

2015 Oat Field Crop Trials Results



Minnesota Agricultural Experiment Station and the College of Food, Agricultural and Natural Resource Sciences

Proper selection of oat varieties requires consideration of the anticipated growing conditions, the pests that might be encountered in a specific production situation, the purpose for growing the crop and its eventual usage. Specific growing situations will dictate the priority and emphasis given to each trait included in the tables.

The results of the variety performance evaluations are summarized in Tables 1 through 4. The oat performance trials were grown in Waseca, Lam-

berton, Kimball, Morris, Crookston, Stephen, and Roseau in 2015. The greatest challenge in both the oat performance evaluations and commercial production this past growing season was lodging. As a result the trials in Waseca, Kimball, and Roseau are not included in the final results. Due to logistical constraints only the performance evaluations in Lambertton and Crookston were treated with a fungicide when the flag leaf was fully extended (Feekes 9). The average yield across the testing locations



Table 1. Origin and agronomic characteristics of oat varieties in single-year (2015) and multiple-year comparisons (2013-2015).

Entry	Origin	Year of Release	PVP Status	Seed Color	Maturity ¹			Plant Height ²			Lodging ³		
					2015	2-Year	3-Year	2015	2-Year	3-Year	2015	2-Year	3-Year
AAC Justice	AAC ⁴	2015	Pending	White	9	8	—	6	4	—	8	6	—
Badger	U of Wisconsin	2010	PVP(94)	Yellow	1	1	1	2	1	1	8	5	5
BetaGene	U of Wisconsin	2015	Pending	Yellow	4	4	5	3	3	4	7	5	5
Colt	SDSU	2010	PVP(94)	White	1	1	1	4	2	2	8	6	6
Deon	U of Minnesota	2014	PVP(94)	Yellow	7	8	8	7	5	7	4	3	3
Esker	U of Wisconsin	2006	PVP(94)	Yellow	3	2	2	4	3	3	8	4	4
GMI 423	General Mills	2015	Pending	White	8	—	—	7	—	—	9	—	—
Goliath	SDSU	2013	Pending	White	7	8	—	9	9	—	8	6	—
Hayden	SDSU	2015	Pending	White	5	6	—	5	5	—	8	5	—
Horsepower	SDSU	2012	PVP(94)	White	3	3	3	3	1	1	8	6	6
Jury	NDSU	2012	Pending	White	5	6	—	7	7	—	9	7	—
Natty	SDSU	2015	Pending	White	3	3	—	8	5	—	7	5	—
Newburg	NDSU	2011	PVP(94)	White	5	6	6	7	7	9	9	7	7
Rockford	NDSU	2008	PVP(94)	White	7	8	8	7	6	7	8	5	5
Ron	U of Wisconsin	2014	PVP(94)	Yellow	4	6	—	4	4	—	7	5	—
Saber	U of Illinois	2010	PVP(94)	Yellow	2	2	2	3	2	2	8	4	4
Shelby 427	SDSU	2011	PVP(94)	White	2	2	2	6	5	6	8	5	5
Souris	NDSU	2008	PVP(94)	White	7	7	6	5	4	4	8	6	6
Tack	U of Illinois	2006	PVP(94)	White	2	3	3	1	1	2	8	5	4
LSD (0.10)					1	1	1	2	1	1	1	1	1

¹1 = earliest and 9 = latest.

²1 = shortest and 9 = tallest.

³1 = least prone and 9 = most prone.

⁴Agriculture and Agri-Food Canada.

was 151 bushels per acre in 2015. This compares to an average of 170 bushels per acre in 2014 and a three-year average of 144 bushels per acre. Deon, the latest University of Minnesota release, was the top yielding variety across the State in both the single- and three-year comparisons followed by BetaGene, Natty, and Ron in the single-year comparison and Newburg, the 2011 release from North Dakota State University, in the three-year comparison (Table 4).

Relative maturity, as measured by the number of days to heading, plant height, and resistance to lodging have been converted to a 1-9 scale to allow for easier interpretation of the data (Table 1). Differences for all three characteristics are generally much less in the southern half of the state or when seeding is delayed. In the northern half of the state the gap in characteristics widens as is also the case when seeding early. Presenting averages of the actual data therefore can be misleading. Earlier varieties tend to perform relatively better in the southern parts of the state, while later maturing varieties usually have a yield advantage in the north. Varieties with lodging scores greater than 4 should be chosen with caution as lodging problems can take away yield, quality, and reduce harvestability. This is especially important if your soils are highly fertile. The extensive lodging encountered across the state will put more emphasis on straw strength in the variety selection process for next year. Deon provide some of the best straw strength available in oats but as this past year proofed when conditions are favorable even Deon will encounter substantial lodging.

Table 2. Quality characteristics of oat varieties in single-year (2015) and multiple-year comparisons (2013-2015).

Entry	Test Weight ¹			Grain Protein Content ¹		Groats Percentage ¹
	2015	2-Year	3-Year	2015	2-Year	2-Year ²
	----- (1-9) -----			----- (1-9) -----		----- (1-9) -----
AAC Justice	6	7	—	9	9	—
Badger	6	9	8	5	6	9
BetaGene	7	9	9	6	9	—
Colt	3	3	3	4	3	2
Deon	6	5	5	4	5	4
Esker	7	9	9	3	4	6
GMI 423	9	—	—	5	—	—
Goliath	6	4	—	5	4	—
Hayden	3	2	—	6	6	—
Horsepower	4	5	5	6	7	7
Jury	5	4	—	6	7	—
Natty	3	3	—	3	2	—
Newburg	6	7	7	5	8	7
Rockford	4	3	4	5	4	6
Ron	5	6	—	1	1	—
Saber	3	4	4	4	5	1
Shelby 427	1	1	1	4	3	4
Souris	7	7	8	7	7	5
Tack	1	3	3	4	3	3
LSD (0.10)	1	1	1	2	1	6

¹ 1 = highest and 9 = lowest.

² 2012 and 2013 data.

Table 3. Disease characteristics of oat varieties in single-year (2015) comparisons.

Entry	Crown Rust	Smut	Barley Yellow Dwarf
	----- (1-9) -----		
AAC Justice	5	2	2
Badger	9	1	5
BetaGene	5	1	7
Colt	9	1	9
Deon	4	1	3
Esker	7	1	6
GMI 423	5	2	3
Goliath	6	4	1
Hayden	6	1	2
Horsepower	9	5	8
Jury	6	3	6
Natty	6	2	3
Newburg	5	6	3
Rockford	6	4	2
Ron	4	2	7
Saber	9	8	7
Shelby 427	9	2	7
Souris	6	2	6
Tack	9	8	7

1 = most resistant and 9 = most susceptible.

Like the agronomic characteristics, so too have the quality traits been converted to a 1-9 scale (Table 2). Groat percentage is an important consideration for grain production, perhaps equal to grain yield, whether the crop is intended for food or feed. It is defined as the percentage of germ, bran, and endosperm in proportion to the whole seed on a weight basis. In addition to groat percentage, test weight and the grain protein percentage is being reported.

The disease ratings are based on inoculated screening nurseries for crown rust and smut on the University of Minnesota's St. Paul campus and for Barley yellow dwarf virus or red leaf of oats on the University of Illinois' Champaign Urbana campus (Table 3). Consider most oat varieties to be moderately to very susceptible to crown rust. The use of a fungicide at Feekes 9 is warranted if crown rust is present in the lower canopy at that time

and the variety has crown rust rating of 4 and higher. Expect some yield losses due to crown rust with the most susceptible cultivars even when a fungicide application is made at Feekes 9 if conditions for crown rust remain favorable during the grain fill period. Therefore selecting moderately susceptible cultivars like Deon and Ron is still prudent. Treated seed should be used for smut-susceptible varieties. Varieties susceptible to Barley yellow dwarf (a rating of 6 or higher) should be chosen carefully.

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

crop does not exempt the buyer from the legal obligation to purchase only certified or registered classes of seed.

Authors

Jochum Wiersma, Ruth Dill-Macky, Howard Rines.

Plot Management

Robert Bouvette, Amar Elakkad, Dave Grafstrom, Mark Hanson, Tom Hoverstad, Chris Olson, Curtis Reese, Steve Quiring, and Donn Vellekson.

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

Table 4. Relative grain yield of oat varieties in Minnesota in single-year (2015) and multiple-year comparisons (2013-2015).

Entry	Lamberton			Morris			Crookston			Stephen		State ²		
	2015	2- Year	3- Year	2015	2- Year	3- Year	2015	2- Year	3- Year	2015	2- Year ¹	2015	2- Year	3- Year
	----- (% of Mean) -----			----- (% of Mean) -----			----- (% of Mean) -----			---- (% of Mean) ----		----- (% of Mean) -----		
AAC Justice	75	81	—	99	95	—	109	109	—	98	107	94	100	—
Badger	71	88	91	76	77	77	92	92	90	92	82	82	86	90
BetaGene	127	120	123	101	92	92	109	111	114	105	107	107	107	103
Colt	74	82	83	56	60	62	93	75	75	69	67	74	73	75
Deon	136	128	120	125	123	121	92	103	108	103	110	116	114	115
Esker	109	113	110	86	95	95	95	96	102	89	94	97	99	102
GMI 423	84	—	—	109	—	—	106	—	—	91	—	94	—	—
Goliath	87	96	—	88	89	—	92	100	—	117	111	97	98	—
Hayden	95	101	—	104	120	—	114	114	—	101	108	99	110	—
Horsepower	72	74	82	87	96	99	108	107	107	117	118	98	100	101
Jury	97	100	—	98	98	—	112	111	—	94	101	97	103	—
Natty	103	103	—	100	97	—	104	101	—	107	109	106	102	—
Newburg	90	96	99	97	103	107	109	110	110	104	104	95	105	105
Rockford	72	76	80	87	102	101	91	95	98	82	86	83	90	92
Ron	118	118	—	116	107	—	101	99	—	100	95	105	104	—
Saber	86	92	97	114	112	107	93	92	96	95	96	99	97	100
Shelby 427	80	86	84	100	101	101	100	96	95	91	93	98	94	96
Souris	59	70	77	81	90	93	106	101	100	102	105	90	92	91
Tack	98	91	92	70	78	81	94	90	93	87	87	83	88	90
Mean (Bu/Acre)	163	154	144	117	137	120	218	185	173	149	122	151	154	144
LSD (0.10)	16	9	11	14	7	11	10	6	7	14	6	13	5	5

¹2014 and 2015 data.

²Includes 2013 data from Waseca and St. Paul and 2014 from Roseau.