

INTEGRATED ANNUAL-PERENNIAL FORAGE SYSTEMS FOR LIVESTOCK PRODUCTION IN SOUTHWESTERN NORTH DAKOTA

[Jim Nelson](#)

[Lee Manske](#)

SUMMARY

Based on results of this trial to date (two years), it appears producers can expect to get about 67 days of grazing using annual pastures with calf gains averaging from 23.5, 57.5 and 93.1 pounds per acre on Winter Rye, Siberian Millet or Oats and Peas. Oats and Peas appear to offer the most grazing to date.

Pearl Millet has yet to prove its merit due to its difficulty in stand establishment.

OBJECTIVE

This trial was designed to study and document the use of annual forage pastures as a supplement and/or a replacement for native range. The goal of this trial was to graze a mixture of oats and peas in June; Pearl Millet in July; Siberian Millet in August; Pearl Miller in September and Winter Rye in October.

METHODS

In 1993, the oat and pea pastures were grazed for 14 days in July. The Siberian Millet pastures were grazed from September 1 to the 15th, and again from October 8 to the 14th. The Pearl Millet did not develop adequately to graze and this fall seeded Winter Rye was severely injured by grasshoppers.

In 1994, the Winter Rye seeded in 1993 had overwintered and was ready to graze by June 16. There were two sets

of replicated pastures so the cows grazed on Winter Rye - Rep. 1 from June 16 to June 30. On June 30, they were transferred to Rep. 2 and grazed there until July 13.

The cows and calves were weighed off the rye pastures and moved to the oat and pea pastures on July 13. They grazed on oats and peas from July 13 until August 8, a period of 26 days. Gains were good for both cows and calves.

Since the Pearl Millet failed to make adequate growth, it was decided to put the cows and calves on native range pastures until the Siberian Millet pastures were ready to graze.

On August 23, the herd was moved to fields of Siberian Millet, where they grazed until September 6, a period of 14 days.

There was no rye pasture available to graze on September 6, so the herd was moved to native pasture.

Due to the dry weather conditions, much of the Siberian Millet was pulled out of the ground and either stepped on or grazed, roots and all. The rye that was grazed in June and July was too mature and coarse to support adequate cow or calf gains. In fact, the cows lost considerable weight while grazing the rye pasture.

RESULTS AND DISCUSSION:

[Tables 1-4](#) summarize the cattle performance on annual pastures in 1994. [Table 5](#) shows the estimated increase in calf value based upon actual calf gains and a sliding market value based on calf weight. Estimated increase in calf value varied from \$95.84 to \$124.00 per calf based on the figures used.

[Table 6](#) summarizes the returns per acre based on calf value and gain for the three annual pastures grazed in 1994. The best gain and return per acre were obtained by grazing a mixture of oats and peas. The lowest return was gained on Winter Rye pastures grazed in June. The Siberian Millet pastures were intermediate.

[Table 7](#) shows the two year results from 1993 and 1994 for oats and peas and for Siberian Millet pastures.

Cow gain shows an advantage for grazing oats and peas while average calf are almost identical for the two pasture types.

CONCLUSION:

So far, we have had difficulty in getting a good stand of Pearl Millet. It appears that for the best use of Winter Rye pastures they need to be grazed earlier than they were in 1994. Weather conditions in 1993 and 1994 have not been conducive for the annual pastures selected for this trial, being either too cold or too dry.

Table 1. Cattle performance grazing Winter Rye Pastures						
Period Grazed	Rep	Initial Weight	Final Weight	Total Gain/hd	Days Grazed	Avg. Daily Gain
June 16-30						
COWS	1	1193	1105.7	-87.3	14	-6.24
	2	1205.1	1052	-153	14	-10.90
June 16-30						
CALVES	1	231.5	248.92	17.42	14	1.20
	2	260.9	271.67	10.76	14	0.77
June 30-July 13						
Cow s	1	1105.7	1105.2	-0.53	13	-0.04
	2	1052	1045.2	-6.83	13	-0.57
Calves	1	248.92	281.75	32.83	13	2.53
	2	271.67	275	4.16	13	0.32
June 16-July13						

Cow s	1	1193	1105.2	-87.8	27	-3.25
	2	1205	1045.2	-156.2	27	-5.78
	Avg	1197.2	1075.2	-122.0	27	-4.52
Calves	1	231.5	281.75	50.25	27	1.86
	2	260.9	275.83	14.92	27	0.55
	Avg	246.2	278.79	32.58	27	1.22

Table 2. Cattle performance grazing Oats and Peas						
Period Grazed	Rep	Initial Weight	Final Weight	Total Gain/hd	Days Grazed	Avg. Daily Gain
July 13- Aug 8						
COWS	1	1105.2	1161.9	56.75	26	2.18
	2	1045.2	1123.5	78.33	26	3.01
	Ave	1075.2	1142.71	67.54	26	2.60
CALVES	1	281.5	345.75	64.25	26	2.47
	2	275.8	340.42	64.58	26	2.48
	Ave	278.7	343.08	64.41	26	2.48

Table 3. Cattle performance grazing Native Pasture						
----------------------------------------------------	--	--	--	--	--	--

Period Grazed	Rep	Initial Weight	Final Weight	Total Gain/hd	Days Grazed	Avg. Daily Gain
Aug 8-Aug 23						
COWS	1	1161.92	1211.42	49.5	15	3.30
	2	1123.50	1168.3	44.8	15	2.99
	Avg	1142.71	1189.90	47.20	15	3.15
CALVES	1	345.75	379.0	33.2	15	2.22
	2	340.42	380.0	39.6	15	2.64
	Avg	343.08	379.5	36.4	15	2.43

Table 4. Cattle performance grazing Siberian Millet						
Period Grazed	Rep	Initial Weight	Final Weight	Total Gain/hd	Days Grazed	Avg. Daily Gain
Aug 23-Sep 6						
COWS	1	1211.4	1224.17	12.7	14	0.91
	2	1168.3	1187.0	18.7	14	1.34
	Ave	1189.9	1205.6	15.7	14	1.12
CALVES	1	379.0	418.9	39.9	14	2.85
	2	380.0	419.7	39.7	14	2.83
	Ave	379.5	419.3	39.8	14	2.84

Table 5. Economics of Grazing Annual Pastures based on calf gains and calf value.

Pasture type	Rep	Initial w t	Price per pound*	Calf Value	Final Weight	Price per pound*	Calf value	
Winter Rye Pasture								
June16-30	1	231.5	1.00	231.50	248.9	1.00	248.90	
	2	260.9	1.00	260.9	271.7	1.00	271.70	
June 30-July 13	1	248.9	1.00	248.90	281.9	1.00	281.90	
	2	271.7	1.00	271.70	275.8	1.00	275.80	
Oats and Peas Pasture								
July 13- Aug 8	1	281.9	1.00	281.90	345.8	0.95	328.51	
	2	275.8	1.00	275.80	340.42	0.95	323.40	
Native Pasture								
Aug 8 - Aug 23	1	345.8	0.95	328.51	379.0	0.88	333.52	
	2	340.42	0.95	323.40	380.0	0.88	334.40	
Siberian Millet								
Aug 23- Sept 6	1	379.0	0.88	333.52	418.7	0.85	355.90	
	2	380.0	0.88	334.40	419.7	0.85	356.74	
Total increase in Calf value	1							124.40
	2							95.84

* Price per pound estimated for comparison only.

Table 6 - Gain per acre and expected dollar returns per acre based on calf performance.			
	Winter Rye Pastures	Oats and Peas Pasture	Siberian Millet Pastures
Number of calves	24	24	24
Acres grazed	33.2	16.6	16.6
Weight gain per calf	32.58	64.4	39.8
Total gain per pasture	781.9	1545.8	955.2
Average gain per acre	23.55	93.1	57.5
Increase in calf value per pasture	\$783.60	\$1130.52	\$536.64
Average return per acre based on increased calf value	\$23.60	\$68.10	\$32.33

Table 7. Two year Cattle Performance Grazing Annual Seeded Pastures.				
Pasture Type	Year	Gain Per Head	Avg. Daily Gain	Gain Per Acre
Oats and Peas Mixture				
Cows	1993	28.0	2.07	59.3
	1994	67.5	2.60	97.6
	Avg.	47.8	2.33	78.4
Calves	1993	43.0	3.07	88.1
	1994	64.4	2.48	93.1

	Avg.	53.7	2.78	90.6
Siberian Millet Pasture				
Cow data	1993	46.0	2.31	94.8
	1994	15.7	1.12	22.7
	Avg.	30.8	1.72	58.8
Calves	1993	61.0	3.07	125.6
	1994	39.8	2.84	57.5
	Avg.	50.4	2.96	91.6

[Back to 1994 Research Report Table of Contents](#)

[Back to Research Reports](#)

[Back to Dickinson Research Extension Center \(http://www.ag.ndsu.nodak.edu/dickinso/\)](http://www.ag.ndsu.nodak.edu/dickinso/)

[Email: drec@ndsuent.nodak.edu](mailto:drec@ndsuent.nodak.edu)