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# MERIDIAN

## Hard Red Winter Wheat

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Meridian (PI557013) is a new hard red winter (HRW) wheat variety released for irrigated cereal production areas along the Snake River Plain in Idaho. Meridian was released jointly in 1992 by the Idaho Agricultural Experimental Station and the U. S. Department of Agriculture Agricultural Research Service. Meridian is a semi-dwarf most similar in appearance to Neeley.

### History

Meridian is a pureline selection from A75232W-3-2, a 1975 cross of A68231W-A-7-5-3 by A7111W-5-1. A68231W-A-7-5-3 was an Aberdeen winter wheat breeding line with the pedigree Cheyenne//7\*Lee/Transfer/5/SM4/4/Burt/3/Rex/Rio//Nebred. The breeding line A7111W-5-1 is a sib of Neeley HRW wheat.

In 1987, A75232W-3-2 was assigned the advanced line number IDO360 and entered into the Tri-State (Idaho, Oregon, and Washington) HRW Wheat Nursery. In 1988, IDO360 was entered into the Western Regional HRW Nursery. IDO360 was reselected for uniform heading date in the spring of 1988, and the derived uniform bulk reentered into the Tri-State HRW Wheat Nursery in 1989, and in 1990 into the Western Regional Nursery. Seed from 200 heads was grown in 1991 at Aberdeen. The bulk composites were designated as breeders seed for Meridian.

### Variety Description

Meridian is 2 days earlier than Neeley and 1 day later than Nugaines soft white winter wheat. Meridian is 4 inches shorter than Neeley and 7 inches taller than Ute.

Meridian has prostrate, dark green, juvenile vegetation. Meridian has dark green leaves at flower-

ing without waxy bloom. Meridian's flag leaf is erect and broad with light anthocyanin pigmentation of the auricles. Meridian's spike is mid-dense and awned. Shoulders of Meridian's spike vary from base to apex.

Basal glumes have wanting shoulders, apical florets have more elevated shoulders, and terminal florets have square shoulders. The glumes are glabrous with acuminate beaks. The chaff color of Meridian is white. Meridian's kernels are elliptical with angular cheeks and have a mid-deep crease and a mid-long brush at time of release.

Meridian was moderately resistant to stripe rust (*Puccinia striiformis* West.) field races at Aberdeen and susceptible to field races at Pullman, Washington. Meridian is moderately susceptible to dwarf bunt (*Tilletia Controversa* Kuhn) and moderately resistant to snow mold (*Microdochium nivale* (Fr.) Samuels and I. C. Hallet, and *Typhula* spp.). Meridian is susceptible to the Russian wheat aphid (*Diuraphis noxia* Mordvilko).

### Areas of Adaptation and Agronomic Characteristics

Meridian is adapted to high yielding, irrigated environments along the Snake River Plain. It appears to be an excellent alternative for the Magic and Treasure valleys, where high protein in soft white wheats is a limiting factor, and for irrigated acreage in the upper Snake River Plain, where winter kill is a limiting factor to white winter wheat production.

During irrigated trials from 1989 through 1992 (table 1) in southwestern Idaho, Meridian averaged 114.5 bushels per acre, a yield advantage of 9 and 2 bushels per acre more than Ute and Hawk, respectively. Test weight for Meridian averaged 61

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**Table 1. Agronomic data for Meridian and selected winter wheat varieties for southwestern Idaho Extension trials, 1989-92.**

Variety	Yield (bu/acre)	Protein content (%)	Test weight (lb/bu)	Height (inches)	Lodging (%)
Loc. years	14	14	14	14	1
Meridian	114.5	12.2	61.0	37	7
Hawk	113.8	11.8	62.3	38	17
Ute	105.0	11.9	58.8	29	0
Average	111.1	12.0	60.7	35	8

pounds per bushel, which was 1.2 pounds per bushel heavier than Ute and 1.3 pounds per bushel less than Hawk. Meridian's plant height was 8 inches taller than Ute and 1 inch less than Hawk. Lodging averaged 7 percent compared to 17 percent for Hawk and no lodging for Ute. Protein content averaged 12.2 percent for Meridian, and 11.9 and 11.8 percent for Ute and Hawk, respectively.

In irrigated trials conducted from 1989 through 1992 in southcentral and southeastern Idaho (table 2), Meridian averaged 117 bushels per acre compared to 122, 112, 111, and 108 for Promontory, Neeley, Manning, and Ute, respectively. Test weight of Meridian was slightly lower than Promontory, Neeley, and Manning, but slightly higher than Ute. Maturity of Meridian, as measured by days to head, was 1 day earlier than Neeley and 1

and 2 days later than Ute, Promontory, and Manning. Lodging percentage of Meridian averaged 4 percent while Ute, Manning, Neeley, and Promontory averaged 0, 17, 17, and 29 percent, respectively.

Although Meridian is not primarily adapted to dryland conditions, it has performed well at the higher yielding sites (table 3). In three dryland trials, Meridian averaged 55 bushels per acre compared to Blizzard with 57, Promontory with 56, Survivor with 55, Manning with 50, and Weston with 48 bushels per acre. Test weight for Meridian averaged 62.6 pounds per bushel, which was less than Weston and Promontory, equal to Blizzard, and more than Manning and Survivor. Protein content of Meridian under these dryland conditions was higher than all varieties except Survivor. The two limiting factors to dryland production of Meridian are poor emergence from deep plantings (greater than 2 inches deep) and moderate susceptibility to dwarf bunt.

During intensively managed irrigated trials at Aberdeen (table 4), Meridian had lower grain yields than Malcolm, MacVicar, and Stephens soft white winter wheats, and 1 bushel more than Ute hard red wheat. Winter killing did not occur in these trials, but Meridian had better winter survival at other trials where differential winter killing has been evaluated (data not shown).

**Table 2. Agronomic data for Meridian and selected winter wheat varieties for southeastern and southcentral Idaho irrigated Extension trials, 1989-92.**

Variety	Yield (bu/acre)	Protein (%)	Test weight (lb/bu)	Height (inches)	Date head (June)	Lodging (%)	Spring stand (1-9)	Kernel hardness
Loc. years	10	10	10	10	5	6	2	5
Meridian	116.5	11.6	61.1	34	9	4	9	75
Promontory	121.6	12.4	61.8	36	7	17	9	72
Neeley	112.2	12.2	61.6	38	10	17	9	71
Manning	110.6	11.6	61.7	36	7	29	9	73
Ute	107.5	11.3	60.0	28	8	0	9	69
Average	113.7	11.8	61.2	34	8	13	9	72

**Table 3. Agronomic data for Meridian and selected winter wheat varieties for southeastern and southcentral Idaho dryland Extension trials, 1990-92.**

Variety	Yield (bu/acre)	Protein (%)	Test weight (lb/bu)	Height (inches)	Kernel hardness
Loc. years	3	3	3	1	3
Meridian	54.9	12.8	62.6	23	83
Blizzard	56.7	12.4	62.7	26	81
Promontory	55.9	11.6	63.3	25	80
Survivor	54.6	12.9	61.8	27	82
Manning	50.3	12.3	62.2	26	78
Weston	47.7	12.5	65.2	29	66
Average	53.3	12.4	63.0	26	77

**Table 4. Agronomic data for Meridian and selected winter wheat varieties in five Aberdeen irrigated trials, 1989-93.**

Variety	Class	Yield (bu/acre)	Test weight (lb/bu)	Height (inches)	Date head (June)	Lodging (%)
Meridian	HRW*	142.0	61.0	40	7	16
Ute	HRW	141.0	59.0	33	4	10
Malcolm	SWW	156.0	59.0	38	8	10
MacVicar	SWW	145.0	60.0	38	3	11
Stephens	SWW	150.0	59.0	38	8	15
Average		146.8	59.6	37	8	12

\*HRW = Hard red winter wheat; SWW = Soft white winter.



**Table 5. Milling and baking quality data for Meridian and selected varieties at Aberdeen irrigated trials, 1988-90.**

Variety	Milling yield (%)	Flour protein (%)	Mixograph			Bake absorption (%)	Mix time (min)	Loaf volume (ml)	Exterior texture 0-4'	Interior texture 0-4'
			Peak (min)	Height (cm)	Tolerance (degree)					
Meridian	62.6	11.4	3.0	5.3	72.0	65.1	2.5	830	2.6	2.5
Ute	66.6	11.6	3.0	5.9	63.8 <sup>p</sup>	64.9	2.1	944	3.1	2.1
Manning	64.4	11.9	2.9	5.5	71.9	65.1	2.4	986	2.6	2.6
Neeley	63.8	12.0	2.7	5.5	73.6	65.1	2.4	896	2.8	2.5

<sup>p</sup>Poor quality. Parameters for poor performance: Flour protein—below 10.5 percent protein; milling yield—below 57 percent; Mixograph tolerance—below 65°; Mix time—less than 2 minutes or more than 5 minutes; Corrected loaf volume—900 ml; <sup>1</sup>Texture—0 is least desirable and 4 is most desirable.

Flour milling yields for Meridian under irrigation were lower than Ute, Manning, and Neeley (table 5). Dough mixing tolerance is superior to Ute and comparable to Manning. Loaf volume of Meridian is lower than other adapted varieties. Grain protein content of Meridian is similar to Ute, Manning, and Neeley. Flour protein is similar to Ute but lower than Manning and Neeley.

#### **Availability of Meridian Seed**

Breeder and foundation seed of Meridian will be maintained by the Idaho Agricultural Experiment Station, Foundation Seed Program. Direct requests

for seed to Coordinator, Foundation Seed Program, Kimberly Research and Extension Center, 3793 North 3600 East, Kimberly, Idaho 83341. The USDA has no seed for commercial distribution.

#### **The Authors**

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## Further Readings

For information on other wheat varieties, the following publications are available from the Cooperative Extension office in your county, or write to the University of Idaho Agricultural Publications Office, Idaho Street, Moscow, Idaho 83844-2440, or call (208) 885-7982.

- CIS 408 Winter Wheat Varieties—For Dryland and Irrigated Areas of Southern Idaho and Irrigated Areas of the Treasure Valley, Eastern Oregon (35¢)
- CIS 870 Blizzard Hard Red Winter Wheat (25¢)
- CIS 921 Northern Idaho Fertilizer Guide: Spring Wheat (35¢)
- CIS 935 Vandal Hard Red Spring Wheat (25¢)
- CIS 1005 Malcolm Soft White Winter Wheat (50¢)
- CIS 1015 MacVicar Soft White Winter Wheat (50¢)
- EXP 682 Spring Wheat Varieties for Idaho (75¢)

For information on other wheat crop topics, these publications are available:

- CIS 453 Northern Idaho Fertilizer Guide: Winter Wheat (35¢)
- CIS 828 Idaho Fertilizer Guide: Irrigated Spring Wheat, Southern Idaho (35¢)
- CIS 832 Using Soft White Protein to Our Advantage (25¢)
- CIS 899 Idaho Fertilizer Guide: Dryland Wheat Production in Southeastern Idaho and Northern Utah (35¢)
- CIS 901 Resource Use Under Three Tillage Systems for Winter Wheat in Northern Idaho (35¢)
- CIS 1007 Seasonal Price Index: Soft White Winter Wheat (50¢)
- EXP 636 Idaho Grain Producers: Adoption of New Marketing Methods (\$1.50)
- EXT 697 Irrigated Spring Wheat Production Guide for Southern Idaho (n/c)
- EXP 717 The Benefit of Research to Producers and Consumers of Western Wheat (50¢)