

USE OF PLANT GROWTH REGULATORS ON GRASS PASTURES

Project No. 3731

L.L. Manske

Mefluidide on Crested Wheatgrass Pasture

Introduction:

Crude protein content of unfertilized crested wheatgrass drops below 10% in late June and it 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 X Angus 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 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 (Table 1 and 2) 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 (Table 3) 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 (Table 4). 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 (Table 5). The mean percentage of reduction for the growing season was 73%. The herbage samples will be analyzed for nutrient content to determine if quality can be improved by treatment.

Only two years of data have been collected from this study. The effects of the chemical on the treated pasture did greatly reduce the number of flower stalks. The number of leaves per plant were slightly increased the first year but not the second year. The total herbage production was reduced on the treated pasture both years. The total pounds of steer weight gain was slightly reduced on the treated pasture the first year but was slightly greater the second year. The advantage in animal weight gain on the treated pasture appears to occur after 1 July.

Table 1. Mean Steer Weights

Treatment	15 May	13 Jun	14 Jul	14 Aug	05 Sep
	Pounds				
Control	574	663	753	804	830
Mefluidide	564	647	709	789	832

Table 2. Mean Steer Gain/Day/Head

Treatment	15 May- 13 Jun	13 Jun- 14 Jul	14 Jul- 14 Aug	14 Aug- 05 Sep
	Pounds			
Control	3.1	2.9	1.6	1.2
Mefluidide	2.9	2.0	2.5	2.0

Table 3. Mean Above Ground Herbage Production

Treatment	01 May	15 May	13 Jun	14 Jul	14 Aug	15 Sep
	Lbs./Acre					
Control:						
Ungrazed	1296	2678	3837	3911	4477	3598
Grazed		2678	2660	2447	2893	2068
Mefluidide:						
Ungrazed	1160	2100	2295	2579	3047	2982
Grazed		2100	1409	1121	1855	1040

Table 4. Mean Number of Leaves/Plant

Treatment	20 Mar	21 Apr	15 May	13 Jun	14 Jul	14 Aug	15 Sep
Control:							
Ungrazed	2.2	3.7	4.8	6.1	6.8	7.3	7.2
Grazed				5.5	5.9	6.0	6.7
Mefluidide:							
Ungrazed	2.3	3.8	4.8	5.8	6.9	7.0	6.6
Grazed				5.6	6.1	6.6	4.8

Table 5. Mean Flower Stalk Density

Treatment	13 Jun	14 Jul	14 Aug
Control:			
Ungrazed	35	29	24
Grazed	28	19	24
Mefluidide:			
Ungrazed	6	8	9
Grazed	2	1	2

Literature Cited

Nyren, P.E., W.C. Whitman, J.L. Nelson and T.J. Conlon. 1983. "Evaluation of a Fertilized 3-Pasture System Grazed by Yearling Steers". *J. Range Manage.* 36(3):354-358.

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