Increasing Utilization of Weeping Lovegrass by Burning[1]

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Highlight

Burning increases the production and cattle preference of weeping lovegrass. A winter burn increased spring and summer herbage yields of weeping lovegrass 14% and utilization 53%. Burning increased crude protein from 3.6% on untreated lovegrass to 7.6% on unfertilized burned plots. It increased crude protein content from 5% on unburned fertilized plots to 10.5% on burned fertilized plots. Forty-four pounds per acre nitrogen fertilization increased crude protein but had little effect on forage production and utilization.

Resumen[2]

Estudio Sobre el Uso de Quema y Fertilizantes para Aumentar el Pastoreo de Weeping Lovegrass

Weeping lovegrass (*Eragrostis curvula* (Schrad.) Nees) tiene buena adaptación a varios climas y suelos, especialmente suelos arenosos. Este zacate tiene menor palatabilidad. Este estudio se llevó a cabo en la granja experimental de Texas Tech cerca de Amarillo, Texas, E.U.A., se demostró que puede aumentar la palatabilidad del zacate con quema. La quema durante invierno aumentó la producción de forraje en un 14%, la intensidad de pastoreo en un 53%, y el contenido de proteína en un 3.4%. La fertilización de nitrógene a 44 Kgs/Ha. aumentó el contenido de proteína pero no influyó en la producción de forraje ni en la palatabilidad del zacate.

This study was conducted to determine the effects of burning and fertilization on production and utilization of weeping lovegrass (*Eragrostis curvula* (Schrad.) Nees). Weeping lovegrass has been seeded extensively throughout the southern United States since its initial introduction in 1927 from Tanganyika, South Africa (Hoover et al., 1948). It is readily adapted to a wide range of climate and soils, especially on sandy soils of the southwest. Weeping lovegrass that can withstand extended drought periods (Staten, 1952). Its ability to survive high summer temperatures and winter temperatures as low as –11 F has led to its use as an erosion control grass (Staten, 1952).

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Weeping lovegrass grows quickly, and if planted in April, can be grazed about the first of the following July (Staten, 1952). Although a warm season grass, seed can mature as early as June, and growth generally subsides with hot weather.

Palatability is its weakest point. Grazed readily by cattle during the early growth period, its palatability drops off sharply as it reaches maturity. Spring controlled burning and fertilization improved early forage quality and increased forage production in Oklahoma (Dalrymple, 1968). The use of fire as a management tool for weeping lovegrass needs study on deep hardland sites of the Southern High Plains.

Study Area and Procedures

An established 14 acre weeping lovegrass stand planted in May 1967 on the Texas Tech University Research Farm 14 miles east of Amarillo was used for the study. The vegetation consisted primarily of seeded weeping lovegrass, although Kochia (*Kochia scoparia*), Johnson grass (*Sorghum halepense*), and silver bluestem (*Andropogon saccharoides*) were present in small amounts. The soil is a Pullman silty clay loam, the major soil of the deep hardland sites in this region (Mathers, 1963). The climate is typical of the High Plains with high summer and low winter temperatures. Precipitation averages 19 inches, coming mostly during the spring and fall. Desiccating winds occur year round and commonly reach velocities of 35 mph.

The study area was divided into 4 plots. Two plots were burned on January 2, 1969. One plot each in the burned and unburned areas received 44 lbs. of nitrogen per acre by applying 200 lbs. of bulk ammonium sulfate. Fertilizer cost was $5.60 per acre. The plots were grazed from May 27 to June 9 with 5 heifers and one bull. To determine herbage yield and utilization, ten randomly located, paired, caged and uncaged 4.8 ft^2 plots were clipped in each of the four treatments (Fig. 1). Crude-protein was determined by the Kjeldahl method.

Forage Production

Nitrogen fertilization did not significantly increase production (Fig. 2). An inconsistent growth pattern contributed to this behavior. The weeping lovegrass made some growth during April, but growth tapered off rapidly before rains in May relieved dry soil conditions. The fertilizer appeared to have had detrimental effects on the weeping lovegrass during the early dry period. A noticeable cessation in growth and a marked deterioration of the new growth was observed on May 2. This effect was more evident in the fertilized plots.

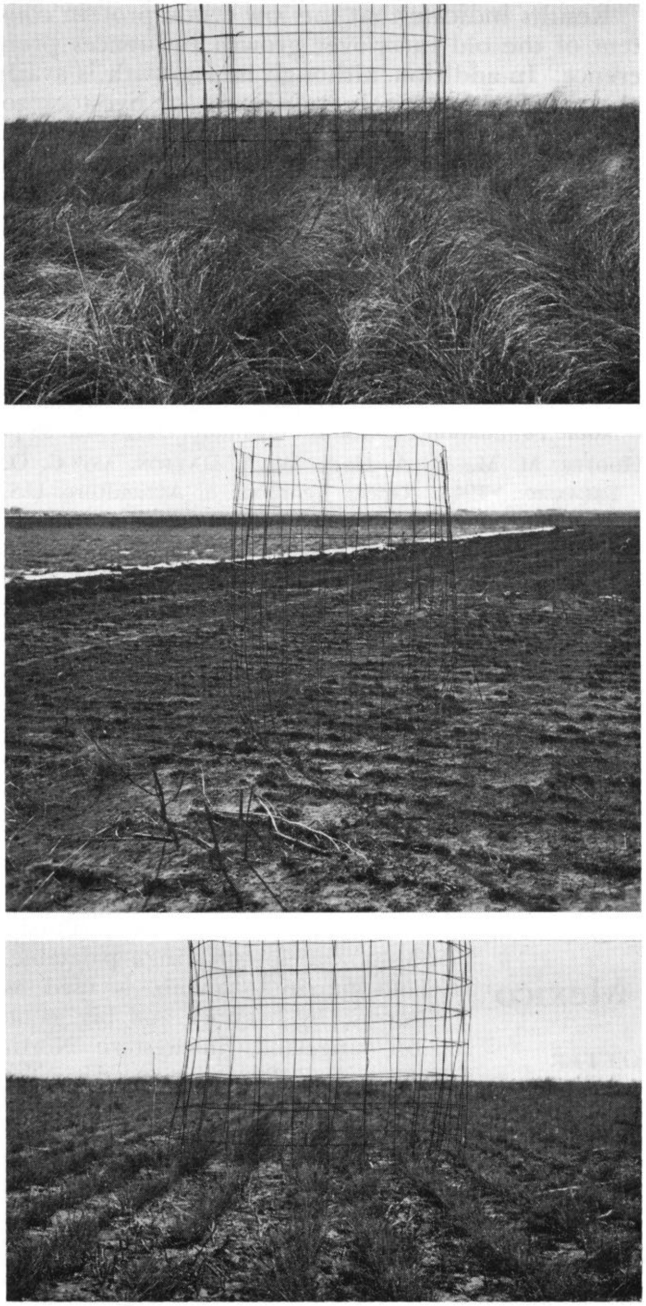

FIG. 1. Upper: Unburned weeping lovegrass showing dead carryover growth from previous growing season: Middle: Burned weeping lovegrass area in foreground shows complete removal of old growth. Lower: The burned area produced more than the unburned area and was preferred by cattle.

Herbage production was significantly higher (14%) on the burned plots. Burned plots averaged 332 lbs. more forage per acre than unburned plots (Fig. 2). These production figures represent growth only for the period January 2, 1969, to June 10, 1969, yet production on burned plots surpassed that of previous studies on unburned plots in this area (Whitfield et al., 1949).

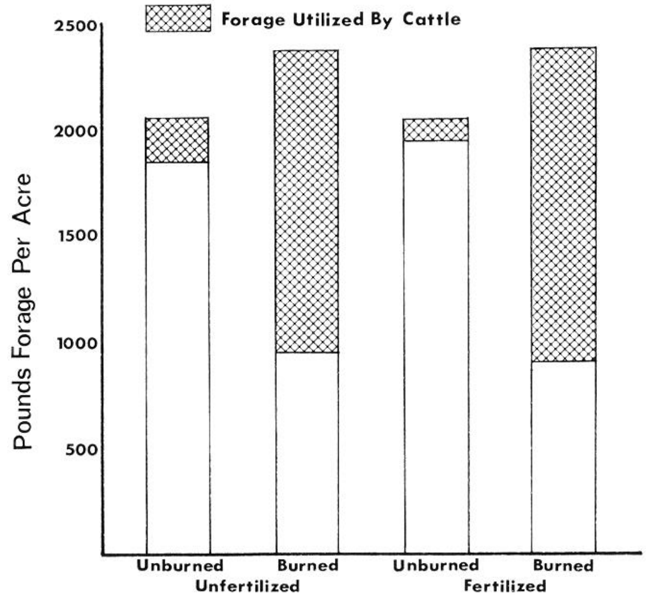

FIG. 2. Pounds of oven-dry forage and utilization of weeping lovegrass with various treatments.

Utilization and Preference

Nitrogen fertilization had no influence on grazing preference on either burned or unburned areas but burning greatly increased utilization

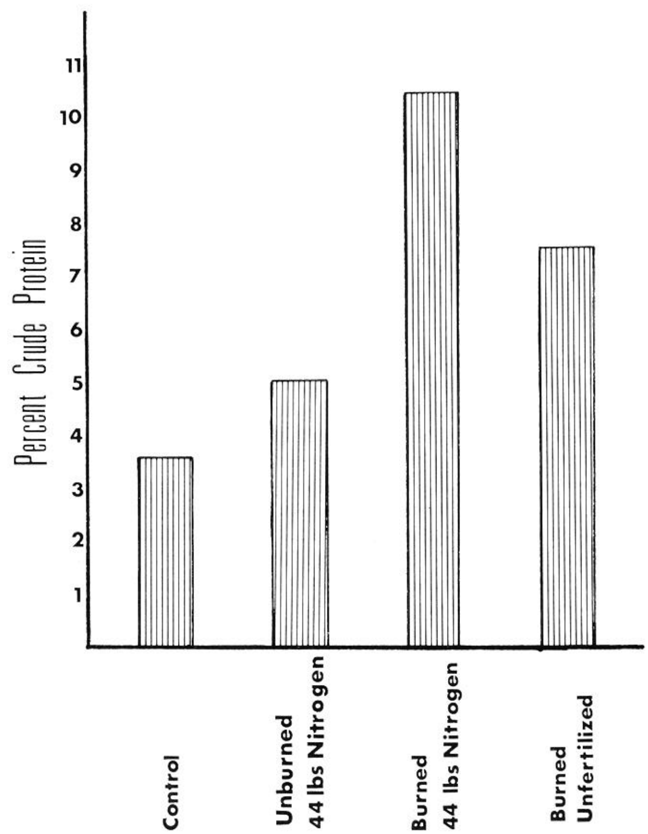

FIG. 3. Percent crude protein of weeping lovegrass samples collected June 10, 1969.

(Fig. 2). At the end of the 14 day grazing period the cattle had grazed 52% of the burned weeping lovegrass but only 8% of the unburned. The lush green growth free of dead carry-over growth on the burned area contributed to this difference. Higher protein content of regrowth on the burned area could also be a factor.

Crude Protein Content

Samples from the untreated plot containing 81% carry-over growth and 19% current season growth yielded 3.6% crude protein (Fig. 3). Similar samples from the fertilized-unburned plots contained 5.0% crude protein—an increase of 1.4%. Crude protein for the green material and carry-over growth on the untreated control plot averaged 5.7% and 2.9% respectively.

The regrowth on the burned areas had significantly higher amounts of crude protein. Samples from burned and fertilized plot average 10.5% crude protein and the burned-unfertilized plot yielded 7.5% crude protein. In other studies, Whitfield et al. (1949) reported crude protein for untreated weeping lovegrass at 6.3% while Dalrymple (1968) recorded 19.7% crude protein on spring burned and fertilized plots and 11.8% on unburned-fertilized plots.

Results indicate that the low crude protein content of the old carry-over growth influences preference. In addition, although new growth is available in the bunches, it is difficult for livestock to graze. Therefore, cattle tend to leave the entire plant ungrazed. The ability of weeping lovegrass to "green up" during the winter with adequate soil moisture and warm temperatures is of little value unless the carry-over growth is first removed. Burning appears to be one method of doing this on deep hardland sites in the Southern High Plains.

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