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INTERSEEDING NATIVE MIXED GRASS PRAIRIE
Project No. 1917

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Grazing Alfalfa Interseeded Pastures

Summary

Research on interseeding productive plant species into native rangeland has been conducted at the Dickinson Experiment Station since 1969. Several species of grasses and legumes have been triad. Interseeding grass species into good to excellent condition range does not increase total herbage production. Interseeding alfalfa was more successful than other legumes.

Several techniques for seedbed preparation and plant competition control have been tried. Using chemical herbicides for competition control has not been shown to provide adequate control for optimum seedling survival. Mechanical sod control has shown variable results. No technique has shown consistent successful results. A technique that can be used to successfully establish plant species into native sod on a relatively consistent basis needs to be developed.

Information on livestock performance and the effects of grazing on the herbage of alfalfa interseeded native range pastures in North Dakota was lacking and needed to be studied.

Procedure

The purpose of this study was to evaluate the effects on the herbage production and on the performance of cow-calf pairs on alfalfa interseeded pastures compared to untreated control pastures.

A pasture type alfalfa (Travois (Medicago falcata)) was interseeded into 10 acres of mixed grass prairie using a mechanical sod control method in May 1977. The seeding rate was 4 pounds per acre. An 18 acre pasture with no treatment was used as the control.

The soils of the alfalfa interseeded and control pastures were fine sandy loams which were predominantly sandy range sites with small areas of thin sandy range sites. The species composition on the native range was mixed grass prairie dominated with blue grama (Bouteloua gracilis), sun sedge (Carex heliophila), prairie junegrass (Koeleria pyramidata), western wheatgrass (Agropyron smithii), and needleandthread (Stipa comata).

Herbage production was determined by clipping to ground level inside and outside exclosure cages. Animal performance was determined by weight gains or losses. Cattle were weighed on and off each pasture and at 28 day intervals. The same number of commercial cows with their calves were used in each treatment each year. Ten cow-calf pairs were used in 1978 and 1979, eight pairs in 1981 and 1984, seven pairs in 1980, and six pairs in 1985. The alfalfa interseeded pasture was not grazed in 1982 and no weight data was collected in 1983.

Extremely low levels of precipitation occurred in the fall of 1979 and the spring of 1980. This caused drought conditions for the 1980 grazing season. The data collected during these drought conditions were treated separately in this report.

Results and Discussion

The mean total above ground herbage production data are shown in Table 1. Total herbage production was generally increased on the alfalfa interseeded pasture except when the stand was young and during drought conditions. The mean total herbage production was 1665 and 2431 pounds per acre for the control and alfalfa interseeded pastures, respectively. This represents a 46% increase in mean total herbage production on the alfalfa interseeded pasture. The mean grass and forb production was 1536 pounds per acre on the alfalfa interseeded pasture. This was about 8% below the mean grass and forb production on the control pasture.

The total herbage production was reduced by 28%, and 67% on the control and alfalfa interseeded pastures, respectively, due to the drought conditions of 1980.

The livestock stocking rates are shown in Table 2. The mean stocking rate was 0.66 and 1.10 AUM's/acre for the control and alfalfa interseeded pastures, respectively. The alfalfa interseeded pasture had a 67% increase in mean stocking rate above the control pasture. The drought conditions of 1980 reduced the stocking rates by 65% and 78% for the control and alfalfa interseeded pastures, respectively.

Calves and cows generally showed good performance on both treatments during the non-drought years. The animal weight gains are shown in Table 3. The mean calf daily gains per head were 1.98 and 2.26 pounds for the control and alfalfa interseeded pastures, respectively. The mean cow daily gains per head were 0.50 and 0.67 pounds for the control and alfalfa interseeded pastures, respectively. This represents an increase of 14% and 34% for the calves and cows, respectively, on the alfalfa interseeded pastures above the control pasture. The mean gain per acre for the calves was 36.9 and 71.9 pounds for the control and alfalfa interseeded pastures, respectively. The mean gain per acre for the cows was 9.2 and 26.8 pounds for the control and alfalfa interseeded pastures, respectively. The calves and cows had and increase in mean gain per acre of 95% and 191%, respectively, on the alfalfa interseeded pasture compared to the control pasture.

During the drought conditions of 1980, the animal performance was generally reduced compared to the non-drought years. The reduction in performance was greater on the alfalfa interseeded pasture than on the control pasture.

Total herbage and animal production can be increased on native range pastures by interseeding alfalfa. Total herbage production per acre can be increased by about 46%. Calf and cow production per acre can be increased by 95% and 191%, respectively. Daily individual animal performance has been improved on alfalfa interceded pastures. Stocking rate can be increased by about 67% on alfalfa interseeded pastures.

The detrimental effects of drought conditions were greater on alfalfa interseeded pastures compared to untreated native range. Total herbage production and animal performance were least variable between drought and nondrought conditions on the untreated native range pasture compared to alfalfa interseeded pasture. This indicates that the amount of alfalfa herbage production in a native range pasture should be at the lowest level that still provides beneficial results. It is suspected that this level of alfalfa herbage production is between 12% to 25% of the total herbage production.

Additional research needs to be conducted on development of techniques for establishment of interseeded alfalfa stands and the development of management guidelines for grazing pastures with established interseeded alfalfa.

Table 1. Mean Herbage Production

Year	lbs/acre			
	Alfalfa interseeded			Control
	Grass & forbs	Alfalfa	Total	Total
1978	2324	56	2379	2048
1979	1057	80	1137	1253
1981	1211	326	1537	1713
1982	2160	908	3068	2302
1984	1398	2282	3680	1246
1985	1064	1720	2784	1428
Mean	1536	895	2431	1665
1980	739	70	809	1204

Table 2. Stocking Rate

Year	AUM's/acre	
	Alfalfa interseeded	Control
1978	1.77	1.12

1979	1.01	0.56
1981	0.83	0.57
1984	0.94	0.52
1985	0.96	0.54
Mean	1.10	0.66
1980	0.24	0.23

Table 3. Animal Weight Gain in Pounds

Year	Mean gain/day/head (ADG) and mean gain/acre (G/A)							
	Alfalfa interseeded				Control			
	Calf		Cow		Calf		Cow	
	ADG	G/A	ADG	G/A	ADG	G/A	ADG	G/A
1978	2.32	113.6	1.46	72.2	1.78	55.2	0.44	13.4
1979	2.16	60.5	2.21	61.9	2.05	31.9	1.54	23.8
1981	1.92	43.1	-1.52	-34.2	1.77	27.5	0.34	5.6
1984	2.27	65.2	1.11	32.0	2.01	32.2	0.16	2.5
1985	2.62	77.0	0.07	2.0	2.31	37.8	0.03	0.6
Mean	2.26	71.9	0.67	26.8	1.98	36.9	0.50	9.2

1980	1.03	6.5	-5.48	-34.5	2.01	12.5	0.04	0.32

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