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Utilization of extended grazing periods to increase the net value of cow/calf enterprise

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Introduction

Western North Dakota produces a variety of forages that can be utilized for late fall and early winter grazing when daily nutrient demands are relatively low. Grazing corn with stock cows in North Dakota offers the potential to: extend the grazing season, eliminate or reduce manure handling and minimize feeding labor and expense. Investment in both harvesting and feeding equipment is minimized when cows do the harvesting. The residual stalk residue acts as a snow trap and helps reduce both wind and water erosion. To be successful, cattle need access to adequate water and protection from wind during extreme cold weather and blizzards. One negative aspect of corn grazing is the potential for cattle to founder due to excessive levels of grain in the ration.

A rotation of corn and small grains has proven beneficial for sustained crop production. Modern corn production that incorporates: no-till planting, herbicide based weed control, and varieties bred for disease resistance and lodging has produced good yields with minimum labor input.

Materials and Methods

A twenty-eight acre plot of land approximately one half mile south of the DREC Ranch Headquarters was split into two- 14 acre fields, orientated in an east-west direction. A barbed wire fence divides the fields into an East and West fields.

Using a corn-oat rotation, one field was seeded to oats and harvested for hay at the soft dough stage of maturity. The other field was planted to corn. In May, 2001the fields were tilled with a Summers diamond heavy disc (two operations). Following tillage, corn was planted using a Model 400 4-row IH Cyclo Planter on May 7, 2001. The corn was planted in 36" rows at a population of approximately 20,000 kernels per acre. The West field was planted with Pioneer Seed corn (variety 38R21) with a relative maturity of 92 days. This seed was priced at $68.70/ 80K bag. The East field was planted with Pioneer seed corn (variety 39D81) with an 84 day maturity rating.. This variety was priced at $98.90 per 80K bag. Both fields were fertilized with 90 lbs of a (9N-39P-15K-3Zn) fertilizer blend applied at planting in a band that was beside and below the seed. Weed control was initiated on June 6,when both fields were sprayed with a herbicide mix of Accent (nicosulfuron) @ 1/3 oz/A, North Star (39.9% dicamba @ 4 oz/A, crop Oil (1 qt/A) and ammonium sulfate (1 qt/A). Chemical cost per acre totaled $25.23 / A plus an application cost of $3.50/A. See table 5 for cost breakdown for tillage, seeding, fertilization and spraying.

On October 26, 2001, the fields were sampled for plant material and grain production. Using paired rows of corn each 14.52' long, one row was cut approximately 3-4" above the ground and tied into a bundle while the other row was hand picked, bagged and labeled. Eight paired row samples (1/1000 of an acre) were collected from each field. Plant height was also recorded . The samples were returned to the main station, weighed and processed. Chopped samples of the whole corn plant material were obtained by processing randomly chosen whole stalks through a small, portable brush chipper. After chopping, the samples were mixed and then a sub-sample was selected, weighed, and placed in a drying oven. After drying, the samples were reweighed and percent moisture was calculated. The ears of corn without husks were weighed and oven dried. After drying, the ears were re-weighed and then shelled . Weight of the dried shelled corn samples was then used to calculate bushel weights and total production of shelled corn per acre.

Since the cows also had access to the oat stubble, forage samples were obtained by hand clipping and bagging the material from inside a 0.25 meter^2 frame. The forage material from each frame was sorted into a forb or a combined oat stubble, regrowth and annual grass fraction. These samples were weighed, dried and re-weighed to estimate total forage yield available. Results of corn and oat aftermath yields are shown in Table 1.

Eight pregnant crossbred (AXH) cows ranging in age from 4-12 years old were weighed and randomly assigned to each treatment. They were allowed access to the unharvested corn fields on November 15, 2001. The cows continuously grazed the corn until March 7, 2002 a period of 112 days. The cows were supplemented with 1.7#/cow / day of a 32% protein cake (GTA's Forager 32) group fed on Monday, Wednesday and Friday. The cows also had free choice access to a mineral feeder containing loose white salt and a calcium-phosphorous mineral (Nutra- Serve 12:12 Range Master). Water was provided via to an automatic water fountain and the cows had access to 9' tall, 20%porosity slotted board fence for wind protection. Individual weights and body condition scores (BCS's) were taken every two weeks. No additional roughage or grain was fed during the trial period. Table 3 lists the cow performance for the 112 day wintering period.

Results and Discussion

Winter conditions were favorable for extended grazing with very little snow accumulation and above normal temperatures. Cows grazed for

112 days, from November 15, 2001 to March 7, 2002. Cows grazing the West field of late maturing corn gained a total of 234.5 pounds per head and increased their BCS from 5.5-8.25. Their ADG for the trial was 2.09 lbs per day. Cows grazing the East field of early maturing corn gained 148.4 pounds per head with an increase in BCS from 6.0 - 8.5. Their ADG for the trial averaged 1.32 lbs per day. Using the average of initial and final weight, both groups of cows had an Animal Unit Equillivent of 1.34. The stocking rate was calculated at 126.2 animal days per acre.

The mild weather conditions and abundant corn allowed individual gains to be better than expected. None of the cows experienced any digestive upsets during the trial, even though they had access to abundant cob corn at the start of the trial. Daily feed costs per cow averaged from $1.20 -$1.26 for all costs.

Conclusions

Grazing standing corn with gestating cows offers the advantage of low labor and minimal effort in waste management. Inexpensive slotted board windbreaks provided adequate shelter from weather extremes. The inclusion of corn in a corn-small grain cropping rotation offers both weed control and a possible reduction of some cereal diseases. The economics of corn grazing are largely dependent upon the overall costs of the corn production system consistent with good management and weed control. This trial did not identify the best time to graze corn or whether the level of supplement fed was optimal. The best type of corn for grazing is still debatable. Producers planning to graze standing corn with cattle should be aware of the potential dangers such as founder and acidosis. They should check with their local veterinarian before turning cattle into standing corn. If possible, cattle should be exposed to limited amounts of corn before they are allowed to graze in a free choice manner.

Table 1 . Estimated forage and grain yields of corn and oat stubble aftermath..

Dry weight samples taken from the West Oat aftermath field			Dry weight samples from the East Oat aftermath field		
Sample #	**Net dry wt /.25 meter^2 (gms)**	**lbs/A**	**Sample #**	**Net dry wt /.25 meter^2 (gms)**	**lbs/A**
1	23.8	849	1	23.0	821
2	13.1	468	2	30.2	1078
3	30.4	1085	3	63.4	2263
4	19.0	678	4	25.7	917
5	47.1	1681	5	19.8	707
6	102.4	3654	6	98.6	3519
7	38.5	1374	7	30.2	1078

8	28.0	999	8	42.1	1502
Total lbs		10787	**Total lbs**		11884
Average	Lbs of oat stubble and regrowth	1348#/A	**Average**	Lbs of oat stubble and regrowth	1486#/A

Estimated yields of forbs from the oat aftermath in the West field.			Estimated yields of forbs from the oat aftermath in the East field.		
Sample #	**Net dry wt /.25 meter^2 (gms)**	**lbs/A**	**Sample #**	**Net dry wt /.25 meter^2 (gms)**	**lbs/A**
1	0	0	1	17.3	617
2	53.4	1906	2	75.1	2680
3	34.2	1220	3	21.4	764
4	53.6	1913	4	44.8	1599
5	58.0	2070	5	57.1	2038
6	3.5	125	6	0.0	0
7	68.0	2427	7	35.9	1281
8	66.2	2362	8	54.1	1931
Total lbs		12023	**Total lbs**		10909
Average	Lbs of forb material	1502#/A	**Average**	Lbs of forb material	1364/A

Table 2. Corn samples (1/1000 A) taken on Oct 26, 2001. Corn planted in 36" rows.							
Sample #	**Height (ft)**	**Dry T/A**	**Bu/A**	**Sample #**	**Height (ft)**	**Dry T/A**	**Bu/A**
1-West	6.5	5.64	77.14	1-East	5.0	4.95	88.21
2-West	6.5	5.46	104.29	2-East	6.0	6.58	93.57
3-West	6.0	5.40	92.86	3-East	5.0	4.33	57.14
4-West	6.0	5.28	108.21	4-East	5.0	3.32	66.07
5-West	6.5	5.46	87.86	5-East	4.5	2.39	27.86
6=West	6.5	6.12	85.00	6-East	5.0	4.18	66.07
7-West	5.5	4.3	64.29	7-East	5.5	4.10	82.86
8-West	6.5	7.65	118.21	8-East	6.0	4.42	72.86

Total	50.0	45.15	737.86	**Total**	42	34.28	554.64
Average	6.25'	5.64 T/A	92.23 bu/A	**Average**	5.25'	4.28 T/A	69.33 bu/A
Test Wt			57.0 #/bu	**Test Wt**			57.5 #/bu

Table 3. Cow gains while grazing late maturing corn in the West field.

	Date Weighed									
Cow Number	**11/15**	**11/29**	**12/13**	**12/27**	**1/10**	**1/25**	**2/10**	**2/21**	**3/7**	**Total gain/hd**
D4331	1340	1435	1475	1475	1540	1610	1660	1700	1650	310
C3036	1295	1415	1495	1485	1505	1525	1565	1600	1550	255
F6016	1480	1535	1575	1605	1670	1685	1770	1780	1735	255
F6023	1385	1440	1495	1520	1575	1630	1690	1700	1655	270
F6113	1250	1280	1345	1375	1380	1370	1430	1465	1460	210
G7016	1485	1570	1575	1635	1670	1680	1750	1765	1730	345
G7095	1380	1460	1485	1500	1510	1575	1645	1640	1595	215
Y9X13	1224	1270	1320	1260	1285	1330	1390	1395	1340	116
Total wt/lot (lbs)	10839	11405	11765	11855	12135	12405	12900	13045	12715	
Ave cow wt (lbs)	1354.9	1425.6	1470.6	1481.9	1516.9	1550.6	1612.5	1630.6	1589.4	+234.5
Total gain/hd	0	70.75	115.75	127.	162.0	195.75	257.63	275.75	234.5	
ADG/trial	0	5.05	4.13	3.02	2.89	2.76	3.07	2.90	2.09	
Ave B.C.S.	5.5	6.25	6.63	6.75	7.13	7.13	7.65	8.25	8.25	+2.75

Table 4 . Cow gain while grazing early maturing corn in the East field.

	Date									
Cow #	**11/15**	**11/29**	**12/13**	**12/27**	**1/10**	**1/25**	**2/10**	**2/21**	**3/7**	**Total gain (#)**
A1108	1238	1320	1380	1400	1420	1415	1365	1355	1300	62
C3107	1585	1670	1690	1700	1690	1695	1730	1745	1695	110
E5233	1445	1540	1605	1630	1595	1610	1615	1630	1590	145
F6003	1455	1510	1545	1565	1580	1600	1600	1630	1545	90
F6035	1525	1630	1700	1710	1730	1760	1805	1800	1730	205
G7014	1310	1380	1425	1485	1510	1510	1550	1550	1525	215
G7053	1410	1500	1520	1595	1565	1570	1640	1635	1600	190
G7088	1285	1325	1375	1370	1395	1440	1485	1495	1455	170
Total wt/lot (lbs)	11253	11875	12240	12455	12485	12600	12790	12840	12440	
Ave wt/cow (lbs)	1406.6	1484.4	1530.0	1556.9	1560.6	1575.0	1598.8	1605.0	1555.0	+148.4
Total gain/hd	0	77.75	123.38	150.25	154.00	168.38	192.13	198.38	148.38	
ADG /trial	0	5.55	4.41	3.58	2.75	2.37	2.29	2.09	1.32	
Ave B.C.S.	6.0	7.0	7.25	7.25	7.63	7.75	8.0	8.50	8.38	+2.38

Table 5. Protein supplement , salt and minerals fed.

	GTA's Forager 32	White salt	Nutra-Serve Range Master 12:12 mineral
West cows Total cost= $215.74	1479# @ 0.115/ lb=$170.09	50# @ $0.063/ lb=$3.15	125#@ $0.34/ lb= $42.50
East cows Total cost= $215.74	1479# @ 0.115/ lb=$170.09	50# @ 0.063/ lb= $3.15	125#@ $0.34/ lb= $42.50
Ave supplement cost/ cow = $26.97	$21.26 / cow	$0.39 / cow	$5.31 / cow

Table 6. Overall economics of grazing standing corn in 2002		
	West Pasture **7 A** **8 cows** **112 days**	**East Pasture** **7A** **8 cows** **112 days**
Land rental charge / A	$25.00	$25.00
90# Starter fertilizer / A (9N-39P-15K-3Zn)	13.19	13.19
Heavy discing /A	10.00	10.00
2nd Pass / A	6.00	6.00
Planting / A	8.00	8.00
Seed / A	17.18	24.73
Herbicide / A	25.23	25.23
Spray application / A	3.50	3.50
Total corn production cost/Acre	**$122.89**	**$130.44**
Supplement cost		
32% cake	$170.09	$170.09
12:12 mineral	42.50	42.50
white salt	3.15	3.15
Total supplement costs.	**$215.74**	**$215.74**
Total corn production and supplement costs / field	$1075.97	$1128.82
Corn and supplement cost per cow/day	$1.20	$1.26
Cost per lb cow gain	**$0.5735**	**$0.9508**