Extending the grazing season with stockpiling
Laura Paine, Grazing Specialist
Wisconsin Department of Agriculture, Trade, and Consumer Protection
PO Box 8911
Madison, WI 53708
608-224-5120
Laura.paine@wi.gov

Winter feeding is often the largest single expense for livestock farmers in the Upper Midwest, so anything you can do to extend the grazing season has the potential to reduce feed costs. Many producers have found that the longer you can keep your stock on pasture, harvesting their own feed, the better it will be for the bottom line. In a recent survey of Wisconsin producers using managed grazing, we found that 49% of dairy producers and 54% of beef producers graze their cattle into November. Approximately 20% of them extend the grazing season further by using stockpiling.

The concept of stockpiling is simple. Rather than mechanically harvesting, drying, and storing hay to feed in winter, pasture forage is grown starting in late summer until frost and ‘stored’ in the field to be grazed in winter. Once cold temperatures halt pasture growth for the season, forage quality and yield remain fairly stable for several months into the winter, depending on weather conditions.

Stockpiling takes advantage of the second, smaller flush of growth that cool-season grasses experience in late summer and early fall. Nitrogen and moisture during this period are the limiting factors in how much growth will occur and how much accumulated forage you will have going into winter. Other factors that influence stockpiling outcomes are the date when stockpiling is begun in summer, pasture species composition, and winter weather conditions. Several studies conducted in the region provide guidance on how to get the best results.

Pasture Selection
Select a grassy pasture. A number of studies evaluated different species for stockpiling performance. In general, grasses perform better than legumes. Legumes tend to lose their leaves after frost, and both quality and yield decline rapidly. Among legumes, alfalfa and birdsfoot trefoil may perform better than clover species (Baron et al, Robinson et al).

Among grass species, tall fescue and orchardgrass yielded better than other species in most of the studies (Dierking et al, Cuomo et al, Riesterer et al, Robinson et al, Volesky et al), accumulating one to 1.5 tons per acre between August 1 and first frost. Without irrigation, smooth brome, festulolium, quackgrass, and reed canarygrass performed more poorly, accumulating an average of one ton or less per acre. Under irrigation, festulolium, orchardgrass, smooth bromegrass, and tall fescue performed similarly, averaging two tons across initiation dates (Volesky et al).

Start date
Not surprisingly, the earlier in summer the pasture is set aside for stockpiling, the more biomass will be accumulated by late fall. Typical dates recommended are between July 15 and August 15. Wisconsin research documented an average yield of 1.2 tons per acre for non-irrigated pasture that was stockpiled starting on August 1. Studies comparing start dates suggest that starting on July 15 will provide 20 to 30% more accumulated forage and starting on August 15 reduces yield by a similar amount. (Volesky et al, Cuomo et al).
Nitrogen fertility
When moisture is adequate, nitrogen fertilizer significantly increases yield of stockpiled forage and can improve quality slightly. Optimal response is achieved with about 50 pounds of actual N applied at the time of stockpiling initiation. Riester et al reported increases in yield with N fertilization averaging 79% across three sites and several winter harvest dates. Two studies documented increasing tall fescue response to higher levels of nitrogen fertilization (Gerrish et al, Singer et al), but there is no evidence that other species respond to more than the recommended 50 lb/a. Current cost of nitrogen fertilizer must be balanced with the value of the forage produced. Applying the N just prior to significant rainfall can improve the likelihood that it will be effectively utilized.

Yield and quality of stockpiled forage
Across the studies, yields from non-irrigated, stockpiled pasture averaged between 2000 to 3000 pounds dry matter per acre, depending on species, fertility, rainfall, and start date. Irrigation increased accumulated forage by an average of 80%. Crude protein levels varied across the studies from 11 to 19%. Digestibility and/or Relative Forage Quality also varied across the studies, with total digestible nutrient levels ranging from below 60% to over 70%. There was no clear indication of the reason for these differences, but clipping the pasture prior to initiating stockpiling to remove mature, stemmy material will ensure that the stand is primarily young, leafy material and should improve quality. However, the variability observed across these studies suggests that forage quality analysis at the start of grazing would be appropriate.

Decline in yield and quality over the winter
The quantity and quality of the stockpiled pasture at the time of grazing is strongly influenced by winter weather conditions. The studies show that forage quality and yield are maintained into late November, but as winter progresses, stockpiled forage loses significant biomass and quality. The Wisconsin work showed that digestibility declined an average of three percentage points between October and December, and another five percentage points between December and March (Hedtke et al). Yields declined as well, with a loss of approximately 50% in dry matter between October and March.

Summary
Stockpiling pasture is a valuable tool for graziers in the Upper Midwest for extending the grazing season, and reducing feed costs and labor. With proper management and adequate moisture a ton or more per acre of high quality forage can be ‘stored’ in the pasture for early winter grazing. Grazing stockpiled pasture in early spring is more problematic, as both quality and quantity of stockpiled forage declines significantly over winter.

References


