

MALCOLM

Soft White Winter Wheat

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Malcolm (PI497672) is a common soft white winter wheat developed by Oregon State University and jointly released in 1987 by Oregon State University, the University of Idaho, and Washington State University. It is a replacement for Stephens. Malcolm has yielded better than Stephens in many irrigated production areas and offers the additional advantages of lower protein contents and better leaf rust and mildew resistance.

History

Malcolm originated from a 1972 top-cross between Stephens and 63-189-66-7/Bezostaja at the Hyslop Agronomy Farm. The original selection was bulked from an F₅ plant row in 1977. Head rows were selected in 1983 and increased for breeder seed at the Central Oregon Branch Experiment Station. The variety is named for the late Malcolm Johnson, former superintendent of the Central Oregon Agricultural Experiment Station.

Description

Malcolm is stiff strawed and semidwarf with awned, nodding heads. The spike is oblong and mid-dense. The glumes are glabrous and white with narrow shoulders and beaks. Kernels are white with a shallow crease, and the germ is small. Kernels are 1/4 to 1/3 inch long and smaller than those of Stephens. Awns are 1 to 4 inches long.

Areas of adaptation

Malcolm is well adapted for irrigated southern Idaho production areas where Stephens is currently grown and winterkill is not normally a problem. This includes southwestern (SW), southcentral (SC), and southeastern (SE) Idaho. Malcolm has

been tested throughout Idaho in replicated Extension trials and plant breeder nurseries (tables 1-4).

Table 1. Agronomic data for selected irrigated soft white winter wheat varieties in southwestern Idaho.

Variety	Yield (bu/acre)	Protein content (%)	Test weight (lb/bu)	Height (inches)	Lodging (%)
1985-91 (23 locations)					
Malcolm	124	10.7	58.5	37	6
Stephens	120	11.2	58.4	36	9
1989-92 (13 locations)					
Malcolm	115	11.0	58.2	36	4
Stephens	111	11.4	58.4	35	7
MacVicar	119	10.7	58.6	36	3

Table 2. Agronomic data for selected irrigated soft white winter wheat varieties in southcentral and southeastern Idaho.

Variety	Yield (bu/acre)	Protein content (%)	Test weight (lb/bu)	Height (inches)	Julian heading date ^a	Lodging (%)
1989-92 (12 locations)						
Malcolm	119	10.8	59.3	34	156	0
Stephens	112	11.4	59.0	34	156	1
Daws	111	10.3	59.5	34	159	2
1990-92 (9 locations)						
Malcolm	124	10.4	60.2	34	155	0
MacVicar	119	10.4	60.0	35	156	3
Daws	115	10.0	60.0	34	158	2
Stephens	116	11.3	59.4	34	155	0

^aJulian day 152 is June 1.

Malcolm yielded 4 bushels per acre more than Stephens across 23 irrigated Extension nurseries in SW Idaho and 7 bushels per acre more than Stephens in nine SC and SE Idaho irrigated nurseries. Malcolm yielded about 9 bushels per acre more than Daws in SC and SE Idaho trials. In breeder nurseries at Aberdeen, Malcolm yielded 8 to 10 bushels per acre more

Table 3. Agronomic data for selected irrigated soft white winter wheat varieties in southeastern Idaho breeder nurseries at Aberdeen.

Variety	Yield (bu/acre)	Test weight (lb/bu)	Height (inches)
1985-92			
Malcolm	136	59	36
Stephens	126	59	36
Nugaines	115	60	35
1989-92			
Malcolm	147	59	37
Stephens	139	59	37
Kmor	148	58	37
Madsen	144	60	39
MacVicar	136	60	37
Rod	147	59	38

Table 4. Agronomic data for selected soft white winter wheat varieties in northern Idaho, 1988-92 (19 locations).

Variety	Yield (bu/acre)	Protein content (%)	Test weight (lb/bu)	Height (inches)	Lodging (%)
Malcolm	93	12.7	55.5	33	11
Stephens	99	12.9	55.8	34	24
Madsen	93	13.4	56.2	32	14
Hill 81	94	13.8	57.7	36	15

than Stephens, depending on the years examined. Malcolm has not performed as well as Stephens in northern Idaho.

Malcolm was comparable in test weight to Stephens in SW Idaho, but averaged more than 0.5 pound per bushel higher test weight than Stephens in SC and SE Idaho. Malcolm and Stephens have comparable straw strength and lodging resistance. Malcolm can be slightly taller than Stephens. Malcolm has smaller seed than Stephens; generally, 10 to 15 percent fewer pounds of Malcolm seed are needed to establish a given plant population.

Malcolm averaged 0.6 percentage point lower in protein than Stephens in the SW Idaho nurseries and 0.9 percentage point lower in protein in SC and SE Idaho. Malcolm and MacVicar had similar whole grain protein contents in SE and SW Idaho. The lower protein potential should interest growers trying to produce wheat for the low-protein market. Maximum yields of irrigated Malcolm in SW Idaho are possible while still maintaining protein contents at harvest below 10.5 percent. This may not be possible with Stephens.

Malcolm heads about the same time as Stephens. Malcolm does not have a high level of winter hardiness, nor does Stephens. It should not be grown

in areas where winterkill is common.

Malcolm has stripe rust and common bunt resistance similar to that of Stephens, but has better resistance to leaf rust. Malcolm and Stephens are both susceptible to Septoria and Cephalosporium stripe. Stephens has better powdery mildew resistance than Malcolm.

Milling and baking

Malcolm has good baking and milling qualities (table 5). Flour yield, mill score, ash content, and cookie diameter are comparable to those of Stephens in southern Idaho irrigated environments.

Table 5. Milling and baking quality of selected irrigated soft white winter wheat varieties at Aberdeen, 1989-92.

Variety	Flour protein (%)	Milling yield ^a (%)	Cookie diameter ^a (cm)
Malcolm	8.0	68.1	8.86
Stephens	9.5	67.7	8.77
MacVicar	8.8	67.2	8.71
Kmor	8.7	67.6	8.87
Madsen	9.4	69.7	8.80
Rod	8.7	68.1	8.77

^aLarger numbers are preferred.

Availability of Malcolm seed

Breeder seed of Malcolm will be maintained by Oregon State University but foundation seed will be available through the Idaho Agricultural Experiment Station. Requests for foundation seed should be directed to Coordinator, Foundation Seed Program, College of Agriculture, University of Idaho, Kimberly Research and Extension Center, 3793 N 3600 East, Kimberly, Idaho 83341.

The authors

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