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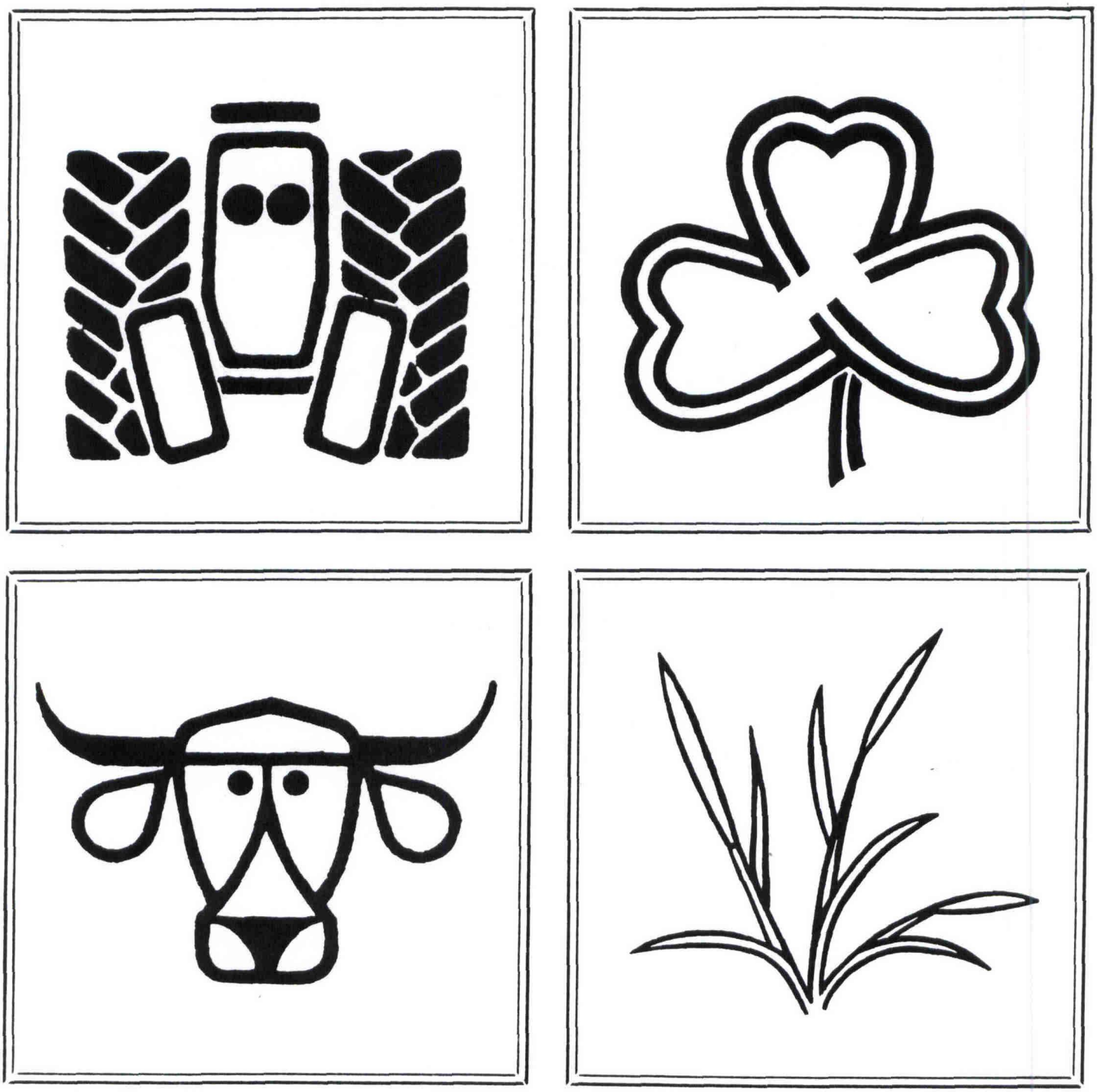

Forage Research in Texas

1984

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Water Use by Alfalfa Over Winter

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SUMMARY

The water used by an alfalfa crop during the 1983-84 winter was monitored at Bushland, Texas. From the last alfalfa harvest (September 14, 1983) to the beginning of spring growth (March 20, 1984) the total water use by alfalfa was 3.7 inches. This water loss occurrred during an unusually cold winter in which there was no growth from approximately November 1 to March 1.

INTRODUCTION

Many farmers neglect their alfalfa fields from the last harvest in the fall until spring growth has started. However, the alfalfa crop is alive and continuing to function at some reduced level over winter. This lack of attention, particularly with regards to irrigation, may cause the plant to become severely stressed towards spring and delay the onset of spring growth. Therefore, a study was initiated to measure water use by alfalfa over winter.

PROCEDURE

Ten access tubes for measurement of soil water by the neutron moderation method were installed to a depth of 6 feet in an established alfalfa stand to a. The alfalfa crop was irrigated to approximate field capacity after the last harvest on September 12, 1983. Soil water use by the alfalfa was monitored by periodic readings with a neutron probe. Precipitation was recorded in U. S. standard 8-inch rain gauges.

RESULTS AND DISCUSSION

The precipitation and change in soil water by approximate monthly periods are presented in Table 1. The change in soil water was subtracted from the precipitation to determine the total water use by the alfalfa crop for the same time periods. As can be seen from the table, the alfalfa crop used a significant amount of water over winter. The total water use by the alfalfa crop for the winter of 1983 was 3.7

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inches. The large water use is suprising since the winter of 1983-1984 was unusually cold. The cold weather prevented regrowth after the last harvest. This accounts for some of the lack of water use immediately after the last cutting.

It is not known to what extent this water use by alfalfa is necesary. Alfalfa plants that are not water stressed have a greater degree of winter survival. However, it may not be necesary to give alfalfa all the water it can use over winter. The data indicated that alfalfa will largely deplete a soil profile of water over winter and that it is necesary to begin irrigating early in the spring to stimulate early growth of the alfalfa crop.

Table 1. Water use by alfalfa during the winter in North Texas

Time period	9/14-10/12	10/12-11/16	11/16-12/27	12/27-1/11	1/11-2/22	2/22-3/20	Total
	Inches						
Precipitation	0.1	2.1	1.7	0.0	0.6	0.0	4.5
Change in soil water *	0.1	0.7	-0.5	0.6	-0.3	0.2	0.8
Water use in alfalfa	0.0	1.4	2.2	0.0	0.9	-0.2	3.7

* To depth of 6 feet