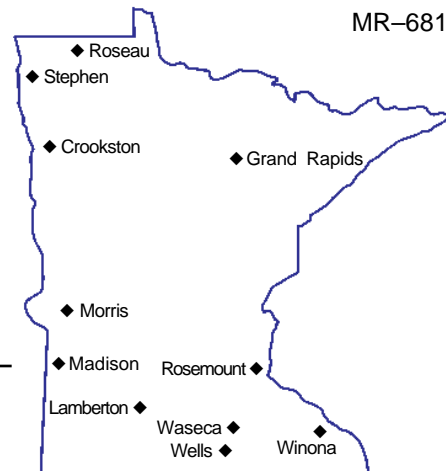


# Minnesota Agricultural Experiment Station

# VARIETY TRIALS

## Oat



Locations of oat trials.

Successful oat production depends to a considerable extent on selecting the best varieties for a particular farm. For that reason, varieties are compared in trial plots on Minnesota Agricultural Experiment Station fields at Rosemount, Waseca, Lambertson, Morris, Crookston and Grand Rapids, and on farmers' fields. Important old varieties and new varieties are grown in replicated plots at each location. These plots are handled so that the factors affecting yield and other characteristics are as nearly the same for all varieties at each location as is possible.

### Variety Classifications

Oat varieties are classed into groups under the headings "recommended," "not adequately tested," "special purpose," "other," etc. Variety descriptions are arranged alphabetically within groups.

Classifications of oat varieties as "recommended," "other" and "special purpose" are determined each year by the Experiment Station Crop Variety Review Committee. A variety is usually not eligible for the "recommended" group unless it has been better than other varieties in important characteristics in three years of testing.

Varieties from other public experiment stations, but not sufficiently evaluated here, are listed as "not adequately tested." Available information is presented for these varieties, but no conclusions are drawn regarding their suitability for Minnesota conditions. Listings in an "other varieties" category are usually inferior in one or more characteristics, as demonstrated in comparative tests.

Seed of varieties in all these groups may be eligible for certification, and the use of certified seed is suggested. However, certification does not imply recommendation. Registered and certified seed of varieties described in this report can be purchased from seed dealers or from

growers listed in the *Minnesota Registered and Certified Seed Directory for 1997 Planting*. This annual publication can be obtained without charge from the Minnesota Crop Improvement Association, 1900 Hendon Avenue, St. Paul, MN 55108, or from county extension agents' offices. The information is also available on-line at <<http://www.rtrade.org/mcia/>>.

### Interpreting the Tables

The LSD (Least Significant Difference) figures listed for forage quality performance in Table 4, under columns of tests at Rosemount and Arlington, are statistical measures of variability within the trials. This statistic is used to determine whether the differences between two quality tests are due primarily to genetic difference in the varieties.

If the quality difference between two varieties equals or exceeds the LSD value listed at the bottom of each quality test column, you can conclude that the higher quality variety was superior in quality. If the difference is less, greater attention should be given to other traits which are also important in making your variety choices.

The relative maturities of varieties are indicated in the tables as date of heading, measured as days after planting.

### Plant Protection Act

Varieties receiving their U.S. Plant Variety Protection Act registration beginning in 1995 are identified by the code "PVP(94)." These varieties may *not* be sold by a producer, not even to a relative or neighbor, without the express permission of the variety's developer/owner.

### Authors/Researchers

The author of this oat report is Deon Stuthman. Information on variety reactions to specific pathogens was provided by Ruth Dill-Macky, Department of Plant

Pathology; to smut by Kurt Leonard; to crown rust by Gerald Ochocki, USDA-ARS Cereal Rust Lab; and to BYDV by Fred Kolb, University of Illinois, Urbana. Field work at various sites was supervised by Steven Quiring, Gregory Cuomo, John Wiersma, and Russell Mathison.

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# **OAT** **VARIETY TRIALS**

**Minnesota Agricultural Experiment Station — University of Minnesota**  
**December 1996**

Results of Oat Variety Tests Conducted by the Minnesota Agricultural Experiment Station. This report was prepared by Deon D. Stuthman, agronomist, University of Minnesota, St. Paul, MN 55108. [phone: 612/625-3709; e-mail: <stuth001@maroon.tc.umn.edu>]

## **Crown Rust Caution**

Crown rust infection has dramatically increased in Minnesota oat fields since 1990, and at least five new races have been identified in recent years. As a result, varieties previously reported to have good crown rust resistance are now known to be vulnerable. Varieties with limited or no rust resistance should be grown with caution.

## **Recommended Varieties**

**Dane**—Early maturity, high yield, short, good lodging resistance, fair test weight, high groat percentage, yellow seed. Moderately resistant to crown rust and smut, susceptible to red leaf. Selected at the Wisconsin Agricultural Experiment Station. Released 1990. Foundation Seed available to Certified Seed producers only under a license/fee collection agreement. Seed sale regulated by U.S. Plant Variety Protection Act.

**Jim**—Early maturity, high yield, short, good lodging resistance, high test weight and groat percentage, yellow seed. Small resistance to crown rust, resistant to smut, good tolerance to red leaf. Selected at Minnesota Agricultural Experiment Station. Released 1996. Application for Plant Variety Protection Certificate has been submitted.

**Milton**—Medium-late maturity, very high yield, medium height, good lodging resistance, medium test weight and groat percentage, yellow seed. Small resistance to crown rust, resistant to smut, susceptible to red leaf. Selected at the Minnesota Agricultural Experiment Station. Released 1994. Application for Plant Variety Protection Certificate has been submitted.

**Jerry**—Medium maturity, very high yield, tall, good lodging resistance, very high test weight, high groat percentage, ivory seed. Moderately resistant to crown rust, susceptible to smut, tolerant to red leaf. Selected at North Dakota Agricultural Experiment Station. Released 1994. Seed sales regulated by the U.S. Plant Variety Protection Act, PVP(94). *Because of smut susceptibility, planting only treated seed is recommended.*

## Special Purpose Varieties

**Pal**—Forage establishment only. Medium-late maturity, low grain yield, very short, good lodging resistance, low test weight, medium groat percentage, yellow seed. Moderately resistant to crown rust, susceptible to red leaf, resistant to smut. Selected at the Minnesota Agricultural Experiment Station and released in 1994 as a special purpose forage oat variety. It has good forage yield with high levels of crude protein and good relative feed value, although no forage data for Pal is provided in this publication.

**Paul**—Hulless. Medium-late maturity, high yield for hulless cultivar, tall, very good lodging resistance, hulless so very high test weight. Resistant to crown rust, smut, and moderately susceptible to red leaf. Selected at North Dakota Agricultural Experiment Station. Released 1994. Seed sales regulated by the U.S. Plant Variety Protection Act, PVP(94).

## Varieties Not Adequately Tested

**Gem**—Medium-late maturity, very high yield, medium height, good lodging resistance, high test weight and groat percentage, yellow seed. Resistant to crown rust and smut, good tolerance to red leaf. Selected at Wisconsin Agricultural Experiment Station. Released 1995. Foundation Seed available to Certified Seed producers only under a license/fee collection agreement. Application for Plant Variety Protection Certificate has been submitted.

**Belle**—Late maturity, medium yield, tall, very good lodging resistance, very high test weight and groat percentage, yellow seed. Resistant to crown rust and smut, susceptible to red leaf. Selected at the Wisconsin Agricultural Experiment Station. Released 1995. Foundation Seed available to Certified Seed producers only under a license/fee collection agreement. Application for Plant Variety Protection Certificate has been submitted.

**Whitestone**—Late maturity, medium yield, medium height, fair lodging resistance, high test weight and groat percentage, white seed. Resistant to crown rust and smut, some tolerance to red leaf. Selected at North Dakota Agricultural Experiment Station. Released 1994. Application for Plant Variety Protection Certificate has been submitted. *Because of smut susceptibility, planting only treated seed is recommended.*

## Other Varieties

**Armor**—Early-medium maturity, poor yield, medium height, fair lodging resistance, poor test weight and groat percentage, yellow seed. Susceptible to crown rust, resistant to smut, tolerant to red leaf. Selected at the Ohio Agricultural Experiment Station. Released 1992.

**Bay**—Late maturity, medium yield, short, very good lodging resistance, poor test weight, fair groat percentage, ivory seed. Moderately susceptible to crown rust and smut, tolerant to red leaf. Selected at the Wisconsin Agricultural Experiment Station. Released in 1993. Foundation Seed available to Certified Seed producers only under a license/fee collection agreement. Application for Plant Variety Protection Certificate has been submitted.

**Brawn**—Medium maturity, medium yield and height, good lodging resistance, poor test weight, fair groat percentage, dark ivory seed. Susceptible to crown rust, some resistance

to smut and little tolerance to red leaf. Selected at the Illinois Agricultural Experiment Station. Released 1993.

**Classic**—Medium maturity, high yield, medium height, very good lodging resistance, medium test weight and groat percentage, yellow seed, moderately susceptible to crown rust, good resistance to smut, very tolerant to red leaf. Selected at the Purdue Agricultural Experiment Station. Released 1995. Foundation Seed available to Certified Seed Producers only under a license/fee collection agreement. Application for Plant Variety Protection Certificate has been submitted.

**Don**—Early maturity, medium yield, short, fair lodging resistance, medium test weight and groat percentage, low protein percentage, white seed. Susceptible to crown rust and red leaf, some resistance to smut. Selected at the Illinois Agricultural Experiment Station. Released 1985.

**Hazel**—Medium maturity and yield, short, good lodging resistance, high test weight, very high groat percentage, medium protein percentage, ivory seed. Susceptible to crown rust and smut, tolerant to red leaf. Selected at the Illinois Agricultural Experiment Station from a cross involving Clintford and Portal. Released 1985. *Because of smut susceptibility, planting only treated seed is recommended.*

**INO 9201**—Early maturity, high yield, short, good lodging resistance, medium test weight and groat percentage, yellow seed. Moderately susceptible to crown rust, tolerant to red leaf, susceptible to smut. Selected at the Purdue Agricultural Experiment Station. Released 1994. Foundation Seed available to Certified Seed producers only under a license/fee collection agreement. Application for Plant Variety Protection Certificate has been submitted. *Because of smut susceptibility, planting only treated seed is recommended.*

**INO 9212**—Medium maturity and yield, short, good lodging resistance, medium test weight, fair groat percentage, yellow seed. Susceptible to crown rust, smut and red leaf. Foundation Seed available to Certified Seed producers only under a license/fee collection agreement. Application for Plant Variety Protection Certificate has been submitted. *Because of smut susceptibility, planting only treated seed is recommended.*

**Premier**—Medium maturity, yield and height, good lodging resistance, medium test weight, groat percentage and protein percentage, yellow seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at the Minnesota Agricultural Experiment Station from a cross between Noble and an unreleased Wisconsin line. Released 1990. Seed sale regulated by U.S. Plant Variety Protection Act.

**Prairie**—Medium-late maturity, medium yield and height, fair lodging resistance, medium test weight and groat percentage, white seed. Susceptible to crown rust and smut, very tolerant to red leaf. Selected at the Wisconsin Agricultural Experiment Station. Released 1992. Foundation Seed available to Certified Seed producers only under a license/fee collection agreement. Seed sale also regulated by U.S. Plant Variety Protection Act. *Because of smut susceptibility, planting only treated seed is recommended.*

**Starter**—Early maturity, medium yield, short, fair lodging resistance, medium test weight and groat percentage, medium protein percentage, yellow seed. Susceptible to crown rust

and red leaf, resistant to smut. Selected at the Minnesota Agricultural Experiment Station from a cross of Noble and a Pal derivative. Released 1986. Seed sale regulated by U.S. Plant Variety Protection Act. *Well suited for companion cropping.*

**Troy**—Medium maturity, high yield, tall, poor lodging resistance, low test weight, medium groat percentage, white seed. Moderately susceptible to crown rust, resistant to smut and good tolerance to red leaf. Selected at the South Dakota Agricultural Experiment Station. Released 1991.

**Valley**—Late maturity, medium yield, short, fair lodging resistance, medium test weight and groat percentage, medium protein percentage, ivory seed. Susceptible to crown rust and smut, some tolerance to red leaf. Selected at the North Dakota Agricultural Experiment Station. Released 1988. *Because of smut susceptibility, planting only treated seed is recommended.*

Table 1A. Oat yield by experiment station location (1994-1996), measured in bushels per acre. Sorted by days to heading, to match order in Table 1B.

Note Key:

[1] 1996 only, adjusted.

[2] 1995-1996 only; adjusted.

[3] Yields of hullless varieties should be adjusted upward by about one-third when comparing to seed yield of standard varieties.

Locations: Ros=Rosemount, Was=Waseca, Lam=Lamberton, Mor=Morris, Cr=Crookston, GRap=Grand Rapids, AVG=average for all six locations.

Variety	Ros	Was	Lam	Mor	Cr	GRap	AVG
Dane	81.9	59.7	57.3	88.5	89.5	98.5	79.2
INO 9201	78.7	76.2	56.4	87.3	103.7	88.2	81.8
Jim	79.5	61.9	44.4	79.7	112.1	88.8	77.8
Jerry	95.4	81.9	69.6	88.2	93.8	101.1	88.4
Troy	83.2	70.3	58.7	78.8	123.7	84.9	83.3
Pal	59.4	61.4	59.4	58.3	86.6	68.6	64.8
Classic	93.8	83.7	69.6	72.9	89.0	86.9	82.7
Milton	86.6	78.0	64.1	92.0	124.4	108.0	92.2
Gem [1]	87.8	78.6	75.2	103.9	111.8	95.8	92.2
Paul (hullless) [3]	49.3	46.6	54.2	75.2	81.5	74.4	63.5
Belle [2]	85.2	75.7	61.0	96.4	101.3	82.7	83.7
Whitestone [2]	82.8	72.2	62.8	68.4	93.3	103.9	80.6
LSD 5%	9.0	7.7	7.4	10.4	9.6	11.0	3.8

Table 1B. Characteristics of oat varieties, 1996. Sorted by days to heading.

Note Key:

[1] Heading, expressed as days after planting.

[2] Height expressed in inches.

[3] Lodging score: 1 = erect, 5 = flat.

[4] Test weight, measured in pounds per bushel.

[5] CR=Crown Rust. Rating: IR = intermediate resistant, IS = intermediate susceptible, R = resistant, S = susceptible.

[6] BYDV ("red leaf") rating: 1 = no symptoms, 9 = dead.

NA = Not applicable.

Variety	Heading [1]	Height [2]	Lodging [3]	Weight [4]	Groat %	Reaction to Disease		
						CR [5]	Smut %	BYDV [6]
Dane	52	31	2.1	34	72.6	IR	1	8
INO 9201	54	31	2.1	36	70.7	IS	30	4
Jim	55	32	2.1	37	73.3	IS	0	4
Jerry	60	37	2.3	39	71.7	R	40	4
Troy	60	39	3.4	33	68.4	S	0	3
Classic	60	34	1.8	36	68.5	IR	10	2
Pal	61	27	2.0	33	67.8	IR	1	6
Milton	61	34	2.2	35	70.9	IS	5	7
Gem	61	36	2.3	38	73.3	R	5	4
Paul (hullless)	62	40	1.9	NA	NA	R	0	6
Belle	63	38	1.8	38	74.8	R	5	7
Whitestone	65	35	2.7	38	72.0	R	5	5

Table 2. Oat yield, off-station locations, measured in bushels per acre, 1996. Sorted by days to heading, to match order in Table 1B.

Note Key:

[1] No pesticides.

[2] Certified organic.

[3] No-till.

Locations: Rou=Roseau, Stn=Stephen, Win=Winona, Wells=Wells, Mad=Madison, AVG=average for all five locations.

Variety	Rou	Stn	Win [1]	Wells [2]	Mad [3]	AVG
Dane	99.8	48.2	25.0	60.0	74.0	61.4
INO 9201	93.9	57.9	38.0	43.0	97.0	66.0
Jim	98.4	56.2	31.0	40.0	89.0	62.9
Jerry	106.2	67.1	48.0	30.0	95.0	69.3
Troy	97.1	72.2	18.0	38.0	59.0	56.9
Pal	81.4	55.9	38.0	46.0	64.0	57.1
Classic	88.5	60.9	26.0	42.0	96.0	62.7
Milton	112.7	68.4	39.0	45.0	74.0	67.8
Gem	110.3	73.4	31.0	87.0	108.0	81.9
Paul (hullless)	81.6	55.9	58.0	60.0	66.0	64.3
Belle	116.3	66.4	44.0	77.0	121.0	84.9
Whitestone	112.9	76.0	50.0	69.0	117.0	85.0
LSD 5%	11.0	14.2	16.0	21.5	17.5	7.3

## Oat Planting Rate and Date

Rate is based on normal seedbeds and on normal size, good quality seed. Rate used can vary greatly depending on seed cost, desired stand, expected mortality, emerging ability, seed weight, seed germination, seedbed condition, depth of planting and planting equipment. Weight given is the most widely accepted in the U.S.

Bushel Weight (pounds)	Seeds/pound (number)	Rate/acre (pounds)	Rate (seeds)	Planting Date
32	16,200	80	28/square foot	Early spring