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# GRASSROOTS NEWS & VIEWS



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# JANUARY 2019

## DIRECTOR'S NOTE—MIKE ROBERTS

### Happy New Year One and All

Here on the Waldron Ranch we strive to graze 10 months of the year, during April and May no cattle are allowed on the ranch so as to let the grass get a good start. A system has been set up so that in June shareholders only have 50% carrying capacity, (again to let the grass get a good start) but after June the share carrying capacity increases so as to encourage share holders to graze their cattle on the ranch later in the growing and dormant seasons.

At 4300' above sea level, which incidentally is the same elevation as the summit of Highway 1 on the Rogers Pass, this portion of the Foothills Fescue and Montane Subregion that the ranch inhabits lends itself well to this type of grazing schedule. With only approximately 90 days of frost free growing season and our strong and fairly reliable Chinook winds we can graze cattle throughout the summer and winter months quite consistently..... Mind you this last winter definitely challenged our resolve and by late February we had to pack it in and send all the cattle to their home ranches.

The Waldron Ranch was once prime Bison range at times inhabited by thousands upon thousands of Bison. The grasses here evolved along with the massive grazing herds. The Bison are now gone but the grasses remain much as they have been for eons. These grasses are this ranch's greatest asset; we recognize this and manage our grazing with a sustainable system. A system that is highly adaptive as no season or year is the same; some wetter, some drier, always changing and so our management needs to adapt with these changes.

Grazing stock piled native grasses throughout the winter months is not a sure thing, if the chinook winds don't come often enough or are not strong enough to keep the grasses available for easy access we need to add supplements for the cattle or send them home to be fed. Here at the Waldron we usually have 3500 head of cows grazing as of January 1<sup>st</sup> diminishing to 0 on March 31<sup>st</sup>. This type of management needs to be learned both by the cattle and the manager. The cattle need to be the right kind, namely thick bodied, good haired, easy fleshing, and of the right age group; cows in their prime of life. They need to learn that the feed truck will not be meeting them at the gate so they had better keep grazing. The manager needs to keep a close eye on cattle, body condition, access to good grazing, water availability, and snow conditions. When all the stars line up it works fantastically,

when they don't one needs to adapt quickly and decisively.

So far this winter has been easy going, although October 1<sup>st</sup> was a bit of a scare with 10" to 16" of snow that stayed for about a week. At this time, December 18<sup>th</sup>, the cattle are doing fine. The grass is plentiful, but water is a concern as many of the creeks and springs have frozen over leaving only a few choice places for the cattle to water. A few inches of fluffy snow would be welcome as it greatly reduces the water requirements of the cattle.

Moving forward into 2019 I would like to encourage everyone to review and know your "cost of production" (COP). Don't fight your environment anymore than is absolutely necessary; if you do you will eventually lose, mother nature always wins. Each operation is unique and has special assets, learn what they are and capitalize on them while diminishing your liabilities. Get rid of useless time eating chores, spend the time instead on yourself, your family, and friends; it is far more rewarding.

"Success happens when preparation and opportunity meet"

Mike  
Roberts



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# Bale Grazing Trial Looks at Feed Waste



*Photo supplied from article*

Bale grazing is a common winter feeding practice but how much forage are those cows leaving behind? Alberta Agriculture and Food recently shared results from one trial that examined that question.

The Lakeland Agricultural Research Association (LARA) measured waste from bale grazing over four winters, from 2008 through 2011. The study was done using the same cow herd in Bonnyville, Alta. Each fall they laid out tarps in the field, weighed round bales, and centred the bales on the tarps. The bales were fescue-alfalfa. Some were placed on their sides and others on their ends.

Cattle grazed the bales over the winter, usually in January and February, said Alyssa Krone, forage and livestock specialist with LARA. Krone said the cows were turned out to the bale at about 9 a.m. and moved off the bales around 4 p.m. each day.

“On really cold days, the cattle were left in the bales overnight until the weather changed,” she said. “This limited access system could have impacted the amount of waste

produced.”

Each spring, they collected and weighed residue from the tarp. Krone said they did remove large piles of manure before weighing the residue. They also collected samples so they could estimate how much of the residue was forage and how much was manure. About 20 per cent of those samples were manure, Krone said, so about 20 per cent of what looked like feed waste in the field was actually manure.

“The general trend was to see less waste in bales on their sides than on end during the project, but we only found a significant difference in 2011,” said Krone.

That year, side-placed bales saw a seven-per cent waste versus 16 per cent in the end-placed bales. The four-year waste average for end-placed bales was steady at just under 16 per cent. Winters with more snow saw more waste.

Krone said the wasted feed quality was also lower than the initial feed quality.

“This could indicate that it was lower-quality feed being wasted, although weathering could have also contributed to quality loss.”

For more information on the trial, contact Alyssa Krone at 780-826-7260.

Article found in the Canadian Cattlemen  
[https://www.canadiancattlemen.ca/2018/12/19/bale-grazing-trial-looks-at-feed-waste/?utm\\_source=GFM+Publications&utm\\_campaign=36e3d3ebee-Canadian+Cattlemen+daily+enews+Dec+21%2C+2018&utm\\_medium=email&utm\\_term=0\\_2da8244677-36e3d3ebee-88437173](https://www.canadiancattlemen.ca/2018/12/19/bale-grazing-trial-looks-at-feed-waste/?utm_source=GFM+Publications&utm_campaign=36e3d3ebee-Canadian+Cattlemen+daily+enews+Dec+21%2C+2018&utm_medium=email&utm_term=0_2da8244677-36e3d3ebee-88437173)

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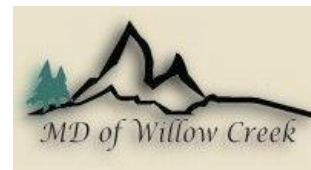
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# Doing the Math on a Straw-grain Ration for Pregnant Cows

Feeding a straw-grain ration to pregnant cows is a viable option, but you've got to do the math.

The first step is to test the quality of the feed, but determining what type of supplements or mineral product must also be done, said provincial beef and forage specialist Barry Yaremcio.

"It is often a point of consternation when choosing what to use because each company 'has the best' product to use," said Yaremcio.

When considering a straw-grain ration for pregnant cows, some nutritional concerns need to be addressed.

Straw typically is high in fibre, but low in energy, protein, calcium, and magnesium.

"Straw should not be fed at levels more than 1.5 per cent of body weight," said Yaremcio. "To be safe, and depending on the type and age of the straw, intakes could be only 1.25 per cent of body weight.

"Using a 1,400-pound animal, straw intake can be anywhere from 17 to 21 pounds per day on a dry basis. This example may be applicable for many operations this winter that are feeding pregnant cows. Along with the straw, roughly 10 pounds of barley or 11 pounds of oats need to be included to meet energy requirements."

This straw-grain ration example has roughly 6.5 per cent protein on a dry basis, but a cow in mid-pregnancy requires seven per cent and one in late pregnancy needs nine per cent. One option to make up this difference is to add two pounds of peas in mid-pregnancy and five pounds in late pregnancy.

"One pound of canola meal in mid-pregnancy and three pounds in late pregnancy will also work," added Yaremcio.

Peas cost about 10.3 cents per pound and canola meal 14.2 cents per pound while a 32 per cent supplement is about 25 cents per pound. This supplement is designed to be fed at one pound per head per day but this doesn't provide adequate protein for a late-pregnancy cow, so a combination of supplement and peas or

canola meal will be required, said Yaremcio.

"For example, peas contain 24 per cent protein, which supplies 240 kilograms, or 528 pounds of protein from a tonne of peas. At a price of \$235 per tonne, the cost of this protein is \$1.08 per kilogram or 44 cents per pound. Canola meal contains 38 per cent protein, which supplies 380 kilograms, or 837 pounds, of protein per tonne. At a price of \$315 per tonne, the cost of this protein is \$0.91 per kilogram, or 37 cents per pound. Use this technique to minimize protein costs in the ration."

## Minerals and vitamins

Two factors need to be considered when calculating the amount of macro minerals, trace minerals, and vitamins supplied by a product.

"First, consider the expected intake of the mineral or supplement that is listed on the tag or label. Second, know the concentration of the nutrient being evaluated."

The nutrient concentrations on the tag or label are listed as a percentage for the macro minerals (calcium, phosphorus, salt, magnesium and potassium). The trace minerals (copper, manganese, zinc, selenium, iodine and cobalt) are listed as milligrams per kilogram. Vitamins A, D and E are listed as international units (IU) per kilogram.

"For the macro minerals, multiply the inclusion rate of the product in grams by the concentration of the nutrient," said Yaremcio. "For example, if the product is fed at 100 grams per day and contains 16 per cent calcium, multiply 100 grams by 0.16 to determine that the product will sup-

ply 16 grams of calcium. For the straw-grain ration mentioned above, a high-calcium product such as a 24:3 mineral, or even limestone is needed. A 1:1 and 2:1 mineral is not adequate to meet animals' requirements."

For the trace minerals and vitamins, multiply the inclusion rate of the product in kilograms by the concentration of the nutrient.

"For example, if the same product is fed at 100 grams and the copper has a concentration of 3,000 mg per kg, multiply by the intake in kg (100 g = 0.1 kg) by 3,000 to determine the product will supply 300 mg of copper. For vitamins, the process is the same but values will be in IU instead of mg."

This process is time consuming to do by hand so Yaremcio recommends a ration-balancing program such as Cow-Bytes. That program, produced by Alberta Agriculture, costs \$50.

*Alberta Agriculture & Forestry—Alberta Farmer Express*

[LINK](#)

For the online Beef Feed Value Calculator go to <https://www.agric.gov.ab.ca/app19/feedanalysis>

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# Can Cows Help Mitigate Climate Change? Yes, They Can!



Photo: Sonja Bloom

[emissions](#); unsurprisingly, study after study—including the United Nations’ most recent, bleak [climate report](#)—affirms that humans need to reduce consumption of animal-based products in order to fend off planetary disaster. This has led to the advent of a booming industry centered on plant-based “meats”

and “milks,” buoyed by a rallying cry from some quarters to abolish meat and cheese and butter and eggs from our diets wholesale.

Livestock farming such as Massy once practiced it—the way many farmers and ranchers continue doing it, by overgrazing of open grass- and rangelands, or by grazing lands not suited to the practice—can be an ecologically ruinous way to produce food. It can destroy soil health and biodiversity, emitting greenhouse gasses in the process, including carbon dioxide. And yet, research also confirms that livestock provide ecological services too great to warrant their complete removal from the landscape.

Properly managed under the right confluence of conditions, cattle, hogs, sheep, goats, and chickens can help mitigate degraded soils and restore healthy ecosystems, which helps lock carbon deep in the ground. About 40 percent of ice-free land on earth is considered grazing land, which sequesters about [30 percent of our planet’s carbon pool](#).

[Project Drawdown](#), a group of international scientists focused on climate research, lists silvopasture, a form of livestock production that comingles trees with pastureland, number nine on its list of 80 modeled solutions to reverse climate change. It lists managed grazing—what a much-reformed Massy practices today—at number 19.

“The best way to address the carbon issue is to use animals in an ecological fashion,” Massy says. “We need [them] in the landscape.”

## How Carbon Is Sequestered

Every plant plays the vital function of removing carbon dioxide from the atmosphere, via photosynthesis. Using sunlight’s energy, the plant fuses that carbon with hydrogen and oxygen to make carbohydrates, which it moves into the soil through its roots. (It also maintains some carbon in its own leaves and shoots and stems.) The roots feed the carbohydrates to dirt-bound fungi; in return, the fungi feed minerals back to the plant. As [Mother Earth News](#) describes it, “This invisible partnership...is the foundation of the terrestrial carbon cycle, as plants incorporate carbon from atmospheric carbon dioxide into carbohydrate biomass.”

The longer a plant’s roots, the deeper it can sequester carbon in the soil and the more efficiently it can hold it there. A healthy grassland, with a diversity of region-specific native grasses—on Massy’s farm, some of which have roots that [extend four feet](#) into the ground—can create deep carbon sinks. Managing grasslands well also contributes to carbon storage other ways: by building up soil health to make land more resilient to extreme events, according to Marcia DeLonge, senior scientist in the Food & Environment Program at the [Union of Concerned Scientists](#). This, she says, “can protect existing soil carbon to some degree, but perhaps more importantly may allow continued carbon sequestration. In other words, even when events like extreme heat, drought, fire, and floods don’t significantly affect soil carbon immediately, they could affect the plants above ground that contribute to soil carbon in the longer term.”

Trees generally capture and store more carbon than grasses and shrubs. Size, density and longevity all factor into this ability; tropical staple crop

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Livestock emit greenhouse gases. They also can sequester carbon and boost biodiversity.

One summer morning in the late 1970s, Charles Massy got into his tractor and ploughed up the parched, basaltic dirt of a paddock on his farm in Australia’s drought-prone Monaro region. Before he could seed it with grasses and legumes in preparation for pasturing the season’s new lambs, a thunderstorm rolled across the undulating plains. In minutes, Massy recounts in his book [Call of the Reed Warbler](#), driving rains washed away 1,000 years worth of topsoil and with it, the [bacteria, fungi, insects, and nutrients vital to a healthy agricultural system](#).

Massy’s own actions caused another sort of damage. His plowing, amplified by years of leaving sheep to devour grasses down to the nub or yank them up by the roots, churned up what scant carbon was stored in the already fragile, depleted soil and released it into the ether.

[Livestock provide ecological services too great to warrant their complete removal from the landscape](#).

Sequestering carbon has become a topic essential to the broader conversation about how our planet might survive the escalating effects of climate change. Livestock are frequently demonized as the enemy of this process. That’s partly because raising animals for meat and dairy accounts [for 5 percent of global carbon dioxide](#)

# Manage Weather Risks to Feed and Water



Photo: Graeme Finn

Drought is a fact of life for beef producers. And if it's not too dry, there's a good chance it's wet enough to complicate haying operations.

Producers can't control the weather, but they can mitigate risks to water sources, pasture and feed. Extension specialists with Alberta Agriculture and Forestry share ideas on protecting those resources whether it's bone-dry, sopping wet or somewhere in between.

## Long-term winter plans

There is no one-size-fits-all water system for beef operations.

"If you've got a thousand producers, you've got a thousand different situations," says Joe Harrington, an agricultural water specialist with Alberta Agriculture in Lethbridge.

Harrington says there is plenty of innovation in the industry and good products that provide better value than ever to producers. But before looking at specific technologies, he recommends producers create a long-term water management plan.

"It's really just taking a critical look at what they have for sources, what they need, what kind of problems they may have and what situation they're in," says Harrington. Producers then need to look at economics and physical access to water sources, he adds.

"In my mind, that's critical to maximizing the benefits so you're not caught in the next drought without water."

Usually producers will have more grass than water. But this year in Harrington's area, a good run-off followed by a dry spring created more water than grass. Understanding those dynamics is critical to maximizing benefits, he says.

Harrington says producers should also consider how excess water will affect grazing and forage, along with water access. Producers who want to capture water also need to understand water rights in their province.

For example, most provinces require approvals or licences to draw water from a tributary. Legislation designed to protect wetlands can also come into play. Harrington says it's important that producers line up water rights approvals to make sure they have access to that water in the future.

Water rights can be "absolutely critical for the business," he says. "If they have not obtained the proper approval and licences, sometimes they may not have access to that water source when they really need it."

Harrington also recommends practices such as using an off-source watering system to keep cattle out of a dugout. That will help the dugout last longer and protect water quality, he says.

## Protecting winter feed

What do you do if you can't catch a break from the rain during haying season?

"Don't try to make dry hay," Barry Yaremcio, beef and forage specialist with Alberta Agriculture at Stettler, writes via email. "If there is a possibility to make either chopped silage or bale silage the time that the forage is exposed to the rain in the swath is greatly reduced."

If the forage is two to four per cent too high in moisture for baling, an inoculant or preservative can

help, Yaremcio adds. "This could allow the baling process to proceed anywhere from half a day to a day earlier than without an inoculant or preservative."

Moisture movement into the bale decreases quality by feeding microbes. There are several factors that influence moisture and heat retention in the bale, Yaremcio says, including environmental temperature, humidity and bale size.

A more tightly packed bale will shed water better than a less dense bale, he says. Net wrap also helps shed water compared to twine. Yaremcio suggests extending the net wrap onto the flat side of the bale to help reduce moisture migration. John Deere and Tama now make a wrap that is reported to allow more moisture evaporation compared to older wraps, he adds.

Once the hay is up, the next step is to protect what you've got. Remember that rotting occurs from the top down and the bottom up. To prevent rotting from the ground, it's best to locate the feed yard somewhere with a higher elevation and a gentle slope. Place bales in the higher areas so the moisture runs down the slope, away from the bales.

Mowing the area reduces plant growth trapped under the bales. Rake the mowed material and haul it away if needed, Yaremcio adds. Producers can also layer washed rock on the ground to drain moisture from the bale surface. Make sure there's no sand in the rock, he cautions.

Even with an elevated feed yard that's been mowed, producers can expect some loss in overwintered bales. Research in Westlock, Alta., found that even with those steps, bales lost 5.7 per cent of their weight over the winter. Other research has found weight losses as high as 15 per cent. Unprotected hay also leaches protein and soluble sugars.

The best way to prevent loss is to store bales under a shed, says

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Yaremcio. Covering them with tarps or plastic is better than no protection, he adds. Producers can also wrap bales individually or in a tube to get them out of the weather. Cows may waste up to eight per cent more from unprotected bales compared to those stored under a shed or tarp, he says.

Stacking matters, too. While a pyramid stack may provide recreational opportunities for farm kids, it leaves hay open to damage. Rain and melting snow moves between the bales, both on the outside and inside of the pyramid. Yaremcio says wherever bales touch, spoilage occurs.

Mushroom-stacking is a better option. One bale is placed flat-side to the ground, and the other on top. It causes less damage than the pyramid, but moisture still moves from the top to the bottom. Yaremcio says it's the more common way to stack bales these days.

"People are starting to pay more attention to how they stack their forage and are trying to minimize losses."

The second best way to stack hay is to not stack it at all. Instead, place individual bales six to 10 inches apart, round side to the ground. Bales should be in rows oriented with prevailing winds.

"This allows the wind to remove any snow from between the bales so there is less snow to melt (and surface water) in the spring."

The 2018 feed shortage means producers are looking for any forage they can find, says Yaremcio. There is two-year-old hay available in some areas. Yaremcio suggests reweighing these bales at the time of purchase. Producers should also keep in mind that if the bales weren't protected from weather, digestibility of the outer layers can be 10 per cent lower and feed refusal and waste can increase.

Producers can also blend straw or grain into a pregnant cow ration, depending on the quality, Yaremcio says. It's easier to use lower-quality feeds when the cow is not lactating and her nutrient requirements are a bit lower.

Yaremcio suggests taking a representative sample of the feed, whether it's hay, greenfeed, straw or grain. Have the sample analyzed and then balance rations to meet animal requirements. Producers can consult with a nutritionist to create a feed program.

Producers can also use a program such as Alberta Agriculture's CowBytes. CowBytes balances rations, provides feed costs and calculates how much feed is required for the winter. Producers can buy the program or try a trial version online at [www1.agric.gov.ab.ca/\\$Department/deptdocs.nsf/all/agdex12486](http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/agdex12486).

### **Managing pastures during or after drought**

No year in grazing is ever the same because no pasture functions the same year to year, says Grant Lastiwka, Alberta Agriculture forage extension specialist based out of Olds.

Producers who had a dry 2018 need to remember that damage accumulates over time with perennial pastures.

"And with that in mind, what are your remedial actions going to be? Ask yourself that before you start, when you have a chance to make some of these decisions. And have those decisions bear fruition."

Lastiwka recommends watching animals for dissatisfaction and monitoring the pasture. Keep an eye on both forage quantity and quality. If forage quality is declining, high-protein tubs are an option.

"If you're using a supplement tub, (make sure) you're selecting particularly for highest protein," he says. Many people buy something with 25 per cent protein, but he suggests something in the neighbourhood of 40 per cent.

Decisions will depend on an operation's particular situation. Producers who run a higher percentage of yearlings have more flexibility in dry years. Calving time and calf size also come into play. Herds with smaller, younger calves may have higher forage requirements, he explains, than 600-weight calves with

plenty of milk.

Previous pasture management, climate, pasture biodiversity and soil quality are also factors. A biodiverse forage stand with litter will capture and hold rain. Deeper-rooting grasses can access more nutrients and water in the soil profile. But nitrogen is highly correlated to water-use efficiency, Lastiwka says, and so even shallower-rooted legumes can be resilient. He suggests keeping and reviewing records over time to get an idea of how much water infiltrates the soil when it rains.

Native pastures will be biodiverse unless they've been overgrazed. Overgrazing tends to take out species with root depth, Lastiwka explains. Managing previously damaged native pastures well can improve root depth, health and vigour "but you can't make a Clyde a Thoroughbred. It just doesn't quite happen."

Producers should consider the law of the most limiting factor when looking at their forage stands — and often that means nitrogen. Lastiwka suggests using other management practices first, then using fertilizer if needed to set the stage for better development. Banding is always effective, but surface application in the spring will give plants a shot in the arm, too.

Fertilizer isn't cheap. But it can be more cost-effective when feed prices are high. "So that idea that it doesn't pay — doesn't pay when? When paying 10 cents a pound for hay, maybe fertilizer's a good investment."

When forage is short, weaning calves early is also an option. But producers need to consider feed requirements for those young calves.

"How do you get enough protein into a little calf? How do you get enough energy into them, knowing that their rumen capacity and erratic eating habits are putting them at risk?"

Little calves need around 16 per cent protein, Lastiwka says. Something like second-cut alfalfa has plenty of protein but risks bloat.

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But, says Lastiwka, if it's a sainfoin-alfalfa mix, "you now have your cake and eat it too. You've got organic bloat control in with alfalfa."

Sainfoin is high in condensed tannins, which bind to soluble proteins and cut bloat risk, Lastiwka explains. Producers can use those tannins to create a safety margin in pasture and hay mixes. A high-legume pasture project found that other high-tannin plants include purple and white prairie clover, birds-foot trefoil, and some native plants, says Lastiwka. Alan Iwaasa, Agriculture and Agri-Food Canada researcher, is working on the topic as well, he adds.

Cicer milkvetch is another legume that doesn't cause bloat, but it doesn't contain tannins, either. It has cells that don't break down easily during chewing or digestion, which slows the release of nutrients such as protein and reduces gas.

One risk-management strategy is to reseed a couple of pastures that are on better land. The idea is to create a resilient pasture with multi-functional species in it and with the needs of the land in mind. That pasture can be a buffer, says Lastiwka, and give producers some flexibility during tough times.

Next year might be the year to try a cocktail mix on poor grainland, Lastiwka says. That crop can be grazed or silage if needed.

Whatever strategies producers employ, it's a good idea to baby perennial pastures after a dry year. When Lastiwka weaned his own calves in late October 2018, he left some grass in the pasture to protect next year's production. Perennial pastures develop tiller buds

in the fall to set themselves up for the next year, he explains, so leaving cattle on continuously grazed pastures into the fall would damage next year's production.

"The fact is that we need to nurture (pastures) and realize they're stressed too."

Alberta producers can reach Joe Harrington, Barry Yaremciio, Grant Lastiwka or other extension

specialists toll-free by calling 310-FARM (3276).

Lisa Guenther  
Canadian Cattlemen

[https://](https://www.canadiancattlemen.ca/2018/12/18/managing-weather-risks-to-cattle-feed-and-water/)

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(Continued from page 5)

trees are especially good at it. And tropical forests sequester half our terrestrial carbon—about 470 billion tons worth.

Often working against these heroic efforts on the part of plants and trees, though, is agriculture. To produce some of the food we need in order to live, we disturb or destroy our carbon-storing ecosystems. We run animals through them in unsustainable ways, or we chop them down and plow them up to raise monocultures of crops like corn and soy—some of them to feed livestock, others to produce the fake meat that's meant to replace real meat—that require still more plowing, as well as the application of chemicals that kill beneficial soil bacteria, fungi, insects. The land becomes degraded, and carbon-poor.

Improbable and illogical as it may seem, livestock can help.

The trampling of the sheep's hooves mixes manure with soil, fertilizing it and depositing organic matter. That opens up the soil, seeds it, and allows plant roots to go deeper without tilling or plowing. Credit: Lela Nargi

### **The Benefits of Animals: Managed Grazing**

That disastrous storm on Massy's farm was followed by five years of drought. Across Australia, over-cleared, over-grazed grasslands suffered, susceptible to dust storms and erosion. Massy, though, began to “swing toward ecological grazing and cropping,” he says, educating himself by visiting other farmers who'd recognized the destructiveness of ranching-as-usual.

That swing meant rotating sheep more frequently from paddock to paddock, giving grasses and forbs a long rest in order to bounce back. It meant seeding in more and various plants adapted to the parched soil, including nitrogen fixers such as alfalfa. The trampling of the sheep's hooves mixes manure with soil, fertilizing it and depositing organic matter. This action opens up the soil, seeds it, and allows plant roots to go deeper—all without the destruction of tilling or plowing. Over time, “native

grasses, forbs, and legumes that seemed to have disappeared slowly returned,” Massy says. So did many species of wildlife: “We now have over 140 bird species, four macropod species, and much else.”

[If managed grazing could be amped up worldwide, it could sequester over 16 gigatons of carbon by 2050.](#)

According to Project Drawdown, livestock grazing occupies one-quarter of land area in the world—some 3.3 billion hectares. It estimates that 79 million hectares already employ managed grazing along the lines of what Massy now practices on his farm, although it considers 1.3 billion hectares of the earth's plant-able surface to be wet enough to be suited to this practice. If managed grazing could be amped up worldwide, it could sequester over 16 gigatons of carbon by 2050.

What managed grazing does not do, is eliminate methane and nitrous oxide emissions. And yet, Project Drawdown found that carbon sequestration more than offset them. “If we can figure out where the best places to have rangelands are, and make sure they're well managed, we can gain all these benefits,” says DeLonge.

### **More Animal Benefits: Silvopasture**

Massy has done another important thing across his rangelands over the past 10 years: He's planted 50,000 native trees and shrubs, building on efforts begun by his father in the 1960s. That is exactly what silvopasture is, and it increases soil biodiversity and the carbon-storing potential of animal husbandry. Eric Toensmeier, who researches Project Drawdown's food-supply land use, calls it “a powerful tool...that is not being taken seriously.”

How powerful? Project Drawdown estimates that silvopasture can sequester almost two tons of carbon per acre per year, making it one of the most effective carbon-storing tools in agriculture. This power is already recognized in countries like Brazil, [Australia](#), and Mexico, where governments give farmers

financial incentives to transition to silvopasture systems. So far in the U.S., though, it remains little-known and -understood.

With some notable exceptions—like on Steve Gabriel's 35 acres of once-nutrient-poor hayland outside Ithaca, NY. There, Gabriel, an agroforestry specialist in Cornell University's [Small Farms Program](#), has been experimenting with silvopasture for the past five years. He wrote a [guide-book](#) to it for North American farmers interested in learning more about it, based partly on his own experience.

“When we got [the farm], there was pretty poor diversity—a lot of goldenrod, a lot of woody stuff, soil that didn't soak up water very well after rain because it had become compacted from having machinery driven over it for decades,” Gabriel says. He introduced a flock of sweet-tempered Katahdin sheep and quickly saw “a transformation of the soil as they freed up nitrogen and nutrients and fertilized it at the same time,” transforming the land into vibrant pastures rich with clover, plantains, wildflowers, and grasses.

In two pastures Gabriel planted black locust trees and says he began to notice an increase soil organic matter—that is, decomposing plant and animal bits that provide a steady nutrient supply to everything growing in it—which, according to Toensmeier, also increases soil carbon and carbon storage in above-ground biomass. The trees have a range of other uses. They provide shade to the animals, as well as nutritious forage—Gabriel supplements the animals' grass grazing with locust branches he snips off the trunk.

The main reason Gabriel chose black locusts as plantings is because they're fast-growing and “the faster the tree grows, the more carbon it's going to sequester,” he says, at least in its early decades, both in the soil and in the tree's trunk, branches, leaves. He's been experimenting with willows, too, which potentially have an added climate bonus when munched by livestock: Their tannins

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might slow down digestion, reducing methane emissions.

In the longstanding woodlands that surround his open pastures, Gabriel uses the sheep to clear out underbrush. This frees the ground up for shelter, and for the seeding in of forage grasses, which can lead to soil remediation and—potentially, in the long run—carbon storage.

When managed properly, livestock can help sequester carbon or keep invasive brush under control. Credit:

Trisha Dixon

### The Even Bigger Picture About Why Any of This Matters

“Getting invasive brush under control with [livestock] is a beautiful, elegant practice,” says Toensmeier, “but I can’t tell you the carbon balance—it’s certainly not as powerful as fresh trees in pasture.” But other researchers have found that there are benefits to letting (carefully managed) livestock into a woodlot to tidy it up.

Finding flexible solutions to land usage, plus more good land on which to grow food, is essential to our survival.

Forests in their own right are critical to climate mitigation and carbon storage—tropical forest preservation ranks number five on the Project Drawdown list; temperate forest preservation is number 12. But in countries such as Ecuador, forest preservation can be at odds with the needs of impoverished subsistence farmers, who often clear trees to raise crops. Teaching these farmers about silvopasture, then helping them implement and maintain, say, goats on their land, could help to keep forests more intact—and carbon stocks

somewhat more secure.

As part of diverse farming systems in places like Argentina, on degraded land especially, silvopasture has also been found to be more profitable for farmers than pasturing alone, which might encourage people to adopt it—again, preventing them from cutting down forest for crops; the Argentine government has provided some subsidies to help farmers switch over.

Toensmeier hopes financial incentives might one day be available to American farmers, to adopt carbon-friendly

methods like adding trees to pasture. However, he says, “I would definitely not recommend paying people to convert forest to silvopasture for carbon reasons unless and until there is evidence that it actually results in net sequestrations, which I doubt for now.”

via [Wikimedia Commons](#)

By: [Lela Nargi](#)

<https://daily.jstor.org/can-cows-help-mitigate-climate-change-yes-they-can/>



### Sharing Knowledge for Profitability

Date	Location	Venue	Time
January 15, 2019	Vermilion	Vermilion Regional Centre	9 a.m. registration 9:30 a.m.-3:30 p.m. session
January 16, 2019	Westlock	Hazel Bluff Community Hall	
January 17, 2019	Olds	Olds College - Student Alumni Centre	
January 22, 2019	Lethbridge	Lethbridge College – Garden Court Room (Parking in Garden Court area and lots labeled SPP)	

### The agenda this year will cover:

<b>Future Opportunities</b> - Market Outlook	<b>Business Planning</b> – Financial Aspects
<b>Industry Case studies</b> - Interactive Opportunities	<b>Cost of Production</b> – Tools & Benchmarks
<b>Lesson Learned on Profitability</b> - Local Producers	<b>New Cereal Varieties for Forage</b>

### How to Register

All participants are requested to register prior to Wednesday, January 9, 2019. The registration fee is \$35 and includes lunch. Registration for students and young producers (those under 25 years of age) will be sponsored by the Alberta Beef Producers. To register please call the Ag-Info Centre at 1-800-387-6030.





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## FFGA MISSION & VISION STATEMENTS

**Mission:** Assisting producers in profitably  
improving their forages and regenerating their soils  
through innovation and education.

**Vision:** We envision a global community that  
respects and values profitable forage production and  
healthy soils as our legacy for future generations.

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