

Extending the Grazing Season: Swath Grazing

In recent years, extensive research on swath grazing has been carried out across the Aspen Parkland of western Canada to optimize the swath grazing system.

Feeding accounts for the majority of the costs of wintering beef cows and producers are looking for ways of reducing these costs. Forage yield, quality and the local environment are the three major considerations in developing strategies for reducing wintering costs and the focus has been on developing grazing systems that reduce feeding costs, hauling costs, harvesting costs and losses, and manure removal costs.

Grazing cereals that have been cut in fall and left in the swath for winter grazing is the cheapest way to winter beef cows in western Canada: this system may reduce wintering costs by about 37 to 60%¹ compared to a traditional winter feeding system.

This grazing system is much cheaper than feeding stored feed in a traditional winter feeding system.

In order to swath graze, cereal crops are seeded in late May or early June and swathed in the soft dough stage just before the first killing frost, which usually occurs in mid-September in the Aspen Parkland.

Forage yield

High forage yield of the annual cereal is essential for successful swath grazing. Producers need to seed the annual cereal crop that will give them the greatest yield at the lowest cost per cow grazing day. The more days the cows are grazing in winter the more money that is saved; the number of grazing days is more important than the number of cows grazing on an acre of land.

During the winter, cows require more feed due to cold weather and exposure to wind. Sometimes in the southern, dryer areas of the prairies or in dry seasons there simply isn't enough swathed forage due to low yields. Other grazing areas or conserved feed is then required for the stock.

Cereal species and seeding dates

Yield is determined largely by the number of growing days it takes to reach the soft dough stage for harvest. For example, later planted barley quickly reaches the soft dough stage but the yield is substantially reduced compared to early seeded barley. The growth rate of oats is slower so oats take longer to mature.



Figure 1: Beef cow Swath Grazing triticale

**Swath Grazing can reduce
cattle over-wintering costs
by about 37 to 60%¹**

Since triticale takes more growing days to reach the soft dough stage, it potentially produces more than other cereals.

Barley is usually seeded between mid-May and the first week in June, and oats and triticale are seeded between the last week in May and mid-June.

In southeastern Saskatchewan, oats and barley should be seeded between May 20-25 to exploit spring moisture and cool temperatures. However, when seeded this early, the cereals are ready for swathing in early August. Swaths left in the field from early August to freeze-up are subject to significant weathering due to rain. It may be advantageous to exploit the higher yields of early-seeded spring cereals by grazing swaths in August and September, and utilizing the regrowth of other perennial forages for late fall and early winter grazing. Research at the Agriculture and Agri-Food Canada Research centre in Brandon showed that grazing cereal swaths in August and September gave perennial brome/alfalfa pastures a chance to rest and regrow for later grazing in the fall.

For the northern prairie region of western Canada, triticale provided more flexibility and higher carrying capacity across a range of relatively late planting dates compared to oats and barley.² Delaying planting for barley until late June reduced time until maturity and resulted in lower yield and a 33% loss in carrying capacity. Late planted oats had higher yield and lower nutrient value than barley resulting in similar carrying capacity for the two crops.

A recent study¹ also looked at corn as a swath grazing alternative to barley. Corn needs to be planted early and use the entire growing season to justify the high production costs. Corn can be vulnerable to frost and cool weather. In central Alberta, the nutritional content of the corn was higher than barley or triticale. Over the winter grazing period, cows swath grazing corn were in better body condition and lost less weight than the cows on triticale or barley.



Figure 2: Triticale swaths in September after swathing

Mixtures of annual crops

Mixtures of spring cereals do not have a consistent yield advantage over single species crops, but barley-oat mixtures tend to offer more yield stability. Spring and winter cereals grown in mixtures (spring-planted) have higher protein concentration and digestibility, lower fiber concentration, but lower yield. Producers that graze livestock requiring more protein than required by pregnant beef cows, such as calves, can use mixtures of spring cereals with peas or with winter cereals.

Fertility

High yielding cereal crops used for swath grazing take up a lot of nutrients so inputs are required. Grazing animals return nutrients to the field so these fields may require less chemical fertilizer, especially after several years of grazing.

It is important to monitor soil nutrient status each year by soil testing.

It is advisable to select fields for swath grazing that are relatively flat and away from water runs to prevent nutrient runoff from snow melt.

Grazing management

Swath grazing usually starts in November and continues in to the late winter or early spring depending on when the cows are moved to the calving area, usually a couple of weeks before calving begins. It should be noted that cows coming off swath-grazing weigh less, were thinner, and had less backfat than cows fed in traditional confined feeding methods. It is important that cows be on a rising plain of nutrition after calving so that they can be bred early in the breeding season and calve sufficiently early the next calving season. Other studies have shown that swath grazing does not reduce beef cow reproductive performance.

Swaths should be cut as wide as possible to reduce the total amount of exposed surface area for the field. By reducing the number of swaths in the field, the amount of wastage will be reduced. Portable electric fences should be used to allocate 3-4 days of swaths so that the cows will consume all the feed.

It is essential to monitor cows every 3-4 days to identify and remove individuals that perform poorly on swath grazing. To discourage cows from bedding and dunging on swaths, sheltered bedding areas should be provided. Wind protection, such as trees or permanent or portable windbreak fences, is needed. It is best to avoid grazing when the fields are muddy.

The carrying capacity for swath grazing depends on the forage yield and quality, on the amount of snow and ice cover, and on the degree that the cows clean up the area before they are moved. If cows have access to a large area, they will first graze the seed heads, leaving the stalk portion for later. If they graze the stalks for an extended period, nutritional problems may result.

In central Alberta, the mean and range in carrying capacity measured over a number of years and crops is shown on Table 1.

Table 1 – Pasture yield, animal utilization and carrying capacity for swath grazed triticale, corn and barley compared with a traditional pen-fed winter feeding system				
	Swath grazed triticale	Swath grazed corn	Swath grazed barley	Traditional confined feeding system
Dry matter yield – tonnes/ha	9.9 to 21.3 Mean 15.6	12.0 to 15.5 Mean 13.5	5.0 to 14.5 Mean 10.2	
Utilization - %	80.2 to 88.4% Mean 83.7%	56.7 to 86.7% Mean 74.7%	57.6 to 79.8% Mean 71.7%	
Carrying capacity – cows per day/ha	887 to 1283 Mean 1145	661 to 1446 Mean 1004	341 to 765 Mean 554	377 to 736 Mean 516

The carrying capacity is generally similar for triticale and corn, and both of these have higher carrying capacities than barley. Over the five-year study, the carrying capacity of triticale was more consistent. And utilization for triticale by grazing cows was almost always among the highest and on average was higher than corn and barley. This was contrary to anecdotal producer accounts indicating that cows grazing triticale would leave excess waste.

Costs

A recent five-year study¹ has confirmed the effectiveness of swath grazing in reducing the cost of overwintering beef cows. Compared with the traditional confined feeding of cows, swath grazing resulted in an average total cost saving of 61%, 47% and 37% for triticale, corn and barley respectively (Table 2). To put this into dollars: for the case where a producer overwinters 100 cows for 100 days, total savings over

traditional confined feeding systems are about \$12,000, \$9,300 and \$7,400 for swath-grazed triticale, corn and barley respectively.

Table 2. Feed production, yardage and total costs associated with swath grazed triticale, corn and barley compared with traditional confined feeding system

Costs*	\$ per cow-day			
	Swath grazed Triticale	Swath grazed Corn	Swath Grazed Barley	Traditional confined feeding system
Feed production	0.27	0.5	0.47	0.58
Yardage**	0.37	0.4	0.6	1.12
Total cost***	0.78	1.05	1.24	1.98
% Reduction in Cost (over traditional)	61%	47%	37%	

*Mean costs based on 5 years for triticale, corn and traditional; 3 years for barley

** Yardage includes all the costs associated with feed processing and delivery, bedding delivery, and manure removal

*** Total cost includes sum of feed production, yardage, salt and mineral and bedding straw

Swath grazed triticale has the lowest total daily cost for over-wintering beef cows and accordingly has emerged as a competitor to swath grazed barley. Both feed production and yardage costs were lower for Triticale (Figure 3).

Corn is also a swath grazing alternative to barley but needs to be planted early and use the entire growing season to justify the high production costs. Corn and triticale often have comparable forage yields but corn has about twice the cost of production. And corn is more vulnerable to frost and cool weather.

Averaged over a five-year study¹, the daily feed cost of triticale, corn and barley was 47%, 86% and 81% of the confined feeding. When compared to confined feeding, on average swath grazing required about 34 % as much labour, 41% as much fuel, and about 52% as much equipment costs.

Yardage costs represent the post-harvest daily expenditure during winter feeding and grazing. Swath grazing systems involve no feed processing or delivery, just travel to the paddock and moving electric wires. Swath grazing substantially reduced costs of equipment, fuel and labour (Figure 3).

The total daily cost of wintering beef cows varied more annually for corn and barley than triticale and can be attributed to their greater year-to-year variation in carrying capacity.

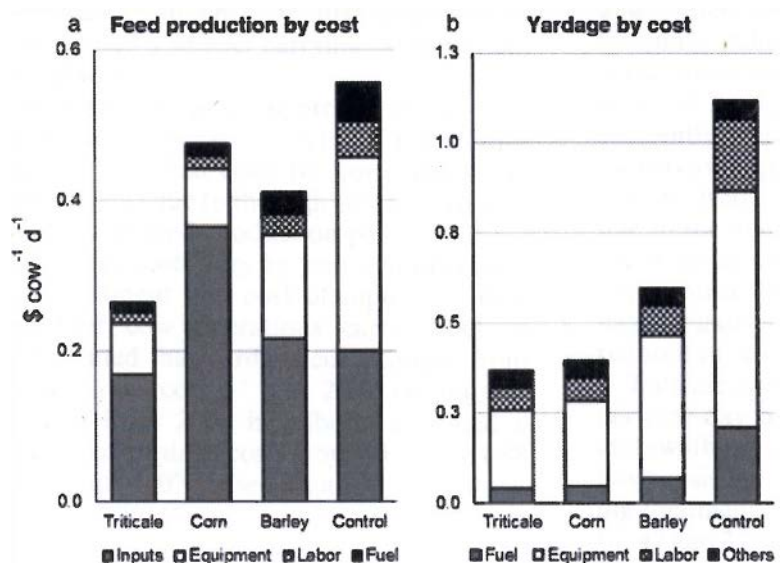


Figure 3: (a) Average cost of items included in Feed Production and (b) Yardage for swath grazing of triticale, corn and barley. “Control” is traditional confined winter feeding system

Other management issues

Dry cows can use snow for their water source; however, when there is insufficient snow, cows need access to water so alternative water supplies are always required.

Damage and feeding by large wildlife can make swath grazing impossible for some producers. The use of a double electric fence spaced about 1-1.5 m (3-4 ft) apart will help prevent wildlife from entering the swath grazing area (Peace River Forage Association).

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1. **Baron, Vern S., Raquel R. Doce, John Basarab, and Campbell Dick, 2014**, Swath Grazing triticale and corn compared to barley and a traditional winter feeding method in central Alberta, *Can J. Plant Sci.* (2014) 94: 1125-1137
2. **Baron, Vern S., A. Aasen, M. Oba, C. Dick, D.F. Salmon, J.A. Basarab, and F. Stevenson, 2012**, Swath-grazing potential for small-grain species with a delayed planting date. *Agron. J.* 104: 393-404

This fact sheet builds on an earlier summary authored by McCartney and Baron (2013), and has been updated to reflect the most recent work reported in Baron et al (2014) as referenced above. Past work on swath grazing was initially reported in McCartney et al (2004).

McCartney, Duane and Vern Baron, 2013, Extending the Grazing Season: Swath Grazing by Beef Cows, Pg 189-191 /Chapter 45 in "Cool Forages – Advanced management of temperate forages" Editors Shabtai Bittman and Derek Hunt

McCartney, Duane, J.A. Basarab, E.K. Ekine, V.S. Baron, and A.J. Depalme, 2004, Alternative Fall and Winter feeding systems for spring calving beef cows, *Can. J. Anim. Sci.* 84: 511-522



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