

► Angus Glen Farms has used bale grazing to feed 100 head of Angus cattle for the last seven years.



PHOTOS COURTESY OF BRETT CHEDZOY

# Bale Grazing: A Treatment for ‘Barnyard Blues’

Graze cattle and fertilize pastures all winter long.

by **Paige Nelson**, field editor

**D**uring his Christmas break from Cornell Cooperative Extension, Brett Chedzoy, owner of Angus Glen Farms, and his family set out a winter’s worth of round bales for their 100-head seedstock operation.

“The objective for [Angus Glen] is to feed as little hay as possible, but feed it efficiently and without causing a major environmental problem,” Chedzoy says. Thus, for the last seven years the farm has fully incorporated bale grazing into its winter feeding routine.

Bale grazing enables cattle to graze strategically placed hay bales throughout the winter in a field or pasture. The bales are divided via fence into manageable sections

resembling a checkerboard. The cattle are allotted a certain number of bales for a given amount of time before a new section is opened up.

Chedzoy says his farm started bale grazing for several reasons. The 300-acre cattle operation abuts Glen Creek, which flows through the adjacent Watkins Glen State Park.

“Both of our barnyard areas are adjacent to the stream, and it became apparent we were going to be polluting that stream if we didn’t change our practices,” he explains. “In colder parts of the world, Angus cattle are able to withstand winter weather just fine, as long as they have their bellies full, so we began cautiously experimenting with feeding more and more of the winter hay out on pasture.”

Jerry Lindquist, Michigan State University (MSU) Extension grazing and crop management educator, adds that producers may choose to bale-graze in order to target soils that need fertility improvement. Other added benefits are the reduced labor and time required with this system and the decreased need to start heavy equipment on cold winter days.

“It is a method that has grown in use across North America in the last 20 years. It has become more popular mainly because it works,” says Lindquist.

## **Bale grazing in practice**

Once a winter’s worth of round bales have been set, it’s time to wean the calves and send the cows back out to pasture at Angus Glen. The upstate New York farm will bale-graze



cows, bred heifers and bulls on roughly 700 bales each winter. The operation has 75 permanently fenced paddocks and, in a given year, will use two-thirds of them for winter bale grazing.

Although Chedzoy uses round bales, Lindquist says other bales — small and square bales — can be used, but they don't shed water well, so they need to be transported to the field on a daily or weekly basis.

**Feeding rate.** Angus Glen feeds five 800-pound (lb.) round bales per day and will save their best hay for later in the winter.

Lindquist offers advice for figuring out the appropriate feeding rate for bale grazing. The average round bale weighs 900 lb. and is 15% moisture. After a 15% storage loss, 650 lb. of dry matter (DM) is left in the bale. If 12% is wasted (falls on the ground), that leaves 572 lb. to be consumed.

“The average beef cow in gestation will eat approximately 30 lb. of DM per day, so one cow could eat on one round bale for 19 days, or 19 cows could consume one bale per day,” Lindquist says. He emphasizes, “This is where animal husbandry must enter and say ‘it depends’ — on the forage quality, on the weather conditions, available shelter, and the body condition or fat cover of the cattle.” For instance, beef cattle ate 20% more last winter because of the extremely cold weather.

**Bale spacing.** According to research from the Western Beef Development Centre near Lanigan, Sask., at 25 bales per acre or 42 feet (ft.) between bale centers, nutrient deposition from one bale just touched the nutrient deposition from adjacent bales with minimal overlap, helping to create an even spread of nutrients.

**Moving.** Although Angus Glen uses permanent fencing, many cattle operations use temporary electric fencing to section off bales. The University of Nebraska-Lincoln (UNL) has published a webinar titled *Feeding Cattle Forage Using Electric Fence as a Management Tool* in which they explain several methods of using electric fence in frozen soil conditions.

Chedzoy says he usually leaves one or two of the paddocks the cattle have already eaten open so they can walk back and lie in the fresh waste hay.

“They seem to really like that vs. having to lie in snow or on frozen ground,” he observes. “The cows readily will walk back a paddock or two to bed down on the waste hay.”

Because the farm doesn't use ring feeders around each bale and doesn't remove the Sisal (natural fiber) twine, Chedzoy says, “We can move them from one paddock to the next, literally in five minutes.”

**Site selection.** Due to bale grazing's



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potential for nutrient deposition in the soil, *Sustainable Management of Nutrients on the Landscape for In-Field Livestock Winter Feeding Systems* published by Agriculture and Agri-Food Canada offers these recommendations for choosing sites to bale-graze:

- gently sloping or flatter landscapes;
- sandy loam to clay-loam soils; and
- land with a recent history of low nutrient additions.

Conversely, the following locations for bale grazing should be avoided:

- steep, sloping land subject to high surface runoff;
- riparian zones; and
- sandy soils located above shallow-groundwater aquifers.

Lindquist advises using bale feeding to improve the soils in certain fields for a few years and eventually moving on to other fields.

### Benefits of the bale

“Since we've gone to bale grazing, we've seen much less ringworm — almost no ringworm in some winters, and the cows definitely stay a lot cleaner,” says Chedzoy. “The animals can be out there moving around in a healthier, cleaner environment, getting exercise, and I think it helps with ‘barnyard fever.’”

“It reduces the amount of waste that we're concentrating in the barnyard,” he points out. “We don't have any big equipment on the farm, just a small 4-wheel-drive tractor we use to move around round bales. I don't have loaders and bulldozers to clean up where we fed 700 round bales.”

Lindquist adds that producers using this system enjoy the ease of winter feeding, little to no spring manure cleanup, and the growth response in old hay fields and pastures.

That response, says Chedzoy, is most noticeable in May.

“When things are first really starting to green up and grow

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► **Left:** In upstate New York, Brett Chedzoy of Angus Glen Farms says, when bale grazing, paying attention to the 10-day weather forecast is crucial in avoiding having the cows in the wrong place when a winter storm happens.

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fast, you can look across every paddock where round bales have been fed and just see, clear as day, the taller green grass where there was a round bale fed,” he says. “It’s a way of closing the loop and recycling the fertility, so that we’re not mining the fertility off of those areas.”

According to *Sustainable Management of Nutrients* that “green-up effect” is not just anecdotal. Round bales fed at 25 bales per acre add 548 lb. of nitrogen (N) per acre and 49 lb. of phosphorus (P) to the soil. In contrast, average annual crop residues add 30 lb. and 3 lb., respectively.

### Overcoming the challenges

“Each farm is going to have to figure out how to take the principle and apply it to their situation,” offers Chedzoy. However, both Chedzoy and Lindquist recommend producers looking for a change in their winter feeding program give bale grazing a try.

Feeding on sites that don’t have a living plant root growing in them to capture nutrients creates a nutrient sinkhole, says Lindquist. “Bale grazing on sod really works well, because even in the dead of winter, those sod roots are active below the soil surface.”

### Hay wastage and weeds.

“Wastage depends on hay quality and whether the bales were stored outside or inside. It certainly seems to depend on the ground conditions. If you’re feeding on nice, clean snow and frozen ground, the waste will be very little. If you’re feeding on thawed-out, muddy ground and it’s pouring rain all night, then obviously, they waste more hay,” says Chedzoy.

“If you balance the availability of hay properly with the amount of animals you have to eat that hay in a given amount of time, they really don’t spoil or waste much compared to alternative feeding methods,” he adds.

“Research at MSU and other universities has shown that bale-ring feeders of various types reduce hay waste by 15%-30%. Some large farms that bale-graze more than 500 cows use no hay feeders of any type,”

Lindquist says. “The cows have direct access to the bales. Hay losses can approach 25%-40% in this method of feeding, depending on environmental factors. These farms reduce this loss by making the cows clean up more of the trampled hay before



► This picture depicts fall regrowth where round bales were fed the previous winter. Research has shown bale grazing can add 548 lb. of nitrogen and 49 lb. of phosphorus per acre.

giving them the next break line of bales, and they justify the loss, knowing it saves them labor by not having to move feeder rings and with the rationalization that the wasted hay is adding organic matter (OM) and nutrients to the soil.”

“Bale-grazing farms have soil test data showing soil OM improvements climbing from 2.5% to over 4% when using multiple years of bale grazing. Soil scientists estimate that a 1% improvement (from 2.5% to 3.5%) of soil OM in the upper 6 inches (in.) of soil is worth \$650 to \$800 per acre in natural fertility,” he says.

“In areas that were more heavily disturbed or with more waste hay left behind, you would see more warm-season annual weeds come in, like ragweed and asters. Weeds are like nature’s scab, but by the second year it’s pretty much gone back to grass,” says Chedzoy.

Lindquist agrees, saying that “the existing forages become much more competitive in their growth so that the weeds do not get ahead of them.”

During the next summer’s growth, the residue hay and manure will decompose. Lindquist explains that most producers swath the hay on a bale-grazed field in June with no problems.

**Soil health.** “Never feed a bale in the same spot twice,” advises Lindquist. “This will not only spread the manure and feed waste more uniformly, but [it will] also reduce the sod injury and compaction. Avoid bale grazing in the muddy season, as well.”

Plenty of adjustments can be made for bale grazing in less-than-optimal conditions, Chedzoy says. If soil conditions get soggy, pull the cattle off and turn them back out



► Above: Cattle at Angus Glen Farms are shown after one day of bale grazing round bales.

► Right: This picture shows hay wastage after two days of bale grazing.



when conditions permit. Shortening the grazing period of each section will also help, if the quantity of hay can be adjusted.

“It’s not like the soil disturbance doubles going from one day to two; it’s more like it triples or quadruples,” he says. “The first day they’re in there, they’re eating, they’re not moving around as much; their feet are kind of buffered on top of the waste hay. By the second day, they’re really in there moving around more, being forced to clean up their plate, and that’s where you really exponentially increase the amount of soil disturbance on soft ground.”

**Twine.** Angus Glen Farms uses a natural-fiber twine called Sisal on their round bales. Sisal is designed to naturally break down as it is exposed to weather. Plastic or nylon twine needs to be pulled in most cases, as well as net wrapping. As the winter progresses, the twine may become frozen to the bale, making the job even harder. Pulling twine during the fall will increase wastage due to the bales falling apart before the cattle can get to them.

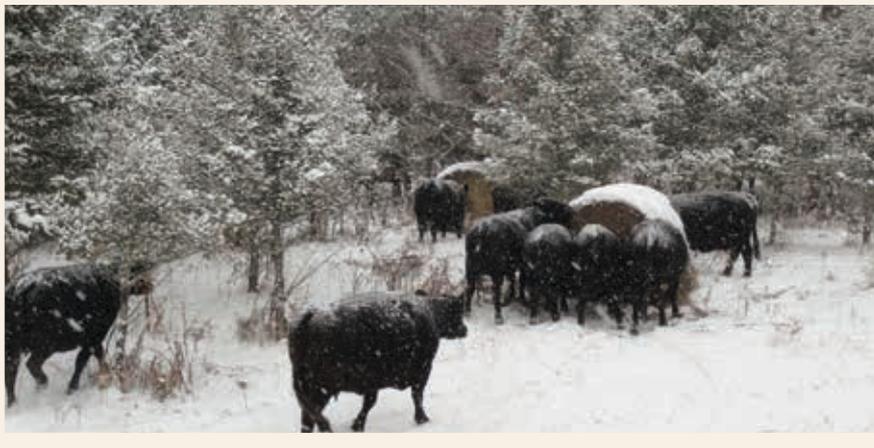
Lindquist uses bale sleeves on his operation. The plastic sleeve covers the round side of the bale, allowing the cattle to pull hay from the ends. He says the sleeves work well and shed the rain and snow but didn’t pose a problem for the cattle.

**Water and supplementation.** “We start in the paddock where the water is and then work our way out. Cows have four legs, and they can walk back to get water just fine. The furthest they might be is 500 or 600 yards (yd.) from the water,” says Chedzoy.

“Exercise is good for them,” Lindquist agrees. He explains that if supplement is provided it should be placed in an area away from the bales that makes cows walk.

“Even 1,200 ft. in the dead of winter is OK,” he says.

**Winter weather protection.** “I always tell



► Angus Glen cattle in upstate New York take shelter in mixed conifer plantations called “living barns.” Round bales are stored between trees, so cattle can continue eating during storms.



folks the big challenge with bale grazing in the winter is watching the 10-day forecast so you don’t have the cows in the wrong place at the wrong time,” says Chedzoy.

Thanks to portable windbreaks, providing protection to cattle during winter weather has never been easier.

The cattle at Angus Glen Farms don’t go into a regular barn when the weather is bad. They take shelter in a “living barn.” Living barns are mixed conifer plantations. They are

thinned to maintain good tree vigor, but dense enough to provide protection in extreme weather.

“We hold those areas in reserve and shift the herd in the direction of one of them when the weather gets bad,” says Chedzoy.

He notes that, “even on the coldest nights last winter, his cows would remain on pasture, despite a short walk to a living barn area. They would just lie around the hay bales, chewing their cud, acting content where they were.”



► **Left:** Plastic bale sleeves cover the round side of the bale, shedding the rain and snow. Sleeves can be pulled off before cattle are turned in, or the cattle can eat from the ends. After leaving the sleeves on for the first time last winter, Lindquist says they posed no problems to the cattle and more than half could be used again.

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