



New Winter Wheat Varieties

Gene—A Soft, White, Winter Wheat

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Gene is a common, soft, white, winter wheat released by Oregon State University in 1991. It is an awnless, early maturing, short-statured, *Septoria tritici*-resistant, semidwarf variety. It has had yields superior to those of Stephens and other common varieties when grown in western Oregon and some areas of eastern Oregon.

Recommended areas

Gene appears to be best adapted to a western Cascade environment. It's disease resistances and level of winter hardiness suit it well for this region. Gene has also shown promise in higher rainfall areas of eastern Oregon; however, it's level of winter hardiness is low, and it should not be grown in areas where frequent winter injury occurs. Gene is an early maturing variety. This attribute may be useful to growers desiring to double crop a field or in areas where early maturity may help in avoiding disease or environmental stresses.

Agronomic Characteristics

Height and lodging resistance. In high rainfall or irrigated environments, Gene has been 2 to as much as 8 inches shorter than Stephens. In dryland areas, height is similar to or slightly less than Stephens. Straw strength is excellent and lodging has not been observed in any production environment.

Maturity. Gene is an early maturing variety. It is 5 to 10 days earlier than Stephens.

Disease resistance. Gene has a unique disease resistance profile in comparison to other Pacific Northwest white wheats. It has good resistance to *Septoria tritici* (a foliar disease common in western Oregon and Washington), adequate resistance to both stripe and leaf rusts, and moderate powdery mildew resistance. It is susceptible to

common bunt, and seed should be prepared with a bunt-controlling seed treatment to avoid bunt problems. Gene is susceptible to *Septoria nodorum* and can become heavily infected late in the growing season; however, these late infections appear to affect yield little. The specific effect of *Septoria nodorum* on Gene is being investigated. Like other *Septoria tritici* resistant/tolerant varieties (Hill 81 and Madsen), Gene does not need to be sprayed with foliar fungicide but will respond to fungicides, especially in high yield (>100 bu/a) production systems.

Test weight and quality. Gene's test weight tends to be lower than those of other commonly-grown varieties. This difference can range from 0.1 to 1.5 lb/bu. Gene is most similar in test weight to Stephens and Malcolm. Madsen and Hill 81 consistently have better test weights than Gene. The trend for lower test weight is seen in both high and low production environments.

Grain protein appears to be equivalent to or slightly higher than that of other commonly-grown varieties. Protein levels have ranged from 0.2 to 0.9 percent higher than Stephens. Other milling and baking characteristics appear to be equivalent to those of Stephens and, though not ideal, are acceptable for a soft white wheat.

Winterhardiness. Gene has a level of winterhardiness equal to or less than that of Stephens and Malcolm. It is not recommended for areas where winter injury is common. Growers are advised to use only moderate rates of diuron and metribuzin herbicides on Gene. There is circumstantial evidence to suggest that Gene may show increased susceptibility to injury by these herbicides if cold injury occurs. Differential response to these herbicides is seen in other varieties.

Yield

Gene has the potential to yield more than other commonly-grown varieties under western Oregon conditions. In production with and without foliar fungicides, yields have tended to be better than those of Stephens and Malcolm. Gene yields have been similar to those of Madsen, but Madsen's height, straw tonnage, and later maturity may be disadvantageous in some production situations.

Gene dryland yields have been equal to or slightly higher than those of other commonly-grown varieties. This relationship varies from environment to environment and will be influenced by severity of winters and available moisture levels. As it matures earlier than other varieties, Gene is likely to show more dramatic responses, positive or negative, to spring and early summer rains than other varieties.

Development

Gene was selected from progeny of a cross between Zenzontli and Cleo/Pichon. The top-cross was made in 1982 at the Hyslop Crop Science Field Research Laboratory. A shuttle breeding approach was employed with sites in the Willamette Valley, Sherman County, and Umatilla County used for evaluation. OR8300801, the experimental designation for Gene, was selected in the F5 generation from

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bulked F4 heads, which trace back to an individual F2 plant.

Following three years of yield testing, head rows were first established in 1986. Head rows were planted and rogued in subsequent years to remove phenotypically different lines and rows with susceptible stripe rust reactions. Foundation seed blocks were planted in the fall of 1991.

Gene was developed by the Cereal Breeding Project in the Dept. of Crop and Soil Science at Oregon State University. This project is lead by Dr. Warren Kronstad. Funding for variety development work is provided by the OSU Agricultural Experiment Station, grants obtained through the United States Agency for International Development (USAID), and grants from the Oregon Wheat Commission.

The name "Gene" recognizes the many contributions of Gene Gross at the Klamath Falls Branch Experiment Station.

Seed stocks

Foundation seed stocks of Gene will be maintained by the Oregon State University Foundation Seed and Plant Materials Project. Seed request forms are available through your local OSU county Extension office.



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Table 1. Yield data (bu/a) for five winter wheat varieties grown at eight eastern Oregon locations in 1990-1991.

Variety	Gene	MacVicar	Madsen	Malcolm	Stephens	PLSD (5%)
1990						
Arlington	40	32	32	31	34	7
Athena	97	96	93	96	94	10
Helix	78	81	80	93	81	13
Heppner	64	63	68	59	64	8
LaGrande	109	128	122	116	128	14
Lexington	65	53	46	43	57	11
Moro	38	51	45	51	47	6
Pendleton	101	96	93	104	101	8
8-location Average						
Yield (bu/A)	74	75	72	74	76	NS
Test wgt. (lb/bu)	59.7	60.1	60.0	60.4	60.4	NS
Height (in)	33	35	36	34	33	1
1991						
Arlington	14	12	32	20	23	6
Athena	103	100	100	88	96	16
Helix	91	67	68	66	62	16
Heppner	35	39	36	36	33	7
LaGrande	102	108	112	109	107	17
Lexington	34	24	30	27	34	4
Moro	53	54	53	53	52	8
Pendleton	76	83	78	82	83	11
8-location Average						
Yield (bu/A)	64	61	64	60	61	NS
Test wgt. (lb/bu)	59.5	59.9	59.3	60.1	60.2	NS
Height (in)	28	32	31	30	30	2

Table 2. Agronomic data for Gene, Madsen, and Stephens grown at Corvallis, OR, in 1990 and 1991.

Year/Variety	Heading date	Height	Test Wgt.	Yield	Protein
<i>Fungicide treated plots</i>					
	(June)	(inches)	(lb/bu)	(bu/A)	(%)
1990					
Gene	3	36	60.0	153	10.3
Madsen	15	45	62.3	143	10.4
Stephens	12	42	62.4	145	9.5
PLSD (5%)	2	3	1.1	15	0.8
1991					
Gene	19	32	58.6	118	9.2
Madsen	29	39	60.7	117	9.5
Stephens	29	37	60.8	100	9.1
PLSD (5%)	3	2	1.1	14	0.5
<i>No fungicides used</i>					
1990					
Gene	3	38	59.0	142	10.4
Madsen	15	46	62.4	133	9.7
Stephens	12	42	61.6	138	9.5
PLSD (5%)	2	3	1.1	15	0.8
1991					
Gene	20	31	57.4	98	9.9
Madsen	30	39	60.0	108	9.2
Stephens	28	37	59.8	91	8.9
PLSD (5%)	3	2	1.1	14	0.5