Clover is the Grazier's Friend

January 2023 Newsletter

Jeff Semler, Extension Agent, UME Washington County

Clover is the grazier's friend. Here in the bleak mid-winter, you may not be thinking of anything other than how low the mercury will dip and whether you will have enough hay to last until green up.

While sipping a hot beverage by the warm fireside, I would suggest you start planning your 2023 grazing system by considering clover.

It won't be long until you can "frost seed" clover into your pastures.

While the sun is high in the winter sky and the west wind has laid by, take a walk through your fields and plan to graze those tightly you plan to frost seed.

The more open the canopy, the better chance the clover seed will hit the soil.

The grass is dormant at this time of year, so if you are ever going to overgraze your pastures, now is the time.

Next comes the debate about which clover is best. My answer is, who cares? Use red or white or both. But if you want a suggestion, go red. It is usually cheaper even though it is shorter-lived and more seed is prescribed.

The seeding rate is also highly contested. If you are only going to seed red, start with eleven pounds per acre. If you mix them, use eight pounds of red and two pounds of white. Use the varieties that are available in your area. Spin it on in late February or early March.

In North America, we fear too much clover as if anyone knows what that is. Our friends from New Zealand say we don't use enough. They like somewhere in the neighborhood of fifty percent clover.

I know that figure would keep many Americans up at night. So, for a good night's sleep, let us shoot for forty percent.

While often maligned, red clover has benefits that are often overlooked. Many people accept the protein advantage of clover in a pasture, and most understand the gift of nitrogen legumes begrudging share with their forage neighbors.

However, if you are on the fence, consider Dr. Jimmy Henning's, Extension Professor and Forage Specialist at the University of Kentucky, thoughts on the subject. "Clover has long been known to benefit ruminant producers because of its high yields, biological nitrogen fixation, summertime production, and dilution of the negative effects of tall fescue."

New research from the USDA-ARS Food Animal Production Research Unit embedded in the UK College of Agriculture Food and Environment adds even more reasons to love red clover. Red clover directly counteracts the vasoconstriction caused by the toxic endophyte of tall fescue.

The constriction of the exterior blood vessels makes ruminants less able to regulate their body temperatures, causing heat stress in summer and cold stress in winter.

Red clover has been found to contain a natural compound that causes these constricted blood vessels to dilate, restoring blood flow and relieving temperature stress.

These compounds, called isoflavones, are also present in white clover and alfalfa but at lower levels than in red clover.

Henning also says, "While alfalfa has long been known as the queen of forage crops for its ability to produce high yields and better animal performance, red clover has qualities that, in some ways, make it superior to alfalfa. Before you burn me at the stake for this bit of forage heresy, hear me out. Both legumes are highly digestible, but alfalfa, as it matures, tends to accumulate more lignin associated with plant fiber than red clover. Lignin in mature forages reduces the digestibility of the fiber. Lower lignin values in red clover give it an energy advantage."

So I hope you consider adding red clover to your pasture management system.

Cover Crops for Livestock Grazing

by David Hartman, PennState Extension

The last several years have seen a surge of interest in using cover crops in cropping rotations.

Much of the promotion of cover cropping benefits has come from farmers who have developed successful cover crop systems and have documented improvements in soil health parameters.

Some of the cover crop gurus see 'getting livestock back on the land' (i.e., grazing) as the final step in making a cover crop program reach its full potential.

Cover crop promoters who are also in the beef cattle business and graze cover crops have documented soil health improvements and at the same time realized significant savings in feeding costs.

The question gets to be 'what should I do'? The answer is not the same for every operation. There are a lot of questions to be answered before you can decide what to do.

Are you already in the cropping business? I've never been a promoter of using only annual crops for beef cow grazing.

Research by Comerford et al. at Penn State (2005) clearly showed that a system of annuals (sudangrass, rape, small grains, corn stalks) was not cost effective for grazing beef cows compared to systems of perennial grasses and legumes. However, there are windows where annuals may fit.

Renovation is one window. Another window is where the annual is being used as a cover crop in the context of a larger program. The cover crop is planted for many purposes, one of which is grazing livestock.

In this situation the beef cattle owner is also in the cash crop business or contracts with a cash crop farmer to allow grazing of cover crops. In this scenario the lengthening of the grazing season can save enough on hay costs that it could pay. And, if you are already in the cropping business, you likely own the equipment necessary to plant a cover crop.

What class of cattle do you have? Nutritional requirements vary from class to class. Properly timed plantings of annuals can make a great system to put weight on growing cattle.

PHOTO: KRISTAL MCCORMICK

In 2005 I had the opportunity to spend a week in the Pampas region of Argentina to learn more about forage finishing systems for beef cattle. One of the aspects of this that I found very impressive was how much cheap weight gain was being put on growing beef cattle by grazing cover crops after cash crops.

I refer to this as double-cropping the land with cattle. No mechanical harvest or storage systems needed. Interestingly, the primary cover crop being grazed was oats.

What are your soil types and associated drainage capabilities? Even if you don't know the actual names of your soil types, you probably have a good feel for the productive capability and the drainage characteristics of the soils on your farm.

Extremely heavy, wet soils could be a problem for grazing cover crops, since much of the timeframe for grazing cover crops might be late in the season or perhaps early the following season.

What is the fencing situation? Most land being cropped is not fenced. Then the question gets to be 'what amount of fence am I comfortable with'? There are many temporary fence options that could be employed, but they are not physical barriers.

In some areas, with low population and low levels of traffic, a cattle owner with brood cows might be comfortable with a minimal amount of fence.

In other areas of the state, where there are more people, a cattle owner would be taking a significant risk by using a temporary arrangement for fence to graze a cover crop. The decision also may differ if the cattle are young stock.

The crop species we can use for cover crops and grazing is extensive. Common choices for covers include cereal grains, oats, annual ryegrass, peas, vetch, sudangrass, brassicas, and clovers. Selection will depend on what time of the season we can plant (summer, late summer, early fall, late fall), do we want a cover that winter kills or not, seed costs, grass versus legume, etc.

Many of the aforementioned cover crop gurus who also graze cattle indicate that they have been most successful with diverse mixtures of cover crop species. Diverse mixes can serve the purpose of improving soil health, holding soil, and providing cheap forage.

Recent field trials conducted with annual ryegrass varieties at Penn State have shown impressive yields of forage. Fields were planted after corn silage harvest, around the third week of September, and harvested three times during May and June.

The top several varieties yielded over 6 tons of dry matter. I relate this to show what one species of cover crop can do in terms of providing forage, whether it be grazed or mechanically harvested.

The decision to use cover crops as part of a grazing strategy will differ from farm to farm. Each person needs to decide this based on their own resources and goals. And, as they say, if two farms are doing exactly the same thing, then probably one of them is wrong.

Grasslands, Part of the Solution

by Matt Booher, Virginia Cooperative Extension

Let's talk about beef cattle, the environment, and climate change. Are you cringing at the words yet?

A lot of times agriculture comes under attack for the impact it has on the environment, and a lot of times the knee jerk response is to deny it, or to attack someone else.

The reality is that beef cattle on the landscape can be a potential contributor to environmental problems—it depends on how they are managed. The best response to blanket criticism may be simply to offer a more complete picture that shows how livestock can be part of the solution to our environmental problems when managed responsibly and with careful stewardship of our land and water resources.

Consider some of the facts:

Virginia has almost 1 million pasture acres of pastureland. According to Virginia's latest implementation report, almost a quarter of Virginia pasture acres are currently using pasture rest and rotation as part of planned grazing.

This particular practice is credited with reducing soil erosion and nutrient loss by up to 40% compared to continuous grazing where cattle are not rotated in a timely manner.

Rotational grazing also improves plant growth, builds soil, and enables soils to hold more water—adding resilience against drought.

Have you seen farms that have fenced cattle out of streams, creating a grass or tree-covered buffer along the stream?

These buffers are credited with filtering up to 60% of nutrient pollutants from surface and shallow groundwater flows.

Fencing cattle out of the creek and using simple rotational grazing can greatly reduce the nutrient pollution and soil erosion that cause so many problems for water quality downstream.

Streamside grass or forested buffers also create and protect habitat for wildlife like brook trout, waterfowl, and pollinators. An increasing number of farms use practices that enhance upland wildlife habitat as well, such as leaving vegetative fencerows in place, or deferring hay harvest until mid-July so that ground-nesting birds can fledge their young.

PHOTO: CBF STAFF

Farms that have fenced cattle out of streams and created a grass or tree-covered buffer along the streams are credited with filtering up to 60% of nutrient pollutants from surface and shallow groundwater flows.

You may have already had a sense of how pastureland can and is being managed to minimize water pollution and help wildlife, but what about that big wildcard—climate change?

As you may know, climate change is centered around greenhouse gas emissions—our carbon footprint it is often called.

You've probably heard that beef cows are one of the biggest producers of the greenhouse gas methane, and that production and transport of feed and livestock contributes significant amounts of carbon dioxide, another greenhouse gas. These things cannot be denied, but they need to be put into perspective.

The U.S. EPA reports that beef production in the United States annually produces about 246 million metric tons of greenhouse gases. This is about 1/10 of what the U.S. transportation sector produces by using fossil fuels.

To put this in a global perspective, the United States produces about 20% of the world's beef supply and emits less than 1% of all human-caused greenhouse gases. About 1/3 of the greenhouse gas emissions produced by the beef industry in North America and here in the U.S. are the result of fertilizing, processing, and transporting feeds.

The message here is that strategies that extend the grazing season—such as stockpiling pasture and rotational grazing—not only reduce feed costs, but also help to mitigate climate change.

Does this mean supplementing cattle with grain or grain byproducts should be avoided at all cost? Not necessarily.

While the production of grain and harvested feeds emit greenhouse gases, these feeds are also more easily digested by cattle, which means that they produce less methane, in addition to being an important option to provide energy in the diet.

This means that feed supplementation often serves a strategic role in boosting the nutrition of livestock with special needs, such as lactating cattle or animals grazing poor quality pasture.

From a global perspective this kind of strategic use of feed supplementation is an important catalyst to ensure livestock grow and reproduce efficiently.

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The United Nations has identified higher quality feeds as one of the largest potential sources of greenhouse gas reductions globally. They also cite optimizing herd health, reproductive efficiency, and genetics as critical parts of reducing greenhouse gas emissions, which is surprising to some people.

Similarly, a common misconception is that the transportation of beef from farm to feedlot and retail point is a major contributor of climate change. Seems logical, but according to the United Nations assessment of emissions, transportation between farm and retail points represents less than 1% of greenhouse gases produced by the North American beef industry.

This information suggests that, despite the temptation to find a blanket solution by "going back to the old ways of doing things," the science shows that many of our modern technologies, production, and supply chain efficiencies allow us to minimize our impact on climate change.

So, while we should look for ways to reduce our carbon footprint when raising beef cattle, we should be reminded to be careful not to throw out the baby with the bathwater.

There are many other practices that are a flat win-win for livestock producers and their carbon footprints.

Well-managed pastures can be a carbon sink—meaning they actually capture and store carbon in the soil.

For example, a 10-acre pasture which practices rotational grazing and has replaced the use of nitrogen fertilizer with clover captures enough carbon to offset the greenhouse gases produced annually by four passenger vehicles.

Planting an acre of trees on a farm is the equivalent of annually removing three cars from the road.

The bottom line is that in addition to producing nutritious protein, our pastures and beef cattle can also be managed to filter water, promote wildlife, and capture carbon if we act as good managers and careful stewards.

Extending the Sheep Grazing Season Using Brassicas

by John Benner, Virginia Cooperative Extension Graze 300 team, and Alston Horn, Chesapeake Bay Foundation

One option to providing fall and winter forage is to incorporate winter annuals into a grazing system.

Winter annuals can make more efficient use of moisture, while providing greater yields over cool season grasses.

For sheep, brassicas such as turnips, rape, and kohlrabi can provide significant supplemental forage during the fall and early winter.

This article summarizes a grazing demonstration using turnips to extend the sheep grazing season at Shamoka Run Farm.

When using annuals in a grazing system we must first determine what percentage of acreage we would like to dedicate to annual plantings, and how often we will use them.

A general recommendation is to have no more than 10-20% of total grazeable acres dedicated to annual forages.

At Shamoka Run Farm, two pastures are used for annual crops. In the spring, warm season annuals utilizing pearl millet, buckwheat, partridge peas, and sunflower are planted for summer grazing.

In the fall, forage turnips and sometimes ryegrass are planted for fall and winter grazing.

Figures 1 and 2: Forage turnip field on November 3, 2022.

This year, we elected to plant only turnips to help keep seed costs low, as well as increase overall turnip vegetative yield. We expect to plant a summer mix in the field this spring.

In July we soil sampled a 7-acre annual field, at which time was planted with pearl millet. The millet was cut for hay in early August.

The soil test indicated fertility was adequate. To terminate the millet, glyphosate was applied after the hay cutting at a cost of $15 per acre ($105 total).

On August 19, 2022, we successfully planted a generic forage turnip at a rate of 4.5 pounds per acre.

We calculated seeding costs using a $5.80 per pound forage turnip cost, which gave us a seed cost of $26.10 per acre, or $182 in total.

We assumed $15 per hour of producer labor, and total time invested in seeding at 6 hours, for a total of $90 in labor costs.

We further assumed a drill rental cost of $100 per day. Thus, our total establishment cost was $105+$182+$90+$100=$477. On a per acre basis, our costs were $68 per acre.

Turnips were sampled for dry matter yield and nutrient content on November 3, after 76 days of growth (see Figures 1 & 2). Forage samples were clipped from a 1/10000-frame and dried in a forage drier.

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Yield was determined from a three-sample average. The sample yield estimate included the turnip bulb (see Table 1).

The turnip bulb likely represents much of the total dry matter. As turnips are a high moisture forage low in fiber, the sheep were allowed access to an adjacent fescue pasture.

This practice allowed the sheep to self-regulate their intake of turnips, while balancing the fiber in their diet. The sheep were turned in on November 15.

We decided to calculate a breakeven number of days grazing for the turnip seeding, comparing the establishment costs to expected costs of feeding hay during the turnip grazing.

Our hay costs were $48.75 per bale (975-pound bale, $100 per ton hay cost). Assuming 100 ewes weighing 200 pounds and consuming 3% of their body weight, puts our estimate of hay feeding costs at $30 per day.

Therefore, our breakeven number of days to graze the forage turnips compared to hay feeding for an equivalent period are: Breakeven Days of Grazing = $477/$30 = 15.9 days of grazing.

Table 1: ***Forage Turnip Yield and Nutrient Density, 11/3/22. Yield results are a three-sample average***

% Moisture	% Dry Matter	Dry Matter Yield (pounds/acre)	CP%	TDN%
83%	17%	7,474	12.6	60.1

By December 10, the flock was still continuing to pick through the turnip bulbs. In total, sheep were allowed access to the turnip field for a total of 26 days.

To be fair, not all of the flock's grazing time during that interval was spent in the turnip field. However, forage provided by the turnips was cheaper than hay past the 15th day of grazing. Using the remaining 11 days of turnip grazing past the breakeven date results in a savings of $330 for the operation.

Caution when using Brassicas

Brassicas can cause nutritional disorders in livestock if not managed correctly. As a very low fiber forage, rumen acidosis can occur with high consumption. Additionally, polioencephalomalacia, hypothyroidism, and bloat have been observed, along with several other conditions. However, the incidence of these disorders is infrequent, particularly when intake is managed. A standard recommendation is to limit brassica consumption to 70% or less of dry matter in an animal's diet.

Recommendations:

Producers who have the grazing infrastructure to incorporate annuals into their system may do well to consider planting forage turnips for sheep grazing in the fall. Producers that are rotating a field into a perennial pasture or row crop may also consider planting turnips as a smother crop and to provide supplemental forage. Producers should allow access to existing cool season grasses to help balance sheep dietary needs and lessen the risk of complications from consuming only turnips.

Figure 3: Sheep grazing November 15. Note some of the flock grazing in adjacent fescue pasture.

Figure 4: By December 10, 2022, sheep have grazed all leaf material, with some continuing to graze part of the bulbs.

How Does Winter Weather Affect Grazing Livestock?

by Matt Booher, Virginia Cooperative Extension

Have you ever wondered how winter weather affects your cattle? A review of the National Research Council's (NRC) Nutrient Requirements of Beef Cattle provides some good estimates to help us better understand how seasonal conditions can impact feed intake and energy requirements. Did you know the following?

An average temperature of 32°F increases a cow's energy needs by 5%

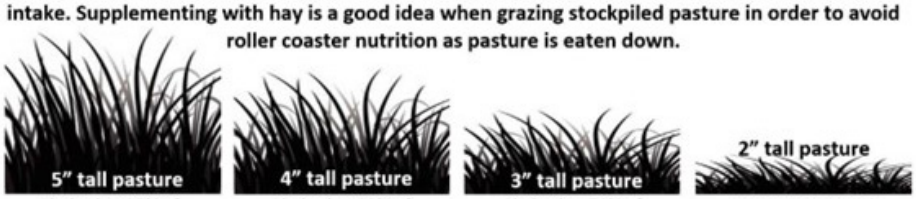
An average temperature of 14°F increases a cow's energy needs by 16%

When air temperatures are below freezing, a 10 mph wind increases the energy demands of cattle by about 20%

Cattle confined on ground with 4 inches of mud will typically *reduce* their daily feed intake by about 15%

Cattle that are consistently wet or mud-covered have a 15-20% higher energy demand than when clean and dry

Because bite size is reduced as plant height declines, winter pasture can limit a cow's daily feed intake. Supplementing with hay is a good idea when grazing stockpiled pasture in order to avoid roller coaster nutrition as pasture is eaten down.



The factors discussed here are additive, meaning cold temperatures plus muddy conditions plus wind can dramatically increase energy requirements. Recall that a lot of our first cutting hay here in Virginia can be low in energy, particularly for lactating or growing animals. A sustained 20% energy deficiency will result in a drop of one body condition score in a little over 2 months, so get your hay tested and talk to a nutritionist today!

Pastures and Mud Minimization

by Matt Booher
Virginia Cooperative Extension

Feeding hay on pasture can often lead to soil compaction, mud, and damaged pastures. When cattle have to walk through mud it significantly increases their energy demand, and when mud begins to build up on cattle it increases their energy requirements further. At the same time, livestock may actually eat less because it requires more effort to get to feed. Delivering hay and removing twine in muddy conditions while cattle crowd the feeder can also become a safety issue for you.

Mud and compaction are not only caused by hoof action, but by tractor traffic as well. While the standing pressure of a cow is around 27 psi, a tractor can place as much as 175 psi of pressure on soils. Sandy loam soils have a load carrying capacity of around 14 psi, and clay soils have a capacity of 42 psi—and these load capacities go down as soils become wet. As you can imagine, choosing well drained sites less susceptible to compaction is very important for winter hay feeding.

While some producers prefer unrolling hay to spread out pressure over a greater area and minimize soil disturbance, many people do not like the potentially greater hay waste or just prefer to keep hay feeding in one manageable location.

A solution may be to create fenceline hay feeders (see photos at bottom left) as a way to restrict tractor traffic to one path and create easy access to the feeding area. Pairing the fenceline feeder with the creation of a simple feeding pad using geotextile fabric and crushed stone can greatly reduce compaction and mud at the feeding site.

If you would like more information, check out the following publication by University of Tennessee: extension.tennessee.edu/publications/Documents/W1031.pdf

load-bearing capacities provided by Jeremy Kichler, University of Georgia Extension

UPCOMING EVENTS

Southern Maryland Forage Conference
January 17, 8:00 AM–3:30 PM
Calvert County Fairgrounds
140 Calvert Fair Drive, Prince Frederick, MD
We have a great line up of speakers to tackle the latest challenges in forage production. Attendance at this program fulfills the requirements for Private Pesticide Applicator Recertification & Nutrient Management Voucher. Registration costs $20 per person. Visit extension.umd.edu/events to register.

Central Maryland Forage Conference
January 19, 9:00 AM–3:00 PM
New Midway Volunteer Fire Company
12019 Woodsboro Pike, New Midway, MD
Topics for the event include: soil health considerations in forage systems, economics of forage production, understanding forage tests and their value, and identifying and troubleshooting issues in forage stands. Nutrient management certification and private and commercial applicator pesticide credits will be available. Registration costs $20 per person. Visit extension.umd.edu/events to register.

Franklin County Graziers Winter Meeting
January 19, 9:30 AM–2:00 PM
Chambersburg Mennonite Church
1800 Philadelphia Avenue, Chambersburg, PA
Topics include: What's a Grazing Decision Really Worth?, Lingering in the Pasture, and Grazing Cover Crops. Registration costs $20. Visit eventbrite.com/e/franklin-county-graziers-2023-winter-meeting-tickets-498840464257 to sign-up.

2023 Forage Conference
January 24, Wytheville, VA
January 25, Blackstone, VA
January 26, Warrenton, VA
January 27, Weyers Cave, VA
9:00 AM–3:00 PM each day
Join the Virginia Forage and Grassland Council as they explore how stockmanship, infrastructure, and forage management can work together to work for you. To register, visit vaforages.org/events.

Virginia No-Till Alliance Winter Conference
February 21
Agriteer
4310 South Valley Pike, Rockingham, VA
Speakers will be Dr. Greg Roth and Leslie Bowman. Dr. Roth is a Professor Emeritus of Agronomy in the Department of Plant Science at Penn State University. Leslie Bowman is the crop manager at Lesher's Poultry Farm, an integrated grain and egg producer near Chambersburg, PA. Register at virginianotill.com.

Mountains-to-Bay Grazing Alliance

VFGC

American Farmland Trust
SAVING THE LAND THAT SUSTAINS US

University of Maryland Extension
Solutions in your community

Virginia Cooperative Extension
Virginia Tech
Virginia State University
www.ext.vt.edu

Maryland Grazers Network

Maryland-Delaware Forage Council

Pasa Sustainable Agriculture

PAGLC Pennsylvania Grazing Lands Coalition

GRAZE 300
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Capital RC&D
Bridging Conservation Communities

USDA United States Department of Agriculture
Natural Resources Conservation Service

Save the Bay
Chesapeake Bay Foundation
Saving a National Treasure

Future Harvest
Chesapeake Alliance for Sustainable Agriculture

Mission Statement: The Mountains-to-Bay Grazing Alliance networks organizations within the agricultural community to support and encourage wider adoption of rotational grazing and related conservation practices that benefit water quality, improve soil health, and boost farm economies.

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