

# Oat Variety Grain and Forage Yield Trials at the Maricopa Agricultural Center 1989

*M. Sheedy, M. Ottman, and T. Ramage*

## INTRODUCTION

A forage and grain trial was conducted at the Maricopa Agricultural Center to compare yields of 10 oat cultivars. Eight hulled and two hull-less cultivars were tested for forage and grain yields during the '88-'89 growing season. Typically, the oat seed is tightly enclosed in a hull which consists of the lemma and palca flower parts. The lemma and palca in the hull-less oats thresh away from the seed when harvested. In this yield trial, two hull-less oats - Tibor and 03669 - were included to compare yields with the hulled varieties.

## MATERIALS AND METHODS

A 6x6 Latin square design was used to compare differences in forage and grain yields. Each Latin square consisted of four cultivars and the two check varieties - Mesa and Cayuse. Four Latin squares were required to test the 10 cultivars for forage yields (LS-1 & LS-2, Table 1) and grain yields (LS-3 & LS-4, Table 2).

The field remained fallow the previous growing season; the seedbed was prepared by incorporating 120 lbs N and 75 lbs P<sub>2</sub>O<sub>5</sub>/A for both forage and grain trials. Seedlings emerged in 12 days. An additional 50 lbs N/A was applied in each of the first and second post-plant irrigations on January 26 and February 27. Four more irrigations were scheduled on March 17, March 29, April 11, and April 21.

Each plot was 5.5 feet wide by 15 feet long, with six rows planted 11 inches apart. Forage was harvested from each of the cultivars at heading time. Three middle rows were harvested with a Jari mower equipped with a 3 foot cutter bar set at a 2 inch cutting height. A sample of material from each harvested plot was taken to determine moisture content; all forage yields presented in Table 1 are based on a 12% moisture content. Grain yields were harvested June 1, 1989. The four middle rows were harvested with a Hege 125B, small plot combine.

## RESULTS

Cayuse oats was one of the top forage-yielding varieties in both Latin squares 1 and 2; was exceeded by only 200 lbs by the variety Colorado 37 in Latin square 2. Although not as high yielding as Cayuse, both Stampede and Tibor produced more than 10,000#/A of forage, significantly more than the other varieties.

Extra irrigations were required for optimum forage production for the highest yielding varieties. This requirement was necessary to accommodate the wide maturity range of the varieties tested for forage production. Early maturing varieties such as Montezuma and 03669 required the least amount of water but were the lowest in forage production.

Mesa and Nora were the two highest grain-yielding varieties tested in Latin square 3; Montezuma and Swan were the two highest yielding varieties in Latin square 4. Although the yield of Mesa is not as high as that of Montezuma, the yield was almost 4000 lbs/A, significantly higher than the two later varieties - Cayuse and Colorado 37. The lower yields of the later varieties, with the exception of Tibor, can be attributed to the high temperature (100°+) observed before heading time. Some sterility was observed in Cayuse, Colorado 37 and Stampede at the time of heading.

The low yields of Tibor and 03669 was due in part to the hull-less nature of these cultivars. The hull surrounding the oat kernel can account for a substantial part of the yield weight. Test weights of these two oats are 43 to 43.5 lbs/bu versus 33 lbs/bu for Mesa and 36 lbs/bu for Nora (Table 2).

In this yield trial, the later maturing oat varieties were best suited for forage production but least productive for grain yield. The earlier maturing varieties produced the greatest grain yield but were lowest yielding forage producers.

Table 1. Oat Variety Forage Yields.

Variety	Source	Heading Date	Plant height in.	% Lodging	No. of Irrigations	lbs/A	Forage Yield % of	
							Mesa	Cayuse
<u>Latin square 1 C.V.=10.9</u>								
Cayuse	WSU	4-17	51.2	90	6	13255 a	161	100
Stampede	WPB	4-19	43.3	50	6	11000 b	134	83
Tibor	Canada	3-28	43.3	80	5	10175 b	124	77
Nora	UofArk	3-19	31.5	75	4	8616 c	105	65
Mesa	UA	3-18	33.5	85	4	8213 c	100	62
03669	Canada	3-11	35.4	60	3	7388 c	90	56
<u>Latin square 2 C.V.=7.1</u>								
Colorado37		4-16	43.3	90	6	13053 a	150	102
Cayuse	WSU	4-17	51.2	90	6	12851 a	147	100
Mesa		3-18	33.5	90	4	8726 b	100	68
Swan		3-13	31.5	60	3	8525 b	98	66
FMC400	FMC	3-20	34.4	90	4	8360 b	96	65
Montezuma	UC	3-5	31.5	10	3	6875 c	79	53

Table 2. Oat Variety Grain Yields.

Variety	Source	Heading Date	Plant height in.	% Lodging	Test weight lbs/bu	lbs/A	Grain Yield % of	
							Mesa	Cayuse
<u>Latin square 3 C.V.=16.0</u>								
Mesa	UA	3-18	41.3	100	33.0	4549 a	100	205
Nora	UofArk	3-19	41.3	80	36.5	4385 a	96	197
03669	Canada	3-11	51.2	80	43.5	2337 b	51	105
Cayuse	WSU	4-17	59.1	100	26.5	2221 b	49	100
Tibor	Canada	3-28	51.2	60	43.0	1348 c	30	61
Stampede	WPB	4-19	41.3	50	26.0	1201 c	26	54
<u>Latin square 4 C.V.=9.6</u>								
Montezuma	UC	3-5	39.4	100	33.5	4790 a	121	222
Swan		3-13	45.3	60	35.5	4495 a	114	208
Mesa	UA	3-18	47.2	100	31.0	3953 b	100	183
FMC400	FMC	3-20	43.3	100	32.5	3881 b	98	179
Cayuse	WSU	4-17	63.0	100	24.0	2158 c	55	100
Colorado37		4-16	59.1	100	26.0	1308 d	33	61

Variety yields within each latin square followed by the same letter are not significantly different at .05% probability level using Duncan's Multiple Range Test.