

Windrow Grazing Annual Forages

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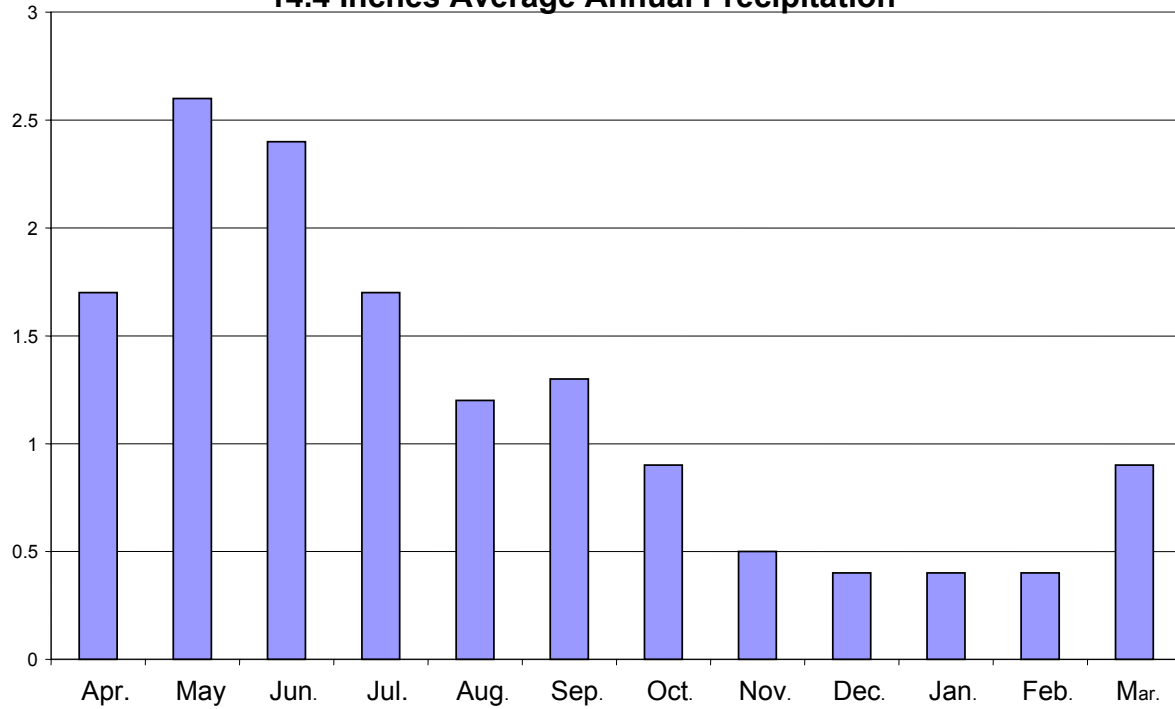
Harvested feed costs can be one of the largest expenses to cattle producers. Windrow grazing, sometimes called swath grazing, is a management practice which can significantly reduce harvesting and feeding costs. Swathing the crop and leaving the windrows in the field eliminates the costs of baling and hauling bales off the field while reducing labor and equipment costs associated with feeding. Grazing windrows in the field also returns some nutrients and organic matter from consumed forage back to the soil where the crop was grown.

Precipitation Patterns

In Western Nebraska and Southeast Wyoming, 75% to 80% of seasonal precipitation falls in the 6-month period of April through September. Only 20% to 25% of precipitation falls from October through March. (See Figure 1.) This seasonality of precipitation allows for the swathing of forage crops in early fall and preservation through the fall and winter with minimal deterioration in quality due to weathering. The greater the average precipitation the farther east one goes in Nebraska, the greater the risk that windrow deterioration will occur compared to the drier conditions of the western part of the state. Snowfall from October through March can be quite variable. However, extended periods when snow cover would prevent windrow grazing are limited.

Figure 1.

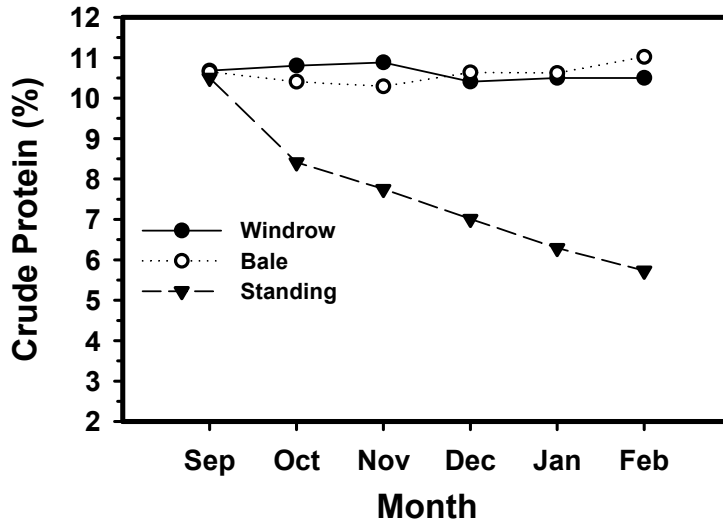
Monthly Precipitation Summary Average April through March
14.4 Inches Average Annual Precipitation



Windrowed Forage Quality

Research conducted during 1997 through 1999 on a subirrigated meadow at the University of Nebraska Gudmundsen Sandhills Laboratory (GSL), near Whitman, Nebraska, found that crude protein content of forage in windrows and bales was similar, 10.6%, during all sampling months (September through February). However, the crude protein content of standing forage declined to 5.7% by February. (See Figure 2.)

Figure 2. Crude protein content of windrowed, baled and standing forage September through February.



Source: Volesky et al. 2002

Cattle Performance Grazing Windrowed Forages Compared to Fed Baled Hay

The performance of weaned calves and bred heifers that grazed windrows of forage cut in early fall, was equal to or better than the performance of cattle fed forage baled as hay from the same location, according to two studies conducted in the High Plains region. (Table 1. and Table 2.)

Table 1. Body weights and gains of calves grazing windrows or fed baled, meadow hay

Trial year	Item	Treatment	
		Windrow grazing	Bale-fed
1997-98	Initial weight, lbs	449	447
	Final weight, lbs		531
			507
	Total gain, lbs	82	60
	Daily gain, lbs/day	1.17	0.86
1998-99	Initial weight, lbs	443	449
	Final weight, lbs	486	487
	Total gain, lbs	43	38
	Daily gain, lbs/day	0.57	0.53

Research took place at GSL near Whitman, Nebraska. The average daily gains of calves grazing forage in windrows along with meadow regrowth was equal to or better than calves fed baled hay in a dry lot.

Source: Volesky et al. 2002

Table 2. Bred heifer performance grazing millet windrows or fed baled millet hay

Trial Period	November 5 to December 3	December 3 to December 31
11/5/1997 -1/08/1998		
Treatment	Daily gain (lbs/day)	Daily gain (lbs/day)
Bale feeding	0.86	0.42
Windrow grazing	1.17	0.45

Thirty heifers were assigned to each treatment in this study.

Research was conducted at the Eastern Colorado Research Center located near Akron, Colorado. Differences were not detected for weight changes between bale feeding and windrow grazing treatments for any of the time periods. Grazing windrows provided similar heifer performance as feeding baled hay.

Source: Munson et al. 1999.

Planning for Windrow Grazing

The following factors should be considered when planning to windrow graze.

- Annual or perennial forage options available
- Class of livestock desired to graze (calves, yearlings, mature cows, etc.)
- Time of year the forage will be grazed
- Livestock performance goals
- Livestock water and fencing needs

Annual Forages for Windrow Grazing

Warm-season annual forages such as foxtail millet, sorghum-sudangrass hybrids, or sudangrass, and cool-season annuals such as barley or oats have been used for windrow grazing. When annual forages are utilized for windrow grazing, time planting so forages reach the boot to dough stage of maturity just prior to the average date of first frost. Harvest during the boot stage for higher forage quality or dough stage for extra tonnage. With adequate rain or irrigation, oats or barley planted in late July to early August will reach heading stages by about mid-October.

Time and Method of Windrowing for Fall and Winter Grazing

Swath forages in early fall when nights are cool to prevent mold growth. Make windrows high and dense to reduce weathering loss if windrows are to be grazed through the winter. It may be helpful to rake two windrows together if forage yields are less than 1½ tons per acre or swather head-width is small. Rake windrows directly after swathing so they “rope” together. Tight, heavy, dense windrows will seal down and be less susceptible to being picked up and scattered by the wind. When possible, swath the crop so windrows lay parallel to prevailing winds. Raising the swather cutter bar to cut forage at higher stubble heights will also reduce losses from hay rotting in the windrows, as stubble will hold the windrows up and keep hay from lying directly on the ground.

Sampling and Testing Windrowed Forages

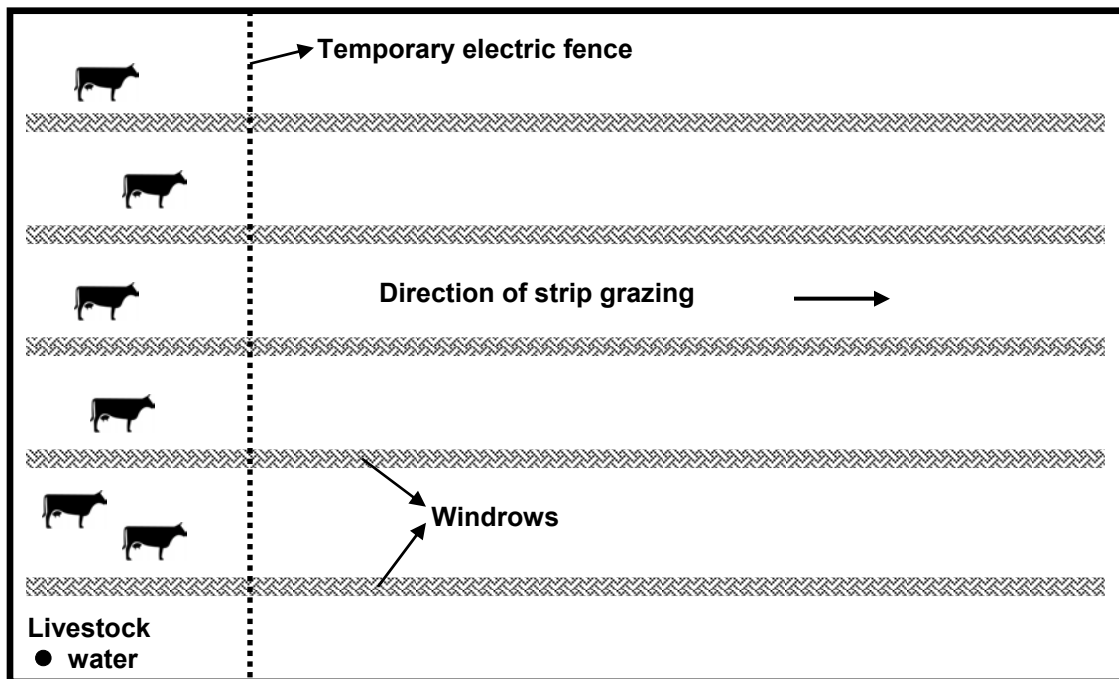
Before grazing, sample and test the quality of windrowed forage. Use this information to adjust the amount fed to meet the animal’s nutrient requirements and to know if additional supplement

is needed to meet performance goals. If annual forages are to be grazed in the windrow, test nitrate and prussic acid levels before grazing to be sure that the forage is safe. Caution should be used when grazing windrowed forages that have moderate levels of nitrates present. If windrowed forage is wet due to precipitation the feed seems to be more toxic because some of the nitrate has already been converted to the more toxic nitrite before being consumed.

Control Windrow Grazing Using Temporary Electric Fence

Use of temporary electric fence in rationing out the windrows will help to efficiently utilize forage and minimize waste. Give cattle one day to one week's allocation of feed to reduce waste due to trampling and cattle bedding on the windrows. Make adjustments depending on class of cattle and weather conditions. A single-strand electric fence is often adequate to separate cattle from grazed and un-grazed windrows. A double-strand electric fence with one ground and one hot wire may be needed when the soil is dry or snow cover is present. A variety of temporary electric fence posts, wire, tools and equipment are available that simplify the task of building and moving temporary electric fence.

Figure 3. Strip Grazing Plan for Allocating Windrows



Amount of forage per unit length of windrow would vary depending on hay yield and the area used to form a windrow. If hay yield was 2 tons/acre and windrows were 30 feet apart, 1 foot of windrow would contain about 3 lbs. of forage. If a producer wanted to allot 30 lbs. of forage per head per day and included 10% waste, this would result in a suggested allocation of about 10 to 12 feet of windrow per cow per day.

Economics of Windrow Grazing vs. Feeding Baled Hay

Windrow grazing can significantly reduce harvesting, feeding and labor costs associated with feeding hay. The difference in costs for windrow grazing versus feeding hay will vary between operations. The following example assumes a two-ton-per-acre yield and 200 cows consuming 30 pounds of forage per head per day. Costs listed below are on a cost per ton basis.

Table 3. Cost per Ton of Forage for Harvest and Delivery to Cattle

Windrow Grazing		Harvesting and Feeding Baled Hay	
Swathing	\$5.00	Swathing	\$5.00
Fencing & Labor	\$3.00	Baling	\$10.70
		Hauling Bales off Field	\$2.00
		Feeding Bales with Labor	\$7.50
Total	\$8.00/Ton	Total	\$25.20/Ton

Utilizing windrow grazing saves \$17.20 per ton of hay fed. This is equal to a savings of \$51.60 per day for 200 cows or \$0.26 per cow per day. Fencing & Labor costs assumes moving fence every 3 days for 1 hour at \$9.00/hour for labor expense. \$2.00 per ton for fencing is the estimated cost of an electric fence charger and material. Example assumes fence material and charger are used over a 10 year time period. Costs for harvesting and feeding baled hay are calculated using rates found in the 2004 Nebraska Farm Custom Rates EC04-823-A.

Expected Waste with Windrow Grazing

The amount of forage that cattle waste when grazing windrows will vary depending upon the weather, quality of the forage available, the class of animals that are grazing and how frequently and tightly restricted the feed is rationed out. The amount of forage wasted with windrow grazing can range from less than 5% to greater than 30%. This compares to dry matter hay loss estimates ranging from 15% to greater than 40% with baling and feeding depending upon storage and delivery methods. See NebGuide G84-738-A *Management to Minimize Hay Waste* for additional information on losses that occurs with harvesting and feeding hay. The amount of acceptable waste with windrow grazing must be balanced with the labor required to move fence and the performance goals for the animals grazing. The use of mature cows or cattle with lower nutrient requirements can be used as a method to “clean up” windrows when excessive forage waste is left behind by grazing calves or stocker cattle.

Frequently Asked Questions About Windrow Grazing

When you swath the hay or forage crop and leave it laying in the field, won't the hay just rot in the windrow?

This can be a concern. Plan for the crop to be swathed in late-summer or fall and cut at a higher stubble height so that windrows are not lying directly on the ground. This will help to

reduce the potential of this being a problem. Risk for windrow deterioration does increase with high rainfall.

What happens if we get snow? Can I still graze the windrows?

If the cattle know that the windrows are there, they will graze the windrows through the snow, as long as the snow has not crusted. If the snow crusts or if ice is present, breaking the crust next to the windrow can help the cattle get to the feed.

If I am windrow grazing on a perennial hay meadow, will the grass underneath the windrow be killed?

There will be minimal damage to the perennial grass underneath the windrow when swathing occurs in late-summer to early fall as the majority of the growing season has been completed.

Won't the cattle just trample and pick through the windrows resulting in a lot of wasted feed?

Controlled, strip-grazing of the windrows is essential to minimizing the amount of waste.

How do I move and use electric fence when the ground is frozen?

A pointed rod that can be driven into the ground, or a portable drill with a concrete bit to open holes to drive electric fence posts into frozen ground have reportedly worked well. Galvanized 1/16 inch cable, polywire and polytape work well as an alternative to wire for temporary electric fence that is going to be moved frequently.

References:

Windrow Grazing. 2006. University of Nebraska-Lincoln Extension NebGuide

Munson C.L., J.C. Whittier, D.N. Schutz, and R.L. Anderson. 1999. Reducing annual cow costs by grazing windrowed millet. *Prof. Animal Scientist*, 15, 40-45.

Thomson, W. V. 1999. Reducing harvesting costs using windrow grazing. Proc. The Range Beef Cow Symposium, Greeley, CO, XVI:61-66.

Volesky, J.D., D.C. Adams, and R.T. Clark. 2002. Windrow grazing and baled-hay feeding strategies for wintering calves. *J. Range Manage.* 55:23-32.

Additional Information

An Introduction to Swath Grazing in Western Canada. 2004. Alberta Agriculture, Food and Rural Development Agdex 420/56-2