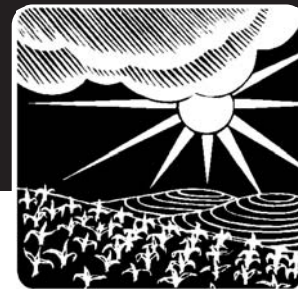


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Iowa Crop Performance Tests — Oat and Barley, 2008

Oat and Barley for Iowa

Oat and barley are the major spring-sown small grain crops in Iowa. Spring-sown small grains can be used for grain and straw production, as companion crops to establish pastures, or as a source of early-season forage or hay. Because these small grains generally mature before the end of July in Iowa, a forage legume, cover crop, or green manure crop can follow them, or animal manure can be spread on the field in which they were grown.

Oat grain production is best under cool conditions, which rarely occur during Iowa summers, but careful management and proper choice of variety can make oats a profitable crop due to their low input requirements and favorable effects on succeeding crops in a rotation. Test weight is the most commonly used indicator of grain quality, and high test-weight varieties should be chosen by growers who intend to market oat grain. Oat is regularly affected by crown rust and barley yellow dwarf virus diseases in Iowa. Some varieties have adequate resistance or tolerance to these diseases, and disease resistance should be considered when choosing an oat variety. Because the pathogen populations can change from year-to-year, varietal resistance often breaks down within a few years, and growers should consider switching to a newer variety when this occurs.

Barley performs best where high temperatures and high humidity do not occur simultaneously.

Well-drained, fertile soils are essential for producing good quality barley. Barley grows best in the northwestern and north central regions of Iowa. Barley grain can be infected with the scab fungus, which is prevalent in the state. Scab-infected grain may have mycotoxins that are detrimental to animals. Oat does not get the scab disease.

The 2008 Growing Season

A cool, wet winter was followed by a cool, wet spring in 2008. Planting oats before April 15 is recommended for optimal yields in Iowa. This year most of the oat acreage was planted in mid and late April. Continued cool, wet weather throughout the season produced yields that varied across the state but were lower than in 2007. Disease was not a major problem this year.

Oat Tests

Yield trials of oat and barley are conducted annually by Iowa State University (ISU) and the Iowa Crop Improvement Association. Thirty-four oat varieties were tested at three locations in Iowa (Figure 1). Testing locations in 2008 were near Ames in central Iowa (planted April 16, harvested July 23), near Calumet in northwestern Iowa (planted April 7, harvested July 22), and



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near Nashua in northeastern Iowa (planted April 16, harvested July 28). Each plot of a variety occupied 32 square feet of land and consisted of four rows spaced one foot apart. Narrower row spacing can be used to allow denser plantings, higher yields and better competition against weeds. All plots were maintained weed-free by hand without use of herbicides. All tests were grown on land that had been in soybeans in the previous year. Fertilizer was broadcast before spring land preparation. Seeding rate was based on equal numbers of seeds per plot, at rates that approximated three bushels per acre. Cultural practices varied, but in general all tests were conducted under conditions of high fertility. Plots were replicated three times at each location. All plots were drilled and harvested with small plot equipment.

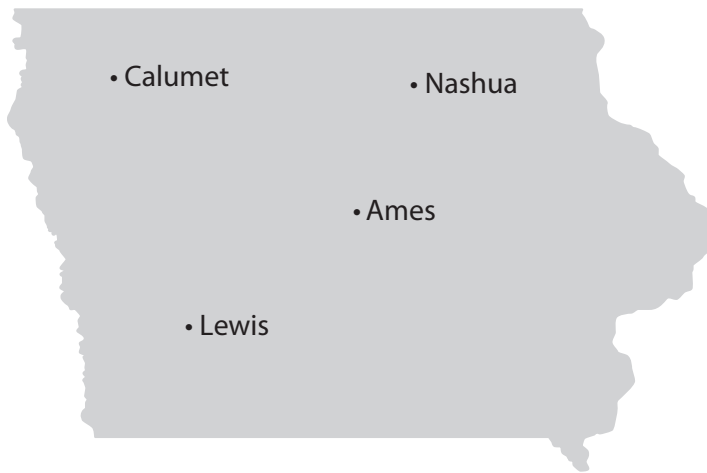


Figure 1. Location of 2007 and 2008 oat and barley performance trials.

Yields and test weights were recorded from seed grown at all three locations (Ames, Calumet, and Nashua). Groat percents (the weight of grain that is due to groats rather than hulls) were recorded from seed grown at Ames. Heading dates and plant heights were recorded at Ames only.

Barley Tests

Nineteen spring barley varieties were tested at three locations in Iowa: near Ames (planted April 16, harvested July 23), near Calumet (planted April 7, harvested July 22), and Nashua (planted April 16, harvested July 28). Each variety was replicated in three plots at each location, and each plot occupied 32 square feet of land. Plots consisted of four rows spaced one foot apart,

drill-seeded at rates approximating two bushels per acre. Management of barley trials was similar to management of oat trials described previously. Grain yield and test weight of each variety was recorded at each location. In addition, each plot at Ames was rated for heading date and measured for plant height.

Oat Test Results

The results of the oat test for 2008 are presented in Table 1. Averages of each trait over the different locations are given. In addition, yield averages from each testing location are presented because some varieties yield relatively better in certain regions of the state than others. The statewide yield average for all varieties in the tests was 132 bushels per acre, and ranged from 117 bushels per acre in the central location to 147 bushels per acre at the northwest location.

Yield results from a single year are not reliable predictors of next year’s yield. Environmental and disease conditions fluctuate greatly from year to year, so it is important to consider yields averaged over a number of years. Table 2 presents long-term regional and statewide yield averages for each trait. These averages were computed using all data available for each variety from the past three years of this trial. Lewis, in southwest Iowa, was not used as a testing site in 2008. Data from the southwest region (SW) in Table 2 are from 2006-2007.

Yields reported are on a 32 lb/bushel basis. Test weight is the most important indicator of grain milling quality. Minimum test weights are 36 lb/bushel for U.S. No. 1 oats and 33 lb/bushel for U.S. No. 2 oats.

Barley Test Results

The average results from 2008 alone and from long-term testing of barley varieties are presented in Table 3. The 2008 average yield of barley varieties in the test was 78 bushels per acre, reported on a 48 lb/bushel basis. The 2008 average test weight was 44 lb/bushel.

New Oat and Barley Varieties

No new oat lines were tested in 2008. Two new barley varieties, Pinnacle and Rasmusson, were released this year. They have been tested since 2006 under the names ND21863 (Pinnacle) and M109 (Rasmusson).

Specialty Oat Varieties

“Buff” is a hull-less oat. When hull-less oat are harvested and threshed, the groat separates freely from the hull. Hull-less oat generally produce lower yields because the weight of the hull is not included in their grain yield weights. Hull-less oats generally have higher feed value per bushel than hulled oats.

Certified Oat

Baker, Classic, Don, Esker, Excel, INO9201, Jay, Jerry, Jim, Reeves, Robust, Tack, and Woodburn varieties of oats were grown for certified seed or quality assurance in Iowa in 2008.

Certified Barley

No varieties of barley were grown for certified seed or quality assurance in Iowa in 2008.

Prepared by George Patrick, Research Associate, and Jim Rouse, Executive Director, Iowa Crop Improvement Association. This work was supported by the Iowa Crop Improvement Association, Iowa State University Extension, Iowa State University of Science and Technology.

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File: Agronomy 2-5

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Table 1. Performance of oat varieties tested in Iowa in 2008.

Variety	Grain Yields (bushels/acre)*			State Average	Test Weight (lbs/bu)	Heading Date (June)	Plant Height (inches)	Groats (%)
	Cen	NE	NW					
Baker	128	138	158	142	33.9	21	37.4	74.0
Blaze	129	143	159	145	34.7	22	35.7	73.5
Buff	94	110	121	107	42.3	22	35.5	91.5
Chaps	120	140	151	138	33.1	22	36.5	75.3
Cherokee	79	103	108	94	33.0	18	35.5	75.3
Classic	110	118	135	120	33.3	24	36.9	67.3
Don	122	130	138	130	34.4	18	32.3	76.5
Drumlin	121	136	160	140	33.0	25	36.5	75.2
Esker	122	133	147	134	33.6	21	36.2	75.9
Excel	125	143	159	143	35.0	21	35.7	69.3
Hi-Fi	116	139	157	138	33.6	26	36.0	70.5
IA02130-2-3	123	136	153	138	36.1	20	36.2	73.8
IN09201	115	135	144	131	34.3	19	34.5	72.3
Jay	119	131	147	132	35.4	22	34.8	71.9
Jerry	110	136	142	129	35.4	23	38.4	72.6
Jim	124	128	147	133	34.9	20	37.7	75.6
Kame	119	130	151	134	32.7	19	34.5	73.4
MN02234	126	133	149	136	35.1	23	37.7	76.2
Morton	106	127	144	126	32.1	26	38.6	70.2
Ogle	136	132	155	142	32.3	21	37.7	74.7
Reeves	112	129	132	123	35.9	20	39.1	73.2
Richland	101	120	130	116	32.3	21	36.2	74.1
Riser	81	118	109	100	35.9	16	34.0	76.8
Robust	113	133	155	134	33.5	28	33.8	71.1
Souris	125	144	149	140	34.5	24	34.5	74.4
Spurs	127	142	159	144	36.1	20	35.0	72.6
Stallion	135	144	159	147	36.3	25	39.6	73.7
Tack	109	128	151	129	37.5	21	31.8	74.0
WIX8787-3	117	129	145	130	33.9	20	37.4	74.1
WIX8787-4	117	126	154	132	33.9	21	35.7	72.3
WIX8995-4	109	139	144	131	34.1	18	33.1	73.2
Wabasha	120	132	148	134	34.1	24	37.9	73.5
Winona	114	131	127	123	35.3	18	36.5	74.7
Woodburn	119	128	150	132	35.7	18	36	73.2
Mean	117	133	147	132	35	21	36	74
LSD	14	12	16	11	1.2	1.9	1.6	3.7

* Grain Yields are based on 32 lbs/bushel test weight.

Table 2. Long term performance of oat varieties tested in Iowa.

Variety	Grain Yields (bushels/acre)*						State Average	Test Weight (lbs/bu)	Heading Date (June)	Plant Height (inches)	Groats (%)	Lodging (%)
	SW	Cen	NE	NW	Average							
Baker	145	104	134	141	131		33.1	16	35.5	72.7	59.2	
Blaze	124	116	129	123	127		34.0	17	35.0	73.1	67.1	
Buff	111	89	96	97	94		43.9	16	34.3	100.0	43.4	
Chaps	129	106	125	121	122		32.1	17	34.9	74.4	51.3	
Cherokee	81	74	102	71	77		32.3	13	34.2	73.7	19.7	
Drumlin	141	106	130	118	128		33.0	20	35.4	73.1	80.3	
Esker	153	120	141	127	132		32.9	15	35.0	74.9	51.3	
Excel	160	109	130	142	137		33.7	15	35.2	70.6	43.6	
Hi-Fi	125	107	124	108	124		32.8	20	34.7	70.9	40.8	
IA02130-2-3	151	100	126	123	128		35.5	15	35.5	73.9	43.6	
IN09201	133	109	136	123	124		33.5	14	33.7	71.9	24.9	
Jay	134	104	118	124	124		34.6	17	32.5	70.8	38.1	
Jerry	122	105	125	119	119		34.9	17	37.8	73.5	19.7	
Jim	136	107	127	119	125		34.2	14	35.2	75.2	48.7	
Kame	128	108	132	121	125		32.1	14	33.9	74.2	17.0	
MN02234	122	108	126	112	122		34.3	17	35.5	75.1	43.6	
Ogle	134	110	141	128	129		31.4	17	35.4	73.9	23.6	
Reeves	128	95	118	126	116		35.9	15	37.3	74.1	80.3	
Richland	97	84	103	85	95		31.4	16	34.7	73.0	56.6	
Robust	142	104	132	134	131		34.6	20	33.6	71.8	17.0	
Spurs	147	118	128	125	133		35.3	15	33.9	72.6	27.6	
Stallion	125	107	127	134	130		35.3	19	38.2	72.9	80.3	
Wabasha	129	105	116	119	120		33.5	18	36.5	73.2	38.1	
Winona	134	112	121	115	122		34.1	13	35.5	74.8	18.4	
Woodburn	136	110	138	127	129		34.7	13	35.6	73.4	53.9	
Mean	133	106	126	118	123		34	16	35	74	44	
LSD	28	19	19	20	22		1.1	1.9	2.0	2.4	37.9	

* Grain yields are based on 32 lbs/bushel test weight.

Table 3. Performance of spring barley varieties tested in Iowa.

Variety	2008 Averages						Long Term Averages							
	Grain Yields (bushels/acre)*						State Average	Test Weight (lbs/bu)	Heading Date (June)	Plant Height (inches)	Yield*	Test Weight (lbs/bu)	Heading Date (June)	Plant Height (inches)
	Cen	NE	NW	Average	NE	NW								
CDC Clyde	71	76	93	81	44.8	17	26.9	72	47.3	12	27.0			
Conlon	69	77	91	80	45.1	17	26.4	68	47.8	10	27.0			
Conrad	69	76	90	78	45.2	22	26.2	73	48.1	19	25.0			
Drummond	65	76	89	76	43.0	18	26.7	71	46.3	11	27.6			
Excel	70	79	93	83	43.9	17	27.3	73	46.8	11	27.2			
Kewaunee	73	80	92	84	42.7	17	29.5	76	45.1	11	30.0			
Lacey	67	78	87	77	44.8	19	25.8	72	47.5	12	26.9			
Legacy	69	69	89	73	43.2	18	29.3	67	46.2	13	29.1			
Logan	65	75	87	74	45.0	18	27.3	68	47.9	12	28.4			
MNBrite	65	76	86	75	44.7	18	29.1	-	-	-	-			
Pinnacle	72	75	89	79	44.7	17	28.4	71	47.3	12	28.6			
Rasmusson	72	79	94	84	44.6	16	25.5	77	47.2	11	26.0			
Rawson	75	76	88	80	43.4	19	28.2	73	46.5	12	28.0			
Robust	68	77	85	76	44.9	18	28.6	69	46.9	12	29.0			
Royal	66	78	86	76	43.3	18	25.8	-	-	-	-			
Stander	62	76	90	76	44.0	19	25.3	-	-	-	-			
Stark	68	77	93	81	47.3	20	28.9	73	48.8	15	29.0			
Steller	62	73	86	72	42.9	18	27.3	66	45.6	12	27.6			
Tradition	65	75	85	74	44.0	18	28.0	66	46.6	12	28.6			
Mean	68	76	89	78	44	18	27	71	47	12	28			
LSD	8	10	11	8	1.1	1.8	1.9	8	0.9	2.7	1.8			

* Grain yields are based on 48 lbs/bushel test weight.