PROJECT TITLE: Montana Statewide Spring Oat Cultivar Performance

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OBJECTIVES:

To evaluate the agronomic performance of new and existing cultivars and experimental lines of oats under various growing conditions and environments of Montana.

RESULTS:

The 2000 Montana Statewide Spring Oat Yield Trial was grown at five dryland locations (Table 2 to 5) and three irrigated/high rainfall sites (Tables 7 to 10) in replicated multi-row plots. Yield, test weight, Julian heading date, and plant height are summarized across locations in Tables 1 and 6.

Planting at **Bozeman** was 10 days earlier than normal under adequate but below normal soil moisture levels. Precipitation events were timely but amounts were less than average in June, July, and August. For the crop year (September 1999 to August 2000) precipitation was 3.35 inches less that normal and mean temperatures were four degrees less than average. Crop development in the nurseries was earlier than average. Yields and test weights were good despite hot dry conditions in June, July, and August.

Mean temperatures at **Huntley** were 2°F above 30-year average in April and May, near average in June but nearly 4 and 3°F above average in July and August, respectively. Annual precipitation was 3.4 inches below long-term average with June notably 1.6 inches less. Dryland yields ranged from over 70 for ABSP9-2 to 38 for Paul with a mean yield of 57 bu/acre. Provena, Paul, and Lamont had test weights over 45 lbs/bu. The irrigated trial had an average yield of 193 bu/acre. Yield ranged from 140 bu/acre for Paul to 244 bu/ acre for Monida. Test weights were excellent averaging over 42 lbs/bu. Test weight of Lamont, Provena, and Paul exceeded 48 lbs/bu.

Disease infections were low at **Kalispell**, and although precipitation for the growing season at 16.15 inches was nearly four inches below normal, growing conditions were excellent. Average temperatures were only slightly greater than long-term average. Lodging in the trial was considerable on some plots but erratic. Greatest yield exceeded 200 bu/acre and cultivars Provena and Paul had test weights of 43 lbs. Two proteins determinations exceeded 20%.

Soil moisture at planting was good, but surface conditions were muddy at **Moccasin**. The nursery was seeded notill into barley stubble. The growing season was warmer and drier than normal. Daily pan evaporative losses in late July and August exceeded 0.5 inches. Typical greatest losses would be 0.4 inches for only 2 to 4 days per year. Monida and Rio Grande had yields greater than 81 bu/acre. The trial average yield was 66 bu/ acre. Monida also had the greatest test weight at 35 lbs/bu. Percent protein of cultivars 95A11633, Provena, and Lamont exceeded 20%.

Heavy residue from the 1999 crop caused emergence problems at the **Sidney** minimum-till recrop trial, even though planting moisture was adequate. Subsoil moisture was short and even though growing season precipitation was greater than long-term average (9.5 inches) the recrop nursery was stressed early in the growing season. The average recrop trial yield was 34 bu/acre. Whitestone at 48.6 bu/acre was the greatest yielder in the dryland trial and was significantly greater than the check cultivar Otana. Provena and Paul had test weights over 46 lbs/bu. The dryland trial was planted on fallow and showed the value of subsoil moisture. Yields averaged 139 bu/acre six of the cultivars had yields over 150 bu/acre. Average test weight for this trial was 40 lbs/bu. The irrigated trial received a flood irrigation of 3 inches on June 13. Average yield was 190 bu/acre. Several entrants (Lamont, Provena, 95A11633, AC Belmont, and Paul) performed well below trial average. Lamont, Provena, and Paul had excellent test weights.

Total annual growing season precipitation (9/1/99 through 8/31/00) was 15% less than the 85-yr average at **Havre** and April 1 through July 31 precipitation was 11% less than normal. Average July temperatures were 3% higher than normal with a maximum of 103^{o} F recorded on July 14. Both moisture and heat stress at critical growth periods resulted in lower than average oat yields at Havre while test weights were somewhat above average. However, average overall nursery test weight was positively influenced by the presence of some hulless oat lines.

SUMMARY:

The Statewide Oat dryland trial average yield was 73 bu/acre. Rio Grande, 90Ab1322, ABSP19-9, Monida, and Whitestone had statewide average yields of over 80 bu/acre. Paul, 95A11633, Provena, and Lamont had average yield of less than 56 bu/acre. Provena, Paul and Lamont had test weights exceeding 41 lbs/bu.

Several trial entrants had statewide average yields in the irrigated trial exceeding 190 bu/acre. 95Ab1322 topped the list with a yield of 206 bu/acre, Yields of Provena, 95A11633, AC Belmont, and Paul were all less than 141 bu/acre. Lamont, Provena, and Paul had test weights over 42 bu/acre.

FUTURE PLANS:

The Montana Statewide Oat Yield Trial will be continued in 2001.

Table 1. 2000 SPRING OATS STATEWIDE DRYLAND OVERALL SUMMARY

Variety or ID	Yield	Test Weight	Heading Date	Plant Height
	bu/ac	lbs/bu	Julian*	inches
Rio Grande	80.6	35.4	172.5	25.6
Ajay	71.3	35.3	176.2	20.9
Lamont	54.2	41.0	179.5	25.4
87AB5125	78.3	35.2	176.7	24.6
Provena	52.4	44.8	177.5	24.8
90Ab1322	80.4	35.7	174.8	24.3
95A11633	56.3	39.0	177.8	25.5
ABSP19-9	83.5	37.1	173.9	26.8
ABSP9-2	81.3	37.5	177.5	25.3
AC Belmont	60.1	38.7	175.6	27.9
Celsia	78.2	35.4	178.9	27.9
Otana	76.5	36.6	174.7	31.4
Monida	83.3	36.3	177.9	27.1
Paul	52.5	44.0	175.7	30.7
Whitestone	80.7	35.8	175.5	26.7
ND930122	79.4	36.6	172.0	28.2
MEAN	72.7	37.7	175.9	26.3

*Days from January 1

Table 2. 2000 SPRING OAT STATEWIDE DRYLAND REPORT - YIELD (bu/ac)

Variety or ID	Havre	Sidney	Sidney Recrop	Moccasin Notill	Huntley	Ave.
Rio Grande	81.0	134.0	38.4	81.1	68.7	80.6
Ajay	66.0	126.8	30.2	65.6	67.9	71.3
Lamont	52.4	107.0	20.1	44.8	46.6	54.2
87AB5125	74.3	142.0	33.1	72.4	69.7	78.3
Provena	51.0	97.4	20.5	48.5	44.4	52.4
90Ab1322	72.5	149.7	37.4	74.7	67.7	80.4
95A11633	49.2	107.3	24.7	49.8	50.6	56.3
ABSP19-9	77.0	152.2	41.5	75.0	71.7	83.5
ABSP9-2	73.0	155.2	42.3	75.3	60.5	81.3
AC Belmont	56.9	112.5	30.1	52.6	48.4	60.1
Celsia	75.5	151.3	34.0	69.7	60.3	78.2
Otana	73.9	143.5	41.4	72.0	51.7	76.5
Monida	80.5	152.2	37.6	81.3	64.9	83.3
Paul	45.2	104.9	23.5	50.8	37.9	52.5
Whitestone	75.6	153.1	48.6	72.5	53.7	80.7
ND930122	79.1	152.2	42.6	70.7	52.5	79.4
MEAN	67.7	138.5	34.1	66.1	57.3	71.8
C.V.	8.0	5.4	11.9	6.1	13.0	
LSD (0.05)	9.0	12.3	6.8	6.7	12.4	

Table 3. 2000 SPRING OAT STATEWIDE DRYLAND REPORT - TEST WEIGHT (lb/bu)

Variety or ID	Havre	Sidney	Sidney Recrop	Moccasin Notill	Huntley	Ave.
Rio Grande	32.7	37.8	36.7	32.4	37.5	35.4
Ajay	32.9	38.0	37.2	31.7	36.8	35.3
Lamont	40.3	44.2	43.3	32.0	45.2	41.0
87AB5125	33.4	39.7	36.5	29.3	37.2	35.2
Provena	46.9	48.5	48.8	34.2	45.7	44.8
90Ab1322	33.1	39.0	38.2	30.4	38.0	35.7
95A11633	39.8	40.5	43.4	30.7	40.5	39.0
ABSP19-9	35.7	40.5	39.2	31.3	38.9	37.1
ABSP9-2	34.6	38.8	38.7	35.3	40.0	37.5
AC Belmont	38.2	38.8	43.3	31.8	41.4	38.7
Celsia	33.9	38.7	36.7	33.0	34.8	35.4
Otana	35.3	39.3	39.0	31.9	37.2	36.6
Monida	33.4	38.3	37.0	35.1	37.6	36.3
Paul	45.1	46.5	46.4	37.0	45.0	44.0
Whitestone	36.3	39.7	37.5	30.6	35.1	35.8
ND930122	35.7	39.2	37.3	32.9	38.2	36.6
MEAN	36.7	40.0	39.9	32.5	39.3	37.8
C.V.	2.5	1.7	2.1	11.9	9.9	
LSD (0.05)	1.5	1.1	1.4	6.4	6.5	

Table 4. 2000 SPRING OAT STATEWIDE DRYLAND REPORT - HEADING DATE (Julian*)

Variety or ID	Havre	Sidney	Sidney Recrop	Moccasin Notill	Huntley	Ave.
Rio Grande	178.3	161.7	167.0	184.0	171.3	172.5
Ajay	181.3	164.7	172.7	187.3	175.0	176.2
Lamont	186.3	168.3	173.3	191.7	178.0	179.5
87AB5125	183.7	166.3	173.0	189.3	171.0	176.7
Provena	184.0	166.7	172.0	190.0	174.7	177.5
90Ab1322	181.0	164.0	171.0	188.0	170.0	174.8
95A11633	185.7	167.3	173.3	191.7	171.0	177.8
ABSP19-9	180.7	163.3	169.7	186.3	169.3	173.9
ABSP9-2	186.0	166.7	171.3	190.0	173.3	177.5
AC Belmont	180.7	166.3	173.3	189.7	168.0	175.6
Celsia	185.3	167.3	174.0	190.0	178.0	178.9
Otana	180.0	165.0	171.0	187.7	170.0	174.7
Monida	185.0	167.3	173.0	190.3	173.7	177.9
Paul	181.7	166.0	173.0	189.7	168.0	175.7
Whitestone	183.0	165.7	171.3	188.7	168.7	175.5
ND930122	178.0	162.7	169.7	184.7	165.0	172.0
MEAN	182.5	165.1	171.8	188.7	171.6	176.0
C.V.	0.9	0.4	8.7	0.4	0.6	
LSD (0.05)	2.7	1.0	2.5	1.3	1.8	

*Days from January 1

Table 5. 2000 SPRING OAT STATEWIDE DRYLAND REPORT - PLANT HEIGHT (inches)

Variety or ID	Havre	Sidney	Sidney Recrop	Moccasin Notill	Huntley	Ave.
Rio Grande	27.8	24.8	17.3	30.0	27.9	25.6
Ajay	22.5	22.7	14.3	23.0	21.9	20.9
Lamont	28.7	28.1	17.1	27.0	26.4	25.4
87AB5125	26.7	25.6	13.7	29.0	27.9	24.6
Provena	27.0	26.5	16.9	26.0	27.4	24.8
90Ab1322	25.1	25.3	15.6	28.0	27.2	24.3
95A11633	28.0	26.5	16.1	28.0	28.9	25.5
ABSP19-9	28.0	28.2	19.0	28.0	30.9	26.8
ABSP9-2	27.4	28.0	16.1	28.0	27.2	25.3
AC Belmont	30.1	29.9	17.6	29.0	32.9	27.9
Celsia	29.7	31.4	18.1	31.0	29.2	27.9
Otana	34.1	34.9	19.7	35.0	33.3	31.4
Monida	29.9	30.8	15.8	29.0	30.1	27.1
Paul	33.2	34.8	18.6	34.0	32.9	30.7
Whitestone	28.2	29.8	16.5	30.0	28.7	26.7
ND930122	30.0	29.7	18.4	33.0	30.1	28.2
MEAN	28.5	28.1	16.9	29.3	28.9	26.4
C.V.	3.9	4.6	1.2		6.8	
LSD (0.05)	1.9	2.1	3.3		3.3	

Table 6. 2000 SPRING OATS STATEWIDE IRRIGATED OVERALL SUMMARY

Variety or ID	Yield	Test Weight	Heading Date	Plant Height
	bu/ac	lbs/bu	Julian*	inches
Rio Grande	194.8	36.8	171.0	44.7
Ajay	180.9	35.6	174.8	41.2
Lamont	137.0	41.7	177.3	47.4
87AB5125	190.2	36.1	175.2	44.5
Provena	141.2	44.3	176.3	44.3
90Ab1322	205.9	36.1	174.1	43.2
95A11633	141.3	38.2	176.1	43.9
ABSP19-9	189.0	38.1	172.8	46.8
ABSP9-2	193.0	36.5	175.8	46.3
AC Belmont	135.1	37.6	175.2	46.5
Celsia	174.4	36.0	176.8	48.1
Otana	186.2	38.5	174.1	50.2
Monida	197.4	35.1	176.3	48.3
Paul	129.6	45.3	174.7	49.4
Whitestone	177.6	37.3	175.1	45.3
ND930122	179.5	37.9	171.6	45.9
MEAN	172.1	38.0	174.8	46.0

*Days from January 1

Table 7. 2000 SPRING OAT STATEWIDE IRRIGATED REPORT - YIELD (bu/ac)

Variety or ID	Sidney	Kalispell High Moisture	Huntley	Bozeman	Ave.
Rio Grande	194.4	187.6	203.0	194.1	194.8
Ajay	190.3	177.1	183.2	172.9	180.9
Lamont	158.6	113.1	155.4	121.0	137.0
87AB5125	213.7	179.4	188.6	179.2	190.2
Provena	152.1	128.9	146.4	137.4	141.2
90Ab1322	221.1	212.4	203.5	186.5	205.9
95A11633	160.3	119.9	145.1	139.8	141.3
ABSP19-9	208.1	143.1	208.8	195.8	189.0
ABSP9-2	210.1	168.6	215.6	177.8	193.0
AC Belmont	140.4	96.6	161.3	142.2	135.1
Celsia	213.7	121.7	185.1	177.1	174.4
Otana	213.2	162.5	207.5	161.5	186.2
Monida	203.7	164.1	243.5	178.1	197.4
Paul	139.7	104.5	140.0	134.0	129.6
Whitestone	202.0	130.7	193.5	184.2	177.6
ND930122	217.1	124.2	181.3	195.1	179.5
MEAN	189.9	145.9	192.9	173.2	172.1
C.V.	5.2	21.4	11.0	7.8	
LSD (0.05)	16.4	52.1	34.6	22.2	

Table 8. 2000 SPRING OAT STATEWIDE IRRIGATED REPORT - TEST WEIGHT (lb/bu)

Variety or ID	Sidney	Kalispell High Moisture	Huntley	Bozeman	Ave.
Rio Grande	34.8	34.5	40.4	37.3	36.8
Ajay	34.7	32.1	39.8	35.8	35.6
Lamont	43.2	38.5	48.0	37.1	41.7
87AB5125	36.0	31.5	41.6	35.2	36.1
Provena	45.5	41.1	49.6	41.1	44.3
90Ab1322	35.0	32.7	41.1	35.5	36.1
95A11633	39.0	34.9	44.2	34.7	38.2
ABSP19-9	37.7	33.9	42.4	38.4	38.1
ABSP9-2	36.3	32.1	42.3	35.1	36.5
AC Belmont	38.0	34.9	43.2	34.3	37.6
Celsia	35.7	31.0	42.2	34.9	36.0
Otana	38.2	36.3	41.7	37.7	38.5
Monida	35.5	31.7	40.1	33.1	35.1
Paul	45.8	43.0	48.0	44.2	45.3
Whitestone	36.8	33.0	41.7	37.7	37.3
ND930122	35.8	35.5	41.7	38.6	37.9
MEAN	38.0	34.8	42.4	37.0	38.2
C.V.	1.3		1.4	5.0	
LSD (0.05)	0.8		1.0	3.0	

Table 9. 2000 SPRING OAT STATEWIDE IRRIGATED REPORT - HEADING DATE (Julian*)

Variety or ID	Sidney	Kalispell High Moisture	Huntley	Bozeman	Ave.
Rio Grande	163.0	174.3	165.7	181.0	171.0
Ajay	168.3	179.0	168.0	183.7	174.8
Lamont	169.3	182.0	172.3	185.7	177.3
87AB5125	168.0	178.3	171.0	183.7	175.2
Provena	167.7	179.3	174.0	184.3	176.3
90Ab1322	167.7	177.3	168.0	183.3	174.1
95A11633	168.7	179.0	172.0	184.7	176.1
ABSP19-9	164.0	176.7	168.3	182.0	172.8
ABSP9-2	168.0	180.3	170.0	184.7	175.8
AC Belmont	168.3	177.7	171.3	183.3	175.2
Celsia	169.3	180.0	172.7	185.0	176.8
Otana	167.0	178.0	168.3	183.0	174.1
Monida	168.3	181.0	171.3	184.7	176.3
Paul	167.7	178.0	169.7	183.3	174.7
Whitestone	168.0	177.7	171.0	183.7	175.1
ND930122	164.0	174.7	166.3	181.3	171.6
MEAN	167.3	178.3	170.0	183.6	174.8
C.V.	0.3	0.3	0.4	0.3	
LSD (0.05)	0.8	0.9	1.2	0.9	

*Days from January 1

Table 10. 2000 SPRING OAT STATEWIDE IRRIGATED REPORT - PLANT HEIGHT (inches)

Variety or ID	Sidney	Kalispell High Moisture	Huntley	Bozeman	Ave.
Rio Grande	35.4	31.9	40.3	34.3	35.5
Ajay	31.0	28.6	33.8	29.5	30.7
Lamont	42.0	37.9	41.1	34.7	38.9
87AB5125	36.2	34.6	37.9	33.5	35.6
Provena	34.8	32.3	38.5	33.5	34.7
90Ab1322	34.1	30.4	38.6	30.3	33.4
95A11633	34.0	32.8	37.5	33.5	34.5
ABSP19-9	39.2	33.6	42.3	36.2	37.8
ABSP9-2	38.5	35.8	42.0	33.9	37.5
AC Belmont	39.9	35.7	40.4	35.8	38.0
Celsia	40.9	39.6	45.3	35.4	40.3
Otana	42.3	43.6	49.0	39.4	43.5
Monida	41.2	39.2	45.9	34.7	40.3
Paul	42.0	38.3	46.7	39.0	41.5
Whitestone	38.1	34.8	39.8	33.5	36.5
ND930122	39.6	37.9	39.2	36.2	38.2
MEAN	38.1	35.5	40.9	34.8	37.3
C.V.	4.9	5.4	5.5		
LSD (0.05)	3.1	3.2	3.7		