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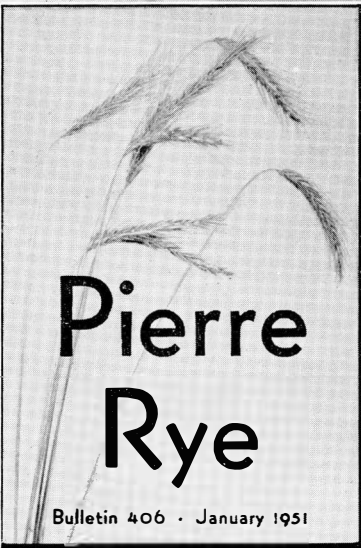
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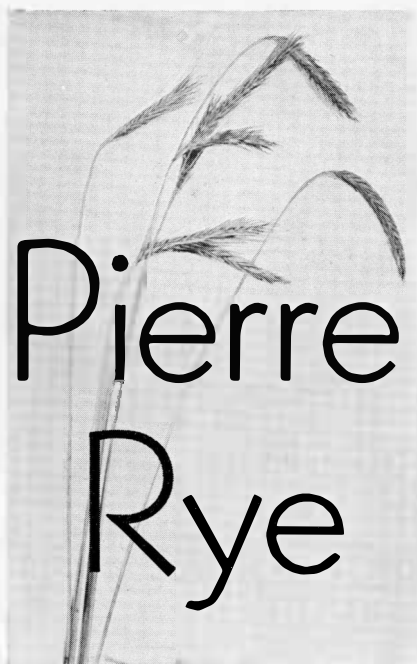


Pierre Rye

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AGRONOMY DEPARTMENT
Agricultural Experiment Station
SOUTH DAKOTA STATE COLLEGE
BROOKINGS, S. DAK.



By J. E. GRAFIUS¹

SOUTH DAKOTA grows a larger acreage of rye than any other state. Several factors are responsible for this. First, the farmers want a fall-sown crop, and in many areas of the state winter wheat is not hardy enough. Second, rye is one of the surest producing crops under South Dakota conditions. It is an excellent weed "fighter," makes good pasture and also functions as a winter cover crop. Although rye can be grown on soils of low fertility, it is not a "poor land" crop, and in order to produce a profitable crop, it should be grown on good soil in a well-managed rotation. Where the soil fertility is high, yields of 30 or 40 bushels to the acre are not uncommon.

Rye differs from other small grains

in one important aspect. It is cross-pollinated. Therefore, special care needs to be taken to keep a variety or strain isolated to prevent pollination by other rye. One of the main reasons for the release of Pierre was to make available a winter-hardy variety of known origin.

Other Adapted Varieties

One of the first adapted varieties to be grown in this area was Dakold which originated at the North Dakota Agricultural Experiment Station in 1902. Dakold was evolved by a process of natural selection. Another variety, Advance, was developed by selection from "Dean" (a variety similar to Swedish) at the substation at Highmore, South Dakota, and was released in 1911. Both Dakold and Advance have been lost through contamination with other varieties.

In 1945, a variety called "Emerald" was released by the Minnesota Agricultural Experiment Station. This variety performed well in some areas of South Dakota, but occasionally showed appreciable winter-killing in the northern part of this state.

History

Pierre rye is the result of a composite of 16 inbred lines isolated from a population of Dakold and Swedish origin. The inbred lines making up the new variety were chosen on the basis of superior winterhardiness and top-cross yield performance.² This is a synthetic variety in that it is made up of inbred lines which were then allowed to cross-pollinate. The original hybrid vigor has been lost, but winter-

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²Top cross is a term invented by the corn breeders to describe a progeny test of an inbred line crossed with an open-pollinated variety.

Table 1. Winter Survival Percentages for Pierre and Two Other Varieties at Three Locations in South Dakota

	1946	1947	1948	1949	1950
	%	%	%	%	%
Brookings					
Pierre	100	90	100	100	100
Dakold	100	80	95	100	100
Emerald	100	70	95	100	100
Highmore					
Pierre		95	90		100
Dakold		90	75		100
Emerald		90	60		100
Eureka					
Pierre		80	50	95	100
Dakold		55	15	95	95
Emerald		70	5	90	90

¹Did not emerge due to fall drouth.

Table 2. Yield Comparisons in Bushels per Acre of Pierre With Two Other Varieties at Three Locations in South Dakota

Variety	Brookings 1946-50	Highmore 1947-50	Eureka 1947-50
Pierre	41.7 ¹	18.1 ²	17.3
Dakold	39.7	17.6	11.4
Emerald	41.9	17.2	14.1
Least significant difference	1.7	1.6	2.1

¹Four-year average because of hail damage in 1947.

²Three-year average due to fall drouth in 1949.

hardiness has been retained. Pierre is expected to outyield the better strains of common rye only when winter-killing is a factor.

Winterhardiness and Yield

As an indication of relative winterhardiness, Pierre is compared with Dakold and Emerald in Table 1. It should be mentioned that the Dakold used in these comparisons is of unknown origin, since the original strain has become mixed with other rye varieties through cross-pollination.

Average yields are given in Table 2. Since yielding ability cannot be measured with absolute accuracy, small differences in yield are not important. Unless the difference in yield exceeds the "least significant difference" given in the table, little emphasis should be placed on the superiority in yield of one variety over the other.

The stability of yield given in Table 3 shows how Pierre performed in respect to Dakold. A plus mark indicates a significantly higher yield in a given year. It will be noted that at Eureka, where winterhardiness is very important, Pierre exceeded the so-called Dakold strain, one of the most winter-hardy strains, by a significant difference for the four years for which data are available.

In addition to having superior winterhardiness, Pierre has a high test weight, exceeding the better of the two other varieties by an average of 1½ pounds per bushel.

Availability of Seed

Over 4,000 bushels of Pierre rye were released by the County Crop Improvement Associations in the fall of 1950. Certified seed will be distributed by these associations in July or August of 1951.

Table 3. The Stability of Yield of Pierre and Emerald in Respect to Dakold

Station and Variety	1946	1947	1948	1949	1950	Av. ⁴
Brookings						
Pierre	+ ¹	■	+	0	0	+
Dakold	0	■	0	0	0	0
Emerald	0	■	+	0	0	+
Highmore						
Pierre	0		0	■	0	0
Dakold	0		0	■	0	0
Emerald	0		0	■	0	0
Eureka						
Pierre	+		+	+	+	+
Dakold	0		0	0	0	0
Emerald	+		0	0	0	+

¹0 = no statistically significant increase over Dakold; + = a significant increase; — = a significant decrease.

²Destroyed by hail.

³Failed to emerge in fall due to drouth.

⁴From averages in Table 2.