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# SEASONAL FORAGE PRODUCTION OF SOD-SEEDED CLOVER MIXTURES

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## Summary

Forage production of clover mixtures was evaluated at Overton, Texas, for three years. Arrowleaf, ball, white, and red clover were grown in pure stands and in mixtures with crimson clover on a 'Coastal' bermudagrass sod. A mixture of crimson and red clover was more productive than crimson alone and more productive at first harvest (mid-March) than red clover alone. A mix of crimson and red clover was productive from early March through late May or early June.

## Introduction

Annual clovers are useful components of East Texas pasture systems but the productive growing season for an individual clover species is often short. Crimson clover produces forage early, usually in the months of March and April. Arrowleaf clover has a longer and later production season than crimson, but does not grow rapidly in the early spring. Red and white clover are perennials that generally act like annuals under East Texas climate and soil conditions. Both red and white clover are most productive from late April to early June in East Texas. Ball clover grows rapidly in April and May but usually produces little forage before April.

Mixtures of two or more different clovers can be used to extend the forage legume growing season. The objectives of these experiments were to determine the seasonal distribution of forage yield from mixtures of two clovers.

## Procedures

'Kenland' red clover, 'Dixie' crimson, 'Yuchi' arrowleaf, 'Regal' white, common ball clover, and sixteen clover mixtures were drilled into a Coastal bermudagrass sod on 22 October 1992, on 15 October 1993, and 14 October 1994. Treatments were arranged in a randomized complete block design with four replications. Fertilizer was applied prior to planting according to soil test recommendations (400 lbs/acre 0-20-20 and 1 lb/acre boron in 1992; 400 lbs/acre 0-

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20-33 and 1 lb/acre boron in 1993 and 1994 ). A small-plot drill with six double disk openers spaced 9 inches apart was used to place the clover seed 0.5 inch deep. Seed were inoculated with specific *Rhizobium* inoculant prior to planting. Plots containing only single clovers were planted at 14, 4, 20, 14, and 6 lbs of seed per acre for arrowleaf, ball, crimson, red, and white clover, respectively. All mixtures were planted with crimson clover at either 50% or 75% of the full seeding rate.

Plots were harvested at about 4-week intervals beginning in March with a rotary mower set to cut 2.5 inches above ground level. Rainfall in April 1994 was lower than normal, clover growth was slow, and one harvest interval was delayed to about 7 weeks. Fresh weight of forage from each plot was recorded at each harvest date. Subsamples were also weighed at each harvest, dried at 140°F for 48 hours, then weighed again to determine percent dry matter. Dry forage yield per acre was calculated.

### Results and Discussion

Dixie crimson alone or in mixtures produced the most forage at the first harvest in all years (Fig. 1, 2 and 3). Red and white clover were consistently low yielding at the first harvest compared to crimson or mixtures containing crimson. The mixture of crimson and Kenland red clover was very productive in all years with good distributions of forage yield over the growing season. The D50/K50 mixture (10 lbs/acre Dixie crimson + 7 lbs/acre Kenland red clover) was generally as productive as the D75/K75 mixture and seed costs were \$10.82 per acre less for the D50/K50 mixture compared to D75/K75 (Table 1).

Mixtures of crimson with Regal white clover, Yuchi arrowleaf, or common ball clover generally resulted in lower yields at the last two harvests and lower total yields compared to the red clover mixtures. Forage production of Yuchi arrowleaf and mixtures of Yuchi and crimson clover were reduced due to fungal and virus diseases of arrowleaf clover.

Mixtures of two or more clovers can result in more high quality forage available to grazing animals over a longer period of time. The best clover mixture evaluated from 1993-95 was Dixie crimson (10 lbs/acre) plus Kenland red clover (7 lbs/acre). In this mix, crimson clover was productive by early March and red clover extended the clover grazing season into late May or early June.

Table 1. Clover seed costs. Fall 1994.

Clover	Seeding rate	Cost	Seed cost
	lb/acre	\$/lb	\$/acre
Dixie crimson	20	0.87	17.40
Kenland red	14	1.85	25.90
Yuchi arrowleaf	14	0.94	13.16
Regal white	6	3.62	21.72
common ball	4	2.00	8.00
D50/K50	10/7	--	21.65
D75/K75	15/10.5	--	32.47

Fig. 1. Clover mixtures sod-seeded in Coastal bermudagrass in 1992-93. Letter number combinations indicate clover species and percent of full seeding rate used.

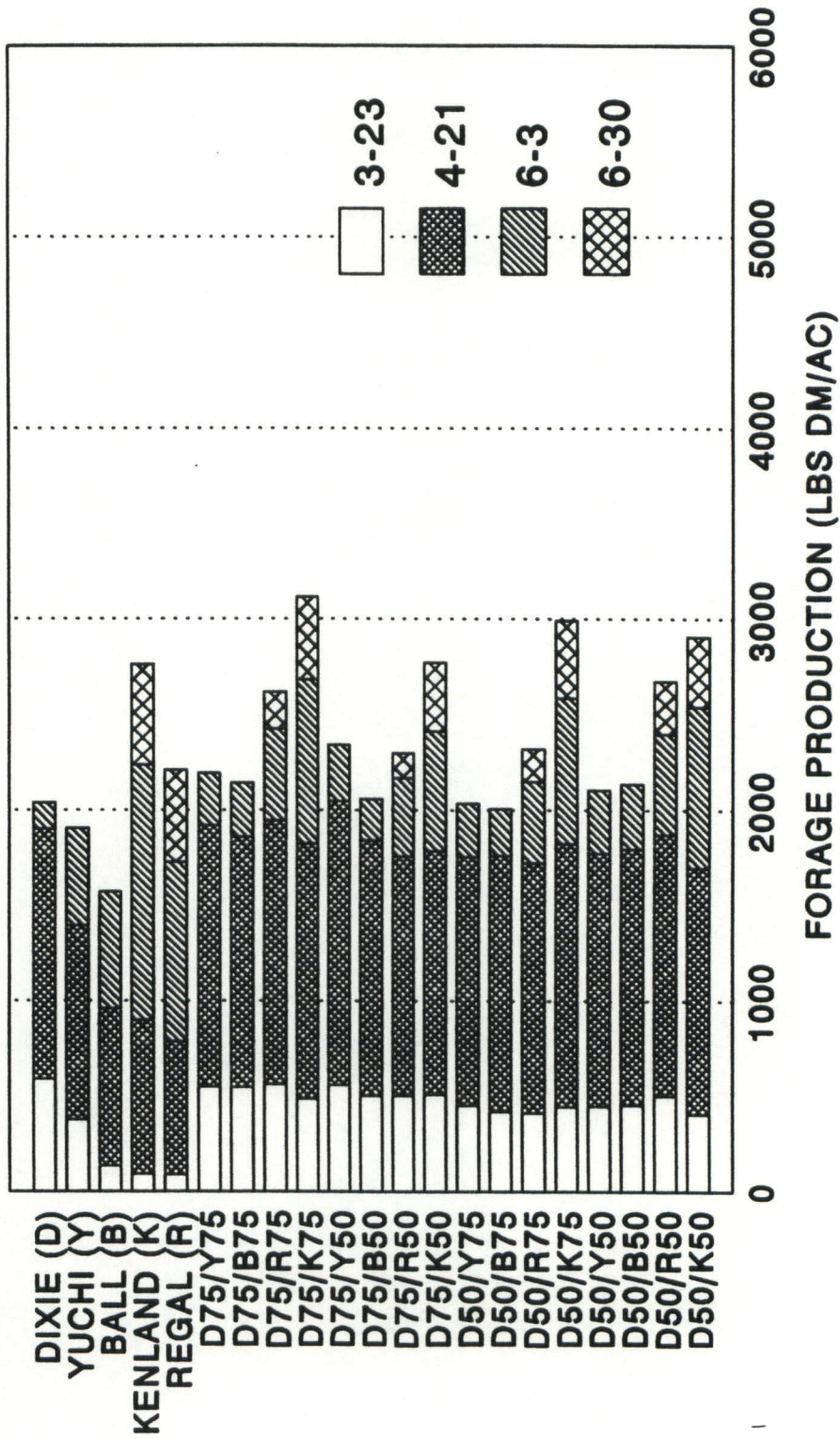


Fig. 2. Clover mixtures sod-seeded in Coastal bermudagrass in 1993-94. Letter number combinations indicate clover species and percent of full seeding rate used.

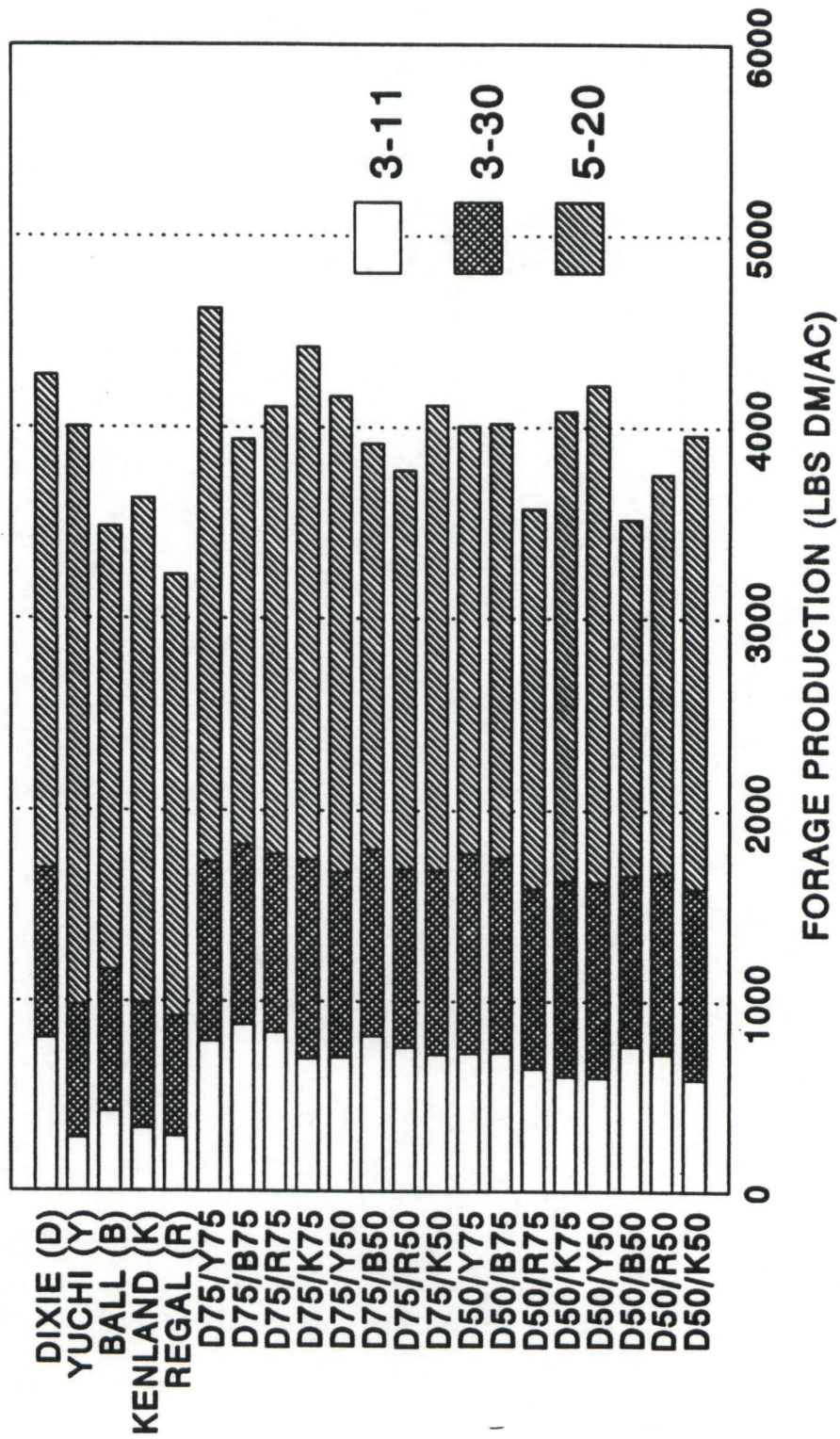


Fig. 3. Clover mixtures sod-seeded in Coastal bermudagrass in 1994-95. Letter number combinations indicate clover species and percent of full seeding rate used.

