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## EFFECT OF TEBUTHIURON, GRASLAN, ON NUTRITIVE VALUE OF WEEPING LOVEGRASS (Eragrostis curvula [Schrad.] Nees)

OBJECTIVES:

To determine the influence of three rates of tebuthiruon on soluble: structural carbohydrate ratio and protein level of three varieties of weeping lovegrass and to monitor the effect of tebuthiuron on vigor, stand maintenance and dry weather production on lovegrass varieties.

PROCEDURE:

Tebuthiuron was applied as 20% pellets (1/16" diameter) on September 4 at three rates (0.5, 1.0, and 2.0 lb ai/ac) and blank pellets were applied to check plots. Herbicide treatments were applied to each of three weeping lovegrass varieties (common, Ermelo and Morpa). Established plots were in a three-replicated, randomized block design. Treatments were distributed across varieties in split-plot fashion. Each treatment subplot consisted of 3 rows, 6 feet long. Forage samples were not taken until after the first measurable precipitation. Sampling dates were 10-8-77, 10-18-77, and 11-18-77. The November date represented a post-freeze sampling. Forage growing conditions were abnormally severe due to drought and cold during the sampling period.

Forage was hand-clipped to a 4-inch stubble, dried at 70°C, ground in a Wiley mill to pass a 40 mm sieve, and stored in amber bottles for subsequent chemical analyses. The structural:soluble carbohydrate ratios were determined via the Van Soest detergent fiber technique (NDF:NDS). Protein was analyzed via micro-Kjeldahl. All plot samples were analyzed in duplicate for each chemical assay.

RESULTS AND DISCUSSION:

Duplicate averages for percent protein and neutral detergent fiber (NDF) are shown for common, Ermelo, and Morpa in Tables 1-3, respectively. The most notable trend that occurred was associated with an increase in NDF with age of plant. At the 10-8 harvest date, there was a slight reduction in NDF on the tebuthiuron-treated Morpa plots (Table 3). However, this difference is undoubtedly related to the high NDF value in the check plot in Rep. I.

Table 4 shows the lovegrass variety averages from the various treatments. There were no identifiable significant trends associated with treatments. Therefore, from these data, it appears that rates of tebuthiuron pellets up to 2.0 lbs/acre do not alter the percent protein or the NDF:NDS ratio.

Visual ratings of percent stand were taken in May, 1978. There was no detectable stand losses or stand damage from any of the treated areas. Thus, it may be concluded from these data that either: (1) the chemical assays used were not sensitive enough to detect those plant components responsible for previously reported animal preference differences; or (2) tebuthiuron does not alter percent protein or NDF:NDS ratio.

There are two important hypotheses that deserve consideration in future investigations concerning the observations of increased animal preference for tebuthiuron-treated areas. First, that tebuthiuron-treated forage undergoes sufficient chemical changes such that nutritive value is in fact increased which ultimately results in improved animal performance. And, secondly, that the animal preference response is directly related to physical alterations in plant communities which, in turn, affects animal behavior patterns, and, hence results in an immediate acceleration of intake but does not have sufficiently long-lasting effects to alter animal performance.

Table 1. Duplicate averages of percent protein (Pro) and neutral detergent fiber (NDF) for common weeping lovegrass.

| | Pounds of Tebuthiuron/Acre | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0 | | 0.5 | | 1.0 | | 2.0 | |
| | (%) | | (%) | | (%) | | (%) | |
| 10-8-77 | Pro | NDF | Pro | NDF | Pro | NDF | Pro | NDF |
| I | 3.76 | 84.21 | 3.79 | 84.01 | 4.02 | 81.39 | 3.94 | 85.02 |
| II | 4.60 | 75.22 | 4.13 | 77.34 | 4.41 | 75.13 | 5.06 | 76.78 |
| III | 5.87 | 76.10 | 4.85 | 79.81 | 4.41 | 78.81 | 4.52 | 79.53 |
| REP AVG | 4.74 | 78.51 | 4.26 | 80.39 | 4.28 | 78.44 | 4.51 | 80.44 |
| 10-18-77 | | | | | | | | |
| I | 3.57 | 83.0 | 3.17 | 81.18 | 4.04 | 83.16 | 4.86 | 82.69 |
| II | 4.21 | 83.59 | 3.44 | 82.80 | - | - | 4.42 | 83.03 |
| III | - | 83.92 | 5.44 | 85.99 | 4.11 | 86.10 | 3.74 | 85.56 |
| REP AVG | 3.89 | 83.50 | 4.02 | 83.32 | 4.08 | 84.63 | 4.34 | 83.76 |
| 11-18-77 | | | | | | | | |
| I | 3.68 | 84.15 | 3.40 | 83.50 | 4.51 | 83.13 | 3.88 | 81.10 |
| II | 4.52 | 84.54 | 3.34 | 82.95 | 3.55 | 84.17 | 4.04 | 84.73 |
| III | 5.34 | 81.94 | 4.39 | 80.94 | 3.26 | 83.90 | 4.30 | 83.16 |
| REP AVG | 4.51 | 83.54 | 3.71 | 82.46 | 3.77 | 83.73 | 4.07 | 83.00 |

Table 2. Duplicate averages of percent protein (Pro) and neutral detergent fiber (NDF) for Ermelo weeping lovegrass.

| | Pounds of Tebuthiuron/Acre | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0 | | 0.5 | | 1.0 | | 2.0 | |
| | (%) | | (%) | | (%) | | (%) | |
| 10-8-77 | Pro | NDF | Pro | NDF | Pro | NDF | Pro | NDF |
| I | 4.00 | 83.60 | 3.61 | 84.30 | 4.89 | 85.17 | 5.63 | 85.95 |
| II | 4.22 | 76.42 | 4.05 | 73.38 | 4.25 | 78.67 | 4.46 | 80.07 |
| III | 4.63 | 79.00 | 4.57 | 78.48 | 4.84 | 78.56 | 4.47 | 79.55 |
| REP AVG | 4.28 | 79.67 | 4.08 | 78.72 | 4.66 | 80.80 | 4.85 | 81.86 |
| 10-18-77 | | | | | | | | |
| I | - | 83.96 | 2.87 | 84.74 | 3.92 | 82.24 | 3.41 | 83.07 |
| II | 3.49 | 84.24 | 3.49 | 83.99 | 4.45 | 86.06 | 4.40 | 86.31 |
| III | 5.58 | 82.50 | - | 83.45 | 2.80 | 85.26 | 4.44 | 83.42 |
| REP AVG | 4.54 | 83.58 | 3.18 | 84.06 | 3.72 | 84.52 | 4.08 | 84.27 |
| 11-18-77 | | | | | | | | |
| I | 3.66 | 85.79 | 3.20 | 84.06 | 4.20 | 82.91 | 3.22 | 82.33 |
| II | 4.17 | 83.77 | 3.04 | 83.57 | 2.98 | 83.60 | 3.88 | 84.45 |
| III | 4.88 | 82.14 | 3.32 | 81.14 | 3.23 | 81.36 | 4.72 | 82.05 |
| REP AVG | 4.24 | 83.90 | 3.19 | 82.92 | 3.47 | 82.62 | 3.94 | 82.94 |

Table 4. Variety and replication averages of tebuthiuron treatments.

| | Pounds of Tebuthiuron/Acre | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0 (%) | | 0.5 (%) | | 1.0 (%) | | 2.0 (%) | |
| 10-8-77 | Pro | NDF | Pro | NDF | Pro | NDF | Pro | NDF |
| Common | 4.74 | 78.51 | 4.26 | 80.39 | 4.28 | 78.44 | 4.51 | 80.44 |
| Ermelo | 4.28 | 79.67 | 4.08 | 78.72 | 4.66 | 80.80 | 4.85 | 81.86 |
| Morpa | 4.65 | 80.57 | 4.62 | 77.09 | 5.11 | 78.78 | 4.91 | 77.90 |
| AVG | 4.56 | 79.58 | 4.32 | 78.73 | 4.68 | 79.34 | 4.76 | 80.07 |
| 10-18-77 | | | | | | | | |
| Common | 3.89 | 83.50 | 4.02 | 83.32 | 4.08 | 84.63 | 4.34 | 83.76 |
| Ermelo | 4.54 | 83.58 | 3.18 | 84.06 | 3.72 | 84.52 | 4.08 | 84.27 |
| Morpa | 4.58 | 85.04 | 3.56 | 83.70 | 3.89 | 83.58 | 4.05 | 83.37 |
| AVG | 4.34 | 84.04 | 3.59 | 83.70 | 3.90 | 84.58 | 4.16 | 83.80 |
| 11-18-77 | | | | | | | | |
| Common | 4.51 | 83.54 | 3.71 | 82.46 | 3.77 | 83.73 | 4.07 | 83.00 |
| Ermelo | 4.24 | 83.90 | 3.19 | 82.92 | 3.47 | 82.62 | 3.94 | 82.94 |
| Morpa | 4.13 | 82.55 | 3.64 | 84.99 | 4.16 | 84.13 | 3.80 | 83.98 |
| AVG | 4.29 | 83.33 | 3.51 | 83.46 | 3.80 | 83.49 | 3.94 | 83.31 |