(Almost) Year-Round Grazing in the Northeast

by Mary-Howell Martens

I came home for lunch several days ago to see Klaas talking on the phone, again, with organic dairy farmer friends. It was a pretty common story this year — they had called for advice because they were finishing the winter, out of forage, out of money, unable to afford the extremely expensive organic grain, and the grass wasn't growing fast enough to feed their hungry cows. They knew they needed to make some changes on their farm, but weren't sure where to start.

Does this sound familiar? As I listened to Klaas guide his caller through an evaluation of pasture needs and resources, I realized that this was information that needed to be shared. If you adopt some of this advice, you should be able to buy less grain. Yes, that does sound like a strange thing for a couple of grain farmers and feed mill owners to say, but it isn't really. We honestly want to see you and your farm more profitable, your pastures more productive, and your cows healthier.

Evaluating your forage needs. The first step is to determine how much forage you need throughout the year. For dairy cows, the basic rule-of-thumb is generally one-half ton of forage dry matter per cow per month, but that can vary considerably with forage quality and depending on other available feedstuff. If a cow consumes 3-4 percent of her bodyweight in pasture forage dry matter per day, that amounts to 24-62 pounds of dry matter for cows weighing 800-1,300 pounds. Since pasture forage usually contains 25 percent dry matter, that means that cows can eat up to 200 pounds of high-quality palatable green forage daily. When you become truly committed to improving the production from your pasture, it might be a good idea to have a pasture specialist from Cooperative Extension visit your farm and evaluate your needs, your current pasture resources and plant species, and your fencing possibilities and then make specific pasture suggestions for your situation.

Matching consumption to production. As anyone pasturing animals knows, there are some times of the year when there is more growth than the cows can eat, and there are also times when there is not enough. In the spring and early summer, forage provides lots of high-quality nutrition, but as summer progresses, especially if it is dry, the cows may not be getting the quantity they need, even if quality is high. Because most young forage plants are much higher in nutrients, especially protein and minerals, and are much more palatable than more mature plants, the challenge is getting young plants in front of the cows for as many days during the year as absolutely possible. This requires planning out different pastures so they contain plant species that mature at different times of the year. There is a physical limit of how many bites a cow can take in a day. The amount of dry matter she eats depends on many things, including the number of bites per minute of grazing time, the amount of forage eaten in each bite, and the total grazing time. For her to get the most out of her pasture and save you the most money on purchased inputs, each mouthful needs to contain as much high-quality forage as possible.

You can get much more good out of a well-managed rotational grazing system than continuous grazing. Cows use only about 35 percent of available forage under continuous grazing, and this tends to lead to overgrazing of some areas and undergrazing of others, resulting in weakened stands, loss of desirable species and declining productivity. Under rotational grazing management, cows can harvest over 65 percent of the available forage, and legumes and other desirable species will thrive.

Implementing a balanced rotational pasture system. A balanced rotational pasture system should provide enough pasture to meet forage needs over a long grazing season and also permit the harvesting of surplus during peak growing periods as hay or baleage. It is based on a series of sequential perennial pastures supplemented with several annual pastures so that the cows can be eating peak quality

pasture for most of the year. Planned out well, this can result in pasture forage that extends the productive grazing season from early spring into early winter. We can extend the length of time when pastures grow fastest by seeding fields with different mixtures to stagger their periods of peak growth. Each pasture is grazed when the plant quality is highest and then allowed sufficient time to regrow before harvest as stored forage or being grazed again later. The cows can be intensively grazed in each pasture, using a polywire that is advanced once or twice each day and a chase-wire to keep them off the grass they have already grazed.

In late spring/early summer, pasture can produce more than the cows can eat each day. If cows can't keep up with the growth rate of a pasture, it quickly becomes over-mature and drops both in feed value and palatability. Pasture should be clipped and harvested as hay or baleage before it becomes over-mature. If pasture plants begin to head out, it is time to get the cows off and mow for harvest. Weeds, brush and coarse grasses are more likely to gain a foothold if a pasture is not grazed or mowed sufficiently, but they can also become a problem if a pasture is overgrazed and therefore weakened. It is important to graze at a rate and intensity that keeps quality high but allows the grass a chance to recover and regrow. If the grass is grazed too short or too often, feed quality may still be good, but yield is reduced and the roots will become depleted, shortening the life of the stand.

Perennial pastures. The core of the system involves a series of several perennial pastures. Each one is planted with a different combination of grasses and legumes that will mature together. The best species to use will vary from farm to farm, and even from field to field. Every farm is unique, having different strengths and challenges to work with. Often the soils that warm up first and are best for early grazing are also the ones that become droughty and go dormant in the summer. Those fields are a great place for the earliest-maturing species, as they can be grazed when other land is still too wet or cold. Wetter fields, north-facing slopes, and lower areas start growing later but will still be actively growing after the early soils have become too dry.

To provide an example of how the approach works, here are some general suggestions of species mixes suited to the Northeast:

1. Early spring pasture (April/May) — Cool-season grasses such as orchardgrass, bluegrass, quackgrass, bromegrass and Reed canary grass (especially in wet areas) with red clover. These plant species should also be productive in the fall.

2. Mid-spring pasture (May/June) — Perennial and intermediate ryegrass, timothy, festulolium, Alice white clover, ladino and other white clovers.

3. Late spring/early summer pasture (June/July) — Birdsfoot trefoil, tall fescue, switchgrass, Indiangrass, big bluestem.

We need to manage the pastures and cows so that we get the most profitable milk production we can from them. Rather than thinking in terms of bushels per acre or pounds of milk per cow, we need to think about *pounds of milk per acre.* When pasture growth slows to the point where cows can't eat enough per day to maintain their production or when they graze the perennial pastures too close, the amount of time each day that they are allowed to graze on that pasture should be reduced to prevent overgrazing or they should be moved to the next maturing pasture.

Supplemental annual pastures. These are designed to provide large amounts of high-quality feed to supplement the perennial pastures at times when the perennial growth isn't sufficient. Each of us knows from experience when our main pastures grow best and when they are likely to fall short of meeting the cows' needs. We can plan ahead and plant some extra grazing land with annual forage crops to be ready when we anticipate the main pastures will not produce enough.

Having supplemental annual forage available also gives you the flexibility you need to make more efficient use of your perennial pastures. Perhaps you will only want to allow the cows to graze a few hours each day in the annual pastures and then move them back to the perennial pastures, or harvest some of each for hay. For the most part, the annual species do not dry well, so if they are not needed for grazing, they are better suited for harvest as baleage.

1. Winter/very early spring (January/April) — Corn stalks in last year's silage or grain corn (the cows will eagerly find dropped ears and early weeds such as chickweed and get valuable late-winter exercise and sunshine). Some fall brassicas, such as marrowstem kale, can provide winter grazing when there isn't too much snow cover.

2. Early spring (April/May) — Winter triticale, barley, spelt or wheat with Austrian winter peas (planted last September). In 2006 we found that by the end of May, spelt and winter peas were nearly 3 feet tall, and by mid June, they were over 5 feet. Winter rye can also be used, but it gets mature and unpalatable very quickly and has been shown to affect the flavor of the milk if the cows get too much of it.

3. Mid-spring/early summer — Spring small grains such as oats, barley or triticale mixed with forage peas. If planted at several times during the spring, this can provide pastures with sequential maturities into the summer. We are also experimenting this year with yellow mustard as an early spring-planted brassica forage that can be mixed with spring small grains. Warm-season annual grasses, such as Italian ryegrass and teff, sown in spring through early summer can provide late summer and fall grazing.

4. Summer (July/August) — BMR sorghum/sudangrass or Japanese millet mixed with soybeans will do well in dry periods or on droughty soils. Field corn can be grazed during this time. Buckwheat can also provide high-quality forage.

5. Fall/early winter (September–early December) — Forage brassicas such as turnip, rape, swede or kale, mixed with oats. Brassicas can be planted in the spring to provide forage in August and September, or planted in August to provide forage from October to December. We have found that grain oats planted in the fall do not try to reproduce and will grow like vigorous forage oats. Later plantings of brassicas and oats can go in on fields that produced the early spring triticale/winter pea pasture earlier in the year. Turnips and rape are the fastest-growing brassicas, reaching maximum production in 80-90 days, while swedes

and kale require 150-180 days. Of the brassicas, rape is best suited to multiple grazings.

Removing grain from the ration. Whether this is advisable probably depends on your expectations for your cows and their milk production, their breed, and on the quality of your forage. Certainly young forage can provide the protein and many other nutrients, but it may be short on energy. Most nutritionists agree that cows on excellent pasture will probably need a reduced amount of grain concentrate, such as cornmeal, to maintain high production and body condition.

Improving nutritional quality of the forage. The mineral content and nutritional quality of your forage depends directly on the mineral content of your soil. How often do you take soil tests on your pastures? If your soil is well supplied with minerals, your forage quality and productivity will be higher, and you will save money on purchased feed supplements. The biologically active minerals that a cow gets through forage are usually more easily absorbed in her body than the mined minerals found in most supplements, which means she should get more good out of them.

Taking soil tests. Soil tests can be taken at any time of the year when the soil isn't frozen, but if you sample cold, wet soil, you will probably underestimate the phosphorus level, which is highly dependent on microbial action. Take several soil cores from each section of the field, avoiding obviously different areas such as gullies, knolls, next to hedgerows, and wet spots. If areas of the field have had significantly different management over the past 10 years, sample them separately. Using a soil-sampling tube or auger, core at least to a 2-inch depth, with a minimum of 20 randomly selected sites. Mix the samples together in a clean pail and send about a pint of the mixed soil in for analysis. Make sure you use a lab that will give you readings on N, P, K, Ca, Mg and trace minerals. The pH level is a measure of soil acidity and does reflect the availability of some of the nutrients, but determining the actual nutrient levels are generally more useful than identifying pH.

Correcting soil nutrient deficiencies. Adequate fertility management will often dramatically increase the yield of forage, improving the vigor, nutritive value and palatability of the plants. Many soils in the Northeast will benefit from additional lime or gypsum. Gypsum or calcium sulfate is a valuable source of both nutrients, which are needed for a healthy animal immune system. We know of several New York organic dairy farms that report significant reductions in somatic cell counts in the years after they spread gypsum on their pastures.

If your soil test results indicate the need for lime or gypsum, it is important to add it slowly, no more than a ton or two per acre per year. Larger amounts, even if indicated as needed, can "shock" the soil and tie up other nutrients as the lime moves through the soil.

If soil tests indicate deficiencies, pastures may benefit from potassium and phosphorus in organically acceptable forms, such as rock phosphate and potassium sulfate. If there are sufficient legumes in the plant mix, added nitrogen may not be needed, but liquid fish fertilizer or chicken and cattle manure can supplement nitrogen organically if necessary.

Depositing nutrients by grazing and removing nutrients by haying can unevenly move nutrients around the farm, possibly depleting some fields. Grazing animals that are heavily fed indoors or supplemented with hay can result in a net localized increase in fertility in some areas, while other areas may become impoverished.

Controlling weeds in the organic pasture. This all depends on which weed species are present. Broadleaf weeds are more easily controlled by mowing than are grassy weeds. Many weeds have vulnerable points in their life cycle. Perennial species, such as Canada thistle, expend much of their stored food reserves between early spring and bloom. If you mow off these perennial weeds just before full bloom, often they won't come back or will be much weaker when they do. Correcting soil-mineral deficiencies, especially if lime is needed, can reduce the vigor of common "poverty weeds." Remember, though, that some weeds can be just as nutritious and palatable as the intentional forage species — they may even have medicinal benefits. Having a few dandelions in a pasture isn't necessarily a bad thing!

"Renovating" older pastures. Older pastures can develop thin spots where weeds move in. There is usually a good reason, so before you simply replant, it is best to figure out what conditions caused the pasture to fail in those particular areas. Take soil tests to see if additional nutrients are needed and consider if there are drainage or traffic problems that need to be improved. Sometimes overseeding with species better suited to the conditions, especially in wet or droughty areas, may be all that's needed. If so, "rough up" the area with a disk or cultivator, add lime, manure and other fertilizer materials, smooth it down, and reseed with a suitable mixture. Keep animals off the renovated area until the plants become well established.

Establishing new pastures. Before you establish a new pasture, take soil tests and apply needed amendments. In the Northeast, most people plant their pasture grass mixtures with a nurse crop of a small grain, such as oats. Sometimes the legume seed is mixed into the grass seed mixture, but because legume seeds are considerably heavier and of different size, this can result in them settling out and not being uniformly spread.

It is often a better idea to overseed the legume seed in a separate pass for more uniform coverage. Make sure you use the correct type of rhizobium inoculant for the legume species — there are different inoculants for (1) alfalfa/clover, (2) birdsfoot trefoil and (3) pea/vetch. We have seen interesting results with using oats and forage peas as a pasture nurse crop — this can then be harvested as baleage during the summer.

Finally, don't forget the water, shade and other creature comforts. As good as pasture is, cows need more than just forage to be optimally productive when grazing. These other factors include access to clean water, shade, and shelter from inclement weather. Elimination of wet areas and piles of manure and moist spilled grain are important for controlling flies, since the organically approved fly repellents won't probably be satisfactorily effective without limiting fly-breeding habitat. Periodically dragging the pasture to break up manure piles may help during fly season.

As I drove home from the mill one day in early spring, our 12-year old son, Daniel, noticed that Fifi, one of our spirited heifers, had apparently snuck under the polywire and was happily grazing in the middle of our wheat field! She knew that the grass was much greener on the other side of the fence, and as we encouraged her back in with the others who were grazing old cornstalks and weeds, she kept taking one last tonguefull of the sweet, lush wheat. Fortunately, soon their early spring pasture will be ready and then the grass will be greener *inside* the fence — and that will be better for everyone!

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Cornell University maintains a website on forages at *www.forages.org*. Growers in New York State can type in their county, soil conditions and intended use and get recommended pasture species mixes, along with lots of information on management and yield expectations. The site also includes forage information for a selected number of other states.