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Alfalfa Variety Performance in the Brazos River Bottom

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SUMMARY

Alfalfa produces relatively high yields of high quality hay on the Brazos River bottom alluvial soils. Twenty-four cultivars (varieties) were planted on Norwood sandy loam in late October 1979 and harvested five times and six times in the early bloom stage in 1980 and 1981, respectively. The first cutting in 1980, lost to alfalfa weevil damage and not included in the yields, averaged 2.2 tons per acre on undamaged plants. There was no effective rainfall from May 16 to September 7, 1980. The plot area was irrigated (approximately 3 inches) on July 18 and again on August 25, 1980. Several cultivars produced approximately six tons of hay each year with two tons of that being lost in 1980 due to alfalfa weevil damage and not included in the reported yields. If the estimated yield lost to alfalfa weevil damage is included in 1980, production in an extremely dry season with two irrigations was approximately the same as in 1981 which was a good rainfall year.

Introduction

Alfalfa is adapted to the alluvial soils of the Brazos River bottom. Four to six cuttings of hay may be expected with annual production in the range of five to six tons per acre. Alfalfa weevil is currently the most critical insect pest though other insects pose some hazard to either production or the harvested hay. Stand persistence is generally limited to two to four years. This study is being conducted to evaluate the potential of a number of cultivars for production and for stand persistence.

Experimental Procedure

Twenty four cultivars or experimental lines of alfalfa were seeded on November 14, 1979 on Norweed sandy loam soil (fine loamy, mixed, thermic, Udertic Haplustoll). Plots were 5 12-inch rows, 20 feet long, with 6 replications. The seeding rate was 20 pounds per acre. Plots were harvested and dry forage yields determined on May 23, June 20, August 1, September 24 and October 31, 1980; and April 3, May 20, June 29, July 27, September 11 and November 20, 1981. Erratic and very heavy alfalfa weevil damage occurred in May 1980 and rainfall prevented either insecticide treatment or earlier harvest. As a result, a reliable estimate of individual cultivar yield on that date was not possible and the May 23 harvest is not included in Table 1 yields.

The 1980 growing season was extremely dry, no effective rainfall between May 16 and September 26. Total rainfall during that 113-day period was 1.97 inches with no rain exceeding 0.3 inches. Drought stress occurred in irregular patterns in the plot area. Irrigation

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water was applied on July 18 and August 25, approximately 3 inches each time, to reduce variability among plots.

Results and Discussion

Forage yields are summarized in Table 1. The 1980 yields do not include the May 23 cutting which was damaged by alfalfa weevil. Samples harvested from undamaged areas on May 23 indicated an average yield of 2.2 tons per acre which corresponds to expected first cutting yields in the spring of about 2 tons per acre. Harvested yields were in the range of 3 to 4 tons per acre the first year and five to six tons per acre the second year, with a two-year average of 4 to 5 tons per acre. The latter would have been about one ton higher had one cutting not been lost. The yields, even if the May 1980 harvest is included, are a little below previous reports at this same site (Holt, 1978, 1980).

The effect of drought stress on yields was lessened by two irrigations but certainly not eliminated. We think that stands would have survived in the absence of irrigation and that considerable growth would have been made but the data would have been much more variable.

Yield differences among cultivars, approximately one ton each year, were not significant statistically. Cultivar rankings varied to some extent between years. Mesilla which ranked second the first year dropped to 12 the second year and WL 512 dropped from 7 to 16. On the other hand, Cimarron, Williamsburg, K7-28 and Riley moved up in rank in the second year. Florida 66a ranked at the top both years and Common was near the top both years. When insect and disease problems are not encountered, Common usually performs satisfactorily because it is a mixture of types. In the presence of specific diseases or insects, cultivars carrying specific resistance to that pest would be expected to show superior performance.

Literature Cited

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Table 1. Yield of alfalfa cultivars, University Farm near College Station, 1980-81

| Cultivar | Tons of dry forage per acre | | |
|-----------------------|-----------------------------|-------------------|---------|
| | 1980 ¹ | 1981 ¹ | Average |
| 10 Florida 66a | 4.36 (1) | 6.12 (1) | 5.24 a |
| 4 Common | 4.08 (3) | 5.94 (2) | 5.01 ab |
| 14 WL 318 | 4.07 (4) | 5.46 (4) | 4.77 bc |
| 2 Cimarron | 3.86 (9) | 5.58 (3) | 4.72 bc |
| 17 Hi-phy | 3.95 (5) | 5.40 (7) | 4.68 bc |
| 23 Mesilla | 4.18 (2) | 5.16 (12) | 4.67 bc |
| 15 Williamsburg | 3.84 (10) | 5.46 (5) | 4.65 bc |
| 5 Classic | 3.86 (8) | 5.31 (9) | 4.59 bc |
| 3 K7-28 | 3.80 (12) | 5.37 (8) | 4.59 bc |
| 1 Riley | 3.76 (14) | 4.53 (6) | 4.59 bc |
| 20 NK-78010 (Raidor) | 3.76 (13) | 5.19 (11) | 4.48 cd |
| 16 WL 512 | 3.86 (7) | 5.04 (16) | 4.45 cd |
| 9 Kanza | 3.64 (19) | 5.28 (10) | 4.46 cd |
| 13 Olympic | 3.88 (6) | 5.01 (17) | 4.45 cd |
| 18 NAPB 42 (Vanguard) | 3.60 (20) | 5.10 (13) | 4.35 cd |
| 6 Apollo | 3.54 (22) | 5.07 (14) | 4.31 d |
| 11 K7-29 (Bancor) | 3.50 (23) | 5.04 (15) | 4.27 d |
| 21 Arc | 3.72 (16) | 4.80 (19) | 4.26 d |
| 12 Saranac | 3.76 (15) | 4.74 (21) | 4.25 d |
| 24 Zia | 3.66 (18) | 4.80 (20) | 4.23 d |
| 22 Moapa | 3.72 (19) | 4.71 (22) | 4.22 d |
| 7 Dawson | 3.82 (11) | 4.59 (24) | 4.21 d |
| 8 Team | 3.56 (21) | 4.92 (18) | 4.12 d |

¹ Yields were not significantly different, Fisher's LSD, Numbers in () are rankings within years.

² Mean separation based on BLSD at 0.05 level.