Extending the Grazing Season with Stockpiling

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Winter feeding is often the largest single expense for livestock farmers in the Upper Midwest, so anything that can be done to extend the grazing season has the potential to reduce feed costs. Many producers have found the longer livestock can be kept on the pasture, harvesting their own feed, the better it will be for the bottom line. In a recent survey of Wisconsin producers using managed grazing, it was discovered that 49% of dairy producers and 54% of beef producers graze into November. About 20% 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 will be available 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 1-1.5 tons/ac between August 1 and the first frost. Without irrigation, smooth bromegrass, festulolium, quackgrass, and reed canarygrass performed more poorly, accumulating an average of 1 ton or less per acre. Under irrigation, festulolium, orchardgrass, smooth bromegrass, and tall fescue performed similarly, averaging 2 tons across initiation dates (Volesky et al.).

Start Date

Not surprisingly, the earlier the pasture is set aside for stockpiling, the more biomass will be accumulated by late-fall. Typical dates recommended are between July 15-August 15. Wisconsin research documented an average yield of 1.2 tons/ac for non-irrigated pasture that was stockpiled starting on August 1. Studies comparing start dates suggest that starting on July 15 will provide 20-30% 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 lbs of nitrogen applied at the time of stockpiling initiation. Riesterer et al. reported increases in yield with nitrogen 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 lbs/ac. Current cost of nitrogen fertilizer must be balanced with the value of the forage produced. Applying nitrogen just prior to significant rainfall can improve the likelihood that it will be effectively utilized.

Yield & Quality of Stockpiled Forage

Across studies, yields from non-irrigated, stockpiled pasture averaged between 2,000-3,000 lbs DM/ac, 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 11-19%. Digestibility and/or Relative Forage Quality (RFQ) also varied across the studies, with TDN 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 & Quality Over the Winter

The quantity and quality of the stockpiled pasture at the time of grazing is strongly influenced by winter weather conditions. Studies show forage quality and yield are maintained into late-November, but as winter progresses, stockpiled forage loses significant biomass and quality. Research in Wisconsin showed that digestibility declined an average of 3% between October and December, and another 5% between December and March (Hedtke et al.). Yields declined as well, with a loss of approximately 50% in DM between October-March.

Summary

Stockpiling pasture is a valuable tool for graziers in the Upper Midwest to extend the grazing season, and reduce 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.

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