

2016 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 10 locations in Min-

nesota including Waseca, Le Center, St. Paul, Lamberton, Kimball, Morris, Fergus Falls, Crookston, Stephen and Roseau in 2016. The greatest challenge in both the oat performance evaluations and commercial production this past growing season was lodging. As a result, the trials in St. Paul, Fergus Falls, Morris and Roseau are not included in the final results. The performance evaluations were treated with a fungicide when the flag leaf was fully extended (Feekes 9). The average yield across the testing



Table 1. Origin and agronomic characteristics of oat varieties in single-year (2016) and multiple-year comparisons (2014-2016).

Entry	Origin	Year of Release	PVP Status	Seed Color	Maturity ¹			Plant Height ²			Lodging ³		
					2016	2-Year	3-Year	2016	2-Year	3-Year	2016	2-Year	3-Year
Badger	U of Wisconsin	2010	PVP(94)	Yellow	1	1	1	2	2	1	5	6	5
BetaGene	U of Wisconsin	2015	Pending	Yellow	4	5	5	3	3	3	5	6	5
Colt	SDSU	2010	PVP(94)	White	1	1	1	3	3	2	4	5	5
CS Camden	Meridian Seeds	2013	Pending	White	8	—	—	4	—	—	3	—	—
Deon	U of Minnesota	2014	PVP(94)	Yellow	8	9	9	6	5	5	4	4	4
Esker	U of Wisconsin	2006	PVP(94)	Yellow	2	3	2	4	4	2	4	5	4
Goliath	SDSU	2013	Pending	White	8	9	9	9	9	9	6	7	6
Hayden	SDSU	2015	Pending	White	6	7	6	5	5	5	5	5	5
Horsepower	SDSU	2012	PVP(94)	White	3	3	3	2	2	1	5	6	5
Jury	NDSU	2012	Pending	White	6	6	7	7	7	7	6	7	7
Natty	SDSU	2015	Pending	White	2	2	3	6	6	6	4	5	5
Newburg	NDSU	2011	PVP(94)	White	6	7	7	7	7	7	6	7	6
Reins	U of Illinois	2016	Pending	Tan	2	2	—	1	1	—	3	3	—
Rockford	NDSU	2008	PVP(94)	White	7	9	9	6	6	6	4	5	5
Ron	U of Wisconsin	2014	PVP(94)	White	6	6	6	5	5	4	5	6	5
Saber	U of Illinois	2010	PVP(94)	White	1	2	1	2	2	1	4	5	4
Shelby 427	SDSU	2011	PVP(94)	White	1	1	2	4	5	4	5	6	5
Souris	NDSU	2008	PVP(94)	Tan	6	7	7	4	4	3	4	5	5
Streaker	SDSU	2016	PVP(94)	Hulless	2	—	—	5	—	—	6	—	—
LSD (0.10)					1	1	1	1	1	1	1	1	1

¹ 1 = earliest and 9 = latest.

² 1 = shortest and 9 = tallest.

³ 1 = least prone and 9 = most prone.

locations was 132 bushels per acre in 2016. This compares to an average of 151 bushels per acre in 2015 and a three-year average of 144 bushels per acre. While Hayden, the 2015 release from SDSU, surpassed Deon for yield in 2016, Deon remained the top yielding variety across the state in the multi-year comparisons (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 provides 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.

Quality traits are also presented on a 1-9 scale (Table 2). Test weight and Groat percentage are important considerations for grain production, perhaps equal to grain yield, whether the crop is intended for food or feed. The latter is defined as the percentage of germ, bran and endosperm in proportion to the whole seed on a weight basis.

The disease ratings are based on in-

Table 2. Quality characteristics of oat varieties in single-year (2016) and multiple-year comparisons (2014-2016).

Entry	Test Weight ¹			Groat Percentage ¹
	2016	2-Year	3-Year	2016
	----- (1-9) -----			----- (1-9) -----
Badger	6	8	8	6
BetaGene	7	9	9	3
Colt	3	2	2	4
CS Camden	8	—	—	7
Deon	4	5	5	6
Esker	7	9	9	4
Goliath	4	6	4	6
Hayden	2	2	1	6
Horsepower	5	7	5	4
Jury	5	5	4	5
Natty	4	3	3	1
Newburg	8	9	8	9
Reins	1	1	—	6
Rockford	4	4	4	7
Ron	6	7	7	5
Saber	4	4	4	1
Shelby 427	3	1	1	4
Souris	6	8	7	7
Streaker ²	—	—	—	—
LSD (0.10)	1	1	1	3

¹1 = highest and 9 = lowest.

²Streaker is a hulless variety and excluded from the ratings.

Table 3. Disease characteristics of oat varieties in single-year (2016) comparisons.

Entry	Crown Rust ¹	Smut ¹	Barley Yellow Dwarf ¹
		----- (1-9) -----	
Badger	5	1	5
BetaGene	3	1	6
Colt	5	1	7
CS Camden	3	3	7
Deon	3	1	5
Esker	3	1	6
Goliath	4	1	1
Hayden	4	1	3
Horsepower	5	3	5
Jury	4	3	2
Natty	4	1	5
Newburg	4	3	4
Reins	5	1	4
Rockford	5	3	4
Ron	3	1	7
Saber	5	9	3
Shelby 427	5	4	5
Souris	4	1	5
Streaker	4	1	—

¹1 = most resistant and 9 = most susceptible.

oculated 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 are 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, especially in the southern half of the state or when planting is delayed as viruliferous aphids are more likely to arrive early enough in the crops development to

cause economic damages.

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.

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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 (2016) and multiple-year comparisons (2014-2016).

Entry	Lamberton			Waseca	Le Center	Kimball	Crookston			Stephen			State		
	2016	2-Year	3-Year	2016	2016	2016	2016	2-Year	3-Year	2016	2-Year	3-Year	2016	2-Year	3-Year
	----- (% of Mean) -----			----- (% of Mean) -----			----- (% of Mean) -----			----- (% of Mean) -----			----- (% of Mean) -----		
Badger	92	79	92	97	105	104	97	92	94	96	94	82	97	91	91
BetaGene	102	114	113	108	98	85	99	104	107	102	99	99	98	102	103
Colt	71	72	78	87	96	110	77	84	77	75	74	74	86	82	79
CS Camden	104	—	—	85	100	95	105	—	—	91	—	—	103	—	—
Deon	110	122	121	105	103	97	98	96	101	117	116	117	106	108	111
Esker	95	101	106	114	109	114	99	97	96	99	97	100	103	100	101
Goliath	98	90	95	99	96	109	102	98	100	109	109	110	99	97	99
Hayden	104	97	101	94	112	116	113	115	113	99	96	102	109	106	108
Horsepower	79	74	74	85	109	108	98	99	101	106	102	106	95	94	97
Jury	99	96	98	100	100	87	102	105	107	101	98	103	98	98	101
Natty	107	102	103	112	101	92	102	101	101	107	106	106	104	103	102
Newburg	102	93	96	89	105	91	102	104	108	105	103	105	100	98	102
Reins	97	101	—	110	105	112	102	95	—	95	94	—	100	96	—
Rockford	83	76	77	66	103	94	102	96	97	90	87	89	92	88	91
Ron	115	114	116	106	107	97	97	99	100	99	98	98	102	101	102
Saber	112	96	97	120	108	103	113	104	101	98	96	96	107	102	101
Shelby 427	92	84	87	101	102	107	91	95	94	91	96	93	95	94	94
Souris	87	71	75	71	100	93	101	102	99	99	97	101	94	92	93
Streaker	76	—	—	70	63	56	90	—	—	72	—	—	69	—	—
Mean (Bu/Acre)	133	150	149	115	164	118	184	190	185	130	133	119	132	141	144
LSD (0.10)	19	39	27	18	13	26	18	21	16	18	27	22	13	14	12