Forage Research In Texas, 1985

Yield of Spittlebug Tolerant Buffelgrass (1979-81)

M. A. HUSSEY AND W. T. W. WOODWARD

Summary

Five experimental buffelgrass cultivars with differing levels of tolerance to the Mexican spittlebug complex were evaluated for forage dry matter production at Weslaco. Dry matter yields during this study ranged from 10,400 lb/A in the establishment year to 23,000 lb/A in 1980 and 1981. During all 3 years, the forage production of the spittlebug tolerant lines was not significantly different from that of Common buffelgrass.

Introduction

The Mexican spittlebug or "Musca Pinta" is a complex of five species of insects belonging to the genera Aeneolamia and Prosapia (Table 1). Observations from Central America as well as coastal regions of Mexico have indicated that a wide range of warm-season grasses are susceptible to this pest. Buffelgrass appears to be particularly susceptible to "Musca Pinta" (Enkerlin and Morales, 1979).

KEYWORDS: Buffelgrass/Spittlebug/"Musca Pinta"/ forage yield.

TABLE 1. SPITTLEBUG "MUSCA PINTA" COMPLEX

Genus	Species
Aeneolamia	postica postica (WLK)
Aeneolamia	postica compechanna (Fennah)
Aeneolamia	postica occidentalis (Fennah)
Prosapia	simulans (Say)
Prosapia	bicincta (Say)

The rapid expansion of spittlebug during the 1960's and early 1970's generated concern that the spittlebug would eventually spread throughout the South Texas Plains. In response to this potential threat, a joint research effort between scientists at Monterrey Technological Institute and The Texas Agricultural Experiment Station was initiated in the mid-1970's. The major thrust of this effort was to develop a screening methodology to facilitate selection for spittlebug-tolerant lines. These evaluations were conducted in an effort to determine the dry matter production potential of spittlebug-tolerant germplasm in South Texas.

Procedures

Selected buffelgrass germplasm, which previously had been evaluated in caged plots and subjected to different intensities of insect pressure at Monterrey, Mexico in 1975, were selected for evaluation at Weslaco (Table 2). Seedlings were started in the greenhouse before being transplanted to the field on July 5, 1979. Each plot consisted of three rows on 40-inch centers, 15 feet long and arranged in a randomized complete block design on a Willacy sandy loam soil.

Nitrogen fertilizer was applied to the plots at a rate of 76 lb/A on March 19, 1980; 93 lb/A on July 25, 1980; and 60 lb/A on August 28, 1981. The center row of each plot was harvested with a flail type small plot harvester to estimate dry matter yield. Supplemental irrigation was applied as shown in Table 3.

Results and Discussion

Dry matter yield of spittlebug-tolerant and susceptible lines of buffelgrass are shown in Table 4. Yields of both susceptible and tolerant lines were similar to that previously reported for Common buffelgrass in South Texas (Wiedenfeld et al., 1980; Woodward, 1980).

Line 35 was the highest yielding genotype in 1980 and 1981 with dry matter yields exceeding 20,000 lb/A. Given that the rankings of buffelgrass germplasm as either tolerant or susceptible are correct, then it should be possible to select for spittlebug-tolerant lines without affecting dry matter production.

Observations of tolerant and susceptible genotypes indicate that the plant structure of tolerant lines was more open, allowing light to penetrate to the ground. This open canopy structure may be a major factor contributing to a lower preference for this germplasm by the spittlebug. Research at Campo Cotazatla, Mexico has indicated pastures of Pangola digitgrass (*Digitaria decumbens* Stent). which were clipped at heights of 10 to 20 cm had lower populations of insects compared to those pastures which exceeded 20 cm (Enkerlin and Morales, 1979).

Evaluations at Monterrey, Mexico indicate that differences exist within the genus Cenchrus for tolerance to spittlebug. From evaluations in South Texas, it appears that tolerance may be incorporated into buffelgrass without sacrificing dry matter productivity. Current research in this area needs to focus on specific mechanisms of resistance (i.e., plant pubescence, canopy

TABLE 2. VISUAL RANKING RATINGS OF SPITTLEBUG DAMAGE ON BUFFELGRASS PLANTS UNDER CAGES, MONTERREY, MEXICO 1975

Entry	Damage Rating[1]
Susceptible	
28	4
Common	5
Tolerant	
35	2
58	2.5
66	2
68	2

[1]1 = No damage; 2 = slight damage; 3 = stunted, yellow leaves; 4 = few green leaves; 5 = no green leaves.

TABLE 3. YEARLY RAINFALL TOTALS, WESLACO 1979-81

Month	1979	1980	1981
		Inches	
Jan.	0.70	0.11	3.10
Feb.	0.82	1.34	0.67
Mar.	0.08	0.10[1]	1.81
Apr.	1.72	0.11	3.33
May	1.01	2.53	6.29
June	3.80	0.00	2.37
July	0.80[1]	0.42[1]	3.88
Aug.	4.44	5.84	4.01
Sept.	3.89	1.38	2.46
Oct.	0.40	2.56	3.85
Nov.	0.42	2.42	0.37
Dec.	3.04	0.56	0.24
Total	21.12	17.37	32.38

[1]Supplemental irrigation - 2 inches.

TABLE 4. DRY MATTER PRODUCTION ON SPITTLEBUG TOLERANT GERMPLASM 1979-81

Entry	1979	1980	1981
		Pounds/Acre	
Susceptible			
28	10,399	18,657	19,699
Common	9,634	17,030	18,652
Tolerant			
35	9,804	23,454	22,172
58	8,787	17,934	19,101
66	5,643	14,725	18,689
68	9,465	17,083	18,538
LSD (0.05)	1,788	3,618	3,087
CV (%)	13.2	13.2	10.5

structure, etc.) and the potential for enhancing these characters in buffelgrass.

Literature Cited

1. Enkerlin, D., and J. A. Morales, 1979. The grass spittlebug complex *Aeneolamia albofasciata* and *Prosapia simulans* in northeastern Mexico and its possible control by resistant buffelgrass hybrids. *In:* Harris, M. K. (ed.) Biology and Breeding for Resistance to Arthropods and Pathogens in Agricultural Plans. pp. 470-494. Texas Agri. Exp. Sta. MP-1451.
2. Wiedenfeld, R. P., W. T. W. Woodward, and R. R. Hoverson. 1980. Dry land forage response to nitrogen and phosphorus fertilization in South Texas. Texas Agri. Exp. Sta. PR-3687.
3. Woodward, W. T. W. 1980. Performance of buffelgrass cultivars for South Texas. Texas Agri. Exp. Sta. MP-1460.