The heads or spikes of Rogers average slightly longer than those of Harbine, but both are slightly shorter than those of Tenkow and Ward, and are usually quite erect. This is especially true up to a few days prior to full maturity. At full maturity occasional nodding heads usually are present. These nodding heads do not represent mixtures, inasmuch as both erect and nodding heads are found on the same plant. Rogers tillers or stools rather heavily and in this respect is usually

superior to Harbine and Tenkow. The grain like that of Harbine threshes relatively free from awns.

## Yield of Grain

### Fall Seeding

Grain yields for fall-sown Rogers and three other recommended varieties of winter barley grown experimentally in Oklahoma for 65 station-years are shown in Table 1. The barley crop was a complete failure at Cherokee and Goodwell in 1950 and 1951; at Woodward in 1950; at Goodwell in 1952, and a near failure at Woodward in 1951. Crop failures were due to drought, low winter temperatures, and green-bug damage. Low yields were produced in 1954 and in 1955 due primarily to drought. Best **average** yields were produced in 1952 even though yields were extremely low at Goodwell. Highest individual yields were produced at Cherokee in 1952. In this test Rogers produced 71.5 bushels per acre compared to 68.9, 61.8, and 55.3 bushels, respectively, for Tenkow, Ward, and Harbine. High yields were also produced under irrigation at Goodwell in 1956. In this test Rogers produced 71.2 bushels compared to 65.7, 65.2, and 46.6 bushels, respectively, for Tenkow, Harbine, and Ward.

Since Rogers is essentially an improved Harbine, the average grain yield in Table 1 are compared to Harbine on a relative basis. As an average of 65 station-years, Rogers exceeded the yield of Harbine by 17.7 percent or 5.36 bushels. It is significant that Rogers produced the top yield at all locations for this period of testing.

### January-February Seeding

In a special date-of-seeding test in January and February Rogers has been compared with Harbine and Tenkow winter varieties and Flynn and Spartan spring varieties at Stillwater for three years, 1954-1956. Grain yields are shown in Table 2. Due to adverse seasons, primarily drought, all yields were low. However, the relative yields between varieties can be compared. In this comparison Rogers exceeded the average yield of Harbine by 4.14 bushels and Tenkow, Flynn, and Spartan by 6.38, 11.29, and 14.46 bushels, respectively. These data indicate

**Table 2.—Grain Yields of Rogers, Harbine, Tenkow, Flynn, and Spartan Sown at Different Dates, Stillwater, Oklahoma.**  
(Bushels per acre)

Variety	Seeding Date									
	Jan. 15 1955	Jan. 16 1956	Jan. 31 1955	Jan. 31 1956	Feb. 1 1954	Feb. 14 1956	Feb. 15 1954	Feb. 15 1955	March 1 1954	Average
Rogers	32.1	19.5	33.5	17.5	24.9	22.4	15.4	32.9	15.2	23.71
Harbine	23.0	17.9	27.6	15.3	20.4	20.6	11.6	34.6	5.1	19.57
Tenkow	25.6	13.0	25.8	13.8	15.1	20.6	10.2	29.3	2.6	17.33
Flynn	12.2	14.3	6.2	12.9	13.9	15.9	12.0	15.1	9.3	12.42
Spartan	3.8	10.7	3.6	12.0	9.1	14.2	11.0	10.1	8.7	9.25

**Table 1.—Grain Yield of Rogers, Harbine, Tenkow, and Ward in Oklahoma for All or a Part of 1950-1956.<sup>1</sup>**  
(Bushels per acre)

Variety	C.I. No.	Experiment Station Variety Test								Oklahoma State-wide Test						Av. 65 station-years	% of Harbine
		Stillwater 1950-1956		Woodward 1952-1956		Goodwell 1952-1956		Cherokee 1952-1956		1952-1956							
		Av.	Rank	Av.	Rank	Av.	Rank	Av.	Rank	Northwestern		Southwestern		Eastern			
Rogers	9174	36.1	1	27.9	1	36.5	1	38.9	1	32.3	1	34.2	1	39.4	1	35.70	117.7
Harbine	7524	31.8	2	24.4	2	30.1	2	31.1	4	27.3	4	30.2	2	32.5	2	30.34	100.0
Tenkow	646	30.0	3	22.3	4	28.6	3	38.7	2	27.7	3	25.0	4	29.4	4	28.15	92.8
Ward	6007	29.7	4	23.6	3	26.7	4	37.5	3	30.5	2	30.2	2	32.3	3	30.55	100.7

<sup>1</sup>Rogers has been in yield trials since 1949. However, in 1949 it was tested only at Stillwater and Harbine was not included in the test; hence, the 1949 data are excluded.

<sup>6</sup> Station-years.

<sup>19</sup> Station-years.

<sup>18</sup> Station-years.

**Table 3.—Test Weights of Rogers, Harbine, Tenkow, and Ward, in Oklahoma, 1950-1956.**  
(Pounds per bushel)

Variety	Experiment Station Variety Test								Oklahoma State-wide Test						Av. 64 Sta. Yrs.	+ or - Harbine
	Stillwater 1950-1956		Woodward 1952-1956		Goodwell 1953-1956		Cherokee 1953-1956		1952-1956							
	Av.	Rank	Av.	Rank	Av.	Rank	Av.	Rank	Northwestern		Southwestern		Eastern			
Rogers	48.3	1	46.3	1	47.0	1	45.5	1	46.6	1	46.5	1	47.6	1	47.14	+2.39
Harbine	44.6	4	43.8	3	45.2	2	42.9	3	46.5	2	45.1	2	44.6	2	44.75	0.00
Tenkow	46.2	2	43.7	4	42.2	4	42.7	4	44.4	4	43.9	4	44.6	2	42.79	-1.96
Ward	45.0	3	44.3	2	43.5	3	43.3	2	45.4	3	44.0	3	44.3	4	44.25	-0.50

that winter barley varieties produce better yields from spring (January-February) seeding than varieties of spring barley and that Rogers is the best of the winter types tested.

### Test Weights

Comparative test weights in pounds per bushel of Rogers, Harbine, Tenkow, and Ward grown in Oklahoma for 64 station-years are summarized in Table 3. Just as in grain yield, Rogers ranks first in the overall average and also ranks first at every location. The average test weight of Rogers in these tests was 47.14 pounds compared to 44.75 pounds for Harbine, a difference of 2.39 pounds.

### Seed Size and Shape

Test weights in barley is an important factor in determining market value. However, when barley is sold for seeding purposes, test weights are frequently not known or considered and more importance is attached to seed size. It is the opinion of the authors that far too much importance is attached to large seed size both from the standpoint of barley for seed or for feed. In Table 4 data are presented on average kernel weights of Rogers, Harbine, Tenkow, and Ward grown in Oklahoma. Tenkow has a significantly higher seed weight than the other three varieties, but has the lowest average test weight (Table 3). Rogers, Harbine, and Ward do not differ significantly from each other in seed weight but, as shown in Table 3, Rogers exceeds the test weights of the other three varieties.

An analysis of kernel size assortment of the four barley varieties is presented in Table 5. Three screen sizes, 7/64, 6/64, and 5/64 inch, were used in making the determinations. The amount of seed remaining on the 7/64 screen ranged from only 0.51 percent for Ward to 4.22 percent for Tenkow. Rogers and Harbine were intermediate. However, only Ward was significantly different from Tenkow. On the 6/64 inch screen, Ward was significantly lower than the other three varieties. The highest amount of seed remained on the 5/64 inch screen with a range of 52.26 percent for Ward to 61.68 percent for Harbine. There was no significant difference between the four varieties on the 5/64 inch screen. The amount of seed passing through a 5/64 inch screen is shown in the bottom portion of Table 5. Ward with 41.99 percent was significantly higher than the other three varieties. These data show that while Tenkow has a significantly higher average seed weight than the other three varieties (Table 4), it does not differ significantly from Rogers and Harbine in the screening tests. There is poor agreement between kernel weight, test weight, and kernel size assortment. This discrepancy is probably due to differences in kernel shape. Rogers has a short, plump, smooth kernel type; whereas, Tenkow has a long, somewhat flat, rough seed. (See picture, page 4). The length of Tenkow barley seed is somewhat misleading inasmuch as a portion of this length consists of unfilled hull. Rogers,

**Table 4.—Kernel weights of Rogers, Harbine, Tenkow, and Ward grown in Oklahoma for seven-station years, 1954-1956.**  
(milligrams)

Variety	C.I.	1954		1955		1956			Average
		Stillwater	Stillwater	Woodward	Stillwater	Woodward	Cherokee	Goodwell*	
Rogers	9174	25.1**	25.1	30.8	25.2	24.3	19.9	31.8	26.0
Harbine	7524	25.4	23.1	28.7	24.3	25.0	20.1	29.7	25.2
Tenkow	646	34.0	30.8	37.2	26.8	31.2	22.3	33.7	30.9
Ward	6007	25.5	21.3	30.2	19.4	26.4	15.8	25.0	23.4

\*Irrigated. \*\*Each of these values represents the average of 3 sub-samples.

Multiple range, .05 level.

Means underlined by a common line are not significantly different:

Ward	Harbine	Rogers	Tenkow
23.4	25.2	26.0	<u>30.9</u>



on the other hand, has a well-filled hull and a plump, smooth seed which probably accounts for its higher test weight. Accordingly, Rogers should be classified as possessing high market value.

### Winterhardiness

In average winterhardiness Rogers has exceeded Harbine between 20 to 30 percent. In the Uniform Regional Barley Winterhardiness Nurs-

**Table 5.—Analysis of kernel size assortment of Rogers, Harbine, Tenkow, and Ward grown in Oklahoma for seven station-years, 1954-1956.**

Variety	C.I.	1954		1955		1956			Average
		Still-water	Still-water	Wood-ward	Still-water	Wood-ward	Cher-okee	Good-well*	
(On 7/64 screen-percent)									
Rogers	9174	5.91	2.86	3.92	1.92	1.12	0.55	2.46	2.68
Harbine	7154	2.33	0.75	1.18	2.46	0.81	0.55	4.36	1.78
Tenkow	646	7.20	4.29	5.79	3.54	1.95	1.06	5.73	4.22
Ward	6007	0.18	0.71	0.49	0.00	1.51	0.23	0.47	0.51
(On 6/64 screen-percent)									
Rogers	9174	25.21	19.75	27.20	16.21	11.16	0.98	43.43	20.56
Harbine	7154	26.39	13.50	27.29	14.01	11.66	3.42	51.08	21.05
Tenkow	646	44.53	33.25	37.46	3.84	19.91	1.59	40.47	25.86
Ward	6007	5.00	6.52	5.74	0.13	7.78	0.85	10.69	5.24
(On 5/64 screen-percent)									
Rogers	9174	53.87	56.84	53.34	59.22	67.95	51.31	46.81	55.62
Harbine	7154	59.94	64.49	60.48	68.47	72.01	66.28	40.12	61.68
Tenkow	646	43.20	55.24	47.55	62.54	64.44	49.44	45.90	52.62
Ward	6007	69.03	62.24	62.77	24.24	68.50	14.85	64.16	52.26
(Through 5/64 screen-percent)									
Rogers	9174	15.00	20.55	15.54	22.65	19.78	47.16	7.29	21.14
Harbine	7154	11.34	21.27	11.09	15.07	15.52	29.75	4.44	15.50
Tenkow	646	5.07	7.22	9.20	30.09	14.73	47.91	7.90	17.45
Ward	6007	25.79	30.52	31.01	75.63	22.22	84.07	24.68	41.99

\*Irrigated.

Multiple Range, .05 level.

On 7/64				On 6/64			
Ward	Harbine	Rogers	Tenkow	Ward	Rogers	Harbine	Tenkow
0.51	1.78	2.68	4.22	5.24	20.56	21.05	25.86
On 5/64				Through 5/64			
Ward	Tenkow	Rogers	Harbine	Harbine	Tenkow	Rogers	Ward
52.26	52.62	55.62	61.68	15.50	17.45	21.14	41.99

eries<sup>3</sup> Rogers was 19.0 percent better than the Tennessee Winter Barley check for 152 station-years while Harbine was 1.5 percent less hardy than the check, a difference of 20.5 percent in favor of Rogers. In Oklahoma tests, Rogers has shown even more superiority over Harbine based on limited survival data at Woodward and Cherokee in the 4-year period, 1953-1956, as shown in Table 6. Rogers had an average survival of 48 percent compared to 36 percent for Harbine. In percentage of Tenkow, a well-known variety in Oklahoma, Rogers had 10 percent higher winter survival and Harbine had 19 percent lower survival than Tenkow. Of the four winter barley varieties recommended for Oklahoma, Ward is the most winterhardy.

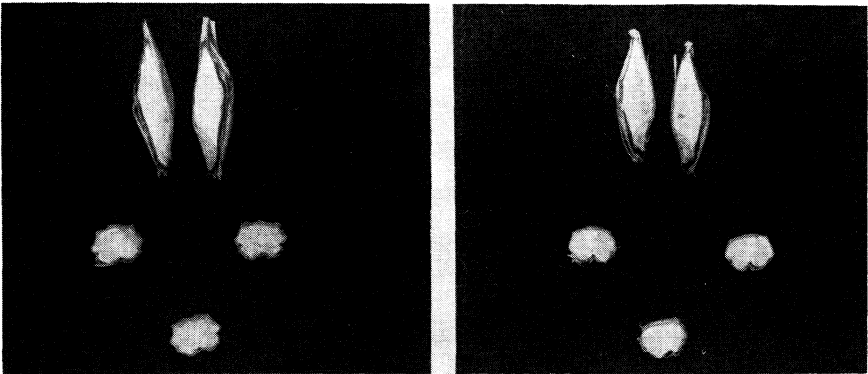


Fig. 2—Longitudinal and cross sectional views of Rogers and Tenkow winter barley kernels showing the smooth, plump condition of Rogers compared with the rough, or ribbed, and slender appearance of Tenkow. Note the unfilled hull of Tenkow which contributes to the low test weight of this variety.

## Other Characteristics

**Lodging.**—In straw stiffness Rogers is equal to or superior to Harbine, presently by far the stiffest straw variety grown commercially in Oklahoma. As an example, of 19 semi-hardy varieties grown in the Uniform Regional Barley Test<sup>4</sup> in 1955 Rogers ranked first in resistance to

<sup>3</sup>With permission of the individuals supervising the tests, the regional data were taken from the mimeographed annual reports of the Uniform Winterhardness nurseries (1937-1956) compiled by Dr. G. A. Wiebe and David A. Reid, Crops Research Division, ARS, USDA.

<sup>4</sup>With permission of the individuals supervising the tests, the regional data were taken from the mimeographed annual reports of the Uniform Winter Barley Nurseries, semi-hardy varieties (1955 and 1956) compiled by David A. Reid, Crops Research Division, ARS, USDA.

lodging with 21.3 percent lodged plants compared to 24.0 percent for Harbine. The weakest strawed variety in this test lodged 41.8 percent. Again in 1956 Rogers ranked first in lodging resistance in the same regional test. This straw stiffness makes Rogers well adapted to combine harvesting.

**Maturity.**—Under Oklahoma conditions Rogers is a medium to mid-late maturing variety. As shown in Table 7 it headed an average of 3

**Table 6.—Winter Survival for 4 varieties of winter barley grown in Oklahoma, 1953-1956.**

Variety	C.I. No.	Location				Av. 1953-56	% of Tenkow for Yrs. Grown
		Woodward	Cherokee	Woodward	Woodward		
		Year					
		1953	1954	1955	1956		
		Av. Survival		%			
Rogers	9174	20	60	13	100	48	110
Harbine	7524	25	17	5	95	36	81
Tenkow	646	30	53	5	88	44	100
Ward	6007	50	94	23	100	67	152

days later and ripened 2 days later than Harbine. Tenkow, a late variety, headed on the average 5 days later and ripened 2 days later than Rogers.

**Height.**—In height Rogers is equal to Harbine. As an average of 13 station-years of testing in Oklahoma Rogers was 24 inches tall, compared to 23 for Harbine and Tenkow. (Table 7).

**Disease Reaction.**—Rogers, like Harbine, has resistance to some of the races of "nuda" loose smut (*Ustilago nuda*) present in Oklahoma. However, from a practical control standpoint seed lots which become infected with this disease should be replaced with smut-free seed. In reaction to mildew, a disease often serious in southern and eastern Oklahoma as well as in nearly all southeastern States, Rogers is highly resistant, compared to high susceptibility of the other varieties presently recommended. Rogers also carries considerable resistance to scald and to leaf rust.

Table 7.—Average heading and ripening dates, and height for Rogers, Harbine, Tenkow, and Ward grown in Oklahoma for all or a part of the period 1951-1956.

Variety	Date Headed				Date Ripe				Height (Inches)			
	Stillwater 1951-1956	Woodward 1952 1953 1956	Goodwell 1953-1956	Av.	Stillwater 1951-1956	Woodward 1952 1953 1956	Goodwell 1953-1956	Av.	Stillwater 1951-1956	Woodward 1952 1953 1956	Goodwell 1953-1956	Av.
Rogers	April 29	May 9	May 10	May 5	May 30	June 6	June 13	June 5	24	23	24	24
Harbine	April 28	May 7	May 6	May 2	May 27	June 4	June 12	June 3	23	23	22	23
Tenkow	May 3	May 10	May 15	May 10	June 1	June 8	June 13	June 7	24	23	22	23
Ward	May 1	May 8	May 6	May 5	May 30	June 5	June 12	June 4	24	24	23	24