Oat Variety Performance in Michigan
Michigan State University
Cooperative Extension Service
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OAT VARIETY PERFORMANCE IN MICHIGAN

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Oat performance tests are conducted each year on farms at several Michigan locations. Recent tests in Ingham, Tuscola, Kalamazoo, Menominee, and Alger Counties have included varieties from Michigan, adjacent states, and Canada. These data, together with information from county demonstration trials, form the basis for our varietal recommendations and new variety release program.

Short term averages tend to be inconsistent, so data on new varieties are not as reliable as that on older varieties. Comparisons between older and newer varieties can be misleading if only two or three years' data are used. To avoid this difficulty, varietal comparisons are graphed against the mean yield of all varieties in that test. In this way, location can be ignored and varietal yield predicted with a reasonably high degree of accuracy based on the test average of all varieties. The procedure often explains over 80 percent of varietal yield variation at the various locations over a 10-year period.

Table 1 gives the expected yield of a particular variety compared to the average yield of all test varieties of 50, 60, 75, 90, 105 or 120 bu/acre. Given an estimate of average oat yields for an area, several acceptable varieties can be chosen. For example, if long-term farm yields are more than 100 bu/acre, production of Rodney would represent a yield sacrifice of at least 7 to 10 bu/acre. Under high management levels, Heritage could be expected to yield 10 to 12 bu higher than the average, and 17 to 22 bu/acre higher than Rodney.

Barley Yellow Dwarf Virus (Red Leaf)

Barley yellow dwarf virus disease (BYDV or red leaf) has become more serious in recent years and can seriously depress oat yields. Presently, the best method of reducing BYDV losses is through the use of tolerant varieties. Table 2 gives BYDV ratings of different varieties grown at three locations in Michigan in 1985. Ogle showed excellent resistance. Porter, Noble, Heritage, Menominee, and Lang (see Table 1) also have varying degrees of resistance to BYDV.

Other possible ways to reduce BYDV losses include early planting and proper fertilization to ensure rapid plant growth. Avoid planting oats adjacent to oat fields that were infested last year or near grass fields, because different grasses can serve as hosts for the virus. Control of BYDV by aphid control does not appear to be feasible.

County Performance Tests

Tables 3 to 5 show yields and test weights of eight different varieties at three different county locations from 1982 to 1985. Tables 6 and 7 show yield and varietal characteristics from various Upper Peninsula locations from 1983 to 1985. Ogle was the highest yielding variety in all but one location. Ogle is a "yellow oat" with good tolerance to BYDV. However, it has a slightly lower test weight than several other varieties. Porter, Heritage, and Menominee are the next highest yielding varieties.

Because Ogle is a yellow-seeded variety, and most Michigan oat varieties have traditionally been white seeded to meet the requirements for horse feeders, growers should be sure of their market before planting.

Table 8 gives the percent lodging in 1985 of oat varieties in several Michigan locations. This information should be considered along with that in Tables 1 through 7 before decisions are made on the oat variety to be grown.

Uses

Oats can be raised at a profit in Michigan. While not the highest income crop, there are a number of good reasons for raising oats. They fit into a rotation schedule, serve an important function as a companion crop, help distribute labor, and supply the farmer with an important feed grain and straw for bedding.

Oats may be used for silage or hay. When fed in these forms, nearly twice as much total digestible nutrient (TDN) per acre is realized as compared with feeding only the grain.

Oats can be produced on land unsuitable for corn or other high value crops. With high-yielding varieties and improved cultural

TABLE 1. Expected yield of a variety when the average yield level of all varieties in the test was 50, 60, 75, 90, 105 or 120 bu/acre. Reliability column refers to the percent of the variation of the varietal yield explained by the average.

Name	Origin	Height	Maturity	Reaction to BYDV*	No. of Tests	Reliability Estimate(r2)	Expected yields based on management level or soil productivity					
							Low Management		*Medium Management*		*High Management*	
							50	*60*	*75*	*90*	*105*	*120*
Allen	Ind.	S (short)	VE (very early)	4.1	7	89	42	52	67	81	96	111
AuSable	Mich.	M(medium)	L (late)	2.0	44	90	56	65	79	92	105	119
Clintland 64	Ind.	M	E (early)	5.0	41	79	48	55	66	77	88	99
Dal	Wis.	M	M (medium)	2.6	22	90	48	57	71	85	99	113
Diana	Ind.	S	VE	4.0	19	81	38	48	64	79	95	110
Elgin	Ca.	M	E	2.5	7	99	51	61	76	91	107	122
Froker	Wis.	M	L	3.0	23	91	45	56	70	85	100	114
Garry	Ca.	T (tall)	M	3.5	44	89	53	63	77	92	107	121
Goodland	Wis.	S	E	3.9	15	88	32	42	56	71	86	100
Heritage**	Mich.	M	M	1.5	11	90	50	62	83	99	115	132
Hudson	Ca.	M	L	1.8	7	90	56	65	80	94	108	122
Korwood	Mich.	M	M	2.1	36	86	52	63	79	95	112	128
Lang	Ill.	S	VE	1.7	7	70	60	68	81	93	105	118
Lodi	Wis.	T	M	3.5	25	88	51	60	73	87	101	114
Mackinaw	Mich.	T	L	3.5	31	85	47	58	74	91	107	123
Mariner	Mich.	M	M	3.0	38	90	54	64	79	95	110	125
Menominee	Mich.	M	L	1.5	44	90	57	68	83	99	114	130
MSU 70-6-1-16	Mich.	M	E	1.5	4	90	60	70	85	103	118	135
Noble	Ind.	M	VE	1.5	16	80	54	64	79	95	110	125
Ogle**	Ill.	M	M	0.5	11	90	60	70	88	108	120	138
Orbit	N.Y.	S	M	2.2	44	85	55	65	80	95	110	125
Otee	Ill.	S	VE	1.2	22	80	48	58	72	87	101	116
Otter	Minn.	M	M	3.0	23	83	45	54	68	82	95	109
Polak	Poland	T	L	3.5	7	94	39	54	64	79	94	109
Portal	Wis.	M	M	3.0	28	89	47	57	72	87	102	117
Porter	Ind.	M	M	1.0	8	80	59	68	83	100	117	131
Rodney	Ca.	M	L	1.5	41	73	53	61	73	85	98	110
Wright	Wis.	M	VE	2.1	7	86	56	64	76	89	101	113

*1 = resistant, 5 = highly susceptible
** = estimated information relative to other varieties.

practices, yields in excess of 125 bu are not uncommon on good land in Michigan.

Seed Quality

Varietal purity is important in obtaining the benefits of improved varieties. Certified seed provides the best assurance of varietal purity. Good seed has high germination rates and is free of impurities such as weed seeds or other crop seeds. The use of high quality seed is a good investment.

Seed Treatment

Treat seed with an effective chemical such as *Vitavax 200* to prevent infection by smuts, seedling diseases, and other seedborne fungi.

TABLE 2. Barley Yellow Dwarf ratings at three locations in Michigan in 1985.

	Kalamazoo	East Lansing	Chatham	Average
Ogle	**1.5***	0.8	3.3	1.9
Heritage	**6.2**	5.5	5.1	5.6
AuSable	**6.2**	3.3	6.8	5.4
Menominee	**5.8**	3.5	4.6	4.6
Korwood	**7.0**	7.0	6.3	6.4
Mariner	**6.9**	6.5	4.8	6.1
Mackinaw	**7.9**	5.2	8.1	7.1
Garry	**7.1**	5.5	7.6	6.7
Clintland 64	**7.7**	6.4	8.4	7.5

*0 = resistant, 9 = susceptible

Planting

Plant as early in the spring as the soil can be worked without causing soil compaction. Early planting allows the flowers to pollinate and the kernels to form before hot weather begins in the summer. Use a grain drill and plant 2 to 2½ bu of seed/acre in moist soil at a depth of 1 to 2 in. Firm the soil over the rows with presswheels to promote more uniform stands.

Weed Control

A good vigorous stand of oats will help keep weeds under control. However, some chemical control may be necessary.

Chemicals such as 2,4-D amine, MCPA, or bromoxynil will control most broadleaf weeds. *Roundup* (glyphosate) is a non-selective herbicide available to control quackgrass and other perennial weeds. Apply *Roundup* in the fall prior to spring planting.

Further information on weed control is available in MSU Bulletin E-434, *Weed Control in Field Crops.*

Remember that the pesticide label is a legal document on pesticide use. Read the label carefully and follow all instructions and limitations closely. The use of a pesticide in a manner not consistent with the label can lead to the injury of crops, humans, animals, and the environment. The use of a pesticide inconsistent with label directions can also lead to civil or criminal fines. Pesticides are good management tools to control pests on crops, but only when they are used in an effective, economical, and environmentally sound manner.

Fertilizer Requirements

Test soil to determine what fertilizer is required and the rates to obtain optimum yields. In general, provide adequate nitrogen. Ten pounds of total nitrogen fertilizer may be adequate following a plowed-down legume, or apply 40 lb manure where no legume or manure is plowed down. When a legume is seeded with oats, limit nitrogen to 25 lb/acre. At higher nitrogen rates, oats become too competitive for the legume.

For the most efficient use of phosphorus and potassium, band fertilizer 1 in. below the seed with the fertilizer attachment on the grain drill. Banded fertilizer will help a vigorous plant develop, even when the soils are somewhat cold in the spring.

Harvesting

Oats are ready to harvest at about 13 to 14 percent moisture. Higher moisture reduces storability unless the seed is artificially dried or the crop is to be used as

TABLE 3. Oat yields and test weight (T.W.) from Tuscola county from 1982 to 1985.

Variety	1982		1983		1984		1985		4-Yr. Average	
	bu/acre	T.W.	bu/acre	T.W.	bu/acre	T.W.	bu/acre	T.W.	bu/acre	T.W.
Heritage	141	35.9	124	30.3	149	43.7	134	39.6	137	37.4
Ogle	149	32.9	127	31.1	108	40.0	146	35.0	133	34.8
MSU 70-6-16	135	37.4	136	30.3	127	44.0	120	39.6	130	37.8
Korwood	121	35.6	125	33.1	116	44.6	119	36.6	120	37.5
Mariner	102	35.1	131	33.6	109	41.9	136	36.6	120	36.8
Mackinaw	131	37.3	123	31.9	103	45.1	111	36.7	117	37.8
Porter	—	—	—	—	128	44.0	133	38.6	—	—
Clintland 64	103	33.0	95	31.3	86	40.1	123	34.5	102	34.7
LSD_{05}	24	1.3	12	1.3	18	2.1	16	1.9		

TABLE 4. Oat yield and test weight (T.W.) from Ingham county from 1982 to 1985.

Variety	1982		1983		1984		1985		4-Yr. Average	
	bu/acre	T.W.	bu/acre	T.W.	bu/acre	T.W.	bu/acre	T.W.	bu/acre	T.W.
Heritage	98	29.4	90	30.0	84	41.7	125	36.4	99	34.4
Ogle	101	30.8	95	28.9	87	40.7	123	33.9	102	33.6
MSU 70-6-1-16	106	31.6	105	31.0	89	44.3	140	37.6	110	36.1
Korwood	66	29.4	87	31.0	85	43.6	122	36.6	90	35.2
Mariner	66	29.0	71	31.7	90	44.4	119	36.6	87	35.4
Mackinaw	69	31.3	79	32.1	81	44.0	114	36.7	86	36.0
Porter	—	—	—	—	85	44.6	123	36.1	—	—
Clintland 64	37	26.6	64	30.6	77	42.6	107	34.5	71	33.6
LSC_{05}	18	1.4	10	1.5	N.S.	1.4	13	1.9		

TABLE 5. Oat yield and test weight (T.W.) from Huron county from 1983 to 1985.

Variety	1983		1984		1985		3-Yr. Average	
	bu/acre	T.W.	bu/acre	T.W.	bu/acre	T.W.	bu/acre	T.W.
Heritage	116	30.5	120	44.4	105	36.4	114	37.1
Ogle	119	31.6	123	43.0	126	33.9	123	36.2
MSU 70-6-1-16	124	33.1	127	45.8	115	37.6	122	38.8
Korwood	129	33.1	121	45.1	111	36.6	120	38.3
Mariner	102	34.7	140	44.8	104	36.6	115	38.7
Mackinaw	106	31.7	125	46.0	104	36.7	112	38.1
Porter	—	—	143	45.1	113	36.1	—	—
Clintland 64	108	31.7	106	43.4	101	34.5	105	36.5
LSD_{05}	N.S.	—	24	—	23	—		

TABLE 6. Oat yields (bu/acre) from seven Upper Peninsula county locations — years 1983 to 1985.

	1983 Menominee/ Alger	1984 Menominee/ Alger	1985 Menominee/ Alger/Chippewa	3 yr. average
Ogle	105	90	102	99
Heritage	115	87	84	95
Menominee	94	88	83	88
Porter	85	92	87	88
Mariner	99	—	75	87
Korwood	100	—	75	87
Steele	—	—	86	—
AuSable	91	83	78	84
Mackinaw	91	71	66	76
Pierce	—	—	75	—
Garry	93	—	—	—

silage. When harvesting, be sure to follow the recommendations in the combine owner's manual regarding cylinder speed, clearance, and operating procedures.

TABLE 7 Yield, test weight, height, and lodging from oat performance trials from seven Upper Peninsula locations—years 1983 to 1985.

Variety	Maturity	Yield bu/acre	Test Wt. lb/bu	Height (in.)	Percent Lodging	Red Leaf Index (1-5)
Ogle	E	99	32.5	34.8	10	2.5
Heritage	M-L	95	35.2	36.8	10	4.0
Menominee	M	88	32.4	36.0	19	3.0
Porter	M-L	88	33.0	34.0	10	5.0
Mariner	M	87	35.8	38.8	21	4.8
Korwood	M	87	34.4	36.8	10	4.3
Steele	L	86	36.9	39.3	14	3.3
AuSable	M-L	84	36.0	38.8	23	4.2
Mackinaw	M-L	76	37.5	40.8	10	5.0
Pierce	L	75	34.5	36.5	10	2.3

TABLE 8. Percent lodging of nine oat cultivars grown in three locations in 1985.

	Tuscola %	Kalamazoo %	East Lansing %	Average %
Ogle	46	66	34	49
Heritage	40	40	26	35
AuSable	64	56	41	54
Menominee	37	70	21	43
Korwood	25	23	56	35
Mariner	39	39	24	34
Mackinaw	30	36	27	31
Garry	89	63	40	64
Clintland 64	59	26	18	34
Nursery mean	**55**	**48**	**37**	**47**

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