

# Forage Production of Four Crops Grown Under Two Different Production Cultures 1990

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## Abstract

*Forage trials of four crops grown under high-input and low-input production cultures were performed at the Maricopa Agricultural Center. Six varieties of each crop were grown to evaluate yield potential under both production cultures. Only a preplant irrigation was applied to the low-input culture, but up to four additional irrigations were applied to the high-input culture. No fertilizer application was given to low-input, but a total of 135#N/A and 75#P<sub>2</sub>O<sub>5</sub>/A was applied to the full production culture. Barley, durum, and wheat cultivars developed for grain yield under a low-input production culture were tested for forage production under both high- and low-input practices. No advantage in forage production was observed by using the following varieties in a low-input production culture: Stampede oats, Westford barley, Mexicali durum, and 911 wheat produced the highest yields in each of the four crops. Yields were greater from crops grown under a high-input culture: Stampede oats, Harlan II barley, Aldura durum, and 911 wheat were highest yielding varieties in each crop.*

## Introduction

Forage yield trials of oats, barley, durum, and wheat were conducted at the Maricopa Agricultural Center during the '89-90 growing season. As in the previous year, six cultivars in each of the four crops were grown under one-irrigation low-input production and, as a comparison, a full-irrigation high-input production culture.

Varieties tested included two barleys (Seco, Solum (2-22-9)), two durums (B83-33, B83-40), and three wheats (M83-39-184, B85-277A, B83-450). These cultivars were developed for grain yield under a low-input culture.

## Materials and Methods

For both cultures, six varieties of each crop were grown in a 6 x 6 latin square design. Plot size was 6 feet wide by 18 feet long consisting of 6 rows planted 12 inches apart. Previous crop on both seedbeds was a green

manure of Harlan barley. The high-input production seedbed was prepared by incorporating 85#N/A and 75#P<sub>2</sub>O<sub>5</sub>/A. No fertilizer was applied to the low-input seedbed, but soil samples to a depth of 6 feet showed a residual amount of 40#N/A. Both seedbeds were pre-irrigated on November 7 and planted on November 15, 1989. All four crops were planted at the rate of 20 seed/foot row which is approximately 70,80,100,80#/A of oats, barley, durum, and wheat respectively.

No additional water was applied to the low-input production culture throughout the growing season. Four additional irrigations were scheduled on Jan. 24, Feb. 23, Mar. 14 and 20 for the high-input culture. An additional 50#N/A was applied in the first postplant irrigation.

Forage was harvested when each cultivar was at the heading stage. Three middle rows of each plot were cut with a Jari mower set at a 2 inch cutting height. Weights and fresh samples were taken from each plot to determine yield and moisture content of the harvested forage. All yields presented in Table 1 (high-input) and Table 2 (low-input) have been adjusted to a 10% moisture content.

## Results

Highest yields were produced in the high-input production culture (Table 1). Stampede oats, Harlan II barley, Aldura durum, and 911 wheat produced yields of 13169#/A, 8051#/A, 7944#/A and 9059#/A, respectively.

Forage yields produced under a low-input culture are presented in Table 2. Highest yields for each crop were 4201#/A - Stampede oats, 4904#/A - Westford barley, 4079#/A - Mexicali durum, and 3162#/A - 911 wheat. Durum lines B83-33 and B83-40 statistically yielded as much forage as Mexicali, and also the wheat line B85-277A yielded as much as the high yield 911 variety. Although these lines were high yielding, no yield increase was observed by growing these lines under a low-input culture.

Table 1. Four Crop Forage Yields Under A High-Input Culture

Variety	Source	Heading Date	Number of Irrig.	Plant Height Inches	% Lodging	Forage Yield lbs/A
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Latin Square 1 CV = 8.1 OATS

Stampede	WPB	4-21	5	35	0	13169 a
Cayuse	WSU	4-19	5	47	30	12557 ab
Markton		4-17	5	49	50	11747 b
Nora	U of Ark	3-28	4	39	0	10464 c
Mesa	UA	4-02	5	41	10	8997 d
Montezuma	UC	3-10	3	31	30	5942 e

Latin Square 2 CV = 6.8 BARLEY

Harlan II	UA	3-19	4	31	0	8051 a
Arivat		3-09	3	33	30	7179 b
Westford	WPB	3-18	4	37	0	7088 b
Gustoe	WPB	3-20	4	70	0	6660 bc
Seco	USDA	2-22	2	33	0	6217 cd
Solum	USDA	2-22	2	33	0	5851 d

Latin Square 3 CV = 7.1 DURUM

Aldura	NK	3-22	4	28	0	7944 a
B83-40	UA	3-06	3	26	0	7302 b
Mexicali	CIMMYT	3-13	3	28	0	7240 b
Turbo	WPB	3-22	4	30	0	7134 b
B83-33	UA	3-13	3	28	0	6752 bc
881	WPB	3-14	3	24	0	6401 c

Latin Square 4 CV = 7.2 WHEAT

911	WPB	3-28	4	26	0	9059 a
Super X	CIMMYT	3-23	4	26	0	8219 b
B85-277A	UA	3-19	4	30	0	7684 bc
M83-39-184	UA	3-22	4	28	0	7072 c
Y. Rojo	UC	3-16	4	20	0	6079 d
B83-450	UA	3-06	3	28	30	5315 e

Table 2. Four Crop Forage Yields Under A Low-Input Culture

Variety	Source	Heading Date	Plant Height Inches	% Lodging	Forage Yield lbs/A
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Latin Square 5 CV = 15.0 OATS

Stampede	WPB	4-12	20	0	4201 a
Montezuma	UC	3-10	24	0	3971 ab
Cayuse	WSU	4-11	26	0	3589 ab
Markton		3-28	24	0	3345 b
Mesa	UA	3-24	26	0	3269 b
Nora	U of Ark	3-25	20	0	3207 b

Latin Square 6 CV = 11.8 BARLEY

Westford	WPB	3-13	20	0	4904 a
Harlan II	UA	3-21	26	0	4704 a
Arivat		3-09	26	0	4384 ab
Solum	USDA	2-24	30	0	3971 b
Gustoe	WPB	3-12	18	0	3941 b
Seco	USDA	2-22	30	0	3879 b

Latin Square 7 CV = 13.0 DURUM

Mexicali	CIMMYT	3-12	22	0	4079 a
B83-33	UA	3-12	22	0	3956 a
B83-40	UA	3-13	24	0	3956 a
881	WPB	3-13	20	0	3624 a
Aldura	NK	3-19	20	0	2703 b
Turbo	WPB	3-18	24	0	2581 b

Latin Square 8 CV = 10.2 WHEAT

911	WPB	3-26	16	0	3162 a
B85-277A	UA	3-13	20	0	3054 ab
Super X	CIMMYT	3-22	16	0	2871 abc
M83-39-184	UA	3-09	24	0	2798 bc
Y. Rojo	UC	3-12	20	0	2627 c
B83-450	UA	3-05	24	0	2504 c