



Oat

D.D. Stuthman and R.A. Caspers

Varietal Trials Results, January 2006



Proper selection of oat varieties requires consideration of the anticipated growing conditions, the pests that might be encountered in a specific production situation and the purpose for growing the crop. Specific growing situations will dictate the priority and emphasis given to each trait included in the tables. Generally, crown rust is the most important disease; this certainly was true in 2005 for southern Minnesota, many parts of the Midwest and much of Canada.

A detailed interpretation of our crown rust data follows. Because we experienced some changes in rust races in 2005, many of the varieties currently grown are now susceptible to crown rust.

In the disease-data table we divided the crown rust readings into two columns. The first column gives a numerical value for the varieties with some resistance, which predicts the relative proportion of rust spores that will achieve a successful infection. The "Reaction Type" column values relate to the size of the pustule, which indicates how much the pustule is restricted by the

host reaction. A small and/or restricted pustule produces fewer spores for reinfection, a major factor in the ultimate level of rust infection.

Depending upon the plant growth stage at initial infection, there can be one to three cycles of re-infection during an oat-growing season. Each infection cycle is 8 to 10 days long. The final amount of rust infection depends upon both the number and size of spore-producing pustules present to cause subsequent infections. It is these later infections that really damage the plant.

Treated seed should be used for smut-susceptible varieties, and those with BYDV (red leaf) susceptibility (score of 7 or higher) should be chosen carefully.

Groat percent is an important consideration for grain production, perhaps equal to grain yield, whether for food or feed. Lodging can be site-specific; varieties with lodging scores above 2.7 should be chosen cautiously if soil is highly fertile. Taller varieties may generally produce more forage and/or straw. Earlier varieties tend to perform relatively better in more southerly parts of the state; later varieties usually have an advantage in the north.

Descriptions of oat varieties covered by the U.S. Plant Variety Protection Act include a PVP designation. When PVP is followed by (94), seed of that variety may not be sold by a grower, not even to a relative or neighbor, without express permission of the variety's developer/owner. If the PVP designation is followed by (pending), consider the variety as having PVP (94) protection.

General-Purpose Varieties

These varieties have been adequately tested three years or more; they usually are not grown for a specific special purpose.

Drumlin—Late maturity, high yield, medium height, average lodging resistance, below-average test weight and groat percentage, yellow seed. Susceptible to crown rust and resistant to smut, good tolerance to red leaf. Selected at Wis. AES. Released in 2003. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (94)**

Esker—Medium maturity, high yield, medium height, average lodging resistance, average test weight and groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, good tolerance to red leaf. Selected at Wis. AES. Released in 2003. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (pending)**

Gem—Medium-late maturity, medium yield, medium height, average lodging resistance, fair test weight and groat percentage. Yellow seed. Susceptible to crown rust, moderately resistant to smut, good tolerance to red leaf. Selected at Wis. AES. Released in 1995. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (94)**

HiFi—Late maturity, high yield, tall, good lodging resistance, high test weight, medium groat percentage. White seed. Resistance to crown rust, moderately susceptible to smut, some tolerance to red leaf.

Selected at N.D. AES. Released in 2001. **PVP (94)**

Kame—Early maturity, very high yield, short, very good lodging resistance, fair test weight, good groat percentage. Yellow seed. Selected at Wis. AES. Released in 2004.

Foundation seed available to certified seed producers only under a license/fee collection agreement.

PVP (pending)

Leonard—Late maturity, fair yield, medium height, fair lodging resistance, poor test weight and groat percentage. Yellow seed. Susceptible to crown rust and smut. Good tolerance to red leaf. Selected at Minn. AES. Released in 2002.

Moraine—Medium maturity, medium yield, short, fair lodging resistance, average test weight and high groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at Wis. AES. Released in 2001. Foundation seed available to certified seed producers only under a license/fee collection agreement.

PVP (94)

Morton—Late maturity, high yield, tall, very good lodging resistance, very high test weight, medium groat percentage. Ivory seed. Good resistance to crown rust and smut, some tolerance to red leaf. Selected at N.D. AES. Released in 2001.

PVP (94)

Reeves—Early maturity, fair yield, medium height, poor lodging resistance, high test weight and groat percentage. Ivory seed. Good resistance to crown rust, moderately susceptible to smut, susceptible to red leaf. Selected at S.D. AES. Released in 2002.

Richard—Early-medium maturity, high yield, tall, good lodging resistance, high test weight, medium groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at Minn. AES. Released in 2000. **PVP (94)**

Oat traits, 2003-2005.

Variety	Days After Planting To Heading	Height, Inches	Lodging, 1 = Erect 5 = Flat	Test Weight, Lb/Bu	Groat %
Winona	62	36	3.0	39.8	71.2
Reeves	63	40	3.7	41.6	71.2
Kame	64	36	1.8	38.3	71.7
Esker	65	37	2.5	39.3	70.4
Moraine	65	38	2.9	39.6	72.0
Richard	65	41	2.9	38.7	69.1
Gem	67	39	2.7	38.4	69.3
Wabasha	67	38	2.8	37.8	71.2
Morton	68	44	1.6	41.1	70.6
Sesqui	69	38	3.1	37.8	65.0
HiFi	69	41	2.0	41.4	70.3
Drumlin	69	38	2.5	38.7	69.5
Leonard	69	39	3.5	35.7	67.5
Mean	66	39	2.7	39.1	69.9

Oat yield, (percent of mean) off-station locations, 2005 only.

Variety	Winona ¹	Wells ¹	Madison ¹	Stephen
Winona	101	112	132	NA
Reeves	105	68	55	56
Kame	81	105	171	112
Esker	140	135	119	88
Moraine	90	116	133	107
Richard	77	113	109	67
Gem	123	123	75	131
Wabasha	100	73	51	90
Morton	NA	NA	NA	99
Sesqui	84	57	56	91
HiFi	NA	NA	NA	125
Drumlin	NA	NA	NA	149
Leonard	NA	NA	NA	87
Location Mean (Bu/Acre)	54	54	35	66
LSD (0.05)	52.0	37.7	45.2	35.3

¹ Organic, reduced-pesticide locations.

Riser—Early maturity, lower yield, short, fair lodging resistance, high test weight and groat percentage. Yellow seed. Resistant to crown rust and smut, susceptible to red leaf. Selected at S.D. AES. Released in 1998.

Sesqui—Late maturity, medium yield and height, fair lodging resistance, fair test weight, lower groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, good tolerance to red leaf. Selected at Minn. AES. Released in 2001.

Wabasha—Medium maturity, yield and height; good lodging resistance, fair test weight, high groat percentage. White seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at Minn. AES. Released in 2001.

Winona—Early, medium yield, short, fair lodging resistance, medium test weight, good groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at Minn. AES. Released in 2005.

Oat yield, percent of mean, by location, 2003-2005.

Variety	Rosemount	Waseca	Lamberton	Morris	Crookston	Average of 5 locations
Winona	90	90	92	99	90	92
Reeves	95	87	91	72	84	86
Kame	116	117	114	114	113	115
Esker	105	109	105	103	105	106
Moraine	96	91	86	102	94	94
Richard	94	95	88	90	92	91
Gem	95	95	93	100	92	95
Wabasha	87	100	92	87	97	93
Morton	116	112	120	103	102	111
Sesqui	81	81	102	99	101	93
HiFi	113	105	111	106	106	108
Drumlin	101	100	103	118	109	106
Leonard	78	80	85	89	93	85
Location Mean (Bu/Acre)	86	91	96	107	135	103
LSD (0.05)	8.5	8.4	9.2	9.1	7.7	3.7

Disease data in single year (2005).

Variety	Crown Rust			
	Amount Infected ¹	Reaction, Type ²	Smut Score ³	BYDV Score ⁴
Winona	>20	S	R	6
Reeves	6	MS-S	MS	7
Kame	5	MS-MR	R	7
Esker	>20	S	R	5
Moraine	>20	S	R	6
Richard	>20	S	R	6
Gem	>20	S	MR	4
Wabasha	>20	S	R	6
Morton	8	MS-S	R	6
Sesqui	>20	S	R	5
HiFi	1	MS	MS	6
Drumlin	>20	S	R	4
Leonard	>20	S	R	4

¹ Relative proportion of rust spores that will achieve a successful infection; varieties with high scores labeled as ">20." The lower the score the better.

² R = resistant, MR = moderately resistant, MS = moderately susceptible and S = susceptible.

³ Artificially inoculated, R = resistant, MR = moderately resistant, MS = moderately susceptible and S = susceptible.

⁴ Barley Yellow Dwarf Virus score from Urbana, Ill., with 1 = no symptoms and 9 = dead.

Special-Purpose Varieties

These varieties also are adequately tested three years or more. They have special attributes that differentiate them from general-purpose varieties or are intended for a specific end use.

Paul-Hulless. Medium-late maturity, high yield for hulless variety. Tall, very good lodging resistance; hulless, so very high test weight. Susceptible to crown rust, resistant to smut, susceptible to red leaf. Selected at N.D. AES. Released in 1994. **PVP (94)**

Buff-Hulless. Medium maturity, good yield for hulless variety. Medium height, good lodging resistance, very high test weight. Susceptible to crown rust, resistant to smut, susceptible to red leaf. Selected at S.D. AES. Released in 2002.



Oat trial locations.

Oat Planting Rate and Date

Bushel Weight, Pounds	32
Seeds/Pound	16,200
Planting Rate, Pounds/Acre	80
Planting Rate, Seeds/Sq. Ft.	28
Planting Date	Early Spring