**Stockpile Grazing: The Key to Lower Feed Costs**
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In the discussion below, I have summarized some of our findings on stockpile grazing from research station work and on-farm observations in northeastern Ontario. While specific management decisions will no doubt vary across geographic regions, I believe the basic trends that we have found are applicable anywhere cool season grasses are grown.

**i) What is stockpile grazing?**

The Forage and Grazing Terminology Committee defines the term "stockpiling forage" as follows: "to allow forage to accumulate for grazing at a later period". In central and northern Ontario, forage stockpiling could begin anytime from early summer to early fall. The most basic form of stockpiling is saving second or third growth hayfields for pasture instead of hay or silage. With some extra planning, a system can be developed to consistently provide pasture for cattle or sheep into late-November or December. In the northern USA, stockpiled forage is often "held over" for grazing in March or April. Local conditions and livestock nutritional requirements will dictate the specific dates that stockpiling should begin and when stockpiled forage should be grazed.

**iii) Why bother with stockpile grazing?**

Forage stockpiling is primarily a tool to reduce production costs by allowing animals to graze longer and thereby consume less stored forage. While costs vary across the province, it is usually safe to assume that feeding ewes on pasture costs half or less than feeding ewes in confinement. Given a typical Ontario cost of $0.08/ewe/day on pasture and 0.15/ewe/day for dry hay, each additional week of grazing will reduce annual feed costs by 1.1%. In the New Liskeard area, the typical grazing season is from mid-May to late September. However, we have demonstrated that with stockpiling, sheep can be pastured until late November (and likely longer). Given the above estimates, annual feed costs can be cut by over 9% using this system. With beef cows the savings would likely be somewhat greater. This ignores the fact that our stockpiled pasture is often of better quality than our dry hay since we often do not have a very good climate for making dry hay. Of course, if 6 to 8 weeks is cut from the hay-feeding period, less hay needs to be made, which may allow smaller or older equipment to do the job. Also, overhead costs of barn feeding such as buildings, feeders, manure removal etc. are not accounted for in this example. Therefore, it seems clear that stockpile grazing is desirable from an economic standpoint.

**iv) What species work best for stockpiling?**

In my experience, any perennial (cool-season) forage grass can be used for stockpiling, although some species may need special management for best results. Species that regrow rapidly and do not form any stem in the regrowth are best utilized with relatively short stockpiling periods (perhaps 30 to 50 days). Given excessive top-growth and wet fall weather, species like orchardgrass tend to lay flat on the ground and the lower leaves are shaded to the point that they die and begin to decay. Also, because they don't "stand up", species like orchardgrass are more difficult to graze after a significant snowfall. Given longer stockpiling periods (50 days or more), species like smooth brome and reed canarygrass will form a stem in the regrowth, which keeps the leaves off the ground and allows easier grazing after snow has fallen. Tall fescue seems to

combine the best of both worlds as it regrows fairly quickly, but is less prone to lodging in fall than orchard. We have ample data to indicate that the feeding value of tall fescue is superior to that of orchard, brome, and reed canary following various stockpiling periods.
On-farm experience has shown reasonably good success with stockpiled quackgrass, but no reliable comparisons have been made with other grass species. Timothy tends to have less regrowth than other grasses, but in a wet year it can provide a reasonable good stockpile. Timothy tends to form a head on the second growth and this may lower the quality of forage available in the fall. Among the common forage legumes, both white clover and trefoil have performed well on-farm. Alfalfa remains useful until about mid-October, but after heavy frost, excessive leaf loss reduces its value greatly.

**v) How do I manage the stockpiling process?**
Stockpile management revolves primarily around the date that stockpiling is initiated and the date when the stockpile is grazed. In general, beginning to stockpile earlier in summer leads to higher stockpile yields but lower quality forage, while later stockpile initiation results in lower yields but higher quality. This is an advantage, since different pastures can be stockpiled to provide the combination of forage yield and quality required for different classes of livestock. It should also be noted that total production per year, not just the stockpile yield, needs to be considered when deciding how best to utilize a particular pasture. I will describe several systems that we have looked at under clipping and sheep grazing (see table below for a summary of each system).

The most basic system is a single hay harvest in late June or early July followed by stockpiling until fall. We expect dry matter yields of 3500 to 6000 kg/ha when the stockpile is sampled in October and November, but only moderate feeding value. This system appears suited to smooth brome or reed canarygrass and is likely best grazed by dry ewes or cows. High stocking rates are needed for efficient use of the forage available, but with lower stocking rates, animals could select only the leaves and have enough stubble remaining to catch snow if necessary. We have compared this system to one where the forage is harvested before the grasses head-out (about June 10), then cut again on July 25 and then stockpiled until fall. Under this system, expected yields range from 1100 to 3000 kg/ha by October. Plots of pure smooth bromegrass are on the low end of the range, while tall fescue and meadow brome are on the top end. Higher quality forage makes this system suited to flushing and breeding ewes or possibly growing lambs. This may also be a low-stress system for weaned calves. Because of the lower yields, it would be difficult to use this pasture following a heavy snowfall, but 5 to 10cm of light, fluffy snow should not be a problem.

We have compared complex mixtures grazed by lambs under two systems, called "early" and late". Each system has silage harvested between June 15 and 20 (early heading for bromegrass). The "early" system is mob grazed between July 10-15 then stockpiled, while the "late" system is not mob-grazed until about August 10-15. Lambs weighing 70 to 80 lbs begin grazing at the end of September. Yields are 4000 to 5000 kg/ha under the early system and 2000 to 3000 kg/ha under the late system. Quality was much higher on the late system. Average daily gains on weaned lambs have been fair at best, ranging from 115 to 180 g/hd/day in 1995 and 45 to 115 g/hd/day in 1996. In general, lamb gains have been good during October, but decline rapidly in November. Lamb grazing days per hectare of pasture have been exceptional, averaging 1500 to 2000 on the early system and 875 to 1200 on the late system. Our experience suggests that

stockpiled forage is best used to carry mature sheep rather than lambs, although growing lambs may be viable depending on local market conditions. For cattle, dry cows are the most logical class of animals to utilize stockpiled forage, but the higher quality forage would be suitable for fall calving cows or weaned calves.

The date when the stockpile is utilized will have an effect on yield and quality. We have found that at our location, yields tend to peak around October 1 and then decline slowly, while quality declines slowly during September, and then more rapidly during October. However, limited data collected during November suggests that the quality decline slows down again with cold weather. In our location, one concern is that heavy snow may restrict grazing in late November, however, if only a few cm of snow have fallen, grazing should not be affected. In fact, some snow is desirable since the need for water is eliminated if dry cows or ewes are grazing.

Applying 50 kg/ha of actual N at the beginning of the stockpile period has increased yield by 350 to 1000 kg/ha. Forage crude protein is also increased, but no effect on lamb gain or gain/ha of pasture occurred. In 1996, we did get more lamb grazing days/ha from the pasture that had nitrogen applied. As a possible negative, we have significantly less legumes (mostly trefoil) in the pastures that have had nitrogen for 2 consecutive seasons. We have seeded another trial to look at nitrogen rates from 30 to 120 kg/ha on pure stands of stockpiled tall fescue and bromegrass.

Hopefully, this report will give you some ideas to apply to your own operation. With some thought and planning, forage stockpiling can significantly decrease your annual feed costs.

**Summary of Stockpile Management Options and Expectations**

| System | Expected Yield | Expected CP | Expected TDN |
|---|---|---|---|
| Hay early July, stockpile, graze Oct-Nov. | 3.5-6.0 t/ha<br>Reed canary, smooth brome highest | 9% to 12%<br>No species effect | 55% to 63%<br>Tall fescue highest |
| Clip June 10-15<br>Clip July 25, stockpile, graze Oct.-Nov. | 1.1-3.0 t/ha<br>Tall fescue, meadow bromegrass highest | 11% to 17% | 59% to 65%<br>Tall fescue highest |
| Change from Oct.01 to Nov. 01 | Lose 7 to 11% of DM yield | Lose 1.5 to 6.0 percentage units | Lose 1.0 to 4.0 percentage units |
| Silage June 15, graze July 10-15, stockpile, graze Oct., Nov. | 4.0 to 5.0 t/ha<br>Lamb gains poor: 115 to ~~180~~ 45 to g/hd/day<br>Carrying capacity high: 1500 to 2000 lamb days/ha of stockpile | 10% | 58% |
| Silage June 15, graze Aug. 10-15, stockpile, graze Oct. Nov. | 2.0 to 3.0 t/ha<br>Lamb gains moderate: ~~45 to~~ 115 to 180 g/hd/day<br>Carrying capacity moderate:875 to 1200 lamb days/ha of stockpile | 15% | 62% |
| Effect of 45 lb/ac nitrogen | Increase of 350 to 1000 kg/ha | Increase by 1.5 to 2.5 percentage units | no change |