

USE OF PLANT GROWTH REGULATORS ON GRASS PASTURES

By

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SUMMARY

Crude protein content of unfertilized crested wheatgrass drops below 10% in late June and drops below 8% in early July (Whitman et al, 1951). These times correlate with the anthesis and seed development phenophases respectively. Nyren et al, (1983) has shown that fertilization increases the crude protein content in May, June, and July but it drops below 11% in early July and below 8% in mid July. Animal weight gains decrease for steers if grazed on crested wheatgrass after 1 July (Whitman et al, 1976).

If flower stalk development could be inhibited or delayed on a high percentage of the plants, the season of use of the pastures could possibly be extended and good animal weight gains continued later into the growing season.

PROCEDURE

Two 20 acre pastures of crested wheatgrass were fertilized with 50 lbs. N/acre. One pasture was treated with a plant growth regulator (Mefluidide). Seven yearling Hereford steers grazed each pasture.

The data that was collected from these pastures were above ground herbage production and percentage difference between grazed and ungrazed plots, flower stalk density, leaf height measurements and flower stalk phenological phases, plant species composition by ten pin point-frame method and animal performance by weight change.

RESULTS AND DISCUSSION

The 1985 grazing season was the first year of this study. The grazing period was from 16 May to 17 September (124 days). The steer weight gains (Tables 1 and 2) were good for most of the grazing season except for late July and early August. The mean total gain for the steers on the control pasture was 284 pounds with an average daily gain of 2.3 pounds. The mean total gain for the steers on the mefluidide treated pasture was 243 pounds with an average daily gain of 2.0 pounds. The mean herbage production was very similar between treatments except for the last clipping period when the control pasture had an increase in herbage production and the mefluidide treated pasture had a decrease in herbage production.

The mean number of leaves per plant increased during the growing season. The fourth leaf stage was reached in mid April. The plant growth regulator was broadcast applied on 2 May at the fourth leaf stage. It may be more desirable to apply the chemical at an early leaf stage. In July and August the ungrazed plants on the treated pasture had about 0.50 leaves per plant more than the control pasture. The number of leaves per plant on the grazed plants were also greater on the treated pasture than the control pasture. There was more than 1.0 leaf greater per plant in July but in August this was reduced to) .30 leaves per plant greater on the plants on the treated pasture compared to the control pasture.

The number of flower stalks per foot squared was reduced on the treated pasture for all periods of data collection. The mean percent reduction from the growing season was about 43% but varied from 26% to 64%.

Table 1. Mean Steer Weights

Treatment	16 May	14 June	12 July	26 August	17 September
	Pounds				
Control	675	799	873	904	959
Mefluidide	675	772	863	883	918

Table 2. Mean Steer Gain/Day/Head

Treatment	16 May- 14 June	14 June- 12 July	12 July- 26 August	26 August- 17 September
	Pounds			
Control	4.3	2.6	0.7	2.5
Mefluidide	3.3	3.3	0.4	1.6

The 1986 grazing season was the second year of this study. The grazing period was from 15 May to 5 September (113 days). The steer weight gains (Tables 3 and 4) were good for the grazing season. The control steers dropped below 2.0 pounds per day after mid July. The mean total gain for the steers on the control pasture was 256 pounds with an average daily gain of 2.3 pounds. The mean total gain for the steers on the mefluidide treated pasture was 268 pounds with an average daily gain of 2.4 pounds. The daily gain for the steers on the control pasture before 14 July was 3.0 pounds and after 14 July was 1.4 pounds. The daily gain for the steers on the treated pasture was 2.4 pounds and 2.3 pounds before and after 14 July, respectively. There was an advantage in daily gains for the treated pasture after mid July in 1986.

The mean herbage production on the treated pasture was below the control pasture for each sample period. Peak herbage production in mid August was 32% below the control pasture. The mean number of leaves per plant increased during the growing season. The fourth leaf stage was reached in early May. The plant growth regulator was broadcast applied on 28 April at the 3.75 leaf stage. The chemical worked at this leaf stage but it may be more desirable to apply the chemical at an earlier leaf stage (estimated to be 3.5). Weather conditions in the area prohibited application at that time. The number of leaves per plant were generally very similar between the treatment and control for the entire grazing season. In 1985, the treated plants had a greater number of leaves than the control plants. The number of flower stalks per foot squared was greatly reduced on the treated pasture for all periods of data collection. The mean percentage of reduction for the growing season was 73%.

Table 3. Mean Steer Weights

Treatment	15 May	13 June	14 July	14 August	05 September
	Pounds				
Control	574	663	753	804	830
Mefluidide	564	647	709	789	832

Table 4. Mean Steer Gain/Day/Head

Treatment	15 May- 13 June	13 June- 14 July	14 July- 14 August	14 August- 05 September
	Pounds			
Control	3.1	2.9	1.6	1.2
Mefluidide	2.9	2.0	2.5	2.0

The 1987 grazing season has just been completed, and data on herbage production and plant growth characteristics are not yet available. Data on animal performance for 1987 are set forth in Tables 5 and 6. Tables 7 and 8 summarize animal gains for 1985-1987.

Table 5. Mean Steer Weights

Treatment	15 May	15 June	15 July	13 August	15 September
	Pounds				
Control	660	754	762	834	940
Mefluidide	664	754	794	864	977

Table 6. Mean Steer Gain/Day/Head

Treatment	15 May- 15 June	15 June- 15 July	15 July- 13 August	13 August- 15 September
	Pounds			
Control	3.1	0.3	2.5	3.2
Mefluidide	2.9	1.3	2.4	3.4

Table 7. Mean Steer Weights – 1985-1987

Treatment	May	June	July	August	September
	Pounds				
Control	636	739	796	847	910
Mefluidide	634	724	789	845	909

Table 8. Mean Steer Gain/Day/Head - 1985-1987

Treatment	May June	June July	July August	August September	Average
	Pounds				
Control	3.5	1.9	1.6	2.3	2.33
Mefluidide	3.0	2.2	1.8	2.3	2.33