



Stockpiling Perennial Grasses to Extend Grazing Into Fall

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Feed costs represent over 50% of the costs to produce beef in Minnesota. Well-managed pasture provides forage for only about 1/3 the cost of homegrown hay (or silage) because forage conservation requires substantial expenditures for equipment, fuel, labor, and infrastructure. In addition, yield and quality losses during harvesting and storing of hay often force producers to purchase supplemental feed.

Snow depth, ice encasement, and extremely excessive or limited moisture should be the only conditions that limit our ability to graze. While forage conservation is a necessity given Minnesota's winters, every additional day of grazing saves money and thus increases potential for profit. The "grazing season" should not be limited to the period of time when forages are actively growing (i.e. the "growing season").

One of the best methods by which to extend the grazing season through fall, and even into early winter in some areas and years, is by stockpiling perennial forages. Stockpiling is the practice of accumulating forage growth in the field and deferring its use as pasture to a later date.

Forage Species for Stockpiling

Any forage species or mixture can be stockpiled for fall grazing, but certain species are more suitable than others. Tall fescue is among the best grass species for stockpiling because 1) it is productive in the fall, 2) its feeding value

deteriorates relatively slowly after a hard frost, 3) it accumulates a high concentration of soluble carbohydrates (readily digestible energy for grazing cattle) in response to fall conditions, and 4) it forms a tough sod which can recover from animal trampling during the wet conditions which can sometimes occur during the stockpile grazing period. In the mid-latitude states east of the Mississippi, stockpiled tall fescue commonly provides grazing through the entire winter. Recent experiments in Minnesota and Wisconsin have demonstrated its potential for stockpiling in this region; but only endophyte-free tall fescue seed should be used, and small acreages tried initially if you have not seeded tall fescue before.

Researchers at the U of M Research Center in Morris, MN studied fall yields on a variety of stockpiled forage species beginning July 15 and harvested prior to a killing frost. Tall fescue had the greatest fall yield and among the greatest total season yields of eight species evaluated. Reed canarygrass and orchardgrass were second to tall fescue in stockpile yield, producing about 600 lb/ac less forage dry matter (about 20% less). Yield data for alfalfa represents the sum of two harvests (mid-Aug and mid-Sept) since alfalfa would likely not be a good candidate for stockpile management. Even birdsfoot trefoil produced over 1 t/ac of stockpiled forage; however, it would be important to use this forage prior to a killing frost since substantial loss in yield and quality would be expected.

University of Wisconsin data also supports tall fescue's superior fall-winter productivity. In addition, in their study, early-maturing orchardgrass had similar fall-winter productivity to tall fescue and was considered a top choice for stockpiling. Since orchardgrass is used on many Minnesota farms, it is a prime candidate for experimenting with stockpiling.

Stockpiled legumes can provide good yields of good quality forage until the first hard frost, after which both yield and quality decline very rapidly. One management strategy might be to use stockpiled fields with the highest legume content in early fall, and fields with greater tall fescue and orchardgrass (and smooth brome in western MN) content later in the fall.

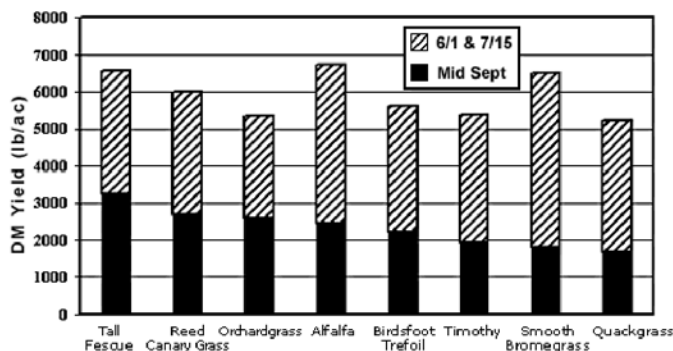


Figure 1. Mid-September and total season yields of forages stockpiled beginning July 15 at Morris, MN (2 yr avg).

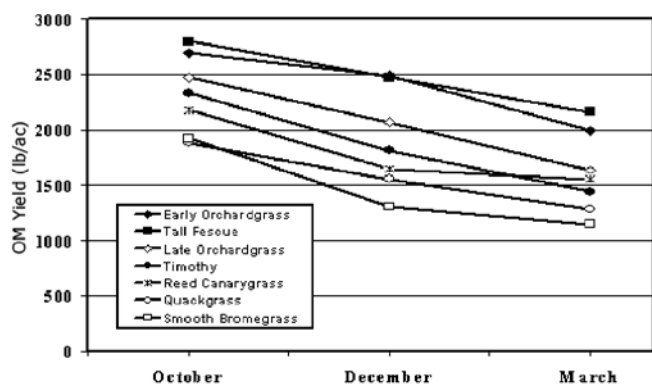


Figure 2. Decline in yield of stockpiled forages during fall and winter in Wisconsin (3 locations, 2yr avg).

Smooth brome and quackgrass can be stockpiled for fall grazing as well; however, they have lower fall productivity and thus animal carrying capacity than the aforementioned species. For example, even though smooth brome had similar total season yield to tall fescue, it produced about 1400 lb/ac less (45% less) fall forage than tall fescue at Morris, MN. Wisconsin researchers went so far as to conclude that smooth brome and quackgrass are not suitable grasses for stockpiling. Nevertheless, given its excellent adaptation and winterhardiness and predominance throughout much of Minnesota, it makes sense to use smooth brome for stockpiling on farms where it is dominant.

Stockpile Management

Mid-summer is generally the time to initiate the stockpiling process. The appropriate time to start stockpiling should be determined by:

1. Soil moisture;
2. The availability of pastures and/or hayfields for deferred use;
3. The nutritional needs of the cattle that will consume the stockpiled forage;
4. The intended date of use, and
5. The average first frost date.

Earlier stockpile initiation (June to early July) will produce relatively more yield of lower quality forage (Figure 3). Later stockpile initiation (late July to August) will produce relatively less yield of higher quality forage.

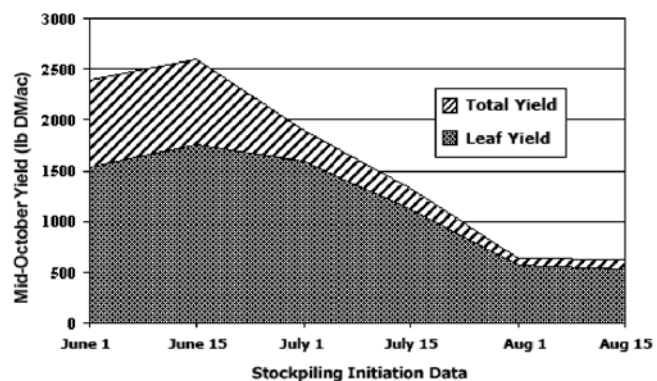


Figure 3. Stockpiling initiation date affected smooth brome stockpile yield at Morris, MN (2 yr avg).

Application of either synthetic or organic nitrogen at the initiation of stockpiling grasses is essential. For synthetic N, 40-60 lb N/ac is recommended. Figure 4 shows the

response of smooth brome grass to N applied at the initiation of stockpiling in July at Morris, MN. Since leaf yield did not increase significantly as N rate was increased from 50 to 100 lb/ac, 50 lb N/ac is probably adequate to initiate stockpiling of smooth brome grass. Wisconsin reported that 60 lb N/ac at the initiation of stockpiling increased yield of stockpiled grasses by an average of 75%.

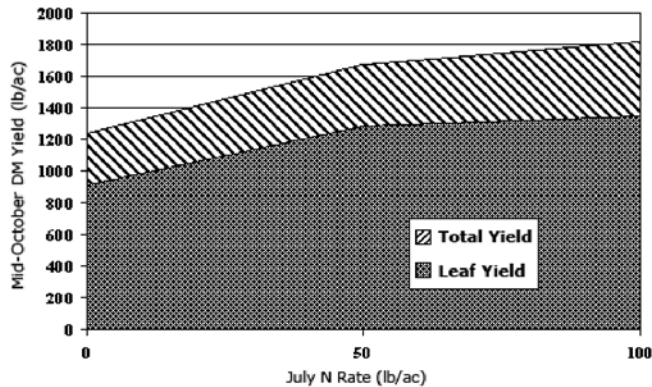


Figure 4. Nitrogen fertilization rate affected yield of stockpiled smooth brome grass at Morris, MN (2 yr avg).

desired amount of pasture. Strip-grazing reduces trampling and thereby improves utilization of the stockpile while improving manure and urine distribution and thus nutrient recycling on the pasture. Efficient use of the stockpiled forage can be improved even further by using a leader-follower grazing system. This allows animals with a higher nutrient requirement (eg. weaned calves) to graze the nutrient-rich top portion of the standing stockpile. These animals are then moved to new pasture, and the remainder of the forage, which is more stemmy and thus less nutritious, is consumed by animals with a lower nutrient requirement (eg. dry cows).

Stockpile Use

Yield of stockpiled forage will generally increase until the first hard frost. After this, both yield and quality of the forage will decline. The energy level of the forage will deteriorate more than its protein level, so supplementation should most often be geared first toward meeting energy needs. In the Wisconsin research mentioned earlier, digestibility of stockpiled grasses declined from about 74% in October, to 71% in December, and about 65% the following March. Over the same period, CP% declined only one percentage unit, from about 12 to about 11%. In addition, as mentioned earlier, forage quality of the stockpiled feed will decline least rapidly with tall fescue, and most rapidly with legumes.

Carrying capacity of stockpiled forage is improved by allocating only enough forage to provide at most a week of feed at a time. This can be accomplished by strip-grazing using portable electrified fencing systems to allocate the