



February 2025 Newsletter

## Five Commandments for Bale Grazing in the East

by Greg Halich, University of Kentucky Department of Agricultural Economics

Bale grazing in the eastern U.S. has its challenges compared to traditional, more Northern regions where the system is used. To be successful in areas with more moderate winters, you need to do a few things differently. In my experience, there are a number of fundamental concepts that need to be followed to make bale grazing work well.

I have had many people tell me they tried bale grazing and that it will not work under conditions such as those found in Kentucky. In just about every case where they explained how they were implementing bale grazing, they were not adhering to one or more of the following fundamental concepts, which I will frame as the “Five commandments for bale grazing in the East.”

### 1) Thou shall not feed more than 2 tons of hay per acre.

The biggest problem I see with bale grazing in the eastern U.S. is feeding at densities that are much too high for our winter conditions. This typically results in pastures that are severely pugged.

Why do so many people make this mistake? If you do an internet search for videos or images of bale grazing, the odds are good you will find something from the Great Plains or Canada.

This is where bale grazing first became popular and is a common form of wintering cattle today.

This region is characterized by cold winters, where the soil is frozen solid for months, and significantly lower levels of precipitation

compared to the eastern U.S. These two factors combine to provide a long window of prime feeding conditions of either dry or frozen ground that results in minimal soil disturbance from bale grazing. This allows animals to be fed at high densities, and pugging is rarely an issue.

This same high-density bale grazing will not work well in most of the East. Sometimes, you will get lucky and conditions will be dry or frozen for a period of time, and the bale grazing will go reasonably well. But at some point, the soil will become saturated, the sod will start falling apart, and pastures will turn into mud holes.

What is the ideal hay density to avoid severe pugging? The answer will depend on the soil type, management skills, cattle size, and other factors.

For beginning bale grazers, I like to see a maximum of around 2 tons of hay fed to the acre, which is roughly four 5x5 bales or five 4x5 bales. Except with the most extreme weather or with poorly drained soils, this will generally keep pugging to acceptable levels.

There are many situations where 4 tons per acre would likely be fine, but you will not know this until you have gained experience.

For the majority of farms, 2 tons per acre is a good place to start.

### 2) Thou shall not allow cattle unfettered access to a pasture.

The only way I have seen bale grazing work well in the East is by using temporary electric

fencing and rotational grazing techniques to ration out the hay and to make sure the cattle are constantly getting fresh pasture every one to seven days.

I have seen farms try to implement bale grazing without using temporary electric fencing.

They either set hay out every few days, gradually spreading the bales around the pasture, or put out four to eight bales at a time in a few large pastures. They then rotate cattle from one pasture to the next and do it all over again when they get to the end. I have not seen even one of these situations turn out where the farmer was happy with the results. Usually, there is a lot more pugging than they were expecting.

Why is this? With well-managed bale grazing, cattle will always be getting “fresh” ground every time the fence is moved forward, which, if planned correctly, hasn’t seen a cow hoof since early to mid-fall. This unimpacted ground will be a lot more resilient compared to ground that cattle have been walking over for weeks or months at a time.

Cattle that have unfettered access to a large pasture are going to tend to wander, especially if they get hungry. It is during these times of aimless walking that the cattle are causing the most damage.

Sometimes the damage is not obvious in that there is not much mud, but the sod becomes weakened from all of the hoof traffic.

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When you then drive over that ground with a tractor or feed a bale in that location, the sod will come apart much quicker compared to “fresh” ground.

Where the fence is constantly being moved forward, cattle will spend the vast majority of their time on that new strip of pasture with the new bales of hay.

The ground will be cleaner and drier than the pasture they previously had access to. As a general rule, they will spend a lot less time walking around, even though they have access to the areas they have already bale grazed in that pasture. The end result is much less damage to pastures compared to cattle having unfettered access to the pasture.

### **3) Thou shall not set out hay piecemeal.**

A major benefit of well-planned bale grazing is a significant reduction in machinery and labor costs compared to any other form of winter hay feeding.

This benefit is made possible by setting out a large percentage of the winter hay needs at one time. It should be obvious that setting out a wagon or trailer load of hay will be more efficient than setting out one to two bales at a time. But what might not be as intuitive is why setting out multiple wagon or trailer loads of hay can be much more efficient than setting out just one at a time.

Once you have the equipment ready, the more hay you can move before that equipment is put away, the greater the efficiencies will be.

You are spending less time per unit of hay moved hooking up equipment, opening and shutting barn doors, inflating wagon tires, getting yourself and your helpers ready, and then putting everything away when you are finished. These are “setup costs,” and it doesn't matter if you move one load or 10 loads of hay, they will be the same.

The other reason that setting out a large portion of your hay at one time is generally more efficient is that it allows you (with proper planning) to wait for soil conditions that are near optimal to move hay—either dry (best) or frozen ground.

Hay can be moved more efficiently in these conditions compared to even slightly wet conditions. For example, I can pull a fully loaded wagon of hay with a medium-sized pickup truck about anywhere on either of

my two farms when conditions are dry, but I struggle to pull a wagon with even a few bales when the soil is saturated.

When both of these efficiencies are combined, it is amazing how quickly you can move hay.

My favorite example is with a farm I'd been working with that was starting into their third year of bale grazing. Up to that point, they were putting hay out mostly one load at a time. That third fall, with some encouragement, they set out all the hay they needed for a 40-cow herd in just under four hours (two people with a tractor-loader and pickup with trailer). The hay lasted from late November until early March. During that time, they never had a tractor on that farm. They moved the cattle every five to seven days, spending an hour on average moving the fence and four hay rings to the next set of bales. I could not believe how drastic a time saver it turned out for them.

You don't have to set out this much hay at a time, but I generally advise setting out at least a third of your overall hay needs. This will capture the bulk of the cost-saving efficiencies compared to setting out hay piecemeal.

Just don't wait until you are within a week of running out of hay. In most of the East, you can easily have two- to three-week periods where ground conditions are constantly wet.

### **4) Thou shall not bale graze the same pasture more than once per winter.**

About six years ago, I was helping a farm implement bale grazing and they underestimated how much hay they would need to get the cattle through the winter. They bale grazed over the entire farm and still had two to three weeks left to feed hay.

They set out more hay on the first pasture they bale grazed. I suspected that pasture would be set back a bit, but I was completely surprised by the severity: A month into the growing season, the pasture still did not look like it was thick enough to graze. By early summer it looked fine, but much of the spring growth potential was lost.

I have seen the same thing happen on other farms after this experience, and thus my general recommendation is that you should never bale graze twice in the same pasture in a given winter.

The only exception to this rule is if you are purposely trying to set back the pasture for something like overseeding clover.

In this case, setting the pasture back temporarily can be a benefit for the establishment of developing forage seedlings and their ability to compete with the existing sod.

### **5) Thou shall not let your cattle go hungry.**

This really is a rule that should apply to any feeding method. As the old saying goes, “You can't starve a profit out of a cow.”

But it can be particularly important with bale grazing because cattle can and typically do have access to large areas of pasture. With well-managed bale grazing, cattle will spend the vast majority of their time on the new strip of pasture they have with the current bales they are eating. This is assuming they have adequate feed in the strip of pasture (hay and possibly stockpiled forages).

However, if the cattle are hungry, they are going to wander around the pasture, and that is going to be when most of the damage occurs. You do not want your cattle to move around the pasture, especially when it is wet. You want them content and either actively eating or lounging on the clean and dry section of new pasture.

Making sure your cattle don't go hungry will go a long way in keeping bale grazing damage to a minimum.

It can be done.

There are some really wet-natured soils that, even if following these rules, you will still have pugging problems with when the soils become wet and saturated.

On most farms, however, following these rules will help avoid the bulk of the pitfalls that can cause bale grazing to be a bad experience in the eastern half of the U.S.

Don't let the challenges of bale grazing in this region scare you off from implementing this winter feeding technique. It can be done effectively; you just need to learn a few fundamental concepts to make it work well.

*This article first appeared in the November 2023 issue of Hay and Forage Grower magazine.*

# Winter Care Tips for Watering Systems

by Cory Guilliams, NRCS District Conservationist

## For Frost Proof Water Troughs on Pressurized Systems

Properly adjust the level of floats so that balls or discs are not too tight against the lid of the trough or too far below the lid of the trough.

Balls or discs that are too tight freeze to the lid quicker during cold weather. Balls or discs that are too low allow cold air into the trough that can freeze water, the float valve, and/or the water the supply pipe.

Ideally, in the winter months, balls or discs should just barely be touching the lid of the trough.

Perform needed cleanings of the inside of troughs before cold weather to prevent ice from forming on trough pads when troughs are drained.

If a trough needs to be cleaned out during the middle of winter, do so on a day when the weather is nice and temperatures are above freezing.

When performing cleanings, try to clean sediment, minerals, and feed trapped under the service access lid of the trough. Doing this can allow for easier access should the lid need to be removed during freezing temperatures.

When temperatures are below freezing, check troughs daily to make sure livestock are getting water from them.

If the balls or discs are frozen in place, a rubber mallet, boot heel, or baseball bat can be gently tapped against them to knock them free. If this doesn't work, dumping hot water on and around them can often free them.

I know one producer who attaches a dryer vent hose to his truck's exhaust and uses it to direct hot exhaust to thaw things out.

After balls or discs are freed, try to observe livestock drinking from the trough to make sure that the float valve is not frozen too and that water is flowing into the trough.

During continuous days below freezing, feed closer (around 200'-300') from the trough to ensure adequate water intake and help keep troughs ice free. During normal weather with days above freezing, return to feeding at sites spread out across the entire pasture.



PHOTO: CBF STAFF

If water is not flowing into a trough during freezing weather, remove the trough's service access lid and check the float valve to make sure that it isn't frozen.

If it is frozen, it can generally be thawed out by dumping hot water over it or applying heat from a heat gun or propane torch. If a heat gun or propane torch is used to thaw out a frozen float valve, do not to melt the valve, float arm, and trough.

Depending upon the brand of trough, the service access lid may need to have hot water dumped around it to melt any ice present and a large flathead screwdriver may need to be used to pry the lid open.

If water is not flowing into a trough during freezing weather and the trough's float valve is not frozen, this generally means that there is a pipeline frozen somewhere in the water system or that the pipe leading to the pressure switch could be frozen and not triggering the well pump to cut on.

Check other troughs or open a hydrant in the water system to see if they are getting water. If they are getting water, this usually means that the pipeline leading to the nonfunctioning trough is frozen somewhere. This may not be an easy fix, and alternative watering arrangements may need to be made until warmer temperatures allow the pipeline to thaw out.

If other troughs or hydrants in the water system are not getting water too, this could mean that the pipe leading to the pressure switch is frozen, in which case the whole water system is down.

Go to the location where the pressure switch is housed for the water system and observe the pressure gauge to see if it is moving at all (indicating water flow and/or pump activity).

If it is motionless, then it is likely that the pipe leading to pressure switch is frozen. This pipe can be unthawed similarly to unthawing a frozen float valve on a trough, depending on the setup of the pressure switch.

Hot water can be splashed or poured on this pipe, being careful not to get water on the switch itself, or a heat gun or propane torch can be used, being careful not to melt plastic pipe.

It shouldn't take too much heat to thaw the pipe leading to the pressure switch. The pressure switch will generally click, cutting the well pump on when the pipe is thawed and water can flow.

If water is still not flowing in the system at this point, there could be water frozen in a main supply pipe in the system, which can be difficult to locate and fix easily.

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To help keep pressure switches in water systems from freezing during the winter months, install them in an area insulated from cold temperatures such as in a basement of a house, heated shop, pumphouse, or in a buried concrete vault.

For pressure switches that are installed in areas that are susceptible to freezing temperatures, consider adding a small space heater with a thermostat to the area that can keep the temperature at least in the low to mid 40s, installing heat tape on the pipeline leading to the pressure switch, or installing a heat lamp or a minimum of a 100 watt incandescent light bulb near and directed at the pressure switch.

For water troughs that will not be used during the winter months by livestock, there are two main schools of thought on what to do with them:

Just walk away and leave them on over the winter. This thought is okay and has worked well for many farmers over the years.

The troughs will overflow with rainfall and other winter precipitation but this should not hurt anything and will keep the trough sealed up to protect the float valve and pipeline from freezing.

Wildlife will take advantage of the available water source throughout the winter.

Before the trough is used by livestock in the spring, it should be thoroughly cleaned out and the float should be checked and readjusted as needed to keep it from overflowing.

Cut them off over the winter. This thought is okay too and has worked well for many farmers over the years.

Using this method, the water supply to a trough is cut off and the drain plug is often removed to drain the trough so that it doesn't hold water over the winter.

In doing this, it is critical to drain or bleed the water out of the pipeline under the trough so that the float valve and pipe do not freeze and bust over the winter since cold air will be allowed to enter into the trough and float valve area.

Some farmers who cut their troughs off do not remove the drain plug and drain the trough. This method is okay too so long as water is drained or bled from the pipeline under the trough. The trough will still get water from direct rainfall and other winter precipitation; however, wildlife could drink the water level down and allow cold air to get to the float valve area.

Some farmers will put a cover (tied on/down tarp or heavy canvas) over water troughs after they have cut them off for the winter. This will help keep wildlife out and can help provide some extra insulation over the winter months.

Regardless of how a trough is cared for after being turned off over the winter months, it should be thoroughly cleaned out and the float should be checked and readjusted as needed to keep the trough from overflowing before livestock start using it again in the spring.

#### **Winter Care Tips for Water Troughs with Electric Heaters**

Going into the winter months and regularly throughout their use over the winter months, electric trough water heaters should be checked to make sure that they are working properly.

At a minimum, they should be checked to make sure that they are functional, not warming water too much or too little, and that they are not shorting out and putting electricity into the water. Even the slightest amount of electricity in water can be harmful to livestock and/or will keep them from drinking.

#### **Winter Care Tips for Open Water Troughs on Pressurized Systems**

Many open concrete troughs or heavy equipment tire troughs on pressurized systems store a large enough volume of water that, when livestock are regularly using them, it takes prolonged freezing temperatures to freeze the water to the point that livestock can't get water from them; however, they can and will freeze at times.

During freezing weather, these troughs should be checked regularly to make sure livestock are getting water from them.

If they are frozen, ice should be broken up and removed from the trough if possible. A

hatchet, small axe, claw hammer, and large screwdriver are great tools to break ice in troughs and scoop shovels, pitchforks, and flat bottom shovels are great tools for removing ice from troughs. Ice removed from troughs should be piled away from the trough so that use of the troughs by livestock is not encumbered by the piled ice.

To help prevent float valves in open water troughs from freezing during prolonged freezing temperatures in the winter months, consider installing a submerged float valve that sits at or slightly above the bottom of a water trough.

This style of valve (often called a "bob float valve") generally consists of a valve with a plastic or metal float attached via an easily adjustable cord or chain.

There are multiple brands of this type system available to livestock producers (e.g. Jobe, Gallagher). This style of float valve is also a great replacement for standard surface floats valves that livestock can knock easily out of adjustment.

#### **Winter Care Tips for Conventional Livestock Water Sources**

Many livestock still get their water from conventional flowing sources such as streams, rivers, springs, and spring branches and stagnant sources such as ponds, dug watering holes, and seeps.

While these water sources are typically reliable and maintenance free, they can be susceptible to freezing during prolonged cold weather.

During extended periods of temperatures below freezing, these water features should be checked regularly to make sure livestock are able to get water from them, especially if they are the only or primary water source available.

If these water features are frozen, ice should be broken and removed in an area big enough for livestock to gain access to drink.

Hatchets, axes, sledgehammers, and tractor or skid loader buckets are all great tools to break ice in frozen water features and scoop shovels, pitchforks, flat bottom shovels, and equipment loader buckets are great tools for removing ice from access areas.

# Grazing Tall Fescue in Winter

by Sjoerd Willem Duiker, PennState Extension

Tall fescue is a cool-season grass with unique properties that explain its dominance in 40 million acres of U.S. pastures. Most of these acres are dominated by unimproved tall fescue.

The predominant feature of tall fescue is its persistence, even under abuse. It has a very tough root system, survives drought periods, is resistant to most insect pests, and comes back after overgrazing.

These characteristics can partly be attributed to an endophytic fungus that lives in symbiosis with the plant. Endophytic means 'inside the plant' because this fungus lives inside tall fescue plants.

It will proliferate throughout the plant, although it is especially concentrated in the lower stem and in the seed.

The endophyte produces alkaloid compounds that help protect the plant from pests, diseases, and drought. In return, the plant provides carbohydrates and nutrients to the fungus.

The problem is that the alkaloids also cause animal health problems at high concentrations due to vasoconstriction—blood vessels in animals contract causing poor blood circulation.

This can cause things like hoof and foot problems, poor hair growth, and overheating in summer, which in turn can affect animal health, reproduction, and growth.

If you plan on renovating a pasture you should choose endophyte-free or endophyte-friendly varieties available from your seed supplier.

However, if you have an unimproved tall fescue pasture you can still use it in a grazing plan if you follow these guidelines:

**Grazing or mow spring growth, leaving at least 3–4 inches of stubble.** The alkaloid concentration is highest in the seed heads, so you want to avoid this grass from creating seed.

Tall fescue only produces heads on the first spring growth, so managing it this way will effectively suppress seed head production.



Cattle grazing on tall fescue in the winter.

The alkaloid concentration is higher in the lower plant part than in the tops of leaves, so do not graze below 3 inches stubble height.

**Rest tall fescue in summer.** Tall fescue slows down its growth in the heat of summer while the alkaloid concentration increases.

Above 88°F, animals become highly sensitive to the alkaloid (probably because of excessive heat stress).

These rested pastures should be reserved for stockpiling—grazing in winter.

**Grazing tall fescue in winter.** Tall fescue has rigid leaves that keep quality better under snow than other grasses that tend to mat down more.

Further, its robust root system withstands the effects of hoof impact better than that of most other forages.

Finally, the alkaloid concentration in the standing forage decreases as much as 85% as winter progresses.

By grazing tall fescue in the winter, you can really extend your grazing season, which means more natural and economical animal nutrition.

**Increase plant diversity.** 'Dilution is the solution to pollution'. Therefore, including companion species with tall fescue reduces the toxic effect of the alkaloid. Other grass species can be mixed with tall fescue, while

legumes are especially suited as companion species.

Red clover is especially effective because it has 'vasodilating' or blood vessel-widening properties. Frost seeding red clover into tall fescue stands can be done in the coming months.

**Supplement with grain.** While this is not an option if you are on an 'all forage' diet, supplementing 0.6% of body weight per day of corn grain will help reduce the effects of alkaloids, supply energy to the animals, and will not interfere with fiber digestion (the latter becomes a problem at higher corn supplementation rates).

Corn gluten can be fed at higher rates without endangering fiber digestion.

With proper management, unimproved tall fescue stands can still be used successfully in a grazing plan with the unique opportunity to use it for winter grazing.

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# New Support for Graziers

by Genevieve Lister, NRCS

USDA's Natural Resources Conservation Service (NRCS) is now offering technical and financial assistance for producers interested in portable shade shelters, annual forage grazing, and bale grazing.

Using portable shade shelters within a grazing system can help livestock distribute grazing and depositing nutrients throughout pastures and use forage more efficiently. They can help extend the grazing season in pastures with limited or sensitive shade areas.

Annual forages for grazing systems is a new practice to support graziers who are growing annual crops specifically for grazing or fodder. This can increase forage supply during periods of low forage production and extend the grazing season.

Bale grazing can be used to extend the grazing season on pastures by strategically placing hay bales for feeding in areas with poor soil quality to encourage the cattle to spend more time there.

The dry matter of the hay and concentrated organic matter from the cows can increase

the organic matter in that specific area to improve forage and soil quality, and soil's water holding capacity and microbe activity.

Consider incorporating these new practices into your grazing system to improve the efficiency of your operation.

If you're just getting started with rotational grazing, NRCS offers the prescribed grazing practice to help with grazing management. We can also help with fencing and watering systems to support prescribed grazing.

Funding to help producers adopt prescribed grazing, portable shade shelters, and annual forage grazing is provided through the [Environmental Quality Incentives Program \(EQIP\)](#).

EQIP helps producers of all types improve the natural resources on their land by offering technical and financial assistance for more than 165 conservation practices.

Bale grazing is one of more than 140 enhancements offered through the [Conservation Stewardship Program \(CSP\)](#).

CSP is for producers who have already applied conservation practices and want to improve their conservation efforts with enhancements. CSP is a 5-year program that offers minimum annual payments of \$4,000 to adopt new enhancements and maintain your existing conservation efforts.

NRCS accepts EQIP and CSP applications year-round and funding is provided through a competitive process. The next cutoff date to evaluate applications for funding is February 7 in Maryland. If you apply after the application cut-off date, your application will automatically be deferred to the next funding cycle.

[Contact your local USDA Service Center](#) and let them know you are interested in improving your grazing operation through NRCS programs.

A conservation planner will work with you to select conservation practices and enhancements to fit your goals and determine program eligibility. For more information about NRCS programs and services, visit [nrcs.usda.gov](https://nrcs.usda.gov).



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The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government or the National Fish and Wildlife Foundation and its funding sources. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government, or the National Fish and Wildlife Foundation or its funding sources.

# UPCOMING EVENTS

**Pasture Renovation**  
February 5, 6:40 PM–8:10 PM  
Virtual Zoom event

We will review and discuss the six critical steps for pasture renovation. It is important to note that pastures decline over time, but with proper care, the rate and severity of decline can be avoided. We will discuss, renovation of feeding areas, grazing methods and soil testing. The workshop will answer several questions, including how to improve your pasture and why it is worth the effort. Register at [ext.vsu.edu/events](http://ext.vsu.edu/events).

**PA Forage Conference**  
February 12, 8:30 AM–3:00 PM  
Overton Village & Museum  
109 W. Overton Road, Scottsdale, PA  
Register by visiting [paglc.org/events-calendar](http://paglc.org/events-calendar).

**Trees for Shade: Silvopasture Landowner Workshop**  
February 20, 6:00 PM–7:30 PM  
George Washington Carver Agricultural Research Center  
9432 N. James Madison Hwy, Rapidan, VA  
Join Rappahannock River Roundtable for presentations, discussion, and valuable insights into silvopasture practices, resources available to support projects, and meet with technical staff from excellent conservation organizations. This workshop will feature engaging presentations from multiple expert organizations, offering the latest research, innovative techniques, and practical guidance on integrating trees, livestock, and forage for sustainable land management. To register, visit [rappahannockroundtable.org](http://rappahannockroundtable.org).

**Southeast PA Grazing Conference**  
February 19-20, 8:30 AM–5:00 PM  
Solanco Fairgrounds  
172 S. Lime Street, Quarryville, PA  
This conference features speakers who will discuss building community with stewardship. For more information and to register, visit [paglc.org/events-calendar](http://paglc.org/events-calendar).

**Knee-Deep Grazing and Pasture Management Series**  
February 26, 5:00 PM–8:00 PM  
March 5, 4:00 PM–8:00 PM  
Valley Pike Farm Market, Weyers Cave, VA  
Join us for this comprehensive short course on how to design and implement a managed grazing system. To register, contact Matt Booher at 540-325-7503 or at [mrbooher@vt.edu](mailto:mrbooher@vt.edu).

**Western PA Grazing Conference**  
March 13, 7:30 AM–5:00 PM  
Trinity Point Church of God  
180 W. Trinity Drive, Clarion, PA  
This conference promotes sustainable grazing practices to the farming community and educational information to both new and experienced farmers. For an agenda and to register, visit [westernpagrazing.com](http://westernpagrazing.com).

**Fundamentals of Sheep Production**  
March 29, 10:00 AM–3:15 PM  
Frederick County Fairgrounds  
797 E. Patrick Street, Building 7  
Frederick, MD 21701  
A free event for sheep producers of all ages and experience levels. Learn the basics of raising sheep, including health, nutrition, facilities, and fencing. Network with fellow producers and join breakout sessions after lunch. Register by visiting [go.umd.edu/sheepbasics](http://go.umd.edu/sheepbasics).

## Mountains-to-Bay Grazing Alliance

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