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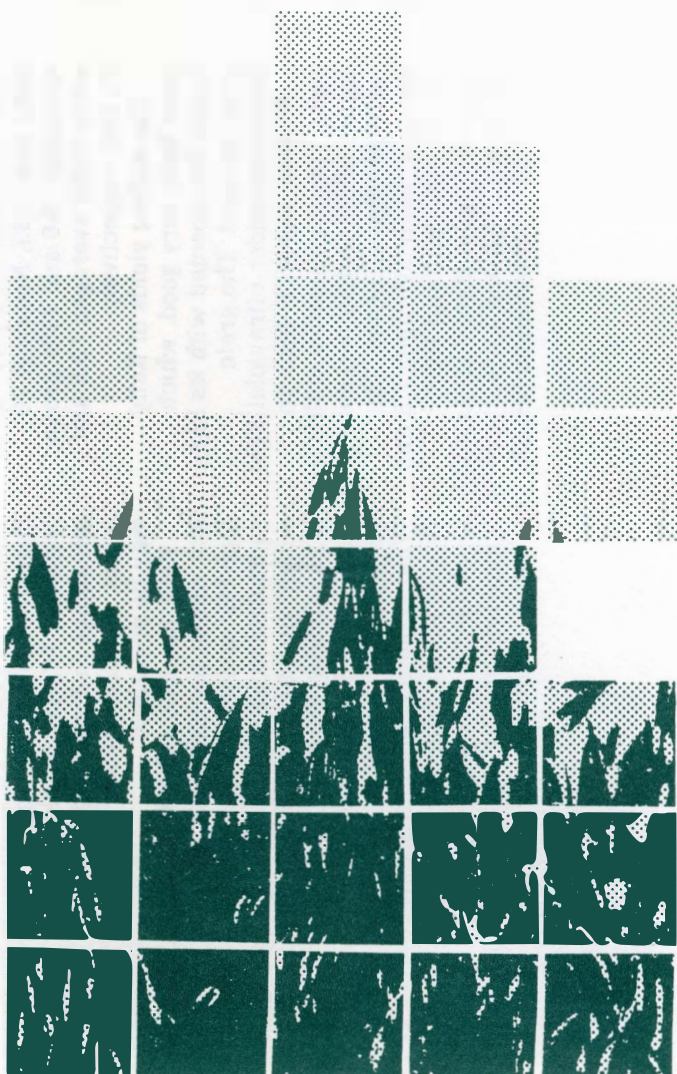
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A new oat: Kelly

Agricultural Experiment Station
South Dakota State University
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A new oat: Kelly

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Kelly is a spring oat developed by the South Dakota Agricultural Experiment Station and released February 1984.

Because of its white hull and high test weight, it is an attractive oat for the racehorse and pleasure horse market. Kelly combines excellent grain quality with moderate height and earliness. Performance in South Dakota has been good.

Kelly was named after Clarence "Kelly" Olson of Brookings, a technician on the SDSU small grain project for many years.

Origin

Kelly is a selection from a Dal x Nodaway 70 cross made in 1972. Dal was one of the first oat releases having high protein grain. Nodaway 70 is an early oat that has been popular, largely because of its very plump, white grain.

The first selection was a third-generation line, SD 743358, chosen for leaf rust resistance in 1974. It was derived from a single second-generation plant. SD 743358 was tested as a bulk for yield and grain quality until the sixth generation, when an early maturing panicle was selected. This sixth-generation selection was designated SD 743358-06 and used in state and regional testing.

Stem rust testing was done through the courtesy of Dr. Paul Rothman at the USDA Cereal Rust Laboratory in St. Paul, MN. Tests for resistance to specific races of leaf rust were run by Dr. Marr Simmons, USDA, at Ames, IA.

The South Dakota Crop Performance Testing Project grew Kelly at all testing locations from 1981 through 1984, inclusive. It was also grown in 1982 and 1983 in the Uniform Early Oat Performance Nursery, which is a regional test coordinated by the USDA.

Characteristics

Kelly is an early oat that heads about the same time as Preston and a day later than Nodaway 70. Plants are tall, equal in height to Nodaway 70 and 3 inches taller than Lang. Straw strength in Kelly is noticeably greater than that of Nodaway 70.

Kernels of Kelly are white, intermediate in length, and plump in appearance. In South Dakota trials, the test weight of Kelly has averaged 37.6 lb.

Hulls are thin, as shown by the high percent groats. The only variety with a higher percent groat has been Nodaway 70. In 1982 and 1983, Nodaway 70 averaged 75.6 and 71% groats, while Kelly averaged 73.5 and 71.4%, respectively.

The milling yields of Kelly have been very good, which would be expected with its high groat percent. The grain fluoresces under ultraviolet light.

Protein content is high. In 1983, the only varieties with a higher grain protein percent were Preston and Otee. The groats of Kelly averaged 7.5 and 6.7% oil in 1982 and 1983, respectively, in state-wide trials. These were 0.8 and 1.0% above Nodaway 70 in the same tests.

Disease resistance

Kelly is moderately susceptible in the seedling stage to prevalent leaf rust races. Under field conditions, it appears moderately resistant, generally being equal to Preston and much more resistant than Nodaway 70.

In 1982 through 1984 at Brookings, leaf rust readings were 22, 50, and 85% for Nodaway 70 but only 17, 10, and 15% for Kelly. Seedling tests show Kelly to be susceptible to leaf rust races 264B, Pc 38, 47, and 53.

Kelly has the Pg₂ and Pg₄ genes for stem rust resistance. These are the same genes most oat varieties possess. It is considered moderate in stem rust resistance.

Kelly's resistance to smut is very good. It has been resistant to all collections to which it has been tested. Kelly is susceptible to barley yellow dwarf virus (BYD).

Performance data

Kelly has an excellent performance record, both state-wide and regionally. Over the past 3 years (Tables 1 and 2) Kelly has outyielded Nodaway 70 at the higher rainfall test locations (Brookings, Beresford, and Watertown). At the more arid test locations, Kelly yields have been variable when compared to Nodaway 70, being slightly lower, equal to, or higher than Nodaway 70.

It appears that Kelly, compared to Burnett and Nodaway 70, has a yield advantage in higher rainfall areas, especially when leaf rust may be prevalent.

Kelly has also exhibited a high test weight potential. It has a high test weight stability when compared to other high test weight varieties. Generally, Kelly is equal to or higher in test weight than Burnett and Nodaway 70 (Tables 1 and 2). What is more important is that its test weight from one location to another is very stable and fluctuates very little, compared to other varieties.

Table 1. Three-year average yield and two-year test weight comparisons for five eastern South Dakota locations.

Variety	Brookings		Watertown		Beresford		Highmore		Selby	
	bu	tw	bu	tw	bu	tw	bu	tw	bu	tw
Kelly	86	36.0	90	37.4	60	37.4	78	38.4	86	38.2
Nodaway 70	66	32.4	81	37.6	53	36.6	81	38.3	87	37.1
Burnett	63	32.0	103	36.9	62	35.7	83	38.4	100	37.6
Moore	94	35.3	106	36.1	73	35.4	87	37.1	105	35.4

Table 2. Three-year average yield and two-year test weight comparisons for four western South Dakota locations.

Variety	Wall		Bison		Martin		Ralph	
	bu	tw	bu	tw	bu	tw	bu	tw
Kelly	82	37.4	48	38.6	52	36.3	45	38.3
Nodaway 70	74	36.6	53	39.0	40	36.5	46	39.8
Burnett	81	34.4	57	35.6	48	35.1	55	37.9
Moore	85	37.8	63	38.8	43	37.1	57	36.7

Table 4. Agronomic characteristics from 1982-83 Early Standard Variety Oat Trials.

Variety	Yield per acre (bu)	Test weight (lb/bu)	Groat protein (%)	Heading date in June	Crown rust resistance	Plant height (in)
	(21)*	(21)	(18)		(1)	(18)
Kelly	68.7	36.5	18.6	12	Good	33
Nodaway 70	67.9	36.2	17.2	13	Poor	32
Preston	69.6	35.2	21.2	12	Good	32

*Number of locations averaged.

Table 3. Three-year statewide yield (1983-85) and two-year test weight and protein (1984-85) comparisons from nine locations.

Variety	Yield (bu/A)	TW (lb/bu)	Groat protein (%)
Kelly	76	37.6	18.0
Nodaway 70	69	37.5	15.7
Burnett	79	36.7	15.3
Moore	84	35.5	15.9