

## The 'W5' of Grazing

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Today, we'll look at the **why, what, when, where, and how** of grazing, to give you some ideas of how to improve the performance and profitability of your pastures. The central theme I want you to consider is that productivity is not profitability, and that those interested in profitability on grass need to adopt the NZ approach of "making money by not spending money" rather than "spending money to make money" - the North American dogma.

### **Why control grazing?**

- \* to get the right nutrition into the animals at the right time
- \* to enhance utilization efficiency (reduce waste)
- \* to manipulate sward composition
- \* to stimulate regrowth and sustain sward productivity

I put it to you that the best way to achieve these aims is not by fancy fencing, regular topclipping, harrowing, spraying, or other mechanical interventions, but rather, by 'working smart'

The "Right" Nutrition. Plant maturity influences not just the *amount* of herbage facing the animals when they enter a fresh paddock but also its nutritional *quality and palatability*. A sward that is 20 cm (8") tall may offer 2000 kg/ha of herbage at 22% crude protein and 30% ADF, while the same sward - if left to reach 45 cm (a foot and a half) tall could present stock with 4000 kg/ha of 12% CP and 45% ADF herbage. The actual numbers will vary with species, soil fertility, and the growing environment, but the sense is the same. Older and taller swards are higher yielding and lower quality.

If you're grazing for milk, or to finish lambs or steers, then it makes sense to design your rotation to bring your stock into a juvenile, 20 cm sward in each paddock. This will mean a shorter regrowth interval and a faster rotation. Conversely, if it is dry cows or ewes that you are grazing, your goal may be carrying capacity rather than very high nutritional quality. Then, it would be a slower rotation and longer regrowth intervals to produce more mature swards.

Utilization Efficiency. Herbage is never really 'wasted', because what is not eaten still contributes to overall ecosystem health, whether eaten by other life forms or decaying to enrich the soil. But in terms of ruminant nutrition, herbage can be and often is wasted by untimely rotation and stocking rate decisions.

Now, when I speak of 'wasted herbage', I'm not including herbage below the target residual grazing height which can account for a large fraction of total growth. Grazing below 5-7.5 cm (2 or 3") is not a good idea, because it removes basal leaf area needed to support regrowth. Tighter grazing also reduces individual animal intake (INSERT from Johnston and Singh).

But even *above* the target residual height - in the 'grazed horizon' - wastage is common, particularly in the late spring when grasses are heading and in tall, mature swards in general. Using controlled grazing to concentrate grazing pressure helps to minimize waste and 'harvest' more efficiently.

Sward Composition? A little known but very useful secret is that *you* as the grazier have the ability to shift species composition simply by how you manage grazing. Species differ in their response to grazing management, and it is these differences that you can harness to achieve and maintain your desired composition.

- Tall coarse species, such as timothy, brome, reed canarygrass, alfalfa, and birdsfoot trefoil, need lengthy regrowth intervals to remain vigorous and healthy. They are weakened or even eliminated by frequent intensive grazing. These are true hay- or silage-adapted species.
- In contrast, species such as Kentucky bluegrass, perennial ryegrass, or white clover are most competitive and aggressive when frequently defoliated, and lose out under hay or silage management. These are true pasture-adapted species.

The pasture-adapted species tend to be adversely affected by midseason drought, and as such, grow best in spring and fall, although they may be more consistent season-long performers in the Maritimes than in Ontario. Many of the coarse, tall species are also more drought tolerant, and as such are valued for pasture in continental climates - like in Ontario.

If you want to keep tall coarse species in your pasture sward, you need to ensure a grazing regime that allows them to persist. An easy way to do this is to replace your first 2 cycles of grazing with a first hay cut, every 2 or 3 years or whatever is needed in your area.

You will certainly want to keep the pasture-adapted species in your pasture sward. Kentucky bluegrass and white clover should be easy to retain - if you're losing them, tighten up your grazing to graze harder (leave less residue) and more frequently. Particularly for white clover, you may also need to check out your soil P and K status, and pH (>5.5). Perennial ryegrass may be more difficult to keep, due to the severity of winter conditions.

A PickSeed Canada-supported study was sown in August 1996 with a total of 8 alfalfa cultivars, sown in 3 mixtures, assessed under 3 grazing regimes. Alfalfa cultivars were chosen to express either hay- or grazing adaptation. Hay types were 8920, Arrow, Centurion, and Viking. Grazing types were Able, Alfagraze, Prowler 1, and Spredor 3. The alfalfa mixtures - nil (e.g. monoculture alfalfa), with timothy, and with orchardgrass - were intended to impose a range of interactive stress on the alfalfa, with timothy being intermediate. The grazing regimes (Table 1) were chosen to apply a range of defoliation stress consistent with producer uses of alfalfa.

**Table 1. Definition of defoliation treatments in alfalfa grazing trial**

<b>Least Stressful</b>	<b>Intermediate</b>	<b>Most Stressful</b>
“Hay/graze”; first hay cut at 25-50% bloom followed by intensive rotational grazing	“Extensive” rotational grazing, with entry at 35 cm and exit at 10-12 cm	“Intensive” rotational grazing, with entry at 35 cm and exit at 5-7 cm

Seeding rates in kg/ha were 12: 2 kg/ha for alfalfa:Richmond timothy, and 12:4 for alfalfa:OKay orchardgrass. respectively, with white clover and Kentucky bluegrass topseeded in spring 1997 to discourage weed encroachment. Fertilizer was applied according to soil test results.

Management was designed to favor alfalfa, using a) simple mixtures with bunch grasses companions; b) lengthy regrowth intervals; and c) withholding grazing entirely during the standard “critical fall harvest period” between early September and mid October.

Yet even under these alfalfa-friendly conditions, alfalfa persistence and contribution to the sward were influenced by both:

- the sown mixture (nil, timothy, orchardgrass; 83, 85, and 75% alfalfa, resp., \*), and especially,
- the **grazing regime (95, 82, and 72% alfalfa** for the hay/graze, extensive, and intensive rotations, resp.; \*\*\*)

Stimulate Regrowth and Enhance Persistence. In a managed grazing system, you depend on continual regrowth throughout the season to sustain most of your grazing. Yet grass grows twice as fast in the spring as in the summer, and rate of summer regrowth is often limited in part by drought or high temperature. If we stop there, then there is really nothing we can do - that is just the way it is - and we are stuck with a very asymmetrical pattern of growth.

But in fact, part of the reason why swards regrow slowly in summer is mismanagement in the spring. If you let a sward get overmature in the spring before taking it off either as hay or as late grazing, the base of the sward sits in the dark for weeks. New tillers that are forming at that time of the year die because of shading. Then, when you finally do get it grazed or hayed, you’ve got nothing but dead stems and no basal leaf area waiting to support regrowth. The bare soil between plants is also an open invitation to airborne weeds - like dandelion or thistle.

Keep your sward young and vigorous by timely spring grazing, so that it is 'fit' to regrow after each use.

### **What do you need to be a grazier?**

In this part of the world, its pretty simple. **Fence, water, and expertise.** If you were in the arid west, you might replace the fence with a skilled herder or shepherd. But that is pretty well it.

**Fence is important**, but needs to be secure only on the perimeter. That is where I put my money. Cross fencing can be very simple, a single strand of temporary fence is just fine for most classes of stock - perhaps 2 or 3 for sheep. Keep the animals happy and they've no reason to try the fence.

Far more important that the type of fence, however, is the **placement of the fence.** Fence to separate dissimilar swards. Species that are adapted to bottom land are different from those on the face or along the top of a fill. Even if you seed it down uniformly, it will soon segregate into different communities - which grow and are consumed differently. Modern high tensile and temporary fence let you readily fence on the contour, to use each piece of land to its strength, to keep different swards apart, and to enclose a homogenous sward. This pays for itself in reduced waste, as stock that are grazing a uniform sward will graze it all much more readily than a nonuniform sward.

**Abundant, clean, fresh water is also a must.** With thought in the design and placement, water can be used strategically, to bring stock back to you for easy handling and processing. Central water requires attention to environmental impact, both with solid footing underneath and periodic scraping to return manure to the land. In paddock water keeps the stock out on the land, and reduces manure buildup and mudding - but detracts from your ease of catching/handling.

What about **land, and seed, and fertility? And stock?!** Well sure, you need land, but you don't have to *own* the land. My friend Troy Bishopp of New York state has demonstrated that grazing can be profitable even from abandoned farmland with no seed or fertilizer. He identifies abandoned land, regrowing back to trees, and then searches out the owner to negotiate a 5 year lease. His only capital expense is a 5-strand perimeter, which he installs and then leaves when he goes. Other than that, he smashes down whatever he can with his bushhog, then come spring, he cross fences and starts rotational grazing the weeds and scrub - with custom animals. With land for his various pastures being cheap or even free, and no animal costs, and his only other cost being the fence, he is able to net US\$25,000 for 10 hours of work a week (a part-time evening job), spread over 7 months each year. And that is all within 10 miles of his home place.

What if you don't have abandoned land in your area? What about grazing grain stubble undersown to red clover? Getting paid to graze down hydro corridors or regrowing forest land? Other ideas?

And what about those weeds? What kind of gain can just weeds support? Well, it doesn't stay just weeds for very long. Bishopp is harnessing the soil seed bank to his benefit, bringing on those species which are adapted to grazing - grasses and clovers - while suppressing those that aren't.

And what about fertility? Remember, cattle (or sheep) retain only a tiny fraction of the N, P, and K that they ingest - most is pooped back out. So, over the 5 year lease, he's just accelerating the cycling of existing fertility, through manure. Could he get more productivity with fertility? Sure. Would it pay? That's another question.

### ***When to graze?***

For most of Canada, grazing is seasonal because grass only grows for 4-6 months of the year. But stock like to eat 12 months of the year, and that means conserved feeds. Cost of nutrition on fresh grass is a fraction of what it is on conserved feed, so the longer we can graze, the less it will cost to feed stock.

Species differ in their suitability for 'extending the grazing season'. Tall fescue has the advantage over all other species, at least in Ontario and the upper midwest, because it continues growing later in the fall, accumulates a higher maximal yield, and retains a much higher fraction of its yield through to year's end. The fescues are noted for retaining their quality under snow, much better than other species.

### ***Where to graze?***

As noted above, grazing can be obtained from many sources - not just from your intentionally sown pasture. I've seen milking Holsteins grazing roadside verges in NZ, and sheep grazing 'the blocks' (regrowing forested land) in BC, pigs rototilling the interface between forested and pastured land to root out woody suckers, and chickens rooting through weeds at the base of trellised raspberry canes. Livestock need to reclaim their value as a tool of production - not just a way of producing meat or milk.

### ***How to graze?***

The key requirement for effective grazing is not something you purchase, but something you acquire - and that is experience. There is no book or consultant or training course that can provide this. You must earn it on your own. There is no substitute for hands-on experience. Some basic hints:

- **Start small and simple;** keep costs down with used equipment - but don't scrimp on the perimeter; let the profit from your first year or two buy needed additional fence or other inputs.
- **Use temporary fencing** as much as possible, both to keep it cheap and to maximize your flexibility in making changes in fence or gate placement.

- **Watch your stock** and learn what they are telling you, in terms of grazing uniformity, behavior at water, etc.
- **Use height-based management** to determine when to enter (20-25 cm) and leave (6-8 cm) a paddock (actual heights will vary with species and expectations).
- **Paddocks should be sized** based on how many days you want to carry your stock, their weight and numbers, and their rate of intake. A high producing animal, such as a lactating beef or dairy cow or fast growing steer, may ingest 3% of bodyweight as dry matter (DM) each day. A cow that weighs 1200 lb consuming 3% of bodyweight would require 36 lb DM herbage each day. Fifty such cows would consume 1800 lb in a day. If you want them to stay in a paddock for 3 days, that would mean  $1800 \times 3 = 5400$  lb. Add 15% wastage or 810 lb = 6210 lb. A productive 20-25 cm tall sward might offer 3000 lb/ac within the grazed horizon, so 2 acres ( $2 \text{ ac} \times 3000 \text{ lb/ac}$ ) = 6000 lb. So, 2 ac would provide just about enough to carry 50 cows for 3 days. Fence it off, and then see how they go through it. Too fast? Perhaps they are consuming more than 3% or wasting more than 15% - give them a bit more next time. Too slow? Perhaps the sward yield was more than 3000 lb/ac, or they consumed less than 3%? Offer a bit less land for the next move.

In sum, managed grazing starts with a clear understanding of your goals - what you are trying to accomplish with controlled grazing. The toolbox of an effective and profitable grazer will be rich with knowledge based on first hand experience, supported by out-of-the-box thinking and creativity. As is best shown by NZ graziers, the key to grass management is knowing how to use what you've got, how to use your land to its strength, rather than how much you invest in it.

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