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Eureka!



Agricultural Experiment Station
South Dakota State University
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Eureka!

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Eureka (C.I. 17738) is a hard red spring wheat variety developed by the South Dakota Agricultural Experiment Station and released on January 1, 1978. Designated SD 2185 while being tested, Eureka combines high yield with good quality and exhibits resistance to stem rust and leaf rust. With these characteristics, Eureka provides a good alternative for producers who prefer standard height, awnless varieties.

Seed increased by the Foundation Seed Stock Division, SDSU, was released to seed growers (Crop Improvement Association) for 1978 planting. Registered and Certified seed will be available for 1979 planting. Plant Variety Protection has been applied for, and Eureka can only be sold by variety name, as a class of certified seed.

Origin

Eureka is a F₅-derived selection from the cross, ERA/3/CORRE CAMINO/ /CIANO 67/SONORA 64. The cross was made in 1970 by CIMMYT (International Maize and Wheat Improvement Center) in Mexico. F₃ seed selected by Dr. R. W. Pylman, Jr. was grown in Brookings in 1972. Two generations per year were grown

during the selection and increase phases until 1976.

Eureka has been tested in the breeders' yield trials for 5 years and several locations in a total of 33 tests. The Crop Performance Testing Project evaluated the variety at eight locations in 1975, 1976, 1977, and 1978. Eureka was entered in the Uniform Regional Spring Wheat Yield Nursery in 1977 and grown at 18 locations throughout the northern spring wheat area of the U.S. and Canada. It was evaluated in Crop Quality Council tests at two locations in 1977.

Description, agronomic characteristics

Eureka is a standard height, awnleted variety of medium maturity. It heads about the same time as Waldron. It is one inch taller than Waldron. The leaf blades and sheaths are a dark bluish-green color at heading. The stems and head are white when mature. Eureka contains a small percentage (less than 0.1%) of short, awned plants. Seed size is large with test weights similar to Waldron. Stem rust resistance is good, similar to other adapted varieties. Leaf rust resistance is better than Chris, Era and Waldron. Eureka does not have

Table 1. Performance data from Standard Variety Spring Wheat Trials, 1975-1978.

| | Brookings | Water- town | Beres- ford* | Grain yield | | | | | | Percent of Waldron | Test weight |
|---------|-----------|----------------|-----------------|---------------|---------------|-------|-------|-----------------|--------------|-----------------------|----------------|
| | | | | High- more | Quinn Wall | Bison | Selhy | Bath Groton* | Ave- rage | | |
| | | | | | | | | | | | lb/hu |
| | | | | | | | | | | | hushels/acre |
| Eureka | 27.5 | 34.3 | 22.6 | 19.1 | 24.9 | 28.9 | 29.0 | 25.5 | 26.6 | 102 | 57 |
| Protor | 25.9 | 34.4 | 21.4 | 17.6 | 27.9 | 26.2 | 28.9 | 28.0 | 26.4 | 101 | 58 |
| Waldron | 24.8 | 36.0 | 22.7 | 19.2 | 25.2 | 26.3 | 29.2 | 23.1 | 26.0 | 100 | 55 |
| Era | 27.1 | 33.2 | 22.0 | 16.9 | 26.3 | 29.2 | 28.0 | 23.4 | 26.0 | 100 | 57 |
| Olaf | 27.7 | 34.5 | 23.2 | 20.1 | 24.2 | 25.7 | 27.2 | 22.6 | 25.8 | 99 | 57 |
| WS 1809 | 25.7 | 32.5 | 23.7 | 18.4 | 26.9 | 24.9 | 27.0 | 24.4 | 25.5 | 98 | 57 |
| Ellar | 24.5 | 33.2 | 20.5 | 19.2 | 25.5 | 27.7 | 27.2 | 25.0 | 25.5 | 98 | 56 |
| Fortuna | 23.5 | 31.3 | 21.3 | 20.0 | 25.7 | 25.5 | 25.7 | 26.1 | 25.0 | 96 | 58 |
| Kitt | 25.8 | 31.4 | 22.1 | 15.3 | 20.4 | 23.8 | 24.0 | 18.4 | 22.8 | 88 | 55 |
| Chris | 23.5 | 26.8 | 18.4 | 16.0 | 21.1 | 21.5 | 24.0 | 17.8 | 21.3 | 82 | 57 |

* 3-year data

the head sterility often observed in Waldron. This sterility has been associated with the occasional widespread ergot problem found in Waldron.

Performance data

In the Standard Variety Trials, Eureka exceeded or equalled the grain yield of all 'Recommended' or 'Acceptable' varieties (Table 1). Eureka outperformed Waldron by 0.6 bu/A, Ellar by 1.1 bu/A and

Chris by 5.3 bu/A. In the 1977 Uniform Regional Nursery, Eureka yielded 1.3 bu/A more than Waldron and 2.7 bu/A more than Chris (Table 2).

The yield response curves indicate that Eureka will yield slightly better than Waldron at locations with yields of 20 bu/A or more (Fig 1). Figure 2 indicates that Eureka will yield better than WS1809 at all yield levels and better than Era at locations having less than 22 bu/A grain yield.

Table 2. Uniform Regional Hard Red Spring Wheat Nursery, 1977.

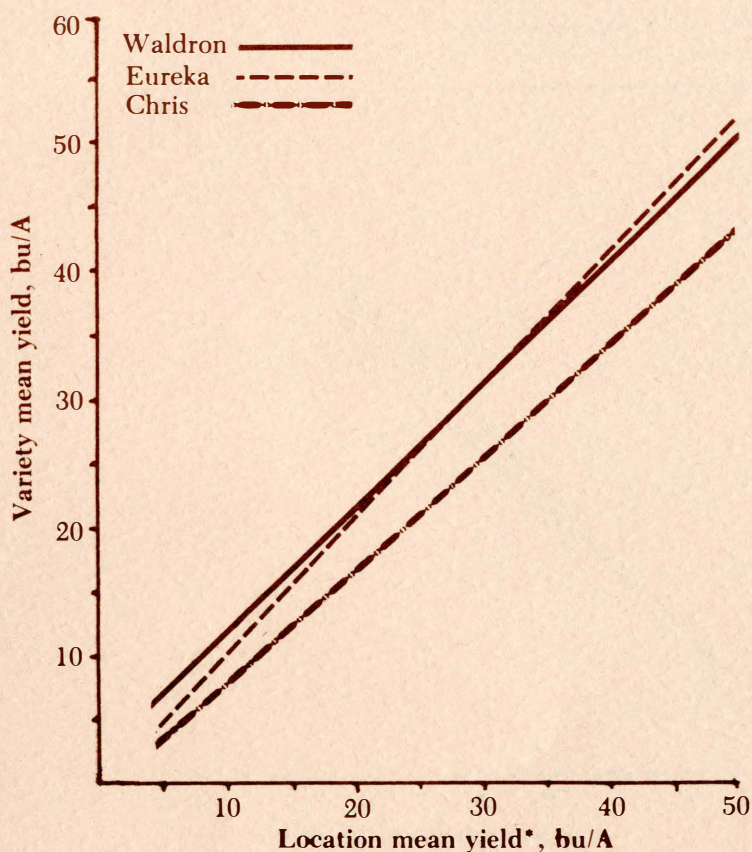
| | Yield (17) ¹ | Test weight (17) | Height (17) | Headed (16) | Ripe (2) | Lodging (10) | Leaf spotting diseases (5) | Stem rust (4) | Leaf rust (4) |
|---------|----------------------------|------------------------|----------------|----------------|-------------|------------------|-------------------------------------|---------------------|---------------------|
| | bu/A | lb/hu | inches | days | days | 1-9 ² | 1-9 ³ | CI ⁴ | CI |
| Era | 51.6 | 59.8 | 27 | 65 | 91 | 1.7 | 2 | 0.5 | 1.5 |
| Angus | 45.8 | 60.4 | 27 | 63 | 92 | 2.0 | 2 | 0.5 | 0.5 |
| Eureka | 44.9 | 59.1 | 32 | 62 | 85 | 2.3 | 4 | 0.5 | 1.3 |
| Waldron | 43.6 | 58.5 | 31 | 61 | 86 | 1.9 | 4 | 0.1 | 5.2 |
| Coteau | 43.5 | 59.3 | 32 | 64 | 91 | 2.7 | 1 | 1.0 | 1.0 |
| Chris | 42.2 | 59.1 | 33 | 63 | 90 | 4.2 | 3 | 0.0 | 1.5 |
| Marquis | 35.7 | 58.4 | 34 | 64 | 89 | 3.8 | 4 | 11.3 | 34.5 |

¹ Number of stations included

² 1 = erect; 9 = completely lodged

³ 1 = no infection; 9 = severe infection

⁴ Coefficient of Infection; 0 = no infection

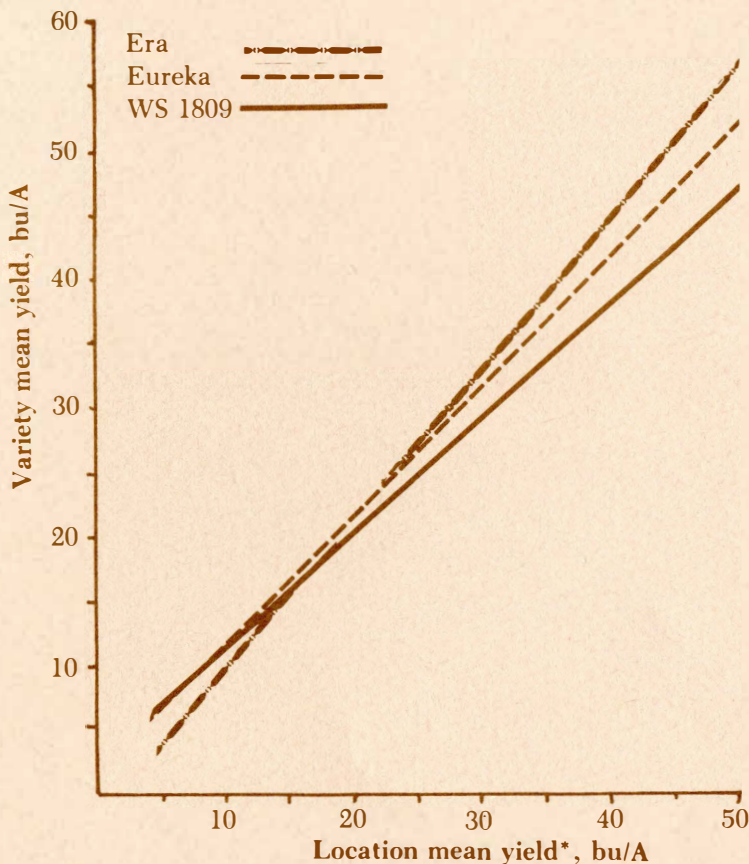


* Average yield of all varieties evaluated at a location within a given year.

Figure 1. Yield response curve from the South Dakota Standard Variety Spring Wheat Yield Nursery, 1975-1977.

Table 3. Protein, milling, and breadmaking quality.

| | Grain protein | Flour protein | Flour yield | Ash | Absorption | Mix time | Loaf volume |
|--|---------------|---------------|-------------|------|------------|----------|-------------|
| | % | % | % | % | % | min. | cc |
| 1977 Standard Variety Trials - 8 locations | | | | | | | |
| Eureka | 16.2 | 15.1 | 63.6 | 0.49 | 65.1 | 4.9 | 198 |
| Waldron | 16.4 | 15.8 | 64.6 | 0.46 | 65.5 | 4.4 | 196 |
| 1977 Breeders' yield trials - 4 locations | | | | | | | |
| Eureka | 16.1 | 15.4 | 63.6 | 0.42 | 62.8 | 5.1 | 202 |
| Waldron | 15.8 | 15.1 | 64.6 | 0.53 | 63.9 | 4.1 | 201 |
| 1977 Crop Quality Council tests - 2 locations | | | | | | | |
| Eureka | 15.1 | 15.0 | 70.6 | 0.41 | 65.2 | — | — |
| Waldron | 15.7 | 14.8 | 71.5 | 0.43 | 65.6 | — | — |



*Average yield of all varieties evaluated at a location within a given year.

Figure 2. Yield response curve from the South Dakota Standard Variety Spring Wheat Yield Nursery, 1975-1977.

Quality characteristics

Eureka is similar in protein content to Waldron, which is the standard for quality traits (Table 3). Flour yield is slightly lower,

and the dough properties are somewhat stronger than Waldron as indicated by a longer mixing time. All other quality traits are similar, indicating that Eureka is of high quality and is acceptable in the marketplace.

The photos, taken when the town was the largest primary wheat market in the world, are used through the courtesy of the Northwest Blade in Eureka.

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How Eureka got its name

Far up in north central South Dakota is a small town named Eureka.

For 15 years, from 1887 to 1902, this "end of track" town was the largest primary wheat market in the world, claim historians. In 1897 alone, two-thirds of the world's wheat crop entering the commercial market was shipped from Eureka.

(A primary wheat market is the first place wheat changes hands after it leaves the farmer's fields.)

Picture over 165 trains of 20 cars each being loaded at one small town. That number of boxcars was needed in Eureka during the \$2 million wheat shipping year of 1892.

That's why the Eureka depot during October and November 1892 could surpass the earnings of any other station on the entire Milwaukee system by reaching' \$100,000 each month.

The bonanza was created by several factors—the end-of-track location for 15 years, the richness of the new land, and the hard work of the German-Russian farmers settling the prairie.

It was hard work. The wheat was sacked, brought from farms as far as 75 miles away to Eureka, carried into one of the elevators or storage houses of 32 commission houses, and dumped into the hoppers by hand. Day and night, some 200 employees of the grain buyers were needed to keep up with the influx of wagons.

In 1902 the railroad moved north, and new towns along the track were more convenient to many farmers. The wheat boom years ended for Eureka.

As a tribute to the town and to the farmers whose grain never needed to be tested for weight or dockage and was known to be number one quality, the breeders at the South Dakota Agricultural Experiment Station have named this new hard red spring wheat "Eureka."