



Bale Grazing: Success as Cattle Feed Themselves for Better Soils and Winter Ranch Life



10 Common Questions and Answers for South Dakota Ranchers

(Answers compiled from Dakota ranchers experienced in bale grazing and NRCS and SDSU Extension Rangeland Management Specialists.)

Q: Why consider planned bale grazing in winter?

A: Have you considered not starting a cold tractor every winter day to move snow then move and unroll bales to feed cows? Does moving a single-strand electric fence once a week or so sound like a better winter ranch life to you? South Dakota ranchers with round bale grazing experience point to the key benefits when cows feed themselves—less work, less fuel and improved soil.

“We started bale grazing in 2014, just leaving bales in the hayfield and strung hot wire for a week’s worth of field at a time, and it’s worked out really good for us,” says Drew Anderson, rancher near Lemmon, SD. He likes the idea that he’s keeping animals and nutrients in the hayfield, instead of hauling the nutrients and carbon off the field, as well as cutting hauling costs. The fuel savings from bale grazing became apparent to Anderson in the winter of 2016, following a Christmas blizzard. “We ran out of bales to graze, and I was burning 35 gallons of diesel a

day to feed the cows. When bale grazing, I’m burning a dollar’s worth of fuel in the snowmobile to make sure they have water. The time and money savings are well worth it.”

Another Dakota rancher, Harold Gaugler, of Grant County, ND, says he’s seen almost one-third higher hay production—he believes it’s due to a combination of increased nitrogen from the manure and urine from cattle grazing bales in winter.

Jessalyn Bachler, SDSU Extension Range Field Specialist in Lemmon, echoes the time savings value for ranchers who also work full-time away from the ranch. “To save several hours daily of feeding in the dark is huge during short winter days. By setting bales and fencing pastures in the fall, you can simply move a cross-fence once a week. It takes a lot less time to run out and check cattle and waters once a day compared to hauling feed daily.”

Q: What is the best method to set up bale grazing before winter?

A: Ranchers use various methods to prepare bale grazing areas before winter, depending on their situations. Some leave the bales in the original hayfield, then add more bales to match cattle numbers according to water and future electric wire placement. Other ranchers may haul bales to pre-determined feeding locations and arrange them in a grid or different pattern to match the frequency of moving cattle.

Regarding setting posts, Anderson likes to place his metal step-in posts before the ground freezes. “Then in January or whenever we start bale grazing, all I have to do is string the hot wire,” he says. “We don’t use plastic posts as cattle rub on



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them, and they break. And when we don't get posts placed, I've found that a cordless drill and a masonry bit work well in frozen soil to place posts."

Bales tied with Sisal twine is another tip from Anderson. "You don't have to cut it, and it biodegrades, so the following summer when you are baling, you hardly see any pieces of twine left. We save labor by not having to cut net wrap or cut plastic twice and pick it up later."

Gaugler has successfully used fiberglass posts and likes to use net wrap on bales for longevity. "Since we tend to stand bales on end, the cows work the wrap to the ground as they graze from top down, making it easy for us to pick it up since it stays at the base of the bales," he says, "and when we stockpile bales for three years before we go into a bale grazing site, the wrap holds together better than twine."

Bart Carmichael, rancher near Faith, SD, strives to keep his cattle on pasture 12 months a year. "We use bale grazing as a Plan B when grazing becomes difficult in deep snow. So we move cattle to the bales, then all we have to do is move electric fence instead of starting a tractor every day," he says. "We also try to place bales on thinner soils and on hilltops to add nutrients to improve the soil."

Q: Can the severity of winter impact bale grazing?

A: Every winter is different and can be highly variable. No matter how you're feeding cattle in the winter, paying attention to them is critical. "We abide by the rule of keeping it simple when winter bale grazing," Carmichael says. "It takes me about nine minutes to move a fence. Then I spend time checking water and the cows while I roll up the wire."

Ranchers have also learned that the bales can act as windbreaks for the cows. Gaugler, who also grazes near Thunder Hawk, SD, says a big blizzard was coming one winter so they decided to bring the cows home. "After the blizzard finished, we went out and checked to make sure no cows were left behind. We got there and found 25 cows had used five bales as windbreaks and were happy as could be, with no intention of coming home. They got along fine."

Another tip Gaugler recommends is to bale graze into the wind rather than with it. "If you have no choice, you can try to bale graze with the wind early, when you aren't expecting any severe weather. Then you can turn around and graze into the wind when you're expecting some of the more severe weather," he says. "Over the years, we've also put in infrastructure in terms of water development and fencing just to make it easier for us."

Q: What about a blizzard backup plan?

A: Most ranchers never forget bad blizzards, such as the winter of 2016/17, when even bale grazing becomes buried and ranchers implement a Plan B to get cattle to the yard. SDSU's Bachler dealt with such challenges during her bale grazing research that winter. "In one blizzard, our free-standing windbreaks blew over, water tanks and fences were completely covered with snow, and we ended up walking them home on foot," she says.

A good Plan B should consider bale grazing field proximity to a safe exit for the cattle, backup water nearby if waters and lines freeze, and additional feed nearby if bales are too difficult to access in the short-term and long-term.

Q: What about waste from round bales that cattle leave behind?

A: Most experienced ranchers will agree, there's a definite learning curve regarding when to move cattle among bales. "Management is critical because if you move them too soon and you leave a six-inch mat of residue, that will take a long time to break down," Anderson says. "There will be other times when they clean it up really good, with barely enough residue to fit in a trash bag. And we've learned that the nastier the weather, the better they seem to clean up hay residue."



When Gaugler first started bale grazing, he used a harrow over the hayfield in the spring. “We spread the organic matter, so we didn’t have as much to work through during summer haying. But the last couple years, we stopped doing that and let the hay grow through it,” he says. “It takes a little longer for the grass and the alfalfa to come through that organic matter. But when it does, it shows an increase in growth.”

Another concern Carmichael hears from other ranchers is leftover bales in a hayfield once the ground thaws. “My answer is simple. I don’t cut hay around them. The grass will grow around the bales. Then, if we need them next year, we can put the cattle in to graze and bale graze. Then, hopefully, we can just bank them for use later.”

Bachler encourages use of clean, higher quality hay to cut waste. “When adding bales from another location, especially if trying to build organic matter on native range, select hay that matches the location to avoid invasive additions. Think of waste as seed or nutrients for that location.”

Q: How does bale grazing improve soil health?

A: One benefit that all bale-grazing ranchers agree on is the soil fertility benefits from manure, urine and decaying bale residue. “We don’t view hay residue as wasted. It is fertilizer,” says Gaugler.

“When we started bale grazing, our hayfield had degraded soil conditions. So we put the bales on hilltops where there was open soil with no organic matter on the ground. Our purpose was to bring that field back into production, and we have succeeded.”

Bachler says that low-producing areas such as clay hardpans, eroded sites or spots with thin topsoil are prime for bale grazing to build soil health and increase forage production.

Q: Do you see more weeds in the pasture after bale grazing?

A: “Yes, we do see some weeds a year after we bale graze. But the first thing the cows go to eat when they get access to those spots is the green weeds,” says Gaugler.

Q: Is there research on the benefits of bale grazing?

A three-year bale grazing research study by NDSU found numerous benefits (see “Impacts of bale grazing on herbage production, forage quality and soil health in south-central North Dakota” in the 2018 North Dakota Beef and Sheep Report):

- Grass production was greater on the bale-grazed treatment compared to the non-bale grazed control area.
- Bale grazing enhanced grass crude protein and phosphorus content.
- Soil nitrate, phosphorus and potassium levels at 0-6-inch

depth increased on the bale-grazed treatment.

- The distance between bales showed the greatest impact on production. Summer herbage production was greater 15 feet from the bales during the year of winter grazing and greatest from the bale center to 10 feet the second year following winter grazing.
- The open spacing pattern of bales 40-50 feet apart appear to better distribute cattle and minimize hay residue.
- There was no evidence of soil compaction by cattle around the bales due to the freeze-thaw cycles common in the upper Midwest.
- Bale litter left behind the first year can impede grass growth if too thick, yet it can increase forage production by retaining moisture during dry periods.

“Other studies show that bale grazing can influence positive environmental and economic changes. Ranchers can achieve more efficient nutrient cycling, positive soil health impacts, increased forage production and quality, improved cattle nutrition, lowered production costs, and decreased nutrient waste, machinery use, and labor. Research indicates that bale grazing is a promising alternative for ranchers to be more efficient and sustainable while winter feeding,” says Bachler.



Q: Do you need a lot of hay bales to get started bale grazing?

A: Ranchers who bale graze recommend starting on a small scale. “While we now rotate cows among bales in 200 acres of hay fields during February and March, my best advice is to start small. You could leave two weeks’ worth of hay bales in a hayfield or haul out two weeks’ worth of hay into a hay field and just try it,” says Anderson. “You don’t have to plan to bale graze all winter. You could even set out bales with the tractor for a week to try it and not mess with the electric fence. But just get started. Once we started, we haven’t missed a winter without bale grazing.”

Gaugler started bale grazing in 2010 with 380 bales over 120 acres of hayfield for 167 head of cattle. “We grew tired of hauling

manure out to the hayfields and realized it wasn’t cost-effective. So, we stockpiled enough bales that year to start and haven’t looked back since then. Now we put out a minimum of 1,200 to 1,500 bales in a field. We’ve changed our bale layout based on a straight-line set of posts to accommodate 17 rotations, rather than bales scattered everywhere. And the last couple of years, we’ve left the calves on the cows until mid-January. But every year is different as we adjust for the weather.”

For More Information:

[Growing Resilience Through Our Soils](#) offers constantly updated content from South Dakota ranchers. The [Bale Grazing Page](#) has recently been added to the website. For other materials, click on the “Content” tab to view the dropdown list that includes videos, podcasts, articles and other free resources on topics from bale grazing and rangeland soil health to drought mitigation, calving on grass, red cedar control with prescribed burning and more. Listen to the [Soil Health Labs podcast](#) where SDSU’s Jesalyn Bachler discusses bale grazing with us.

USDA NRCS-South Dakota [YouTube series on Bale Grazing](#) that feature rangeland drought management, Remember the R’s (rotate, rest, recover), and Alternative calving dates.

USDA NRCS-South Dakota website page [Range & Pasture](#) information and [Publications & Fact Sheets](#).

USDA-NRCS South Dakota [YouTube page](#) videos on many subjects.

