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FORAGE PRODUCTION OF APACHE ARROWLEAF CLOVER

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Background. 'Apache' arrowleaf clover (*Trifolium vesiculosum* Savi.) is a new cultivar developed at Overton in the Forage Legume Breeding Program through selection for tolerance to bean yellow mosaic virus (BYMV). Apache is resistant to BYMV-induced lethal wilt which kills about 20 % of 'Yuchi' arrowleaf plants. Apache is tolerant to other symptoms of BYMV infection, including dwarfing, leaf rugosity, leaf chlorosis, and leaf mosaic.

Apache and Yuchi arrowleaf clover and 'Dixie' crimson clover (*Trifolium incarnatum* L.) were fall-planted at Overton, Texas in 1999. Five planting dates were used to evaluate the effects of planting date on forage production. The clovers were planted in 5 x 15 ft. plots with the entries arranged in a randomized complete block(RCB) design with 4 replications.

Forage production of Apache arrowleaf clover was compared to crimson clover (Dixie in two trials and 'Tibbee' in one) and Yuchi arrowleaf in three different trials at Overton, TX in 2000-2001. The clovers were planted in 5 x 15 ft. plots (RCB, 4 replications) at two locations (NF and P22) near Overton on 19 Oct. 2000. An experiment at a third Overton location (P18) was conducted using larger plots (25 x 60 ft.) in a RCB design with 6 replications.

Research Findings. The early planting dates of late Sept. and early Oct. 1999 resulted in complete stand failure due to extreme dry conditions. Seedling vigor and forage production was measured on plots established at planting date 3 and 4 (20 Oct. and 3 Nov. 1999, respectively). The Apache seedlings were larger and more vigorous than Yuchi (Table 1). Apache shoot dry weight was less than Dixie crimson but 77% greater than Yuchi. Apache arrowleaf planted on 20 Oct. had root growth (as measured by dry weight) equal to Dixie crimson. Total forage production of Apache (sum of three harvests) was greater than Yuchi and equal to Dixie crimson (Table 2). Apache responded well to the 20 Oct. planting date with good early forage production and higher total season yields relative to Yuchi (data not shown).

Forage dry matter yield of Apache was higher than Yuchi at all three 2001 harvests from the P22 location (Table 3). Early spring production of Apache was excellent, with March yields equal to Dixie crimson. At the NF location forage production was measured only on 16 April, 2001. Early forage yield from this experiment was not evaluated due to accidental grazing in early March. Very dry conditions prevented regrowth after the April harvest. Forage yield on 16 April was 2034, 1424 and 710 lbs DM/acre for Dixie crimson, Apache, and Yuchi, respectively. A single harvest taken on 13 April 2001 at the P18 location gave forage production estimates of 1595, 1950 and 1681 lbs DM/acre for Tibbee crimson, Apache and Yuchi, respectively. On 10

May flowering was rated and 15% of Apache plants were in bloom compared to 3% of Yuchi plants.

Table 1. Seedling vigor of arrowleaf and crimson clover evaluated at 105 days post-planting.

Entry	Total shoot† dry weight	Total root dry weight	
		Planted 20 Oct.	Planted 3 Nov.
	lb DM/acre		
Dixie crimson	1631 a*	216 ab	218 a
Apache	969 b	260 a	159 b
Yuchi	546 c	163 b	117 c

*Means followed by the same letter are not significantly different according to Fisher's protected LSD, P - 0.05.
†Averaged over 20 Oct. and 3 Nov. planting dates.

Table 2. Forage production of arrowleaf and crimson clover at Overton, Texas in 1999-2000.

Entry	Forage† yield
	lb DM/acre
Dixie crimson	4526 a*
Apache arrowleaf	4208 a
Yuchi arrowleaf	3418 b

*Means followed by the same letter are not significantly different according to Fisher's protected LSD, P = 0.05.
†Averaged over two planting date treatments (20 Oct. and 3 Nov.). Each value for the two arrowleaf entries is the total of three harvests (7 Mar., 4 Apr., and 30 May). Dixie crimson was harvested twice (7 Mar. and 4 Apr.).

Table 3. Seasonal forage production of arrowleaf and crimson clover at Overton, Texas (Location P22) In 2000-2001.

Entry	Cut 1 13 Mar.	Cut 2 9 Apr.	Cut 3 21 May	Total
	lb DM/acre			
Dixie crimson	1153 a*	1746 a	--	2899 b
Apache arrowleaf	981 a	1513 a	1400 a	3895 a
Yuchi arrowleaf	422 b	825 b	949 a	2197 b

*Means followed by the same letter are not significantly different according to Fisher's protected LSD, P = 0.05.