PROPOSAL FOR THE COOPERATIVE RELEASE OF A HARD WHITE SPRING WHEAT FOR COMMERCIAL PRODUCTION IN THE PACIFIC NORTHWEST

Prepared By

C. F. Konzak
Department of Agronomy
Washington State University
Pullman, Washington 99163

Agencies: Washington, Idaho and Oregon Agricultural Experiment Stations, Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture.

Cooperating Agencies in Development and Principal Evaluation in Washington: Washington Agriculture Experiment Stations; Washington State Cooperative Extension Service; and Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture.

General Situation:
There has appeared to be sufficient market and grower interest in a hard white wheat to justify release of a hard white winter wheat, Coulee, which has Burt type of use quality. The serious problem of quality deterioration from mixing this type of wheat with soft white types is recognized, and has been considered a factor limiting the full acceptance of hard white wheats in the Northwest. Moreover, if hard white wheats could be properly segregated and kept uncontaminated by soft white wheats, healthy foreign and domestic markets appear to be available. One of the factors contributing to the mixing has been the lack of availability of a spring wheat of similar or identical use quality with good agronomic characteristics and with sufficient cold resistance to be overplanted in partly winter killed stands. To assure the availability of a supply of seed, the desirable spring wheat should have sufficient cold resistance and other agronomic properties to be grown as a winter wheat in the areas of the Northwest that have mild winter climate.

A program to breed spring wheats with cold resistance greater than Federation was initiated at Washington State University by Dr. O. A. Vogel, later by Dr. F. C. Elliott and expanded by Dr. C. F. Konzak. Marfed, a soft white spring variety, was the first product of this program.

The Proposed New Variety:
A hard white spring wheat selection, CI 13736, Burt/Kenya Farmer, 58-2025, developed in the course of this program of breeding for cold resistance appears to have sufficient merit to be considered for release to growers in 1971.

Proposed Name: SPURT

Characteristics:
C.I. 13736 has outstanding bread and milling quality characteristics similar to and virtually indistinguishable from Burt or Coulee. The closest approximation for the variety is Adams, C.I. 13722, but Adams has a distinctly different mixograph, which is somewhat more like that of Marfed. C.I. 13736 is intended as a variety for reseeding into winter injured stands of Coulee C.I. 14483 or Burt C.I. 12696. It probably has sufficient cold resistance to be grown from fall plantings in the milder areas, to provide a seed source. It is suggested as a companion release to Coulee.

Description:
C.I. 13736 is a white seeded awned, white chaff, relatively late maturing spring wheat. It has a short standard height and erect, relatively stiff stems, and mid-dense spikes.

C.I. 13636, Burt/Kenya Farmer, 58-2025.

The cross was made in 1951 at Pullman, Washington by Dr. F. C. Elliott. The final selection was made in 1958 by Dr. C. F. Konzak among F_6 lines isolated from a bulk population of the cross.

Testing History:
C.I. 13736 has been extensively tested in Washington and in the Pacific Northwest via the Western Regional Spring Wheat Nurseries. Except in 1967, it has been tested each year in these performance trials since 1963, and is still included.

Evaluation of quality:
C.I. 13736 was originally selected from among a group of lines with good micro-milling ability. It has been extensively tested for bread baking and milling ability through preliminary tests made in the Western Regional Wheat Quality Laboratory at Pullman. These tests show its quality characteristics to be almost identical to Coulee which is equal to Burt. According to evaluations in the Western Wheat Quality Laboratory, Rubenthaler has concluded: "The milling data for Burt X K.F. 58-2025 CI 13736 indicates that this selection is equal to or better than Burt in all respects. The baking data also shows CI 13736 to be better in loaf volume than Burt and about equal to Adams.

"Dough mixing and handling properties of Burt X K.F. 58-2025 CI 13736 are better than Adams. Generally, the bake mixing time for CI 13736 is one half minute longer than for Adams, but most important is CI 13736 exhibits significantly more mixing tolerance as indicated from the mixograph and farinograph data."

Resistance to Diseases:

1. Stripe rust - Data from the several years tests suggest that C.I. 13736 has moderate resistance to prevailing stripe rust races. Its reaction to specific races has not yet been determined. It apparently has more resistance than Burt, based on 1964 results. It is included in 1970 tests by Dr. R. F. Line for reaction to PNW races.

2. Mildew - Reported in 1964 as resistant to mildew with an infection type 2 on a scale of 0-9.

3. Smut - C.I. 13736 apparently carries no resistance to dwarf bunt. It apparently has received at least part of the Burt resistance, at least the T gene for common bunt resistance. It should be considered susceptible to bunt when sown as a winter wheat.

4. Cercosporella Foot Rot - C.I. 13736 appeared to have a moderately susceptible reaction similar to that of Burt in the one test conducted by Dr. O. A. Vogel in 1964.

5. Lodging - C.I. 13736 is generally more resistant to lodging than Marfed, Adams or Idaed 59, due in part at least to its shorter height.

Winterhardiness:

C.I. 13736 appears to have slightly greater cold resistance than Marfed. It was 90% winterkilled in the high nursery at Pomeroy in 1966, when Marfed was 100% killed and Burt 10% killed. It would not be suitable as a regular winter wheat, but should perform well wherever Marfed can be grown successfully from fall-seeding. In 1964 and 1965 C.I. 13736 was grown in the Washington State White Winter Wheat Nurseries. It was about 10% lower yielding than Burt on an average in these tests.

Emergence Characteristics:

Not tested, but stands have been normal; hence it is to be expected that the emergence ability would be similar to that of most standard height varieties.

Other Strong Points:

1. Yield performance just slightly above Adams.
2. May have some stem rust resistance.

Weaknesses:

1. Moderate stripe rust resistance.
2. Test weight tends to be slightly lower than Adams or most other spring varieties from normal to late spring seedings. This is perhaps a reflection of its relatively later maturity. It appears to be about 2 days later heading than Marfed under many conditions.
3. Coldhardiness is minimal, but still greater than any other hard white spring wheat available.

Seed Source:
Approximately three acres of Foundation stock sown at Royal Slope in 1970. This stock will be carefully rogued and used for the first release. Plants selected from this population will be used for the Breeder's Seed stock of future increases leading to Foundation Seed.

No commercial milling and baking trials are planned for 1970. Tests using the MIAG mill may be feasible from a blend of small samples.