NORTH DAKOTA - Winter Swath-Grazing Within Rotations Benefits Beef Animals & Crops

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Integrated crop/livestock-system research was initiated at Mandan, ND, in 1999 to determine potential beneficial synergies to both enterprises. The system emphasizes crop rotation, conservation tillage, cover crops, integrated pest management, grazing, and forage management.

Research objectives were to determine influences of winter-grazing beef cows on: no-till forage and grain production, water-use efficiency, and protein and phosphorous production in an oat/pea, triticale/sweet clover, and corn 3-year crop rotation. Cropping-system treatments included:

- straw and corn chopped and left in place (IP);
- straw and corn baled and removed without livestock (R);
- straw and corn swath-grazed by livestock (L).

All crops were seeded with a no-till drill. Nitrogen rates, less than those used in traditional crop production, were applied to attempt to take advantage of the legumes in the cropping system.

Table. Feed offered, feed refused, and feed costs for the rotationally grazed crops, swathed crops, and baled hay treatments averaged over 3 years.

Feedstuff	DM Offered/Day	Estimated Waste	Days on a Feed	Feed Cost/Cow	Feed Cost/Cow/Day
	lbs	%		$	¢
Swathed Corn	84	48	53	30.44	.32
Crop Residue	97	60	41	3.36	.04
Supplement	3	0	95	12.35	.13
RGSC Total			95	46.15	.49
RGSC Average	93	52			
SWWG	43	7	85	56.62	.60
Supplement	1	0	95	4.37	.05
SWWG Total	44		95	60.99	.65
Baled Hay in Drylot	36	12	95	69.35	.73

RGSC=rotationally grazed swathed crops; SWWG= swathed western wheatgrass.

Water-use efficiency for above-ground DM yield followed trends similar to total DM production. Corn responded to additional residue more favorably than oat/pea or triticale. July rainfall together with additional residue in the IP treatment, suppressed evaporation of soil water in August and improved total DM production per unit of water.

Neither grain, straw, nor total above-ground DM production were different between oat/pea and triticale when 50% of the surface residue was moved away from seed openers for better seed-to-soil contact. Corn averaged 1.5 times more efficient water-use DM production than oat/pea or triticale. Protein and phosphorous production per acre were generally greatest for corn, and least for triticale. About half of the N used for protein production was derived from sources other than commercial fertilizer.

The most expensive aspect of beef cow operations is wintering dry, pregnant cows. Winter swath-grazing of annual crops or crop residues may allow producers to reduce feeding costs, while animal activity and deposition of wastes directly on the land may be beneficial to soils and subsequent crop production. Beef-cow nutrient requirements are least in the mid-trimester when the current-year's calf has been weaned and the fetus for next year's calf is still small. This is when cows should be able to maintain weight and body condition on properly supplemented crop residue.

The winter livestock research began with 20 Herford cows per treatment. Treatments were:

- rotationally-grazed swaths of oat/pea and triticale residue, and corn (RGSC);
- swathed western wheatgrass (SWWG);
- cows fed in dry-lot (control).

Swath grazing had no adverse effects on performance of mid-aged beef cows or their calves. Swath grazing is a viable alternative to dry-lot feeding and results in lower feed costs. Cows wintered on RGSW for an average of 49¢/cow/day which was 24¢/cow/day (~50%!) less than cows wintered in a dry-lot on hay. Direct costs of wintering cows on SWWG were 9¢ less than dry-lot feeding. Cost savings for swath grazing can also include reduced labor costs, less wear on machinery for baling, transporting, and feeding hay, and reduced manure-handling costs. Swathed-corn supported 2.24 cows/ac for 100 days at a cost of $121.50/ac.

If snow or ice is a problem, mechanical treatment may be necessary to assist cows. Cattle can graze swaths in as much as 20" of snow. Swath grazing succeeds when animals have limited access. An electric fence was used to limit cow access to swaths; fence was moved daily to reduce feed waste and provide cows with fresh feed.

Properly supplemented cows swath-grazed on oat/pea and triticale crop residue and swathed corn, or grazed on swathed western wheatgrass had weight changes, condition scores, and reproductive performances comparable to cows fed baled hay in a dry-lot.