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## Farming Magazine - February, 2013 FEATURES

### Goodbye Hay, Hello Turnips

A farm explores brassicas for alternative grazing  
By Kathleen Hatt

"We're trying to kick the hay habit," says Carole Soule. At upwards of \$200 a day for round bales, hay for Miles Smith Farm's 65 Scottish Highlands and Angus crosses is not cheap. Because their old Loudon, N.H., farm has only about 36 acres of good grazing, owners Carole Soule and Bruce Dawson are always on the lookout for alternatives. Currently they trailer their animals to 12 other properties to graze in return for keeping some 200 acres open. Over winter and between engagements, the cows are fed at home.

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Cattle take turns eating a turnip from Carole Soule.  
Photos by Kathleen Hatt.

### Cattle feed and bird habitat

Cattle in northern New England usually graze only four to six months a year, and high-energy pasture is always difficult to find both early and late in the grazing season. When they are not grazing, northern New England cattle are fed corn, silage, hay silage or a total mixed ration (TMR), all of them expensive in part because they require mechanical harvesting.

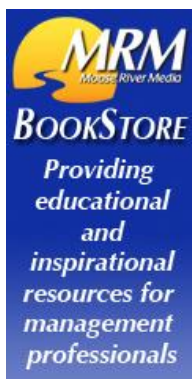
To help fill the need for high-energy feed at both the beginning and the end of the grazing season, Soule and Dawson are experimenting with growing 4 acres of brassicas on 10 acres of land they leased for four years from St. Paul's School in Concord, N.H.

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## Web Exclusive

Forging On After a Farm Accident



Accustomed to seeing Carole Soule moving fencing, a Highland rushes to be the first in the new grazing section.



St. Paul's School supports local agriculture and the local economy by making some of its unused land available to local farmers. The land is managed by the New Hampshire Audubon to provide habitat for grassland birds such as eastern meadowlarks and grasshopper sparrows. Miles Smith Farm's brassica growing and rotational grazing project is supported in part by a grant from the Northeast Sustainable Agriculture Research and Education Program (SARE).

SARE is a program of the National Institute of Food and Agriculture, U.S. Department of Agriculture. SARE provides money for on-farm research, and the reports from these projects are online. SARE funds people in each state to promote sustainable ag practices as they see fit in their states.

### Why turnips?

Although not commonly grown for cattle feed in northern New England, brassicas have long been recognized by the scientific and agricultural communities as high-quality forages. Brassicas grown for forage include turnips, rutabaga, kale and kohlrabi. Soule and Dawson chose turnips because they produce abundant leaves, develop highly nutritive roots, and retain their feed value in cold weather. Research has suggested that brassicas can extend the northern New England grazing season up to three months. Farm profits can potentially be increased by allowing intensively grazed cattle to harvest their own feeds, including brassicas.

### Happy cows, better soil

While 10 of the farm's cattle graze turnips and other perennial meadow fescues like ryegrass on St. Paul's School land, they are also working to improve the soil. The cattle are rotated among paddocks once every 24 hours. Because each paddock is relatively small - about 60 by 50 feet - cattle distribute their manure relatively evenly. Managed intensive rotational grazing benefits the herd by increasing forage quality, decreasing pressure by parasites and improving herd health. All tend to result in higher weight gain per animal.

### Why not hay?

Beyond farmer cost, hay has other disadvantages. Hay needs fertilization, and it needs to be cut at times that wildlife, including ground-nesting birds, are rearing their young. Haying removes nutrients from the soil; grazing cattle replenish nutrients.

Intending to cut others' hay, Soule and Dawson previously purchased equipment. They found that other farmers either wanted to keep the hay for themselves or that available hayfields were unsuitable for mechanical equipment. They sold the haying equipment and offered their cows' services "cutting grass," especially in small paddocks and abandoned orchards where machines cannot operate.

The land on which Miles Smith Farm cows graze is generally leased for an eight to 10-year period. The farm provides fencing and a lease designed to confirm mutual farmer-landowner respect. As the pastures their cattle have grazed and fertilized support



increasingly better forages, Soule and Dawson increase the amount they pay in rent.

### Grazing cows and planting turnips

In spring 2012, Soule and Dawson enclosed 10 acres adjacent to New Hampshire Audubon's land with a high-tensile, solar-powered electric fence. Within the perimeter fence, they used low-tensile fencing to partition three 2-acre sections.

After plowing, they applied fertilizer and seeded turnips in the first 2-acre section. In the second plowed 2-acre section, they seeded a grass mix (timothy, clover, red clover and alfalfa - .). Cattle hoof action "plowed" the third section, which was later planted in turnips.

Pasture was plowed in April and harrowed in both early and mid-June. Thirty head of cattle began grazing in the unplowed paddock on June 17. Beginning on June 21, using a program developed by Kathy Voth, the cattle were trained to eat milkweed and other weeds that could inhibit the seeding and growth of brassicas. Voth founded Livestock for Landscapes in 2004. The company helps farmers use the natural behavior of livestock as an inexpensive alternative for managing weeds and other vegetation.

Fences were moved every 12 hours so the cattle could access a new grazing area within the unplowed 2-acre section. On very hot days, Soule and Dawson observed that their cattle tended to restrict their intake significantly during daylight hours. Cows were quite uncomfortable in unshaded paddocks, and their need for water increased. When released from the unplowed section, cows immediately headed for shade in the larger adjoining field.

Turnips and pasture grasses were seeded and fertilizer spread on the two plowed sections on June 29. Following planting, the two plots were raked.

In the first section, 1 acre each of Topper and Appin turnips mixed with Duo Festulolium (a perennial similar to ryegrass to give cattle forage variety) were seeded, part mechanically, the rest very lightly seeded by hand. The section was spread with 750 pounds of nitrogen-rich North Country Organics' Cheep Cheep fertilizer. Following seeding and fertilizer application, the section was raked.

In the second plowed section, a . mixture was applied. Following seeding and application of 750 pounds of Cheep Cheep fertilizer, the section was raked. On August 29, lamb's-quarters were mowed in this section.

From June 17 to July 15, cattle fertilized and hoof-plowed half of the third section. This plot had not been mechanically plowed. No other fertilizer was added, and the area was seeded on June 29 with 25 pounds of Appin turnips. Only 1 acre was seeded because the cattle, whose plowing action is considerably slower than that of a tractor, had not yet hoof-plowed the second 1-acre portion. It took another two weeks for cattle to complete their work. The area was seeded July 16. Random manure coverage was observed to be nine patties, or .9 percent coverage per acre.

Although grazing (hence soil reclamation) went faster when cattle stayed within the paddocks, they repeatedly declined to stay to appreciate the value of their own work. Previously accustomed to unrestricted grazing, cattle sought periods of freedom when they escaped paddocks and literally kicked up their heels.

On July 15, when all forage had been sufficiently harvested, cattle were moved out of the Audubon pasture. The hoof-plowed portion of the third section was then seeded with Topper turnips.

Checking the area on August 22, Soule and Dot Perkins of the University of New Hampshire (UNH) Extension Service, technical adviser for the project, found that lamb's-quarters were covering 95 percent of Section 2, brassicas in Section 3 needed a few more weeks of growing time, and there were no brassicas growing in Section 1.



Carole Soule found this 10-plus-pound turnip growing in one of the brassica-seeded sections of St. Paul's School land.

Before learning that the heavy coverage of lamb's-quarter may be toxic to cattle, consideration was given to returning cattle to the area. To protect cattle, lamb's-quarters in Section 2 were mowed on August 29. During the time cattle were away, a solar charger used to power the electric fences was stolen. Soule and Dawson replaced it with a less powerful charger, which resulted in continuing issues with cattle escaping from the less-effective fencing.

Five steers were weighed on September 14 and placed within the perimeter fence preparatory to beginning mob (or intensive) grazing in the turnips. Seeding, Soule and Dawson later learned, should have preceded mob grazing. Next year they will seed in the fall after the ground is too cold for the seed to germinate. When Soule and Dawson evaluated the brassica pasture on September 29, they found a huge (upwards of 10 pounds) turnip growing in the walkway, where no brassicas had been planted.

As additional cattle were brought to the Audubon pasture, they were gradually integrated into the herd. Integration and establishment of herd hierarchy is an important step in reducing unnecessary pushing when the cattle are let into the brassica grazing paddocks.

Throughout October, cattle rotationally grazed turnips and other forages. They occasionally knocked down electric fencing. In mid-October, cattle were seen eating long grass before going after turnips. When the presence of diarrhea indicated a need for more grass in their diet, cattle were moved to a section containing . This corrected the problem, and cattle were moved back to the turnip section, where they continued eating turnip tops and exposed sections of turnip bulbs.

Appin turnip bulbs, especially those not anchored in the soil, tended to be too large for cattle to bite. There was hope that a freeze followed by a thaw would soften the large turnip bulbs, but this did not happen before cattle left the Audubon field on November 20. However, Miles Smith Farm cattle had grazed 30 days later in the season than they normally would.

When the cattle return to the Audubon pasture in 2013, with any luck they can begin grazing on overwintered turnips and regrown . Donated Topper turnips (large-bulbed like Appin turnips) will be planted.

### Turnip concerns

Brassicas are high in crude protein and energy, but low in fiber. Low fiber results in reduced rumen action, so it is essential that brassicas not exceed two-thirds of forage and that they be supplemented with roughage.

Another disadvantage to feeding turnips is the risk of cattle choking. Cattle have a difficult time picking up, biting and chewing large turnip bulbs, and occasionally a turnip becomes stuck in a cow's throat. Caught in time, the situation can be remedied by pushing a tube down the cow's throat, forcing the turnip into the stomach. Miles Smith Farm cattle had no known instances of choking on turnips.

Another reported drawback to feeding turnips, especially to dairy cows, is that cows may have off-flavored milk and really bad breath. The odor has been described as a cross between horseradish and propane. Bad breath was not noted in Miles Smith Farm's

Highlands and Angus. After sampling the first of their turnip-fed beef, a rib eye, Soule reported it was "juicy and tender, with no trace of turnips."

As she looks at the 4 acres of brassicas growing in the St. Paul's/Audubon field, Soule thinks back on the experience of growing turnips and rotationally grazing Highlands and Angus. "Rotationally grazing brassicas gave us an average weight gain of 2.46 pounds per day, compared with only .43 pounds per day for our control group. This method of growing and foraging is well worth repeating," says Soule. "We plan to continue it next year, refining amounts seeded. We will also replace our stolen charger with an equally powerful unit."

Soule is also investigating other non-hay options to feed Miles Smith Farm cattle, including growing hydroponic fodder. Stay tuned.

*Kathleen Hatt is a freelance writer and editor and has been a frequent contributor to Farming since 1998. She resides in Henniker, N.H.*

**For further information**

Brassica Fodder Crops for Fall Grazing <http://extension.umass.edu/cdle/factsheets/brassica-fodder-crops-fall-grazing> .

Kathy Voth, Cows Eat Weeds, [www.livestockforlandscapes.com](http://www.livestockforlandscapes.com) .

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