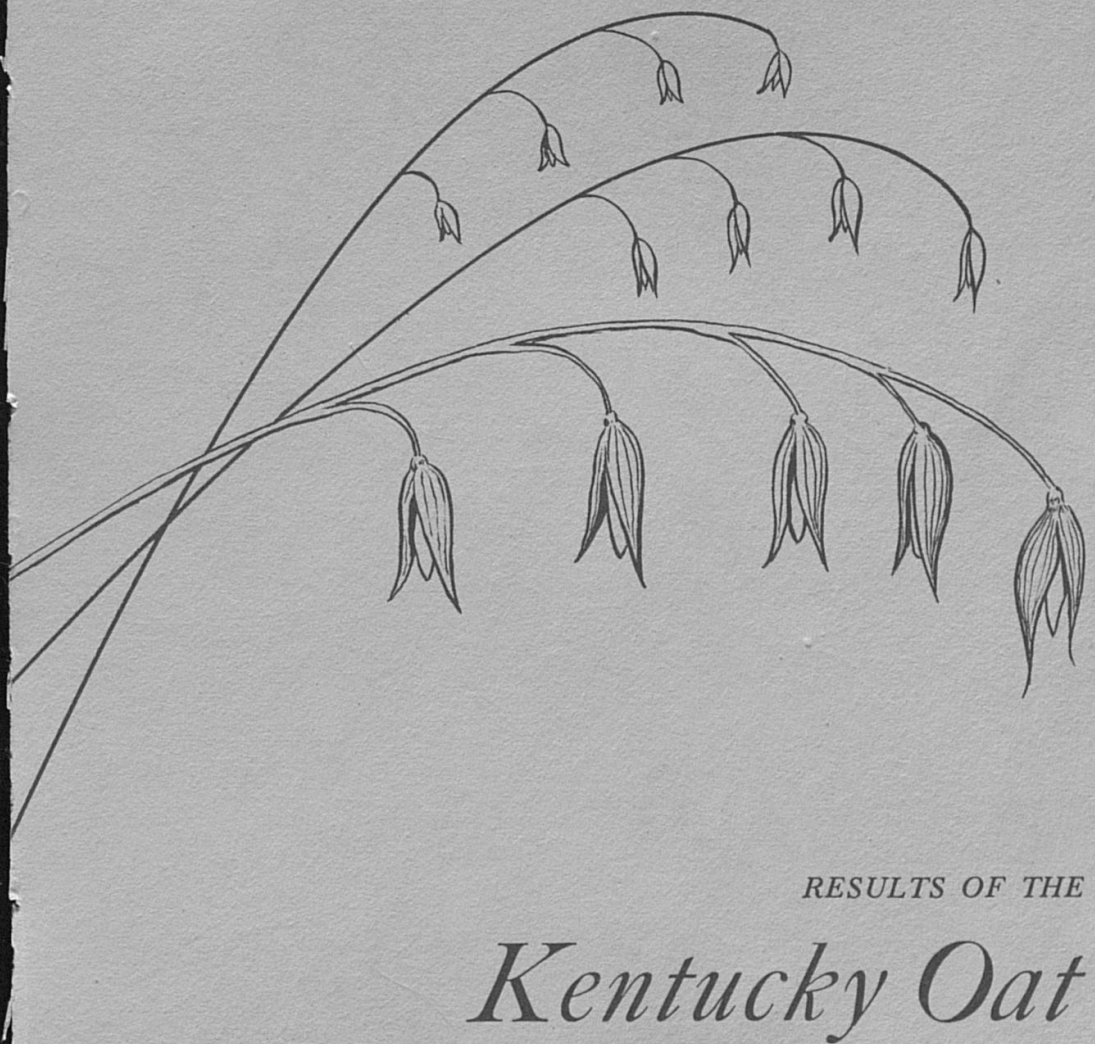

RESULTS OF THE

Kentucky Oat Variety Trials-1970

By Charles R. Tutt and Verne C. Finkner

UNIVERSITY OF KENTUCKY □ COLLEGE OF AGRICULTURE
Agricultural Experiment Station □ Department of Agronomy
Lexington □ Progress Report 193

TESTING LOCATIONS OF THE KENTUCKY OAT VARIETY TRIALS–1970

Location	*Cooperator*
1. Murray	Murray State University Agriculture Department
2. Princeton	West Kentucky Substation
3. Bowling Green	Western Kentucky University Agriculture Department
4. Lexington	Kentucky Agricultural Experiment Station

Acknowledgment is made to John Byars, of the Department of Agronomy, and the University of Kentucky Computing Center, for assistance in summarizing the results reported in this progress report.

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Kentucky Spring and Winter Oat Variety Trials--1970

By Charles R. Tutt and Verne C. Finkner

EXPERIMENTAL METHOD FOR 1970 VARIETY TRIALS

Environmental conditions and soil types may cause a variety to respond differently in different areas of Kentucky. For these reasons, the 1970 spring and winter oat variety trials were conducted at Murray, Princeton, Bowling Green and Lexington. The ultimate test for a variety is how it performs on an individual farm, but performance in a test nearest your farm is a reliable selection guide.

Data are also collected for a period of years at each location. Since results vary from year to year, 3- and 4-year results give a more accurate picture of varietal performance than do annual data.

All experimental areas were fallowed the previous year, and a legume cover crop was plowed under prior to the fall seeding.

Each experimental plot consisted of four rows 1 foot apart and 13 feet long. Each variety was grown in four plots placed at random over the test area and the results presented in the tables are the average response of the four plots. The plots were planted with a specially built four-row seeder, and the data were taken from a 10-foot section of the two center rows of each plot.

Yield

Yields were taken by cutting a 10-foot section of each of the two center rows and threshing the grain through a stationary thresher. The weights of each plot were recorded in grams and then converted to bushels per acre.

Lodged

Lodging was reported as the percentage of the total plants that were lying on the ground or were leaning at a 45-degree angle from the vertical. Lodging was reported when the grain was mature. The term "maturity" as used in this report refers to the date the grain was ready to be combine-harvested.

Plant Height

Plant height was recorded as the number of inches from the ground to the tip of the upright grain head.

Date Headed

Date headed was reported as the number of days after March 31 when 50 percent of the heads had emerged from the plants in each plot.

Survival

Survival was recorded as the percentage of plants which were estimated to have survived the winter when fall planted. This is a measure of winter-hardiness and is an important factor to consider when selecting a small grain variety.

Test Weight

Test weight, or the weight of a bushel of grain, is a measure of the quality of grain. The higher the test weight, the higher the quality and the higher the market value, unless the grain has been down-graded because of another quality factor.

INTERPRETATION

It is important to consider characteristics in addition to yield before choosing a variety. Plant height, lodging resistance, maturity date and grain quality are also important characteristics.

Yields reported in these trials should not be considered the maximum potential for the varieties. High fertilization rates were not used, so as to permit differences in lodging to be recorded.

Lodging data are quite difficult to interpret. A high-yielding variety should not necessarily be down-graded because of a high percentage of lodging for a given year and at a given location. Local weather conditions, such as heavy wind and rain, may cause a variety to lodge more than normal. It should also be emphasized that a variety reported to be 50 percent lodged does not imply that only 50 percent of the grain can be harvested. With good equipment, one may expect to save almost all of the grain. Lodging data for a period of years should receive more consideration than annual lodging data since they will give a more accurate picture of varietal performance.

The yield of a variety is relative and should be compared with the yields of the other varieties in the same experiment and at the same location. Small differences in yield of only a few bushels per acre between two varieties from an individual test should not be interpreted to indicate the superiority of one variety over another. If one variety consistently out-yields another over a period of several years, the chances are that the differences are significant and should be considered important.

For any small grain variety, the ultimate test is how it performs on an individual farm. Therefore to make a sound decision, it is wise to plant a few acres of a new variety and then compare the results with those of another variety presently being grown.

Kentucky Agricultural Experiment Station
1971 Recommended Oat Varieties

Winter Oat

Compact Norline Walken

Spring Oat

Brave

Certified Seed

Planting certified seed is the first step in insuring a good oat crop. The extra cost of certified seed is quite economical in view of the high quality of seed obtained. Certified seed is seed which has been grown in such a way as to insure the genetic identity and purity of a variety. Certified seed also helps to maintain freedom from weed and other crop seed and in some cases freedom from disease. The Agricultural Experiment Station recommends that Kentucky-certified seed be used whenever possible for growing commercial crops of small grains.

SUMMARY OF WINTER AND SPRING OAT VARIETIES EVALUATED AT:

LEXINGTON

PRINCETON

MURRAY

BOWLING GREEN

Table 1. Summary of Winter Oat Varieties Evaluated at Lexington, Kentucky.

Variety	1970	1969	1968	1967	Average
			Yield, Bushels Per Acre		
Compact	68.1	29.3	46.2	99.8	60.8
Norline	62.4	73.5	65.4	81.9	70.8
Walken	72.6	26.2	61.5	82.6	60.7
Average	67.7	43.0	57.7	88.1	64.1
			Lodged at Maturity, Percent		
Compact	97.5	--	--	0.0	48.8
Norline	95.0	--	--	8.8	51.9
Walken	85.0	--	--	22.5	53.8
Average	92.5	--	--	10.4	51.5
			Height, Inches		
Compact	34.5	--	27.5	35.3	32.4
Norline	42.8	--	42.0	50.3	45.0
Walken	41.8	--	34.8	39.8	38.8
Average	39.7	--	34.8	41.8	38.8

Table 1. (continued)

Variety	1970	1969	1968	1967	Average
		Date Headed, No. Days After March 31			
Compact	56.0	--	58.8	49.5	54.8
Norline	50.3	--	48.8	49.8	49.6
Walken	59.5	--	61.3	59.5	60.1
Average	55.3	--	56.3	52.9	54.8
		Survival, Percent			
Compact	93.8	10.0	60.0	95.0	64.7
Norline	100.0	32.5	68.8	81.3	70.6
Walken	100.0	13.8	63.8	92.5	67.5
Average	97.9	18.8	64.2	89.6	67.6
		Test Weight, Pounds Per Bushel			
Compact	33.9	29.4	35.7	38.5	32.8
Norline	34.9	33.9	37.8	35.4	34.9
Walken	34.8	26.4	35.6	31.4	31.2
Average	34.5	29.9	36.4	35.1	33.0

Table 2. Summary of Winter Oat Varieties Evaluated at Princeton, Kentucky.

Variety	1970	1969	1968	1967	4-Year Average 1967-70
			Yield, Bushels Per Acre		
Compact	54.0	48.5	65.5	69.4	59.3
Norline	43.3	44.0	62.0	54.4	50.9
Walken	45.9	48.3	59.5	64.1	54.4
Average	47.7	46.9	62.3	62.6	54.9
			Lodged at Maturity, Percent		
Compact	100.0	100.0	70.0	22.5	73.1
Norline	98.8	100.0	88.8	77.5	91.3
Walken	88.8	100.0	51.3	30.0	67.5
Average	95.9	100.0	70.0	43.3	77.3
			Height, Inches		
Compact	32.5	36.3	39.5	30.5	34.7
Norline	43.3	44.3	46.0	40.0	43.4
Walken	39.5	42.0	45.5	34.2	40.3
Average	38.4	40.9	43.7	34.9	39.5

Table 2. (continued)

Variety	1970	1969	1968	1967	4-Year Average 1967-70
		Date Headed, No. Days After March 31			
Compact	48.5	51.5	50.0	39.5	47.4
Norline	47.0	49.7	48.8	39.8	46.3
Walken	52.8	53.0	55.5	47.7	52.3
Average	49.4	51.4	51.4	42.3	48.7
		Survival, Percent			
Compact	100.0	95.0	100.0	82.5	94.4
Norline	97.5	92.5	100.0	75.0	91.3
Walken	100.0	100.0	100.0	87.5	96.9
Average	99.2	95.8	100.0	81.7	94.2
		Test Weight, Pounds Per Bushel			
Compact	28.8	25.8	36.7	37.3	30.7
Norline	25.2	27.2	33.8	36.4	28.3
Walken	27.6	22.6	32.3	35.9	28.7
Average	27.2	25.2	34.3	36.5	29.2

Table 3. Summary of Winter Oat Varieties Evaluated at Murray, Kentucky.

Variety	1970	1969	1968	1967	4-Year Average 1967-70
			Yield, Bushels Per Acre		
Compact	99.6	41.5	77.2	51.8	67.5
Norline	95.5	47.5	82.2	46.2	67.9
Walken	100.5	42.1	74.9	70.8	72.0
Average	98.5	43.7	78.1	56.3	69.1
			Lodged at Maturity, Percent		
Compact	2.5	0.0	96.3	15.0	28.4
Norline	42.5	13.8	97.5	75.0	57.2
Walken	5.0	0.0	91.3	2.5	24.7
Average	16.7	4.6	95.0	30.8	36.8
			Height, Inches		
Compact	31.8	23.5	35.0	30.5	30.2
Norline	43.5	33.8	45.0	36.5	39.7
Walken	41.8	28.0	42.8	40.8	38.3
Average	39.0	28.4	40.9	35.9	36.1

Table 3. (continued)

Variety	1970	1969	1968	1967	4-Year Average 1967-70
		Date Headed, No. Days After March 31			
Compact	44.8	47.3	42.5	36.2	42.7
Norline	40.8	45.0	40.0	34.7	40.1
Walken	48.5	49.7	47.8	47.7	48.4
Average	44.7	47.3	43.4	39.5	43.7
		Survival, Percent			
Compact	95.0	100.0	100.0	97.5	98.1
Norline	85.0	100.0	100.0	97.5	95.6
Walken	95.0	100.0	100.0	97.5	98.1
Average	91.7	100.0	100.0	97.5	97.3
		Test Weight, Pounds Per Bushel			
Compact	37.8	36.7	36.8	30.7	36.5
Norline	34.0	36.7	34.8	29.5	33.9
Walken	33.9	36.8	33.1	32.0	33.9
Average	35.2	36.7	34.9	30.7	34.8

Table 4. Summary of Winter Oat Varieties Evaluated at Bowling Green, Kentucky.

Variety	1970	1969	1968	1967	4-Year Average 1967-70
			Yield, Bushels Per Acre		
Compact	103.3	58.3	48.5	30.3	60.1
Norline	89.4	52.1	63.3	39.9	61.2
Walken	90.7	55.9	63.4	23.6	58.4
Average	94.5	55.4	58.4	31.3	59.9
			Lodged at Maturity, Percent		
Compact	0.0	0.0	98.8	3.7	25.6
Norline	0.0	5.0	98.8	80.0	45.9
Walken	0.0	0.0	87.5	42.5	32.5
Average	0.0	1.7	95.0	42.1	34.7
			Height, Inches		
Compact	31.0	27.0	38.0	25.0	30.3
Norline	41.5	38.5	43.0	32.5	38.9
Walken	33.3	34.3	42.5	28.7	34.7
Average	35.3	33.3	41.2	28.7	34.6

Table 4. (continued)

Variety	1970	1969	1968	1967	4-Year Average 1967-70
			Survival, Percent		
Compact	100.0	100.0	100.0	100.0	100.0
Norline	100.0	100.0	100.0	100.0	100.0
Walken	100.0	100.0	100.0	100.0	100.0
Average	100.0	100.0	100.0	100.0	100.0
			Test Weight, Pounds Per Bushel		
Compact	36.8	37.4	34.8	35.6	36.4
Norline	35.4	34.8	33.6	32.8	34.7
Walken	32.6	35.7	32.7	31.8	32.9
Average	34.9	36.0	33.7	33.4	34.7

Table 5. All Location Summary of Winter Oat Varieties.

Variety	1970	1969	1968	1967	4-Year Average 1967-70
			Yield, Bushels Per Acre		
Compact	81.8	44.4	59.4	62.8	62.1
Norline	72.6	54.3	68.2	55.6	62.7
Walken	77.4	43.1	64.8	60.3	61.4
Average	77.3	47.3	64.1	59.6	62.1
			Lodged at Maturity, Percent		
Compact	50.0	33.3	88.4	10.3	45.5
Norline	59.1	39.6	95.0	60.3	63.5
Walken	44.7	33.3	76.7	24.4	44.8
Average	51.3	35.4	86.7	31.7	51.3
			Height, Inches		
Compact	32.4	28.0	35.0	30.3	31.4
Norline	42.8	38.9	44.0	39.8	41.4
Walken	39.1	34.8	41.4	35.9	37.8
Average	38.1	33.9	40.1	35.3	36.9

Table 5. (continued)

Variety	1970	1969	1968	1967	4-Year Average 1967-70
			Date Headed, No. Days After March 31		
Compact	49.8	49.0	50.4	41.7	47.7
Norline	46.0	47.4	45.9	41.4	45.2
Walken	53.6	51.4	54.9	51.6	52.9
Average	49.8	49.3	50.4	44.9	48.6
			Survival, Percent		
Compact	97.2	76.3	90.0	93.8	89.3
Norline	95.6	81.3	92.2	88.5	89.4
Walken	98.8	78.4	91.0	94.4	90.6
Average	97.2	78.7	91.1	92.2	89.8
			Test Weight, Pounds Per Bushel		
Compact	34.3	31.1	36.0	35.5	34.2
Norline	32.4	33.5	35.0	33.5	33.6
Walken	32.2	28.7	33.4	32.8	31.7
Average	33.0	31.1	34.8	33.9	33.2

Table 6. Summary of Spring Oat Varieties[1]

Variety	1-Year Average 1970	2-Year Average 1969-70	3-Year Average 1968-70	4-Year Average 1967-70
		Yield, Bushels Per Acre		
Andrew	23.5	30.2	47.4	46.5
Brave	20.7	24.8	45.9	49.0
Clintford	27.7	34.6	48.2	46.5
Diana	38.1	38.8	--	--
Grundy	24.0	30.9	--	--
Jaycee	26.3	30.3	45.1	48.7
Mo. 0-205	26.3	22.1	38.2	36.2
Multline E 70	23.6	29.9	--	--
Nodaway 70	30.9	--	--	--
Pettis	25.7	27.3	39.6	40.7
Average	26.7	29.9	44.1	44.6
		Lodged at Maturity, Percent		
Andrew	48.8	73.1	73.8	79.1
Brave	56.3	78.1	72.9	79.1
Clintford	22.5	57.5	46.7	55.6
Diana	5.0	30.6	--	--
Grundy	55.0	70.0	--	--
Jaycee	42.5	71.3	75.0	81.3
Mo. 0-205	52.5	76.3	79.2	83.8
Multline E 70	12.5	44.4	--	--
Nodaway 70	23.8	--	--	--
Pettis	66.3	83.1	83.8	87.8
Average	38.5	64.9	71.9	77.8
		Height, Inches		
Andrew	29.8	35.9	36.8	38.4
Brave	29.3	34.3	35.8	38.1
Clintford	27.8	31.3	32.6	34.1
Diana	26.8	32.1	--	--
Grundy	27.5	31.8	--	--
Jaycee	26.3	32.0	33.2	34.4
Mo. 0-205	31.5	35.3	37.4	39.8
Multline E 70	26.5	32.6	--	--
Nodaway 70	31.8	--	--	--
Pettis	31.8	36.1	37.3	38.8
Average	28.9	33.5	35.5	37.3

Table 6. (continued)

Variety	1970	1969-70	1968-70	1967-70
	Date Headed, No. Days After March 31			
Andrew	63.5	60.4	62.6	61.0
Brave	63.8	60.9	63.6	60.4
Clintford	63.5	60.8	63.5	62.2
Diana	64.5	61.1	--	--
Grundy	62.3	59.8	--	--
Jaycee	63.5	60.4	62.8	60.8
Mo. 0-205	63.5	60.5	63.4	62.6
Multline E 70	60.5	58.6	--	--
Nodaway 70	63.0	--	--	--
Pettis	63.0	59.6	62.1	60.2
Average	63.1	60.2	63.0	61.2
	Test Weight, Pounds Per Bushel			
Andrew	24.3	24.6	26.1	26.1
Brave	21.6	22.4	24.6	25.3
Clintford	25.0	25.5	27.3	27.5
Diana	26.4	26.5	--	--
Grundy	22.8	23.7	--	--
Jaycee	20.4	21.2	23.5	24.1
Mo. 0-205	22.6	23.8	25.6	25.7
Multline E 70	26.1	26.2	--	--
Nodaway 70	25.6	--	--	--
Pettis	24.2	25.4	27.4	28.0
Average	23.9	24.4	25.8	26.1

[1] Grown at Princeton in 1967, 1969 and 1970.

Grown at Lexington in 1968.

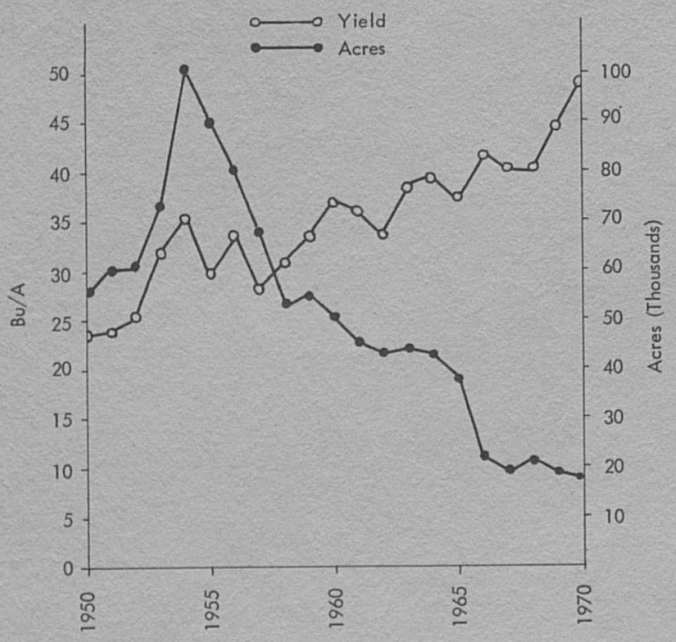
OAT PRODUCTION IN KENTUCKY

Importance

Oat acreage in Kentucky has steadily decreased for the past 20 years, but yield per acre hass steadily increased. Harvested acreage in 1950 was 56,000 acres, with an average yield of 24.0 bushels per acre. By 1969 harvested acreage decreased to 18,000 acres but average yield increased to 48 bushels per acre. In 1969 nearly two-thirds of the oat acreage was seeded to winter varieties and one-third to spring varieties.

Winter and spring oat varieties should not be interchanged. Spring oats are unsatisfactory when fall planted because of winterkilling. Winter oats planted in the spring do not head normally and produce a low yield of grain with poor grain quality.

1950-70 Kentucky Oat Acreage and Yields



Seedbed Preparation

A good seedbed should be prepared for oats. Plowing is the best but if this is not done the ground should be disked enough to form a good firm seedbed. This will probably require two or three deep diskings.

Fertilizer and Lime

Optimum pH range for growth of oats is 6.0-6.5, and lime applications should be made as necessary to maintain that range. A soil test is the most accurate way to determine lime needs, and with the soil test results the following can be used as a guide for lime requirements:

Soil pH	*Lime Needed, Tons/A*
Below 5.3	3-4
6.1-6.7	2-3
Above 6.7	None

A soil test is the most reliable guide for phosphorus and potassium fertilizer applications. The following can be used as a guide:

Phosphorus Soil Test	*Phosphorus (P_2O_5) Needed, Lb/A*
Low	80-120
Medium	40-80
High	None

Potassium Soil Test	*Potassium (K_2O) Needed, Lb/A*
Low	40-80
Medium	0-40
High	None

The amount of nitrogen to apply for oats will depend upon the proceeding crop. Thirty to sixty pounds per acre of nitrogen should be applied if oats are preceded by corn. The nitrogen should be applied in a split application for winter oats, with one-half applied in the fall and the remainder in the spring.

Method of Planting

To insure rapid germination and good growth oats should be drilled instead of broadcast. Drilling will insure good seed coverage and place the seed in contact with available moisture for rapid germination.

Planting Rate

Winter oats should be planted at the rate of 2 bushels per acre. If planting is delayed, the seeding rate should be increased up to 4 bushels per acre. Spring oats should be planted at the rate of 2 bushels per acre.

Planting Date

Winter oats should be planted in the last week of September in northern Kentucky and the first week of October in southern and western Kentucky. Winter oats are not as winter hardy as wheat or barley, and winter killing is therefore more often a problem. It is important to have oat plants well established before cold weather arrives. Spring oats should be planted as soon as possible after the middle of March.

Disease, Insect and Weed Control

Wild garlic may be a problem in oat fields. This weed can be controlled by spraying with 2,4-D in March or early April. Oats are the least tolerant of any of the small grains to 2,4-D, and spraying may also cause damage to legumes seeded in the oats. The rate of 2,4-D per acre should be one-half to one pint of 4 lb/gal of the amine or ester formulation. This rate will also control dock and plantain.

Two diseases which may be a problem in oat fields are smuts and the rusts. The best control of disease can be achieved by planting certified seed of disease resistant varieties.

Armyworms and grasshoppers are the two insects most likely to be a problem and both of these can be controlled with the use of Sevin. This material should be applied at the rate of 2 pounds of the 50% wettable powder per acre.

2M—7-71