

New Alfalfa Variety Trial in Graham County Arizona, 2001

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Abstract

Twenty six alfalfa varieties with fall dormancy ratings of 7 or 9 were tested in a replicated small plot trial on a sandy clay loam soil on the Safford Agricultural Center. This was the third year of the study. Coronado was the highest yielding variety in 2000 with Mecca III following closely behind. Both varieties produced a yield over 9 tons per acre and averaged 9.3 tons per acre over the 3-year period..

Introduction

This is the third year of a new study which includes the best varieties from the previous trial along with several new varieties that seem promising. Because the yield relations by variety vary greatly with soil texture, it is important to note that this variety study was implemented on a clay loam soil that was much lighter in texture than the previous study. This is the 25th year of continuous alfalfa variety testing in Graham county. Although alfalfa is not grown on a large percentage of the acres in Graham County, it continues to be an important rotation crop for the farmers who grow it.

Materials and Methods

Twenty six alfalfa varieties with fall dormancy ratings ranging from 7 to 10 are included in this test. Plots were planted using a John Deere Van Brunt 6-foot grain drill with a small seed attachment. Eight lines were planted down two 36-inch beds, with 6-inch spacings between lines. A ring roller was run over the plots before planting to firm the beds and afterwards to help incorporate the seed.

Crop History:

Location: Safford Agricultural Center, Graham County
Elevation: 2950 feet above sea level
Soil type: Grabe clay loam
Planting date: 2 October 1998 Rate: 25 lbs/acre
Herbicide: None
Fertilizer: 300 lbs/ac 16-20-0 at planting
Insecticide: Treatment to control alfalfa weevil
Irrigation: Border- 15 irrigations (ca. 133 acre inches)
Harvest strategy: Cut around 10% bloom to optimize quantity and stand longevity.
Plot size: 4 feet by 15 feet
Replicates: Four

Plots were cut and weighed immediately to prevent loss of moisture. Weights were converted to dry weight at 0% moisture for reporting purposes.

Results

Table 1. Third year yield summary for 26 alfalfa varieties grown at 2950 feet above sea level grown in a Grabe clay loam soil in southeastern Arizona. Yields are in tons per acre, ranks are in parentheses. (Graham county, Safford Agricultural Center. 32° 49' N, 109E 41' W)

| Variety | Cut 1 4/12 | Cut 2 5/16 | Cut 3 6/18 | Cut 4 7/9 | Cut 5 8/7 | Cut 6 9/12 | Cut 7 11/7 | Total 2001 | % of Cuf 101 |
|---------------|-----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|
| Coronado | 1.26 abc ¹ | 1.95 a | 1.60 a | 1.59 a | 1.09 a | 0.85 bcd | 1.09 abc | 9.44 a | 109.6 |
| Mecca III | 1.25 abc | 1.67 a-d | 1.60 a | 1.54 ab | 1.07 abc | 1.16 a | 1.09 abc | 9.39 a | 109.1 |
| DK191 | 1.36 ab | 1.75 abc | 1.44 abc | 1.41 a-e | 1.09 ab | 0.98 ab | 1.10 abc | 9.12 ab | 105.9 |
| Mecca II | 1.13 abc | 1.80 ab | 1.36 a-d | 1.39 a-f | 1.06 abc | 0.89 a-d | 1.26 a | 8.90 ab | 103.4 |
| ZS9890 | 1.28 abc | 1.83 ab | 1.38 a-d | 1.39 a-e | 0.97 a-e | 0.81 bcd | 1.02 a-d | 8.67 abc | 100.7 |
| ZX9701 | 1.19 abc | 1.73 abc | 1.36 a-d | 1.39 a-e | 1.06 abc | 0.83 bcd | 1.06 a-d | 8.63 abc | 100.2 |
| Cuf101 | 1.19 abc | 1.76 abc | 1.33 a-d | 1.32 a-h | 1.03 abc | 0.80 bcd | 1.18 ab | 8.61 abc | 100.0 |
| ZX9393 | 1.11 abc | 1.62 a-e | 1.53 ab | 1.45 a-d | 1.03 abc | 0.82 bcd | 1.02 a-d | 8.59 abc | 99.8 |
| ABI9283 | 1.12 abc | 1.74 abc | 1.51 ab | 1.38 a-g | 0.96 a-e | 0.79 bcd | 0.97 a-d | 8.47 abc | 98.4 |
| Achiever | 1.37 a | 1.64 a-d | 1.24 bcd | 1.27 b-i | 1.06 abc | 0.82 bcd | 0.99 a-d | 8.40 a-d | 97.6 |
| Maricopa | 1.30 abc | 1.79 ab | 1.32 a-d | 1.29 a-i | 0.96 a-e | 0.87 bcd | 0.95 a-d | 8.32 a-d | 96.6 |
| Mesa | 1.17 abc | 1.71 abc | 1.28 a-d | 1.29 a-i | 1.00 a-d | 0.87 bcd | 1.00 a-d | 8.32 a-d | 96.6 |
| SW7400 | 1.18 abc | 1.74 abc | 1.44 abc | 1.45 a-d | 0.87 b-e | 0.64 d | 0.99 a-d | 8.31 a-d | 96.5 |
| ZG97977 | 1.23 abc | 1.46 b-e | 1.29 a-d | 1.48 abc | 1.02 a-d | 0.81 bcd | 1.02 a-d | 8.30 a-d | 96.4 |
| Yolo | 1.04 abc | 1.54 a-e | 1.26 a-d | 1.45 a-e | 0.95 a-e | 0.95 abc | 1.09 abc | 8.28 a-e | 96.2 |
| SW8210 | 1.01 abc | 1.74 abc | 1.21 bcd | 1.21 c-i | 0.99 a-d | 0.79 bcd | 1.03 a-d | 8.00 a-f | 92.9 |
| Alto | 1.16 abc | 1.44 b-e | 1.38 a-d | 1.26 b-i | 0.96 a-e | 0.92 a-d | 1.05 a-d | 7.74 b-f | 89.9 |
| WL525HQ | 1.05 abc | 1.41 b-e | 1.18 bcd | 1.22 c-i | 1.01 a-d | 0.91 a-d | 0.96 a-d | 7.74 b-f | 89.9 |
| Weststar | 1.11 abc | 1.46 b-e | 1.21 bcd | 1.22 c-i | 0.95 a-e | 0.82 bcd | 0.94 bcd | 7.71 b-f | 89.5 |
| Mecca | 0.99 bc | 1.46 b-e | 1.28 a-d | 1.33 a-h | 0.98 a-e | 0.77 bcd | 0.80 cd | 7.62 b-f | 88.5 |
| Barbara | 1.05 abc | 1.50 a-e | 1.29 a-d | 1.15 d-i | 0.90 a-e | 0.82 bcd | 0.90 bcd | 7.62 b-f | 88.5 |
| UN9L600 | 1.14 abc | 1.66 a-d | 1.18 bcd | 1.07 ghi | 0.85 cde | 0.65 d | 1.00 a-d | 7.55 b-f | 87.7 |
| UN1718 | 1.14 abc | 1.29 cde | 1.20 bcd | 1.13 e-i | 0.92 a-e | 0.77 bcd | 0.84 cd | 7.29 c-f | 84.7 |
| ZL9889A | 0.94 c | 1.38 b-e | 1.11 cd | 1.03 hi | 0.87 cde | 0.68 cd | 0.86 cd | 6.87 def | 79.8 |
| UN9T1078 | 0.94 c | 1.15 e | 1.11 cd | 0.99 i | 0.80 de | 0.87 bcd | 0.85 cd | 6.71 ef | 77.9 |
| DK180 | 1.07 abc | 1.22 de | 1.06 d | 1.08 f-i | 0.76 e | 0.68 cd | 0.77 d | 6.65 f | 77.2 |
| Average | 1.14 | 1.59 | 1.31 | 1.30 | 0.97 | 0.83 | 0.99 | 8.14 | -- |
| LSD(05) | 0.38 | 0.48 | 0.36 | 0.32 | 0.22 | 0.28 | 0.31 | 1.58 | -- |
| CV(%) | 23.48 | 21.42 | 19.31 | 17.21 | 16.23 | 24.05 | 22.33 | 13.81 | -- |
| HU 77/41EF | 1099 | 834 | 978 | 711 | 972 | 1144 | 1456 | 7194 | Avg=1028 |

1. Values followed by the same letter are not significantly different at the 5% level of probability using the Duncan Multiple Range test.

Table 2. Three year yield summary for 26 alfalfa varieties grown at 2950 feet above sea level grown in a Grabe clay loam soil in southeastern Arizona. Yields are in tons per acre, ranks are in parentheses.

| Variety | Source | Fall Dormancy Rating | 1999 Yield Average | 2000 Yield Average | 2001 Yield Average | 3-year Average | Percent of Cuf 101 |
|----------------|---------------|----------------------|----------------------|--------------------|--------------------|-----------------|--------------------|
| Coronado | Novartis | 9 | 9.49 ab ¹ | 9.20 a | 9.44 a | 9.37 a | 114.8 |
| Mecca III | PGI/MBS | 9 | 9.55 a | 9.10 ab | 9.39 a | 9.34 a | 114.5 |
| DK 191 | DeKalb | 9 | 9.29 abc | 9.08 ab | 9.12 ab | 9.16 ab | 112.3 |
| ZS9890 | | | 8.52 a-e | 8.63 abc | 8.67 abc | 8.60 abc | 105.4 |
| ZX9393 | | | 9.09 a-d | 8.03 a-e | 8.59 abc | 8.57 abc | 105.0 |
| Mecca II | PGI/MBS | 9 | 8.18 a-f | 8.43 a-e | 8.90 ab | 8.50 abc | 104.2 |
| ZX9701 | | | 8.58 a-e | 8.03 a-e | 8.63 abc | 8.40 abc | 102.9 |
| Mesa | PGI/MBS | 8 | 8.61 a-e | 8.30 a-e | 8.32 a-d | 8.40 abc | 102.9 |
| Maricopa | PGI/MBS | 8 | 8.69 a-e | 8.18 a-e | 8.32 a-d | 8.39 abc | 102.8 |
| SW 7400 | S&W Seed | 7 | 9.10 a-d | 7.76 a-e | 8.31 a-d | 8.38 abc | 102.7 |
| ABI 9283 | | | 8.54 a-e | 8.12 a-e | 8.47 abc | 8.37 abc | 102.6 |
| UN9L600 | | | 8.98 a-d | 8.50 ab | 7.45 b-f | 8.33 a-d | 102.1 |
| Achiever | | | 7.98 c-f | 8.57 abc | 8.40 a-d | 8.31 a-d | 101.8 |
| Yolo | PGI/MBS | 8 | 8.01 b-f | 8.32 a-e | 8.28 a-e | 8.20 a-d | 100.5 |
| SW 8210 | S%W Seed | 8 | 8.84 a-e | 7.65 a-e | 8.00 a-f | 8.16 a-d | 100.0 |
| Cuf 101 | Public | 9 | 8.08 a-f | 7.80 a-e | 8.61 abc | 8.16 a-d | 100.0 |
| ZG9797 | | | 8.04 b-f | 7.43 a-e | 8.30 a-d | 7.92 bcd | 97.1 |
| WL525HQ | W-L Rsrch | 8 | 8.29 a-e | 7.63 a-e | 7.74 b-f | 7.88 bcd | 96.6 |
| UN1718 | | | 8.52 a-e | 7.76 a-e | 7.29 c-f | 7.85 bcd | 96.2 |
| Weststar | Lohse Mill | 8 | 7.92 c-f | 7.86 a-e | 7.71 b-f | 7.83 b-e | 96.0 |
| Mecca | PGI/MBS | 9 | 8.28 a-e | 7.36 a-e | 7.62 b-f | 7.75 b-e | 95.0 |
| Alto | Grt Plains | 8 | 7.63 d-g | 7.15 b-f | 8.15 a-f | 7.64 c-f | 93.6 |
| Barbara | Argentina | | 8.19 a-f | 6.90 c-f | 7.62 b-f | 7.56 c-f | 92.6 |
| ZL9889A | | | 7.48 efg | 6.47 def | 6.87 def | 6.94 def | 85.0 |
| DK 180 | DeKalb | 8 | 6.28 g | 6.34 ef | 6.65 f | 6.42 ef | 78.7 |
| UN9T1078 | | | 6.76 fg | 5.48 f | 6.71 ef | 6.31 f | 77.3 |
| Average | | | 8.34 | 7.85 | 8.14 | 8.10 | -- |
| LSD(05) | | | 1.50 | 1.62 | 1.58 | 1.41 | -- |
| CV(%) | | | 12.7 | 14.7 | 13.81 | 12.39 | -- |
| Heat Units | (77/41EF) | | 7515 | 7510 | 7194 | 7406 | -- |

1. Values followed by the same letter are not significantly different at the 5% level of probability using the Duncan Multiple Range test.