

# MOUNTAINS-TO-BAY GRAZING ALLIANCE

Working with farmers to implement and improve grazing management and reduce feed costs

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## Tall Fescue, Friend or Foe?

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Across the Mid-Atlantic, tall fescue covers millions of acres, making it one of, if not the, dominant forage in many of our cool-season perennial pastures.

Release of the Kentucky 31 (K-31) variety of tall fescue in the 1940s had a large impact on the forage and livestock industry.

Today there are approximately 40 million acres of tall fescue pastures across the United States, much of it K-31. However, even with its widespread use, this may still be the most mismanaged and misunderstood perennial forage around.

Kentucky 31 tall fescue is infected with a fungal endophyte. This fungus lives between the cells of the plant as part of a symbiotic relationship.

The plant provides the endophyte with shelter and nutrients—a place for the fungus to live and reproduce. The endophyte returns the favor by producing alkaloid compounds that provide the plant with insect and drought resistance, grazing tolerance, and overall plant persistence.

Regrettably, some of the alkaloids produced by an endophyte-infected plant cause poor animal performance, including low average daily gain, decreased reproductive performance, rough hair coats, elevated body temperatures, etc.

Collectively, this poor performance is referred to as fescue toxicosis and is the reason many producers have developed a bad taste for tall fescue.

As a result of this, for many people, the mere mention of tall fescue brings an automatic dismissal conjuring up bad experiences with poor animal performance.

However, while fescue toxicosis can be a very real and valid concern, one could also argue that there is a time and a place for fescue if managed appropriately.

Given the prevalence of this type of tall fescue, there are several steps producers can take to reduce fescue toxicosis and mitigate its harmful effects without a complete stand renovation. Some practical methods to achieve this are discussed below.

### Rotation

For several reasons, moving cattle off of fescue during the hot summer months greatly increases animal performance.

First, fescue is not productive during the summer months, so moving cattle to a summer pasture simply gives them something to graze.

Second, high temperatures can intensify the toxic effect of infected fescue, so moving

cattle to a non-toxic pasture can help eliminate this summer slump.

Research suggests that 88 degrees Fahrenheit may be a threshold for significantly decreased gain.

Additionally, after moving, cattle should remain off of infected tall fescue for the entire summer. Research also indicates a residual effect of toxicity, suggesting that rotating off of tall fescue for only one to two weeks will not greatly reduce the summer slump.

Using rotation within a grazing system will also help with avoiding close grazing.

The highest levels of alkaloids are typically found in the bottom three inches of the fescue plant so by leaving a greater amount of residual (ungrazed) forage, you will also be limiting the animals' exposure to the most toxic forage.

As an additional bonus, grazing no shorter than 3-4 inches will also help improve stand persistence long term.

### Timing

Tall fescue pastures should be grazed when the endophyte concentrations are naturally lower.

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The endophyte concentrates in the lower parts of the plants until the plant goes reproductive. At that time, the endophyte grows through the stem and eventually, alkaloids concentrate in the seed—so avoid grazing tall fescue when seedheads appear.

Tall fescue produces seedheads during the first spring growth only, so one option is to graze the fescue aggressively in the spring to a 3-4 inch stubble height to keep it from going to seed.

Another option is to clip seedheads or mow tall fescue pastures in the spring to make hay.

Timing can also be used to your advantage by stockpiling tall fescue for later grazing.

Tall fescue is one of the preferred grasses for stockpiling. It grows well during the late summer and fall and its nutritional value improves in the fall as temperatures drop; thus, its feed quality is often better than other grasses in the winter.

Recent research has shown that alkaloid concentrations decrease as much as 85% from December to March, making late winter grazing of stockpiled fescue a great option.

Tall fescue also has great standability in winter due to its relatively rigid leaves and robust root system.

Its rigid leaves make it easier for livestock to graze during the winter months, and its robust root system withstands freezing and thawing cycles well.

This characteristic also makes fescue an ideal candidate for grazing during wetter soil conditions. Furthermore, it is highly persistent, so it is likely to come back, even after mistreatment or when grazed under poor conditions.

### Dilution

Ever heard the phrase “dilution is the solution to pollution?” The toxic effects of infected Kentucky 31 tall fescue can be diluted by adding diversity to a pasture, particularly with legumes.

In the Mid-Atlantic region, common grazing legumes for interseeding include red



clover, white clover, alfalfa, and birdsfoot trefoil. Each of these legumes differs in its persistence and growth characteristics, but all can be maintained with proper management.

Keep in mind that legumes should be inoculated, and red clover and birdsfoot trefoil will require occasional reseeding if they are not allowed to reseed naturally every couple years.

These legumes not only help add species diversity and reduce the total toxin concentration within a pasture, but they also serve as a protein-rich companion to the fescue.

Because they have the capability to fix nitrogen, large nitrogen applications are no longer needed (and nitrogen fertilization has been shown to raise alkaloid levels).

Red clover in particular shows promise as a companion of tall fescue because research has revealed that it produces artery-dilating isoflavones that have the ability to counteract the artery-restricting effect of alkaloids from the tall fescue endophyte.

Unfortunately, clover loses its leaves sometime after a frost, so graze the fescue/clover stands prior to a hard frost and keep the pure fescue stands for stockpiling.

### Supplementation

Supplementing with corn or other feeds also reduces the toxic effects of the endophyte on cattle.

Although feeding corn at a rate of one percent of body weight can be effective, it may

interfere with efficient forage fiber digestion.

For this reason, feeding corn at a rate of 0.6 percent of body weight offers an economic compromise—it allows efficient digestion of forage fiber, lowers feed costs, and reduces the effects of toxicity.

An alternate supplement is corn gluten feed, which can be fed at a higher rate without greatly reducing fiber digestion.

In summary, while these recommendations may not totally eliminate the risk of fescue toxicosis, they do provide some tools to help minimize its effects while capitalizing on the positive attributes of a tall fescue stand.

When managed to its advantages, endophyte-infected tall fescue can be a valuable tool in a grazer's toolbox.

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# A Recipe for Successful Weed Control in Pasture and Hay

by Matt Booher, Virginia Cooperative Extension

“In this world nothing can be said to be certain, except death and taxes.” Obviously, Benjamin Franklin was not a farmer, or else he would have added weeds to that list.

Death, taxes, and weeds. We all have weeds, and there are a variety of approaches to controlling them: mowing, grazing, herbicides, and fertility to name the major ones.

The use of many different tactics, including biological, mechanical, cultural, and chemical means, to control pests is called integrated pest management or IPM for short.

One of the often-forgotten tenets of IPM is the idea that using a combination of methods is more successful than any single method, since pests can and do find ways around our efforts to control them.

Within this concept, experience has shown me that the use of herbicides can be an important tool for controlling weeds—and a responsible option when used according to the label.

How exactly does an herbicide label help us be responsible? An herbicide label is the summation of all the research conducted by industry and EPA experts on a particular herbicide, and this information informs guidelines about how to minimize risk to wildlife, water, the environment, and people.

Many herbicides are no longer sold or never even come to market because it is determined that their risk could not be managed effectively.

The herbicides that are available to use in pasture and hay systems provide guidelines about when to spray, what rates should be used, what personal protective equipment is needed, and what kind of setback from water is required.

I encourage you to consider herbicides as an option for weed control, not because I like chemicals, but because I've quite often seen the strategic use of herbicides prevent the need for extensive herbicide usage down the road. I'll give you a quick example.

Farmer Jones starts to see a couple of small

patches of horsenettle, a creeping perennial weed, in his 100-acre pasture field. Despite attempts to graze and mow it out, three years later the weed has taken over the field.

Farmer Jones is frustrated, the cattle waste a lot of grass in avoiding the thorny weed, and ultimately, the local co-op is called in to spray a broadcast application totaling 26 gallons of GrazonNext HL over the field.

If Farmer Jones had spent an hour with a backpack or 4-wheeler sprayer to stop those small patches of horsenettle before they spread, he may have used ounces of herbicide, put the sprayer away, and been done.

Likewise, there are many new invasive weeds out there that, if left to get established, will end up doing more harm to plant and wildlife communities than a strategically applied herbicide application.

Please consider herbicides as part of an IPM program in conjunction with strategic mowing, high-intensity grazing, and other methods.

That all being said, here are some thoughts about how to spray herbicides strategically. Weed control in pasture and hay is as much a matter of when you spray as it is what you spray. Let's take a moment to first review the basic weed life cycles.

Annual weeds complete their life cycle within a year. Winter annuals such as prickly lettuce or wild mustard typically germinate in fall, overwinter as seedlings, and flower in spring.

Summer annuals such as spiny pigweed, perilla mint, ragweed, cocklebur, and woolly croton germinate in spring or summer and set seed and die in the summer or fall. A hard frost will kill summer annuals.

Biennial weeds take two growing seasons to complete their life-cycle. Wild carrot, most thistles, common mullein, and burdock are a few examples you may be familiar with. The timing of germination varies widely, but the important thing to know is that biennials overwinter as a low-growing clump of leaves shaped like a dinner plate. This young plant is called a rosette. Biennials flower, set seed, and die sometime in the summer or fall of



Thistles need to be sprayed in the rosette stage to be effective—not when they are fully mature.

their second growing season.

Annuals and biennials have to be targeted with herbicides when they are small. For annuals this means the seedling stage, generally when the plant is less than six-inches tall. Similarly, biennials need to be sprayed in the seedling or rosette stage. Obviously, all weeds will not be in the same stage at the same time, so there is a bit of an art to observing when the major flushes of various weed species are ready to spray.

The take-home message is that the effectiveness of herbicides drops rapidly once plants begin upright growth and formation of a seedstalk—otherwise known as “bolting.” Once bolting starts you'll get better results by cussing at the weeds than you will by spraying them, and it's much cheaper. Unfortunately, there are a lot of farmers who wait until their thistle or cocklebur patches are waist high before spraying them. It doesn't achieve much, which is why I often hear it referred to as “recreational spraying.” In general, spray for summer annuals in early summer. Winter annuals and biennials are best targeted in mid-fall through late-winter, depending on where you are located. Here in Virginia, there can be some mild winter days that are perfect for killing next summer's crop of thistles.

I'm going to go out on a limb and offer a couple simple herbicide recipes for annual and biennial broadleaf weeds in cool-season forages, since there are some general ones that work well no matter where you live, provided you get the timing right. It goes without saying that you should follow the label and research your specific situation before using any herbicide. The rates I've shown are middle-of-the-road; read the label for more guidance.

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I've given the per acre recipe, but if you are in more of a spot-spray scenario, you can reduce it to a per gallon basis. Most people in this situation tend to apply at a heavier rate, so the spray mixture concentration required will be lower. When spot spraying, if you spray foliage until thoroughly wet but not to the point of runoff—you are likely somewhere around 80 gallons per acre. Armed with this knowledge, we can adapt the recipe for small batches. It works well to use a disposable syringe to measure small amounts by mL, so I've included that here as well.

2,4-D and dicamba are effective and commonly available under many brand and generic names. They work very well mixed together.

**2,4-D + dicamba (per acre)**

20 gallons water  
2 ½ pints 2,4-D  
8 oz. dicamba  
8 oz. non-ionic surfactant

**2,4-D + dicamba (small-batch)**

1 gallon water  
16 mL (1/2 oz.) 2,4-D  
3 mL (1/10 oz.) dicamba  
9.5 mL (1/3 oz.) non-ionic surfactant

Metsulfuron methyl is another fairly common product available (sometimes paired with other active ingredients). It comes as a dispersible granule with a low use-rate, so it is generally too hard to measure out for a small batch.

**Metsulfuron + Chlorosulfuron (per acre)**

20 gallons water  
0.25 oz. Cimarron Plus® or generic  
8 oz. non-ionic surfactant  
\*can harm fescue or timothy

Perennial weeds are a whole different beast. When young they are much the same as an annual or biennial that is in the seedling stage—relatively small and susceptible to herbicides. Once established however, perennial weeds contain extensive stores of energy that allow them to regrow despite your hard work with the bushhog or sprayer.

Dogbane, milkweed, horsenettle, Canada thistle, devil's shoestring, leafy spurge. Sound familiar? Given free reign they will come back

stronger each year. Often perennials possess creeping root systems or underground stems (rhizomes) that not only store energy but also allow it to spread from the mother plant to form large colonies. You've no doubt seen this for yourself and would likely not be surprised to learn that a weed patch acres in size could theoretically be one plant.

The secret to control lies again in timing. An established perennial should be targeted with herbicides when it is close to or just starting to develop flower buds (usually around a quarter of the plant's mature height) in late-spring or early-summer.

Since herbicides move like sugars within the plant, spraying too early in the season (when sugars are still flowing upward from the roots) will result in herbicide that fails to reach below ground portions of the plant. The early bud stage however, matches the downward flow of plant sugars to the roots, and also coincides with low energy stores in the plant. Plants in full flower and seed production again pull resources from below ground, so this stage tends to be a bad time to spray.

Fall spraying is usually very effective, since many perennials are done flowering for the year and are busy sending sugars below ground for winter storage.

Regardless of the time of year, the stage of plant growth is the most important thing to note, as mowing or weather can easily wreck any rules of thumb for timing based on the calendar.

The best herbicides for perennials tend to be in the pyridine family. These herbicides move well within the plant and have long-lasting residual activity in the soil, which provides extended root uptake. They are persistent in soils, plants, hay, and manure, so there are very specific restrictions for their use—particularly in hay. They kill clover and other legumes as fully as they kill weeds, so you should save their use for controlling out-of-hand weed situations.

Here are some example recipes:

Aminopyralid is a general use (over-the-counter) pasture chemical that does well on a wide variety of perennial weeds.

**Aminopyralid + 2,4-D (per acre)**

20 gallons water  
2.1 pints GrazonNext HL®  
8 oz non-ionic surfactant

**Aminopyralid + 2,4-D (small-batch)**

1 gallon water  
13 mL (1/2 oz) GrazonNext HL®  
9.5 mL (1/3 oz) non-ionic surfactant

Picloram is a restricted use (requires a private applicator license) pasture chemical that is very strong on many perennials.

**Picloram + 2,4-D (per acre)**

20 gallons water  
3 pints Grazon P+D® or generic  
8 oz non-ionic surfactant

**Picloram + 2,4-D (small-batch)**

1 gallon water  
19 mL (2/3 oz) Grazon P+D® or generic  
9.5 mL (1/3 oz) non-ionic surfactant

Here is an example of a short-persistence mixture for perennials, one that is labeled for use in hay.

**Triclopyr + 2,4-D (per acre)**

20 gallons water  
1 pint Remedy Ultra® or generic  
3 pints 2, 4-D  
8 oz non-ionic surfactant

**Triclopyr + 2,4-D (small-batch)**

1 gallon water  
6.25 mL (1/4 oz) Remedy Ultra® or generic  
9 mL (2/3 oz) 2,4-D  
9.5 mL (1/3 oz) non-ionic surfactant

When dealing specifically with woody perennials—such as brambles or autumn olives—it is best to select a product containing fluroxypyr or triclopyr. For example, the above recipe for triclopyr + 2,4-D would be a good option.

Now that you're ready to go out and spray, please be responsible: don't spray near your neighbor's tomato plants, leave a buffer around the spring creek where you caught trout as a kid, and protect some habitat for the honeybees to forage on. Remember that reoccurring weed infestations are just symptoms of underlying agronomic problem. Use herbicides to help get the problem under control, but focus on restoring the health and competitiveness of your field with good soil fertility and proper grazing management.

# Technology Talk

by Jacob Gilley, American Farmland Trust

As we move into fall, many of us will be working our livestock through the chutes to pregnancy check our spring calving cows or wean our calves and lambs.

It's certainly an exciting time of year as we are able to quantify the performance of our livestock by obtaining data such as pregnancy percentage, weaning weights, and overall potential for revenue from the sale of our livestock.

Many of us will also collect current weights and body condition scores, which can help us shape our future management.

If you have ever worked livestock before, especially with close family, it's not always without some stress and differences of opinions. For our operation, one of those differences of opinions was how we should record our data chute-side. My better half is conservative in her approach and is fond of the good and faithful pencil and paper. However, I've grown quite fond of digital records primarily for the ability to sort data and be able to easily analyze the information at a later date.

Having a computer chute-side can be a recipe for disaster especially if that one calf—you know the one—decides to make a sharp turn out of the chute and come back to pay you a special visit.

I've found that the smart phone in my pocket provides both a convenient and safe option for recording data. Fortunately for producers, we don't need to record data within the notes section of our phone because there is an app for that.

TagMax app is one that I have grown fond of for capturing data in the field or chute-side for numerous reasons.

It's Free: That is right, there is no cost to download and use this app from CattleSoft, Inc. and doesn't require phone reception for use. This free app can also link data real time to the subscription-based online cattle management software called CattleMax.

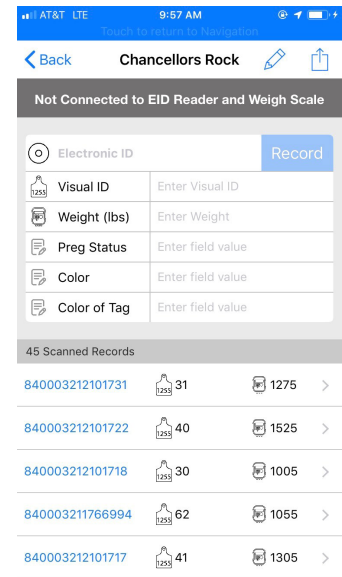
It's Easy: TagMax is easy to download and use. After downloading the app on your device, simply click the plus sign in the top right

corner of your screen to add a new session. This allows you to name your new session and select your settings.

It's Compatible: This app is able to receive and record both electronic tag numbers and weights using blue tooth EID readers and compatible scale heads which have the ability to export weights. TagMax also has an easy export feature which allows producers to email their session data as a CSV file which can be sorted and analyzed on a computer or imported into other management programs.

It's Customizable: In addition to the standard entry fields available—electronic ID, visual ID, weight, date and time stamp, and GPS coordinates—Tag Max also provides producers the ability to create five customized fields. On our operation, we often use these for recording pregnancy results, vaccines or antibiotics administered, dewormer applied, animal color, body condition score, and animal gender.

It's Versatile: In addition to collecting livestock records, our operation has started trialing TagMax as a way to record our day-to-day activities. We have created customized fields to record when and what feeds and minerals are fed to which groups of livestock. We have also recorded our field maintenance activities such as pasture clipping to determine how long it takes to complete the task and the amount of fuel consumed to complete these specific activities. We have used TagMax to record the weights and



inventory of representative hay bales and their corresponding forage analysis results. Using this app is a great way to record hay yield from specific fields to ensure nutrient applications are made to replace nutrients harvested in stored forages.

Collecting and maintaining accurate records through an efficient process is vital for livestock operations to be sustainable. Though the good and faithful pencil and paper can and will get the job done, incorporating the TagMax app into our operation has allowed us to be more efficient, accurate, and less stressed when working livestock and doing our other routine chores.

*Please note that the Mountains-to-Bay Grazing Alliance and its partners and members do not endorse any products featured in this article. This article should be used for informational purposes only; it is not an advertisement.*



# Sometimes It's About Matching, Not Maximizing

by Matt Booher, Virginia Cooperative Extension

I'd like to summarize a good article that I think has some applications for us here in Virginia. The article, *Could Your Pasture Possibly Be Too Good?* was written for Progressive Forage by Ed Rayburn, forage specialist at West Virginia University.

The gist of the article is that lush spring and fall pasture can often be too high in protein and too low in fiber.

Let's look at protein first. There is a metabolic cost to the animal to convert excess protein into urea, which is expelled in the urine. The consequence can be livestock that gain less than expected on forages with much higher protein levels than they need.

As far as fiber goes, ruminants need a minimum of 35% total fiber (NDF) in the diet to adequately ferment and digest what they've eaten. The consequence of this is again less weight gain, even when forage energy content is adequate.

On the surface this sounds like a theoretical rather than a practical phenomenon. However, I have run into instances of unexpectedly poor weight gain on high-quality pasture, and I think it probably occurs more than we realize.

The first time I saw this was on a ranch in Wyoming, which had put in an irrigated, mixed grass-legume pasture heavy on alfalfa, clovers, and short palatable grasses—a mixture everyone said would be ice cream for cows.

When the rancher took their first group of calves off the field, they found they had gained much less than expected, and came to learn with subsequent experience that maintaining a greater percentage of fibrous grasses improved animals' performance on the forage.

I've also seen the same thing occur when grazing cool season annuals. For example, a pasture of turnips testing 25% crude protein and 80% total digestible nutrients (TDN) yielded calves that gained almost no weight after weeks of grazing.

One common situation that Ed mentions is when backgrounding calves. With calves



being fed a supplement on pasture, low NDF can be a major problem.

Supplements are low in effective fiber (large fiber particles that stimulate chewing) and will pull down the total fiber in the diet.

These animals need access to dry hay to maintain a healthy rumen and gain weight efficiently. When first given dry hay, they may devour it for a day or two, then they will moderate hay intake and balance their intake of pasture with supplement and hay.

Another scenario discussed by Ed is vegetative spring or fall pasture. In most grass-dominated pastures, fiber and protein will likely be appropriate. However, if the legume content of the pasture is high or if nitrogen fertilizer has been used, percent protein can be in the high-teens or low-20s—possibly double what some livestock need.

What should be done, since this would be a common scenario with fall stockpiled pasture that has been recently fertilized?

The best solution is probably to give livestock a bale of first cutting dry hay along with the stockpile. Not only will this allow livestock to better balance their nutrition, it can also help stretch the pasture supply longer into the winter.

For those limit grazing pasture with high-requirement animals, supplemental hay can also serve as an insurance policy to ensure adequate daily intake in case forage availability becomes limited.

Limit feeding a high-carbohydrate supplement like shelled corn or barley can also combat excess protein while keeping energy content high in the diet when needed.

As already mentioned, some cool season annuals can be high protein and low fiber when immature. Grazing these pastures with dairy cows or finishing animals is a good fit, but growing annuals for dry cows is probably overkill unless you are going to provide access to dry hay or pasture at the same time.

In the case of the example with the turnip pasture, we learned that seeding oats along with the turnips the following year provided the necessary fiber and pulled down the protein content enough to give us good gains.

Lots of people in Extension and industry (including me) often push farmers toward higher forage quality, and most times it's warranted. However, it's worth being aware of situations where more is not better, and best to keep an eye on matching livestock needs with feed resources rather than always trying to maximize forage quality.

# What is the 300 in Graze 300?

by Carl C. Stafford, Virginia Cooperative Extension

Graze 300 VA, a Virginia Cooperative Extension educational program, was first used as the title of a grazing program held at the Rapidan Firehall in March 2005. Early March was chosen to show producers, most of whom were still feeding hay, another way to winter cattle. Besides the indoor program talking about grass and cattle, fencing and fertilizer, producers were taken to a nearby farm run by a profit-driven guy who figured out how to graze his cattle beyond the end of the growing season.

Today we find some 30 Virginia Extension Agents using this program as part of their efforts with producers, helping them realize the potential economic benefits found from a longer grazing season.

The longest grazing season in our case studies (year-round) shows a profit but not nearly as high as a grazing season of 300 days—about 50% more profitable by comparison.

In Virginia, a number of large herd examples support this finding as does work by Dr. Greg Halich in Kentucky. You would think year-round would be best, but the stocking rate is so low the numbers never add up when compared to 300 days, which supports a larger herd. And, as these animals are

profitable and there are more of them, the total net return is higher when hay is fed for about 60 days.

Hay is the largest cost of any grazing operation—economists say 50 to 75% of total cost—and the first place to start to improve profitability. During times of high prices, it matters little what you do and these days are behind us, so it's a good time to tighten up if you seek more profit from your grazing livestock.

Feeding less hay is supported by stocking rates of multiple acres per cow and calf pair and by timely rainfall, adequate soil fertility, and a willing manager. In Virginia, three acres per pair will support grass accumulation—your region could be different.

With this kind of stocking rate, grass accumulates during the growing season and if it rains in time in early fall, grass will stockpile even more for the winter grazing days needed to get past January.

New Zealanders speak of a feed wedge, an inventory carried not in the barn but on pasture. Allowing the grass to get ahead of you is one way to put it, but instead of a negative, it turns out to be positive when

seeking more days of winter grazing.

Some worry this feed will not keep or will weather too much to be of sufficient nutritional value. Some grasses do not stockpile well; graze these first.

Fescue, a favorite of winter graziers in the United States fescue belt, has a shelf life compared to other grasses and supports winter grazing. In early winter it will make a dry cow fat and in late winter she will maintain on it. Often, stockpile is the best feed on the farm, even when compared to most hay.

A short summary of Graze 300 would be to stock your pastures so that grass can accumulate, to have fencing that puts you in control of grazing intervals, to have water access in support of your management, and to plan on about 60 days of hay feeding. These things will allow you to carry more animals and accumulate more total net return from your grazing herd.

For more information visit <https://ext.vt.edu/agriculture/graze-300.html> to see our videos, to read more about the agents involved, and to see if this profit focused approach to producing livestock is for your operation.



PHOTO: JOHN BENNER

# Grazing Math

by Brian Campbell, NRCS

There are helpful calculations available to help farmers design a new pasture system or avoid damaging existing pastures by not overstocking, overgrazing, or under-sizing. Grazing math can be used to answer questions like:

- How many animals can my pasture/paddock support?
- How many days will my pasture/paddock last?
- How many acres should my pasture/paddock be?

The calculations use some assumptions about (1) how much forage your livestock need to meet their daily dry-matter needs (based on the class of livestock); (2) how efficiently those animals can utilize the pasture (based on how intensively livestock are rotated through paddocks (i.e. pasture subdivisions)); and (3) how much forage the pasture has available (based on pasture height and density):

Daily Dry-Matter Intake as Percentage of Body Weight
Mature Males: 2%
Growing Stock: 3%
Lactating Females: 4%
Dry Females: 2%
Pastured Poultry or Pigs with Supplemental Feed: 1%

Grazing Efficiency
Continuous Grazing: 30%
15-21 days on paddock: 45%
11-14 days on paddock: 50%
6-10 days on paddock: 55%
2-5 days on paddock: 60%
1/2-1 day on paddock: 70%

Pounds of Forage Dry Matter per Acre <sup>1</sup>			
Average Pasture Height	Thin Density	Average Density	Thick Density
2 inches	270	720	1,220
3 inches	490	1,060	1,720
4 inches	720	1,380	2,130
5 inches	960	1,680	2,490
6 inches	1,210	1,960	2,810
7 inches	1,470	2,230	3,080
8 inches	1,730	2,480	3,330
9 inches	2,000	2,720	3,550
10 inches	2,270	2,960	3,740
11 inches	2,550	3,190	3,910
12 inches	2,820	3,410	4,070
13 inches	3,110	3,620	4,200
14 inches	3,390	3,830	4,320

Average pasture height is the height of the tallest leaf within 4.5 inches of an upright ruler.

Thin-density pastures are young stands (one to two years since seeding), hay meadows used for aftermath grazing, and pastures without sod-forming grasses or white clover as an understory.

Average-density pastures are mixed-species stands including tall fescue, orchardgrass, bluegrass, perennial ryegrass, white clover, and red clover.

Thick-density pastures are dense stands of tall fescue or tall fescue mixed with other grasses on fertile soil, closely rotationally-grazed, with adequate but not excessive regrowth periods.”<sup>2</sup>

Once you find the appropriate numbers for your situation, input them into the calculations on the next page. Remember, when you enter percentages into a calculator, they often need to be inputted as decimals—for example, 3% as 0.03. You will probably only need to use one of the calculations at a time because you will often only be changing one variable at a time: the number of animals on a pasture/paddock, the number of days your animals remain on a pasture/paddock, or the size of a pasture/paddock.

(see next page for sample calculations)

## References:

<sup>1</sup>Rayburn, E. (2019). *Accurately Measuring Available Forage Mass Using Ruler or Plate Meter Pasture Height*. Poster presented at the annual conference of the Northeast Pasture Consortium, Grantville, PA.

<sup>2</sup>Rayburn, E., & Lozier, J. (2016). *Estimating Pasture Forage Mass from Pasture Height*. West Virginia University.



Our example calculations will assume the following scenario: Five retired horses averaging 1,100 pounds graze a pasture of mixed cool-season forages; these horses are expected to meet their dry-matter needs on pasture alone (without supplemental feed) and are moved to a new paddock once a week.

**EQUATION 1: How many animals can my pasture/paddock support?**

$$\frac{(\text{forage dry matter pounds per acre}) \times (\text{size in acres}) \times (\text{grazing efficiency } \%) }{(\text{average animal weight}) \times (\text{daily intake } \%) \times (\text{days of grazing})}$$

**ANSWER 1: How many animals can my pasture/paddock support?**

$$\frac{(1,680 \text{ pounds per acre}) \times (1.7 \text{ acres}) \times (55\% \text{ efficiency})}{(1,100 \text{ pounds}) \times (2\% \text{ intake}) \times (7 \text{ days on that paddock})}$$

**= paddock can support 10 horses during a 7-day grazing period**

**EQUATION 2: How many days will my pasture/paddock last?**

$$\frac{(\text{forage dry matter pounds per acre}) \times (\text{size in acres}) \times (\text{grazing efficiency } \%) }{(\text{average animal weight}) \times (\text{daily intake } \%) \times (\text{number of animals})}$$

**ANSWER 2: How many days will my pasture/paddock last?**

$$\frac{(1,680 \text{ pounds per acre}) \times (1.7 \text{ acres}) \times (55\% \text{ efficiency})}{(1,100 \text{ pounds}) \times (2\% \text{ intake}) \times (5 \text{ horses})}$$

**= paddock would last these horses 14 days**

**EQUATION 3: How many acres should my pasture/paddock be?**

$$\frac{(\text{average animal weight}) \times (\text{daily intake } \%) \times (\# \text{ of animals}) \times (\text{days of grazing})}{(\text{forage dry matter pounds per acre}) \times (\text{grazing efficiency } \%)}$$

**ANSWER 3: How many acres should my pasture/paddock be?**

$$\frac{(1,100 \text{ pounds}) \times (2\% \text{ intake}) \times (5 \text{ horses}) \times (7 \text{ days on that paddock})}{(1,680 \text{ pounds per acre}) \times (55\% \text{ efficiency})}$$

**= paddock should be 0.8 acres to support these horses for 7 days**

If you would like assistance in improving your pasture management, please contact your local USDA Service Center.

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## Mountains-to-Bay Grazing Alliance



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# UNIVERSITY OF MARYLAND EXTENSION

## CULLING FOR THE FUTURE OF YOUR HERD

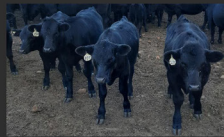
STRATEGY GUIDE

### When – Ideal time to remove unproductive females:

The most economical time to make any culling decisions is within the first two weeks post-weaning. At this point, the cow has entered her maintenance nutrition period without the calf at her side. Culling prior to weaning will result in additional labor on your part to take care of the nutritional needs of the early weaned calf or finding a sale venue.

### Why – “Was she able to do her job and raise a good calf?”

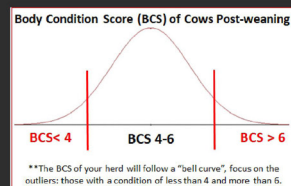
- **Age**
  - Older cows are more injury prone, have a harder time maintaining body condition, and are more likely to have issues with their udder.
- **Injury or illness**
  - Injuries and/or illness happen at every farm and unfortunately they can't always be fixed. For her sake, it's often best to part ways.
- **Disposition**
  - If you find yourself having to know where a problem cow is at all times when you're out on the pasture, it doesn't matter how good of a calf she raises; a bad disposition is a safety hazard.
- **Maternal Ability**
  - How does her calf compare to herd mates peers? Did she have difficulties during calving which have led to issues with producing future calves?



### What to look for:

#### Looking at the Cow:

- **Body Condition: Are they heavy or thin?**
  - **Heavy: WHY?** They put weight on their back and not as milk for their calf. They shouldn't be over a BSC of 6 at weaning
  - **Thin: WHY?** They put everything into milk production for their calf. Age – first calf heifers and older cows tend to pull off a lot of weight. Additional causes: injury or illness.
- **Udder**
  - How does her udder look? Ligaments – hanging low. Teat length and size – don't want too long or too large.
- **Feet and Legs**
  - How are her feet and legs holding up? Mobility issues will affect feed intake



### The Udder

Having good udders on your cows are essential to running a productive cattle operation. One of the best times to evaluate her udder is the first day or two post-weaning:

- **All 4 quarters should be full**
  - Are any quarters dry?
  - Has she already dried herself off prior to weaning? Generally indicates she was a poor producer
- **Teat length**
  - Short is better than long
- **Teat Shape**
  - Enlarged or blown-up teats are hard for calves to drink from, may indicate a previous mastitis infection and potential teat damage.



#### Looking at the Calf:

- **Size and Weight**
  - How does the calf compare in size and weight of the peers in its age group? Keep in mind age of the dam as well as gender of the calf.
- **Structure**
  - Is the calf structurally correct? Does it stand solid of all four legs? Straight through the spine?

**Ultimately the culling choices you make (or don't make) will help determine the future success of your cattle business.**

Questions?

Contact Racheal Slattery – [rslatt@umd.edu](mailto:rslatt@umd.edu) –  
University of Maryland Department of Animal and Avian Sciences

## UPCOMING EVENTS

### Summer Annual Forage Trial Webinar

Thursday, October 22  
12:00– 1:30 p.m.

In 2020, Lebanon County organic dairy farmer Matt Bomgardner partnered with Penn State University Extension agronomist Dave Wilson to run a summer annual forage trial on his farm. Matt and Dave examined a variety of summer annual forage options, including eight different species and three different grazing mixes. The forage was sown using a diverse range of tillage treatments that included no till, rototill, and moldboard plow. In this webinar, Matt and Dave will discuss the results of their forage trial, including lessons learned and plans for moving forward. Graziers interested in potentially including a summer annual in their grazing rotation will learn what worked best for Matt, both in terms of species selection and tillage treatment. Visit [PASA's website](#) to register.

### Solar-Powered Pumping Systems for Livestock Webinar Tuesday, November 10 10:00– 11:00 a.m.

Join Virginia Cooperative Extension for a webinar on solar-powered pumping systems for livestock. Many farmers are exploring ways to fence out livestock from streams. Unfortunately, providing alternative off-stream water sources can be a challenge, especially on leased acreage. Movable solar-powered water pumping systems for use in freeze-free months may serve as an additional management alternative for farmers. Register by visiting [Virginia Tech's website](#).