



UNIVERSITY OF IDAHO
College of Agriculture

Itana and Columbia

New Hard Red Winter Wheats for Idaho

PAUL J. FITZGERALD
H. C. MCKAY

LIBRARY
UNIVERSITY OF IDAHO



IDAHO Agricultural
Experiment Station

Bulletin No. 297
April, 1959

30.72
7/e

Itana and Columbia

New hard red winter wheats for Idaho¹

PAUL J. FITZGERALD AND H. C. MCKAY²

Itana³ and Columbia⁴ are improved hard red winter wheats recommended for planting in the dryland wheat areas of southeastern and southern Idaho. Because of their better

yield, improved quality, and smut resistance, they may be expected to replace much of the acreage now being used for the production of Wasatch, Cache, and Turkey.

Development

Itana, C.I. 12933, was developed from a cross of (Blackhull x Rex) x Cheyenne. Columbia, C.I. 12928, was developed from the cross (Rio x Rex) x Nebred. Both crosses were made in 1942 at the Sherman Branch Experiment Station, Moro, Oregon. The selections that resulted in Itana and Columbia were made at the same station in 1948 by W. E. Hall. Since 1954, both varieties have been widely grown in Idaho in experimental trials and disease nurseries, and subsequent tests for their milling and baking characteristics have been made.

Itana was named by the Foundation Seed Committees of Idaho and Montana after a joint release of the variety was planned. Columbia was named and released in 1955 by Oregon and Washington Agricultural Experiment Stations. It was approved and recommended by the Foundation Seed Committee in Idaho in January 1957. Foundation seed of Itana and Columbia was released to Idaho growers for fall seeding in 1957 by the Idaho Agricultural Experiment Station.

Description

Itana has a long, bearded head and a chaff color ranging from reddish - brown to blackish-brown. The expression of chaff color is strongly influenced by environment. When grown un-

der conditions of high moisture and high fertility, the chaff color approaches that of its Blackhull parent. The red kernels are midlong to long with a narrow crease, resembling those of

¹ Cooperative investigations, Crops Research Division, Agricultural Research Service, United States Department of Agriculture, and the University of Idaho Agricultural Experiment Station.

² Agronomist, Crops Research Division, Agricultural Research Service, United States De-

partment of Agriculture, Aberdeen, Idaho; and Superintendent, Tetonia Branch Experiment Station, Tetonia, Idaho.

³ Named after Idaho and Montana.

⁴ Named and released to growers by the Oregon and Washington Agricultural Experiment Stations in 1955.

Table 1.—Yields per acre and test weights per bushel of Itana, Columbia, Kharkof, Wasatch, and Cache wheat from seven acres in Idaho for the 4-year period 1954 through 1957.¹

Yield or test weight and area	Condition	Number of station years	ITANA	COLUMBIA	KHARKOF	WASATCH	CACHE
			Bu.	Bu.	Bu.	Bu.	Bu.
YIELD							
Aberdeen	Dry Land	2	19.7	16.4	19.1	20.0	19.4
	Sprinkler Irrigation	2	62.7	65.6	59.3	54.7	49.3 ²
	Gravity irrigation	2	85.2	81.3	71.2	62.7	67.3
Grace	Partial irrigation ³	2	35.0	33.6	31.5	27.7	29.4
Tetonia	Dry land	3	36.0	31.0	28.9	27.8	32.3
Swan Valley	Dry land	2	31.0	26.7	28.4	23.4	26.9 ²
Fairfield	Dry land	2	38.6	33.3	28.9	31.9	32.5
Rockland	Dry land	2	33.7	35.4	29.6	26.0	—
Holbrook ²	Dry land	1	40.1	30.8	35.4	36.9	31.1
Average			42.4	39.3	36.9	34.6	36.0
TEST WEIGHT							
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Aberdeen	Dry land	2	59.4	59.1	57.6	58.3	57.4
	Sprinkler irrigation	2	62.7	62.8	61.5	61.8	60.6 ²
	Gravity irrigation	2	63.3	63.9	62.9	63.4	63.6
Grace	Partial irrigation ³	2	61.2	61.3	60.3	61.2	60.1
Tetonia	Dry land	3	60.5	59.8	59.2	59.5	60.6
Swan Valley	Dry land	2	61.8	61.0	61.0	62.1	60.9 ²
Fairfield	Dry land	2	61.7	60.2	60.9	61.3	59.3
Rockland	Dry land	2	62.3	62.3	62.5	63.2	—
Holbrook ²	Dry land	1	63.1	61.9	63.1	63.0	63.5
Average			61.7	61.3	61.0	61.5	60.7

¹ Valid data were obtained only from Tetonia in 1954. All other testing areas suffered at least one unsuccessful nursery in the 1955-57 period.

² Data based on 1 year's test

³ The Grace nursery was sprinkler-irrigated one time just before heading.

Table 2.—Average quality characteristics of Itana, Columbia, Wasatch, and Kharkof grown in Idaho from 1954-1956, and in Montana, Utah, and Washington from 1951-1956.

Place of tests and characteristics	ITANA		COLUMBIA		WASATCH		KHARKOF ¹	
	USDA ²	Comm. ³	USDA ²	Comm. ³	USDA ²	Comm. ³	USDA ²	Comm. ³
IDAHO								
Wheat:								
Test weight, pounds	62.7	60.6	62.6	60.4	62.2	57.0	61.9	57.0
Protein, percent	13.0	14.8	13.9	15.5	14.0	15.5	13.4	14.6
Flour yield, percent	70.0	73.3	67.9	72.3	69.4	72.6	70.3	73.4
Mill score	87.0		82.6		83.7		84.1	
Flour:								
Protein, percent	12.0	13.20	12.3	13.55	12.9	13.70	12.4	12.90
Ash, percent	.33	.36	.36	.34	.39	.39	.38	.39
Absorption, percent	66.0	59.0	67.0	61.9	68.0	62.0	69.0	61.0
Mixing time, minutes	6.86	2.75	4.72	2.25	1.88	3.50	2.63	2.25
Loaf volume, c.c.	840	913	834	988	828	800	843	850
MONTANA, UTAH, and WASHINGTON								
Wheat:								
Test weight, pounds	64.1		64.2		63.2		63.0	
Protein, percent	10.7		11.7		12.1		11.0	
Flour yield, percent	71.8		69.1		71.5		71.9	
Mill score	86.3		82.5		82.5		83.4	
Flour:								
Protein, percent	9.9		10.7		11.2		10.2	
Ash, percent	.39		.38		.43		.41	
Absorption, percent	64.0		65.0		67.0		67.0	
Mixing time, minutes	4.54		3.33		1.66		2.39	
Loaf volume, c.c.	862		838		807		837	

¹ Commercial tests were on Turkey.

² Data from the U.S.D.A. Western Wheat Quality Laboratory, Pullman, Washington.

³ Data from commercial mills in Utah and Colorado. Samples from Aberdeen and Tetonia, Idaho.

Cheyenne. The white straw of this midseason variety has the typical "Turkey" fineness but has shown excellent lodging resistance under dryland conditions and has been found to be acceptable in limited irrigation trials. Straw height has averaged approximately 39 inches under irrigation and 33 inches on dry land. Itana has shown moderate susceptibility to some races of common bunt under conditions of artificial inoculation, but its resistance to common and dwarf bunt under natural conditions, with the exception of two tests in 1958, has been outstanding. However, proper seed treatment is recommended as a precautionary measure. Except for damage by snow mold, the winter survival and spring recovery has been satisfactory for Idaho conditions. Yield, test weight, and shatter resistance have been very good. Milling and baking qualities have shown a definite superiority over those of Wa-

satch, Cache, and Turkey.

Columbia is a brown-chaffed, bearded variety that has averaged approximately 35 inches in height under irrigation and 30 inches on dry land. It is a stiff-strawed wheat, and like Itana, has performed very well on dry land and in limited irrigation trials. It, too, is a mid-season variety, but it is slightly earlier maturing than Itana. The kernels are red and mid-long to long and have a narrow crease. Resistance to tester races of bunt under artificial inoculation has been very good. Resistance to both common and dwarf bunt in field trials, with two exceptions in 1958, has been outstanding. Winter-hardiness, except for damage by snow mold, has been acceptable for Idaho conditions. Yield, test weight, and shatter resistance have been good. The milling and baking qualities of Columbia also show a definite improvement over those of Wasatch and Cache.

Yield and Test Weight

Yields and test weights of Itana, Columbia, Kharkof⁵, Wasatch, and Cache are presented in Table 1 for all areas of Idaho where they have been tested.

Itana has been a slightly higher yielding variety than Columbia at all testing locations except in the Rockland trials. Columbia shows a slight yield advantage here only in the unfertilized trials.

The yields of Itana and Columbia have been consistently

higher than those of other hard red winter wheats recommended for Idaho.

The test weights of Itana and Columbia are equal or superior to the test weights of the other recommended varieties. The test weights of all five varieties are acceptable under most conditions, but under conditions of stress Itana and Columbia have shown a slight advantage.

⁵ Kharkof closely resembles Turkey. It is used as a standard check variety in Western Regional Uniform Hard Red Winter Wheat Nurseries.

COVER PHOTO — Foundation seed field of Itana winter wheat at the Aberdeen Branch Station in 1957.

Quality Characteristics

The acceptance of a new bread wheat by the trade depends upon its milling and baking characteristics. The ability to produce a high yield of patent flour that will bake an acceptable loaf of bread is the final criterion by which a new variety is judged.

The quality characteristics of Wasatch and Cache are not fully acceptable to the commercial baker. Milling and baking data are summarized in Table 2. The data indicate that Itana, with its high flour yield, favorable milling behavior, low ash content, and long mixing time is superior to the other recommended varieties. Itana shows

the same advantage over Cache, which is similar to Wasatch in its milling and baking characteristics. Columbia has a long mixing time and quality at least equal to Wasatch in other respects. The long mixing time of the dough makes it desirable in blends with bread flours having a shorter mixing time. In several baking tests Itana and Columbia have been rated good to excellent, while Turkey has been rated fair and Wasatch and Cache poor.

The production of Itana and Columbia should strengthen the position of southern Idaho as a producer and seller of high-quality hard red winter wheat.

Acknowledgments

Wheat investigations in Idaho are conducted cooperatively by the University of Idaho Agricultural Experiment Station and the Crops Research Division, Agricultural Research Service, United States Department of Agriculture.

Acknowledgment is due the Western Wheat Quality Laboratory and the following commercial mills and organizations for their cooperation and assistance in obtaining the quality information: Colorado Milling and Elevator Company, Denver, Colorado; Salt Lake Flour Mills,

Salt Lake City, Utah; General Mills, Inc., Ogden, Utah; Pillsbury Mills, Inc., Idaho Falls, Idaho and, Ogden, Utah; The Farmers Grain Co-op, Ogden, Utah; and the Ogden Grain Exchange, Ogden, Utah.

Land for growing off-station tests in Idaho was provided by Max Hanson, Fairfield; W. L. Baker, Malad; Harvey Lloyd, Central; Harold Freeman, Swan Valley; George Peterson, Swan Valley; Ed Covington, Rexburg; and Vard Meadows, American Falls. Their cooperation is appreciated.