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ANNUAL CLOVER PRODUCTION AT YOAKUM, TEXAS - 1993

W. J. Grichar, D. C. Sestak, and A. J. Jaks

Summary

Varieties of arrowleaf (Trifolium vesiculosum Savi.), berseem (Trifolium alexandrinum L.), crimson (Trifolium incarnatum L.), subterranean (Trifolium subteraneum L. and Trifolium yanninicum Katzn. Morley), and rose clovers (Trifolium hirtum All.) were evaluated for forage production and adaptation at Yoakum in 1993-94. 'Overton R18' rose clover was the most productive annual clover yielding 5,839 lb/acre, while 'Meteora' and 'Larisa' subclovers (T. yanninicum Katzn. and Morley) were the least productive at 3900 lb/acre. Cold damage was noted with 'Amclo' and 'Yuchi' arrowleaf, 'Bigbee' berseem, 'Meteora' subterranean, and 'Hykon' rose clovers.

Introduction

Winter annual forage legumes are useful in pasture systems because they provide a high quality forage from February through spring and reduce or eliminate the need for nitrogen (N) fertilizer. Legumes are also important in farming systems which emphasize lower N fertilizer and pesticide inputs. When inoculated and infected with the proper rhizobial strain, legumes use nitrogen from the atmosphere through N-fixation.

Legumes also act as cover crops, which protect the soil from erosion, provide weed control through plant competition (Evers, 1983), and improve soil structure and fertility (Evers, 1985). Legumes grown in association with 'Coastal' bermudagrass (Cynodon dactylon L.) replaced two 50 lb/acre applications of N fertilizer and extended the grazing season, improve carring capacity, and improve animal gain (Ocumpaugh, 1990). Legumes are also planted with small grains and/or ryegrass (Lolium multiforum L.) to reduce the need for nitrogen fertilizer (Ocumpaugh, 1988).

The objective of this study was to evaluate cultivars of five forage legume species for dry matter production and adaptation to South Central Texas soil and climatic conditions.

Keywords: arrowleaf clover / berseem clover / crimson clover / subterranean clover / rose clover

Procedure

Twelve annual clovers were drilled into a prepared seedbed using a small-plot drill with six double disk openers, spaced 9 in. apart. The seed was planted on 11 Nov. 1993 in 5-x 20-ft plots. Soil type was a Hallettsville fine sandy loam with a pH of 5.9. Fertilizer applied was 85 lb phosphate ($P_2 0_5$) and 70 lb potash ($K_2 0$)/acre. The seed were inoculated with the appropriate strain of inoculum using the Pelinoc system to adhere the inoculant to the seed.

The experiment was arranged in a randomized complete block design with four replications. The plots were harvested on 21 February, 21 March, 21 April, and 31 May 1994. Two 1.3-ft^2 samples were taken at random from each plot. Weeds and clover were hand-separated to determine forage composition, and dried for 72 h at 140° F. After samples were dried and weighed again, clover yields on a dry matter basis were determined.

Entries and their respective seeding rates (lb/acre) were 'Amclo' and 'Yuchi' arrowleaf clover (10 lb), 'Bigbee' berseem clover (16 lb), 'Chief', 'Dixie', 'Flame', and 'Tibbee' crimson clover (16 lb), 'Mt. Barker', Meteora, and Larisa subterranean clover (16 lb) and Overton R18 and Hykon rose clover (16 lb).

Results

Rainfall was below normal for most of the clover growing season except for December, March, and May (Fig. 1). Overton rose clover was the most productive clover in 1993. Clover production ranged from 3868 lb/acre for Meteora subclover to 5859 lb/acre for Overton R18 rose clover (Table 1).

Yuchi arrowleaf was the most productive arrowleaf clover with its highest forage production at the second harvest (Table 1). Bigbee berseem yields were consistent throughout the growing season. Berseem clover is not well adapted to acidic soils; therefore, forage production of this clover is often depressed in low pH soils.

Crimson clovers were intermediate forage producers with Tibbee producing 7 to 13% more forage than other crimson clovers (not significant). The subterranean clovers were among the lowest forage producers (Table 1). Mt. Barker subclover outyielded Meteora and Larisa by at least 12% (not significant).

The rose clovers were the highest forage producers (Table 1). Overton R18 rose outyielded Hykon by 14% (not significant). Overton R18 produced excellent forage yields at the mid-to late season harvest while Hykon produced more early season forage.

Arrowleaf and berseem matured later than crimson and rose clover but when harvested

on 31 May only the arrowleaf and berseem clovers had any appreciable forage yield.

Freeze damage ratings taken 10 days after an ice storm and a low temperature of 26°F indicated Amclo arrowleaf, Yuchi arrowleaf, Bigbee berseem, and Hykon rose clover suffered 3 to 8% injury (data not shown).

With below average rainfall, the rose clovers produced the highest yields. Overton R18 is a new variety which was released in 1991 (Smith et al., 1992). When grown at six different locations in Texas, Overton R18 was twice as productive as 'Kondinin' rose clover (Smith et al., 1987).

Literature Cited

Evers, G. W. 1983. Weed control on warm-season perennial grass pastures with clovers. Crop Sci. 23:170-171.

Evers, G. W. 1985. Forage and Nitrogen contribution of arrowleaf and subterranean clovers overseeded on bermudagrass and bahiagrass. Agronomy J. 77:960-963.

Ocumpaugh, W. R. 1988. Cattle performance and carring capacity of oat and wheat pastures seeded with clover and ryegrass. In Proc 1988 Forage and Grassland Conference, Baton Rouge, LA. pp. 92-96.

Ocumpaugh, W. R. 1990. Coastal bermudagrass-legume mixtures vs. nitrogen fertilizer for grazing in a semiarid environment. J. Prod. Agric. 3:371-376.

Smith, G. R., G. W. Evers, M. A. Hussey, W. R. Ocumpaugh, J. C. Read, and A. M. Schubert. 1987. Seasonal production of experimental rose clover at six Texas locations. pp. 41-42. In Forage research in Texas 1987. Texas Agri. Exp. Stn. CPR-4537.

Smith, G. R., F. M. Rouguette, Jr., G. W. Evers, M. A. Hussey, W. R. Ocumpaugh, J. C. Read, and A. M. Schubert. 1992. Registration of 'Overton R18' rose clover. Crop Sci. 32:1507.

Table 1. Seasonal forage dry matter production of annual clovers at Yoakum, Texas - 1993-94.

Variety	Harvest Date				
	21 Feb	21 Mar	21 Apr	31 May	Total
	lb/acre				
Overton R18 rose	903	2415	2541	0	5859
Hykon rose	1495	2317	1228	0	5039
Yuchi arrowleaf	1013	1716	1397	798	4923
Tibbee crimson	1515	2437	944	0	4896
Bigbee berseem	1186	1367	1376	779	4707
Dixie crimson	1392	2118	1051	0	4561
Flame crimson	1229	2145	1077	0	4451
Mt. Barker sub	1273	2145	1034	0	4451
Amclo arrowleaf	598	1406	1739	637	4379
Chief crimson	1447	2097	728	0	4271
Larisa sub	673	1446	1797	0	3916
Meteora sub	971	1383	1514	0	3868
LSD (0.05)	362	556	731	314	1034

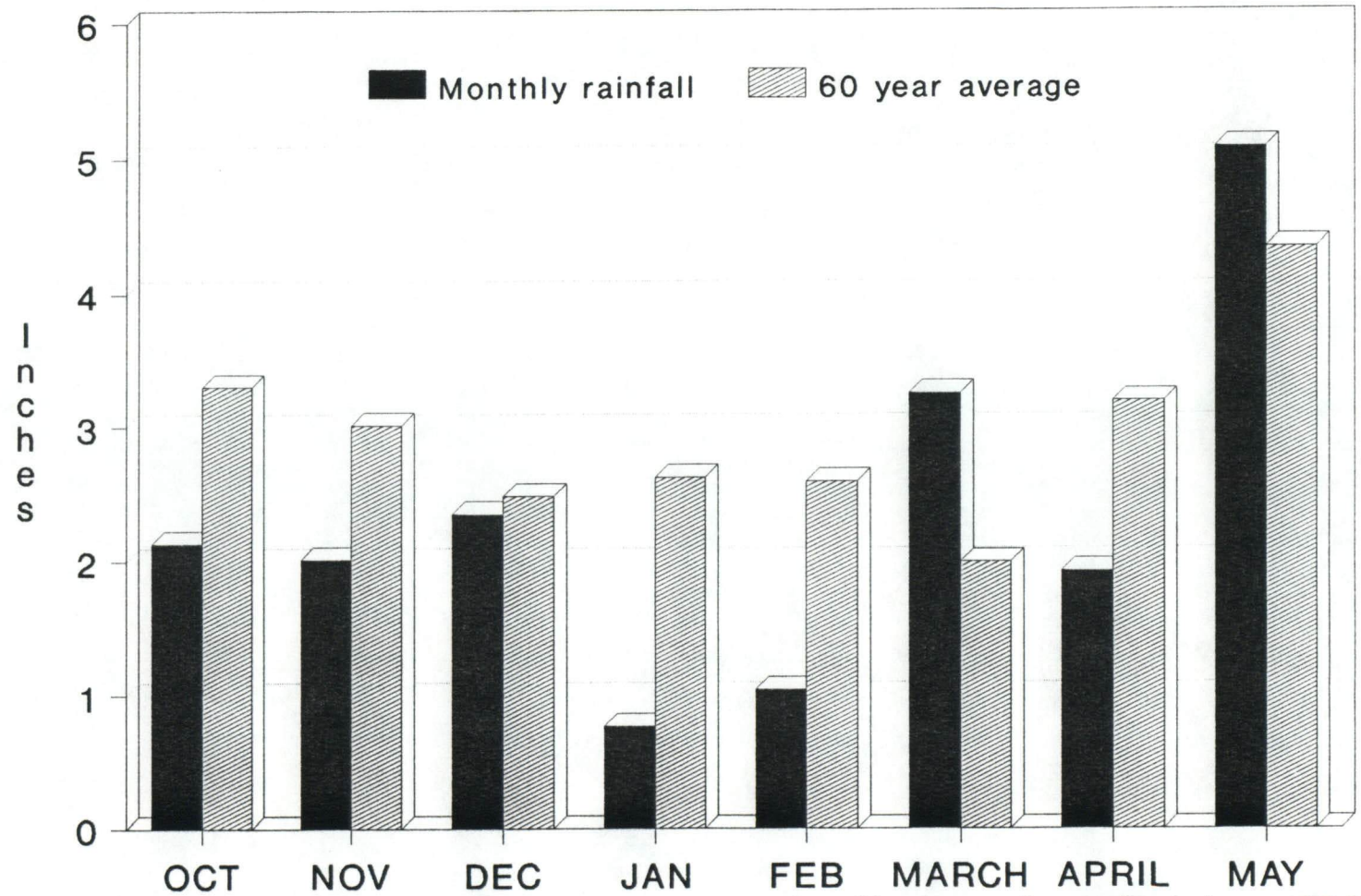

Figure 1. Monthly rainfall and 60 year average for Yoakum from October 1993 through May 1994