

## PASTURE MANAGEMENT

# Stockpiled Forage to Extend the Grazing Season

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Nationwide 75% of all feed consumed by beef is forage. In addition, a survey of beef producers in Nebraska revealed that producers who graze cattle longer during the year had lower costs of production compared to producers who fed more stored or purchased feed. Thus, the longer animals are out on pasture harvesting their own forage, the greater the opportunity to keep production costs down.

A major challenge with grazing in Minnesota is the relatively short growing season. Hay or silage has traditionally been used to feed livestock when green growing pastures are not available. In many situations, stockpiled or autumn-saved pastures offer an excellent alternative to more expensive hay or silage feeding programs. This publication will discuss some of the advantages and disadvantages of using stockpiled forage. It will also provide some preliminary research findings on stockpiled forage in Minnesota as well as a brief introduction of other forage alternatives for providing fall grazing.

Stockpiling forage is accomplished by removing grazing animals from a pasture at some time during the growing season and allowing forage to accumulate for later grazing. Stockpiling forage can also be achieved on a field cut for hay and allowed to regrow.

The brome grass and orchard grass that often dominate the pastures in Minnesota generally produce the majority of their seedheads by late June. Therefore, if stockpiling is initiated after that date, a much greater percentage of the forage produced will be leaf material. Leaves are more readily eaten, and are of higher quality than stems. In addition, stems can reduce the intake potential of grazing animals. When growing forage for stockpiling (or anytime forage is grown), the goal should be to provide ample amounts of leaf material to grazing animals.

Kind and class of livestock is also an important factor when considering if stockpiling forage will be beneficial on your farm. Generally, stockpiled forage is of moderate to poor quality. Stockpiled forage may not be nutritionally adequate for growing or lactating animals. However, it may do a good job of maintaining dry cows. Stockpiled forage will generally be of higher quality when it is less mature (younger), and grazed earlier in the fall.

Stockpiling has not been as widely used in the North Central States as it has in the South. Research in the South suggests that beginning stockpiling earlier in the summer will result in greater forage yield but lower forage quality. In addition, nitrogen fertilization has been shown to increase forage production when stockpiling forage. Much different growing conditions in this region may require different forages and management strategies for stockpile grazing. If desirable

forage species and management strategies can be identified, stockpiled forage has the potential to increase the length of the grazing season and decrease the length of the hay or silage feeding.

The following information is 1 year of data from a trial conducted at the West Central Research and Outreach Center near Morris, MN in 1996. The trial evaluated stockpile initiation date and nitrogen fertilization effects on smooth brome grass. The objective of this study was to identify stockpile initiation dates and nitrogen fertilization rates that will optimize the use of stockpiled forage as a management strategy in Minnesota. Stockpile initiation dates were: 6/1, 6/15, 7/1, 7/15, 8/1, 8/15, and nitrogen fertilizer rates were: 0, 50, and 100 lb N/ac. Nitrogen was applied as ammonium nitrate. A pasture being rotationally grazed by the dairy herd at the West Central Research and Outreach Center was used in the trial. On the date of stockpile initiation, the experimental area was mowed to leave a stubble height of 3 inches and nitrogen treatments were applied. Electric fence was used to exclude cattle from the area. All stockpiled forage was harvested October 15, 1996.

Table 1 shows the effect of stockpile initiation date on total yield and leaf yield. Total yield was greater for brome grass stockpiled June 1 and June 15 than for other stockpile initiation dates. However, forage stockpiled starting July 1 produced just as much leaf yield as the two June dates. By initiating stockpiling July 1 instead of June 1, there was no loss in leaf material available for fall grazing and the pasture could be used for an additional month (June) during the summer. Initiating stockpiling after July 1 reduced total and leaf yield. A dry August (0.52 in. of rain fell between August 8 and September 7) may have decreased yields for pasture stockpiled later in the summer.

Table 1. Date of stockpiling initiation effects on total and leaf yield of smooth brome grass

Stockpile initiation date	Total yield	Leaf yield	Leaf content
	-----lb/ac-----		----%----
June 1	2700a <sup>1</sup>	1640a	61d
June 15	2590a	1780a	69c
July 1	1970b	1640a	83b
July 15	1390c	1200b	86ab
August 1	900d	820bc	90a

<sup>1</sup>Within a column, mean followed by the same letter are not significantly different from each other.

Forage harvested October 15.

Data presented is averaged across nitrogen fertilization treatments.

Table 2 shows the effect of nitrogen fertilization on stockpiled brome grass. There was an increase in forage and leaf yield with 50 lb N/ac compared with unfertilized brome grass. Stockpiled leaf yield was 65% greater for brome grass with 50 lb N/ac compared with unfertilized brome grass. One hundred pounds of nitrogen per acre did not significantly increase forage yield above 50 lb N/ac. This is in agreement with other research that suggests that it is unlikely that an economic response to N fertilizer occurs beyond 50 lb of N/ac when stockpiling pastures.

Table 2. Nitrogen fertilization effect on total and leaf yield of stockpiled smooth brome grass

Nitrogen fertilization	Total yield	Leaf yield	Leaf content
	-----lb/ac-----		----%----
0	1190b <sup>1</sup>	840b	76b
50	1830a	1390b	80ab
100	2060a	1570a	81a

<sup>1</sup>Within a column, means followed by the same letter are not significantly different from each other [LSD (0.05)].

Forage harvested October 15, 1996.

Data presented is averaged across stockpile initiation dates.

Preliminary data has shown pastures stockpiled later in the summer were more digestible and had higher levels of crude protein when compared with pastures stockpiled earlier in the summer. In addition, nitrogen application increased forage crude protein (data not shown). Data from this trial indicate that initiating stockpiling in early July and applying 50 lb N/ac would result in optimal levels of forage leaf yield available for fall grazing.

There is some concern that the use of stockpiled forage in fall and winter would decrease forage production the following spring. However, fall and winter harvesting of stockpiled forage in Kentucky and Manitoba, Canada resulted in little or no yield reduction of spring growth.

In addition to using stockpiled forage for fall grazing, there are several other options for keeping cattle on pastures longer. A brief description of several options follows.

### BRASSICAS

Brassica crops include turnips, rape, typhon, kale, etc. The primary advantage of these crops is that they remain green and lush in fall, after most forage crops go dormant. Thus, they can produce high quality forage and good animal gains on pasture at a time when other forage crops are relatively low quality. However, animal performance when grazing brassicas has been variable. In the literature, gains with growing lambs have varied from 0.04 lb/hd/d to 0.74 lb/hd/d. However, average daily gains have generally been higher for lambs grazing brassica crops than for lambs grazing stockpiled tall fescue or orchardgrass. In 1997 at the West Central Research and Outreach Center, lambs were finished grazing forage turnips, alfalfa, or in the feedlot on an alfalfa, corn, soybean meal diet. Lambs gained 0.60 lb/d in the feedlot, 0.56 lb/d grazing alfalfa, and 0.51 lb/d grazing turnips. Most of the decreased lamb performance associated with grazing turnips occurred in the first few weeks of grazing. These lambs had not been exposed to turnips prior to the trial and took 2 to 3 weeks to begin readily eating the turnips.

The reason for the inconsistency in animal performance while grazing brassica crops is not well understood. Several management strategies can be used to try to minimize the variation in animal performance while grazing brassica crops: 1) allow the animals to become adjusted to the brassicas gradually, and 2) supply dry hay to animals grazing brassica crops.

## ALFALFA REGROWTH

Alfalfa can be an excellent option for high quality forage in fall. Alfalfa is widely grown in Minnesota, and as such is already available on many farms. As mentioned in the “brassica” section, lambs performed very well grazing alfalfa regrowth in fall. Normally, it is recommended that alfalfa be grazed in fall only after it goes dormant. However, research is being conducted on the effect of grazing alfalfa through fall. Preliminary observations imply that moderate fall grazing does not stress plants as much as cutting for hay. Therefore, the risk of winter injury may be less when grazed in fall than when cut for hay

## CORN RESIDUES

The corn, husks, and leaves left in the field after corn harvest can make excellent forage in fall. Forage quality of corn residues is generally not high enough to meet the nutritional needs of lactating or growing animals, but can adequately maintain dry pregnant cows. Grazing corn residues can be one of the lowest cost methods of providing forage. Strip grazing will make for more efficient use of corn residues.

With any fall grazing strategy in Minnesota, one risk is that snow may make fall forage inaccessible. You may have enough stockpiled grasses, alfalfa regrowth, corn stalks, and turnips available for grazing until April; however, a thick blanket of snow can ruin plans for fall pasturing. The key is to be flexible. Obviously, it is unrealistic to expect to graze through winter every year in Minnesota. However, there are many opportunities to keep animals out on pasture through October and November.