ND1917: Inter-seeded Pasture Grazing Trial. D. E. Williams and L. Manske

Summary:

The inter-seeded pasture grazing trial compares animal performance on native range that has received various inter-seeding treatments with fertilized and unfertilized native range. The initial inter-seeding treatments on native range include: (1) Travois alfalfa, (2) Russian wild rye, and an inter-seeded control (a pasture through which the inter-seeder was run, but nothing was seeded). The Russian wild rye inter-seeded pasture, after repeated attempts, never became established and is serving as a replacement inter-seeded control pasture. The fertility treatment on native range involves an annual spring broadcase application of 150 pounds of ammonium nitrate (33-0-0) per acre.

In 1981 eight cow/calf pairs and one bull grazed on each of the inter-seeded pastures, with the size of the pastures being varied to compensate for the different production levels of the pastures. The fertilized native pasture provided the most amounts of grazing (49 days – Table 1). The following amount of grazing was provided by the other pastures (Table 1): (1) unfertilized native – 35 days, (2) inter-seeded control – 35 days, and (3) inter-seeded alfalfa – 28 days.

Forage production for 1981 was very close to the production obtained in 1978, showing that the native range has recovered from reduced production due to drought experienced in 1979 and 1980. However, this year's production showed a marked increase in fringed sage in the inter-seeded alfalfa and inter-seeded control pastures. This increase is due mainly to consecutive drought of two growing seasons in combination with disturbance from inter-seeding that gave a competitive advantage to the spread of fringed sage. Much of this year's production in these two pastures, which showed a fringed sage bloom, was in plants of undesirable grazing quality for cattle; thereby directly reducing available forage production for cattle. The native fertilized and unfertilized pasture did not show such a marked increase in fringed sage.

Forage production for 1981 was highest in the fertilized pasture (2507 lbs/A). Production (Table 1), in the other three pastures was close, being as follows: (1) inter-seeded control – 2176 lbs/A, (2) inter-seeded alfalfa – 2028 lbs/A, and (3) unfertilized – 1906 lbs/A. Forage utilization for this year's season ranged from 54% (inter-seeded control) to 69% (fertilized native) and was generally the highest of the four years for all pastures. Overall forage production was good when one considers the effects of the past two seasons of drought. A severe spring frost seemed to set back this year's alfalfa production (in the inter-seeded alfalfa pasture). Alfalfa comprised 19% of the total of the inter-seeded alfalfa pasture (389 lbs/A out of a total of 2028 lbs/A).

Calf gains (ADG-average daily gain) ranged from 1.5 pounds (fertilized native) to 1.9 pounds (inter-seeded alfalfa pasture) with ADG for the inter-seeded control and unfertilized native pastures being intermediate at 1.7 and 1.8 pounds respectively (Table 2). The low 1.5 ADG for the fertilized native pasture was probably due to the fact that the cattle were on this pasture longer than the others and the nutritive quality was poorer near the end of the season; thus causing poorer gain and lowering the overall gain for the period. Average daily gain for calves is quite comparable to the gains in the previous years of the study.

When considering average gain of calves per acre (Table 2), the fertilized native is highest (50 pounds/acre) with the inter-seeded alfalfa pasture second with 42 pounds per acre. There is little or no difference in pounds of calf per acre between the inter-seeded alfalfa pasture and the fertilized native pasture (42 pounds vs. 50 pounds) for the 1981 season. This spread (Table 3) was much larger the first year (1978), with the inter-seeded alfalfa pasture giving higher calf gains per acre than the fertilized native pasture (113 pounds vs. 73 pounds). From this one can see that the benefit derived from inter-seeding alfalfa over fertilized may be short lived. Next year's data will more fully show if such a trend does exist. One must remember that two successive drought years (1979-80) might have decreased the benefit derived from inter-seeding alfalfa, and the lifetime of this improvement practice might be longer under normal conditions.

The cows and the bull lost weight on the two inter-seeded pastures (Table 2) during the 1981 season. Average daily loss (ADL) for cows ranged from -.6 pounds (inter-seeded control) to -1.5 pounds (inter-seeded alfalfa). The bulls showed a much higher ADL on the above mentioned pastures (-3.1 pounds to -2.3 pounds). On the fertilized and unfertilized native pastures bulls held their initial weights, whereas the cows showed an ADG of .1 to .4 pounds. The difference in cow and bull gains or losses between the fertilized, unfertilized native and the inter-seeded native is due mainly to the fringed sage bloom. There simply was not enough ″grazable forage″ available for a cow or bull to maintain or gain weight. This was not seen in calf gains because there was enough forage available to meet their minimal needs and their nutritional needs were being met more through lactation than in the forage.

When considering the four year average of weights and gains of cattle (Table 4), trends similar to those discussed for 1981 show up. Calf gains are highest for the inter-seeded alfalfa pasture (55 pounds/A) with the fertilized native next (42 pounds/A). Calf gains on the inter-seeded control and unfertilized native are similar, 38 pounds/A vs. 32 pounds/A. The gain/loss picture for cows and bulls is variable, but generally gains are shown.

In 1981 the fertilized native pasture produced enough calf gains per acre, over that on the unfertilized native, to break even on the cost of fertilizer. The alfalfa inter-seeded native pasture produced 15 pounds more calf per acre than the unfertilized. Assuming 60¢/pound calves, this would be a net gain of $9.00 per acre. The cost of inter-seeding was recovered in the increased gains from the first year of grazing the inter-seeded alfalfa pasture. Even though the benefit of inter-seeding alfalfa may be short lived, it produces higher dollar returns simply because it is done once and not every year as in the fertilizer application. Yearly application of fertilizer on native range is more or less a break even situation, depending on the weather conditions for that year.

Table 1. Forage Production and Utilization during the Grazing Periods – Inter-seeded Pasture Grazing Trial 1978-80

Pastures	Year	Pasture Size Acres	Period Grazed	Days In Period	Forage Produced Lbs/A	Forage Utilized Lbs/A	Forage Left On Ground	Percent Utilization
Unfertilized Native	1978	18	6/19-8/14	56	1954	1141	813	58
	1979		6/22-7/20	28	1195	289	905	24
	1980		7/07-7/23	16	825	120	705	14
	1981		6/24-7/28	35	1906	1122	784	59
Fertilized Native	1978	12	7/10-9/15	67	3943	2270	1673	58
	1979		6/22-7/20	28	1846	1135	711	61
	1980		7/07-7/23	16	1319	684	635	52
	1981		6/17-8/04	49	2507	1738	776	69
Inter-seeded Control	1978	15	6/19-8/14	60	2064	1256	808	61
	1979		6/22-7/20	28	1401	474	927	34
	1980		7/07-7/23	16	950	88	862	9
	1981		6/24-7/28	35	2176	1187	989	54
Inter-seeded Travois Alfalfa	1978	10	6/19-8/07	49	2290	1272	1018	56
	1979		6/22-7/20	28	1074	647	427	60
	1980		7/07-7/16	9	766	256	510	33
	1981		6/24-7/21	28	2028	1330	698	65

Table 2. Average Forage Production and Utilization – Grazing Inter-seeded Pasture Trial 1978-81

Pastures	Pasture Size (acres)	Year	Days In Period	Forage Produced (lbs/A)	Utilized (lbs/A)	Forage Left On Ground (lbs/A)	Percent Utilization
Native (unfertilized)	18	78-81	34	1470	668	802	45
Native (fertilized)	12	78-81	40	2404	1455	949	60
Native (Inter-seeded Alfalfa – Travois)	10	78-81	28	1539	876	663	57
Native (Inter-seeded Control)	15	78-81	35	1648	751	897	45

Table 3. Weights and Gains of Cows and One Bull – Inter-seeded Pasture Grazing Trial 1978

Pastures	Period Grazed	Days In Period	No. of Cows & Bull*	Avg. Initial Wt/Cow Lbs.	Avg. Final Wt/Cow Lbs.	Avg. Gain/hd Lbs.	Avg. Daily Gain/hd Lbs.	Avg. Gain/A Lbs.
Unfertilized Native	6/19-8/14 (6/19-8/14)	56 (56)	10 (1)	1044 (1115)	1069 (1145)	25 (30)	.4 (.5)	14 (2)
Fertilized Native	7/10-9/15 (7/10-8/07)	67 (67)	10 (1)	1066 (1000)	1008 (1040)	-58 (40)	-.9 (1.4)	-5 (3)
Inter-seeded Control	6/19-8/14 (6/19-8/14)	60 60	10 (1)	1018 (1215)	1049 (1200)	31 (-15)	.5 (-.2)	21 (-1)
Inter-seeded Travois Alfalfa	6/19-8/7 (6/19-8/7)	49 (49)	10 (1)	1034 (1145)	1106 (1175)	72 (30)	1.5 (.6)	72 (3)

*( ) Indicates data pertaining to bulls.

Table 4. Weights and Gains of Cows and One Bull – Inter-seeded Pasture Grazing Trial 1979

Pasture	Period Grazed	Days In Period	No. of Cows & Bull*	Avg. Initial Wt/Cow Lbs.	Avg. Final Wt/Cow Lbs.	Avg. Gain/hd Lbs.	Avg. Daily Gain/hd Lbs/	Avg. Gain/hd Lbs.
Untreated Native	6/20-7/20	28	10 (1)	1038 (1110)	1080 (1135)	42 (25)	1.5 (.9)	23 (2)
Fertilized Native	6/20-7/29	28	10 (1)	1064 (1110)	1084 (1130)	19 (20)	.7 (.7)	16 (2)
Inter-seeded Travois Alfalfa	6/20-7/20	28	10 (1)**	1158 (1350)	1220	62	2.2	62
Inter-seeded Control	6/20-7/20	28	10 (1)	1120 (1455)	1180 (1435)	60 (-20)	2.2 (-.7)	40 (-1)

*( ) Indicates data pertaining to bulls.

** The bull was not weighed when removed from the pasture.

Table 5. Weights and Gains of Cows and One Bull – Inter-seeded Pasture Grazing Trial 1980

Pastures	Period Grazed	Days In Period	No. of Cows & Bull*	Avg. Initial Wt/Cow Lbs.	Avg. Final Wt/Cow Lbs.	Avg. Gain/hd Lbs.	Avg. Daily Gain/hd Lbs.	Avg. Gain/A Lbs.
Untreated Native	7/7-7/23	16	7 (1)	1108 (1050)	1108 (1095)	0 (45)	0 (2.8)	0 (2.5)
Fertilized Native	7/7-7/23	16	7 (1)	1075 (1595)	1065 (1510)	-10 (10)	-.6 (.6)	-6 (.6)
Inter-seeded Control	7/7-7/23	16	7 (1)	1175 (1320)	1164 (1440)	-11 (120)	-.7 (7.5)	-5.3 (8)
Inter-seeded Travois Alfalfa	7/7-7/16	9	7 (1)	1102 (1050)	1054 (1000)	-49 (-50)	-5.5 (-5.6)	34 (-5)

*( ) Indicates data pertaining to bulls.

Table 6. Weights and Gains of Cows and One Bull – Inter-seeded Pasture Grazing Trial 1981

Pastures	Period Grazed	Day In Period	No. of Cows & Bull*	Avg. Initial Wt/Cow Lbs.	Avg. Final Wt/Cow Lbs.	Avg. Gain/hd Lbs.	Avg. Daily Gain/hd Lbs.	Avg. Gain/A Lbs.
Unfertilized Native	6/24-7/28	35	8 (1)	1148 (1040)	1161 (1040)	13 (0)	.4 (0)	6 (0)
Fertilized Native	6/17-8/4	49	8 (1)	1042 (1190)	1044 (1190)	2 (0)	.1 (0)	1.3 (0)
Inter-seeded Control	6/24-7/28	35	8 (1)	1188 (1940)	1168 (1830)	-20 (-110)	-.6 (-3.1)	-11 (-7)
Inter-seeded Travois Alfalfa	6/24-7/21	28	8 (1)	1163 (1750)	1120 (1685)	-43 (-65)	-1.5 (-2.3)	-34 (-6)

*( ) Indicates data pertaining to bulls.

Table 7. Weights and Gains of Calves – Inter-seeded Pasture Grazing Trial 1978-81

Pastures	Year	No. of Calves	Avg. Initial Wt./Calf Lbs.	Avg. Final Wt./Calf Lbs.	Avg. Gain/hd Lbs.	Avg. Daily Gain/hd Lbs.	Avg. Gain/A Lbs.
Unfertilized Native	1978	10	228	328	100	1.8	56
	1979	10	218	275	57	2.0	32
	1980	7	288	320	32	2.0	12
	1981	8	224	286	62	1.8	27
Fertilized Native	1978	10	255	342	87	1.3	73
	1979	10	252	291	39	1.4	32
	1980	7	286	313	26	1.6	15
	1981	8	221	296	75	1.5	50
Inter-seeded Control	1978	10*	228	332	104	1.7	69
	1979	10	242	274	31	1.1	31
	1980	7	280	321	41	2.5	19
	1981	8	212	272	60	1.7	32
Inter-seeded Travois Alfalfa	1978	10	227	340	113	2.3	113
	1979	10	266	326	60	2.2	60
	1980	7	278	287	9	1.0	6
	1981	8	204	257	53	1.9	42

*On 7/17 one calf was replaced due to sickness.

Table 8. Four Year Average Weights and Gains of Calves, Cows, and One Bull, Inter-seeded Pasture Grazing Trial - 1978-81

Pasture	Class Of Cattle	Avg. Initial Weight (lbs)	Avg. Final Weight (lbs)	Avg. Gain/hd (lbs)	Avg. Daily Gain/hd (lbs)	Avg. Gain/A (lbs)
Native (unfertilized)	Calf	239	302	63	1.8	32
	Cow	1084	1104	20	.6	11
	Bull	1079	1104	25	1.0	1.6
Native (fertilized)	Cow	253	310	57	1.4	42
	Cow	1062	1050	-12	-.2	1.6
	Bull	1099	1116	17	.7	1.4
Native (Inter-seeded Alfalfa – Travois)	Calf	244	302	58	1.8	55
	Cow	1114	1125	11	-.8	16
	Bull	1315	1287	-28	-2.4	-.3
Native (Inter-seeded Control)	Calf	240	300	60	1.7	38
	Cow	1125	1140	15	.3	11
	Bull	1482	1476	6	-.9	-.2