Grazing 101

Kathy Voth, Editor

OnPasture.com

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Getting Started

Kathy Voth

Welcome!

I'm Kathy Voth, the publisher and editor of OnPasture.com and the editor of Grazing 101. For the past two decades I've been working with livestock and graziers to create more sustainable landscapes and healthy, economically stable communities.

My life as a grazier began with the purchase of 1 goat, then another, then 11 more, plus 35 does and a buck and their kids, and from there, things began to expand rapidly!

My knowledge as a grazier grew the same way. In many cases I didn't even know the questions to ask, and when I did, I rarely had a mentor to turn to for answers. I made plenty of mistakes, and, though sometimes painful, they were all great learning opportunities.

If I'd known then, what I know now, this is the ebook I would have wanted to read. And Don Ashford is the mentor I would have asked for help. He's my adopted Louisiana Dad, who you'll meet in the first video. He has sixty some years of experience and a love for helping others succeed and this ebook wouldn't have been possible without him.

This is a 101 course - perfect to get you started with a focus on principles you can use as a foundation to your grazing practice. I've also provided links to helpful resources and to grazing mentoring organizations.

If you like the ebook format for learning about grazing, we have ebooks covering other topics at the On Pasture website. We're also adding more, so if you don't find what you're looking for, do check back.

I'm really excited you're here. I wish you great success!

Don Ashford

An 80-something grazier's tips for starting off on the right foot.

My name is Don Ashford and my wife is Betty and we live in Ethel, LA. It would be impossible for me to write a bio about myself without including Betty in it. We have been together since high school. I was in the senior class of 1955 and she was in the class of 1957. Do the math.

We have raised cattle since 1959 except for a little time that I spent with Uncle Sam. We have grazed stockers, owned several cow- calf herds and custom grazed cattle for other folks. I worked as a pipefitter for more than 25 years. Until we went into the dairy business in 1977 we were as most people down here part-timers or week-end ranchers.

Later after we had learned enough about Management-intensive Grazing (MiG) to talk about it so that it would be understood by others we put together a pasture-walk group to introduce it to our friends and neighbors. We belong to more farm groups then we probably should but we get great joy working with other people.

What makes us most proud are our son and daughter, our 5 grandkids and our 7 great-grand kids. It has been a hell of a trip so far, but we are not done yet.

Click on video to play.

Video Transcript - So you want to be a grazier!

Hi! My name is Donald Ashford.

I live up here at Ethel and we're in the cow business up here. We been in this business since 1956 one way or the other. And I say one way or the other because in that time we've been in the momma cow business, stocker business, we raised roping calves for awhile, we milked cows for 12 years. We feel like that gives us a little bit of experience, that we know a little bit about what we are doing, and we want to take this opportunity to share some of our thoughts and ideas with you.

One thing all of us in agriculture have in common whether we be full-timers, part-timers or weekend farmers, is we want to be successful. The dream comes before the plan, but to make that dream reality we have to have a plan. And one of the things we think you need to start with is an inventory of resources.

An inventory of resources is no more than going over your place and looking to see what you have to work with now. That's what we want to do now.

We going to start with what we feel like is the most important, talk about 8 items down to not necessarily the least important, but we think you need to check before you really commit to this.

Soil is the first thing on this list of this inventory of resources. You need to know about your soil. The first thing you need to do really probably is to take a soil test. Remember this. The foundation that you build on is the soil. So if your soil is lacking, nothing else is going to be like it should be.

The second thing on our list on this inventory of resources is your **pasture**. Look at your pasture. See what your pasture is today. Not what it will be tomorrow or what it will be six weeks from now - what do you have to work with today? And this is one of the places you want to be honest with yourself. You're not going to cheat anybody but yourself.

Let's talk about the water. That's the next thing. The water supply is critical and all your pasture management schemes the availability of water is very very critical. You want a water supply that is clean, plentiful and dependable. And one of the things that is kind of hard for some people to understand is you don't want your cattle to drink water that you wouldn't drink.

Fencing is very important. Check your fences. You don't want to put cattle on a place that you're going to have to be looking for tomorrow. Fencing makes good neighbors. You don't want to fall out with your folks next door because your cattle are getting across the fence.

Power fencing works very well for us. If you look at the cost of electric fence it is very very cost effective. It gives you more management possibilities. That's a thing we'll get into greater detail later. But fences cannot be stressed enough how important they are.

Finances

You don't want to spend more than you can get back. You want to be very cost effective in your operation. It can be the weak link of your operation. There are things you want to do that you can't possibly afford so you have to scale back a bit. Credit is a tool! Use it wisely and seldom.

Labor

Alright labor - let's talk about labor. How hard do you want to work? Plan your operation to where it's sustainable And I have understood over the years, you can't build a sustainable operation on an unsustainable effort. What that simply means is what you can do today if you're 25 years old you won't be able to do when you're 55 years old. So plan your operation from the start to where you'll be able to operate it efficiently 25 -30 years down the road.

The next thing on this list is handling facilities - catch pens. It's very frustrating to be a cattle owner and not be able to do for your animals what you need to do because you don't have a place to restrain them. It doesn't have to be a high dollar, expensive thing. Just something that is workable. Something you can use to keep yourselves and your animals from being hurt.

If it is at all possible and you can locate that catch pen in a traffic lane where the cattle go through it, that's going to give you a lot less trouble getting the cattle in and out of the catch pen.

OK - we're at the end and we're going to talk about cows now. This probably would have been for a lot of people a place to start. But think about it a minute. It takes a trip to the sale barn to get in or out of the cattle business. All these other things have to be done before you can buy the cattle. The cattle should be a choice, what you want - not necessarily what your neighbor raises or what the man in the magazine tells you to raise. Buy the kind of cattle, deal with the kind of cattle that you like that you feel comfortable with because you're the guy that's going to have to work with them.

Now that you've completed this very basic inventory of resources, it's time to make a plan. And the idea of the plan is to make all the parts come together to create a whole. And what you're trying to do then is put everything in some kind of sequence and end up with a profitable sustainable grass farm.

Soil Health

Guiding Principles

“The foundation that you build on is the soil. So, if your soil is lacking, nothing else is going to be like it should be.”

~Don Ashford

- **Minimize disturbance.**
- **Keep the soil covered.**
- **Keep live roots in the soil.**
- **Promote diversity.**
- **Integrate livestock.**

A note from Don

For any hope of success the beginning grazier must understand that building a sustainable and profitable grass farm requires each of the components in this book.

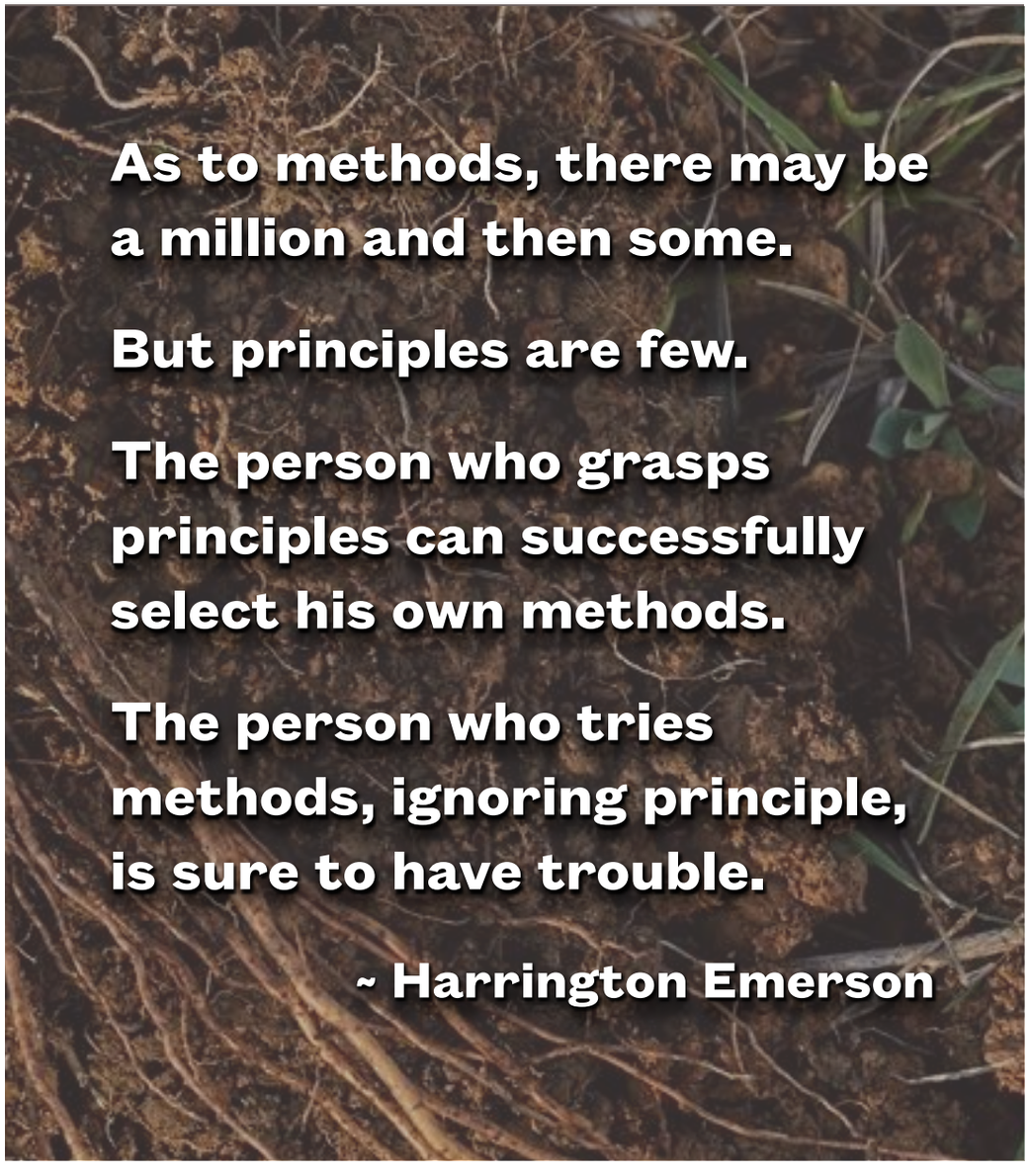
Naturally the soil is the foundation. Think about building a house. You must build a foundation first, you can't start from the roof and work down. I have seen too many novice graziers fail simply because they started by putting all of their resources and attention on the livestock first and could not understand why they failed to become successful graziers.

One of things that a beginning grazier must learn is patience, it took a lot of years for the soil in your pastures to get in bad shape, if this is the case. The only way you can know this for certain is with a soil test, but in any case a soil test will give you the information you need to begin the process of soil improvement.

With the cost of fertilizer it is irresponsible and costly to waste money applying the wrong mix or amount of fertilizer. What your neighbor uses may not be what you need. If your funds are limited the application of lime to improve your pH can be your best dollar value. Lime has been called a pasture's premier fertilizer.

Don and Betty with great grand child. They've had plenty of time to learn patience.

A Closer Look at Soil Health Principles



As Buz Kloot says in this episode of his series *Unlock the Secrets in the Soil*:

"Before we discuss the principles of soil health, it's worthwhile talking about the nature and properties of soils. Because if we don't understand at least the basics, it's going to be difficult to provide a context for soil health itself."

Watch this 4:29 video or read the transcript to get a quick look at what the basics are. Then we'll cover each of the five soil principles and give you some ideas of how to apply them.

Click on video to play.

Video Transcript - Buz's 5 facts of healthy soil

Before we discuss the principles of soil health, it's worthwhile talking about the nature and properties of soils. Because if we don't understand at least the basics, it's going to be difficult to provide a context for soil health itself. So just bear with me as I highlight some of these ideas that I think are important.

The first idea I'd like to highlight is that soils vary a lot. They vary in things like texture, soil structure or color. Just look at a road cut and you'll see what I mean.

Soils can be classified into something like 19,000 different soil series across our country alone. (Actually, the number is now 22,364 established soil series.)

The second idea I'd like to highlight is that soils are 3 dimensional bodies. They go down typically to 6 foot or 72 inches. This is important especially in light of the fact that we take our soil samples down to the 6 inch "plow pan." This is a traditional way of measuring soils, but often when we get our soil test back we're apt to think that's all there is. I want to tell you that below 6 inches is a reservoir of soil moisture and nutrients that you want to tap into and there are ways that you can do that.

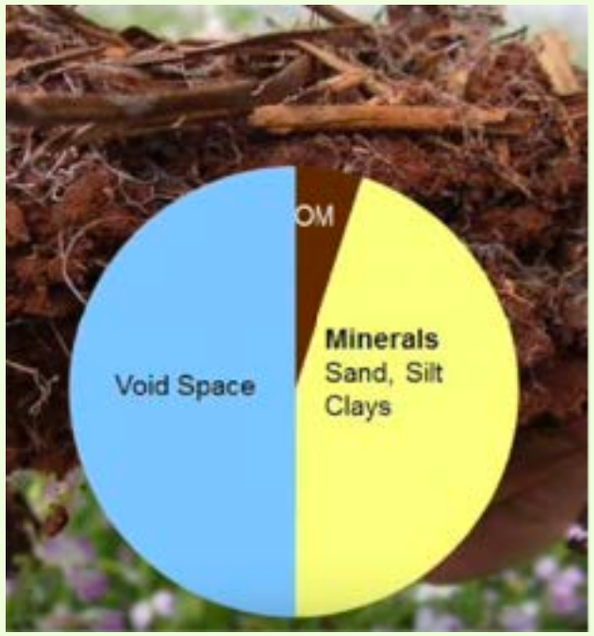
One of the most mind-blowing things that I learned is that

a good soil might contain a ton or two tons or even more of soil microbes. That's the equivalent of one or two cow calf pairs and that's a lot of microbes. Now these microbes might be bacteria, fungi, protozoa, nematodes, and then the other part of soil life are the little macro-invertebrates like macro arthropods and earthworms and these all make up soil life. We're apt also to think that microbes are bad, but the reality is that the majority of these microbes are good and the farmer and gardener need to look at these microbes as allies and not enemies. One of the things we

need to do is learn to keep these microbes fed. When we keep them fed they serve us.

Dr. Kris Nichols says that about 90% of soil function is dependent on soil biology. Now what does that mean? Soil functions that farmers care about are water going into the ground and recycling nutrients and making them available to plants and keeping plants healthy. That's what microbes help with.

The fourth really important idea that I'd like to highlight is the composition of soils. We know that soils are made up of minerals, namely sand silt and clay particles. Soils are also made up of organic matter. But that's only half the story. The remainder of the soil is actually made up of something we call void space. Void space can either be filled by gas, namely air and carbon dioxide, or by water. This void space is really where the microbes live. When we take away this void space through tillage or compaction, we're really removing the habitat in which microbes live. So part of our job as farmers is to look after that void space.



The final idea that I'd like to highlight is that soils change. We're often apt to think that soils only change over geologic time or over a lifetime. But if you listen to what Skye Wills says is that there are many soil properties like infiltration, like organic matter, change in literally a matter of a few years. So in this sense we can consider soils not as just a medium to grow plants, but as a living, dynamic, mutualistic ecosystem. As farmers and gardeners, we want to know how to look after that ecosystem.

1. Minimize disturbance.

Soil microbes are critical to soil function and plant health. Their jobs include decomposing organic material, and making soil nutrients available to plants. They live in the empty spaces or “pores” in the soil, and when we till the soil we destroy their “homes” and kill them.If you’re a grazier who doesn’t raise crops, tillage may not be a problem, but there are other things you can do to minimize disturbance. First, you can manage your grazing to avoid compaction using these tips from Mark Kopecky, and On Pasture author and the state agronomist in New Mexico for the Natural Resources Conservation Service:

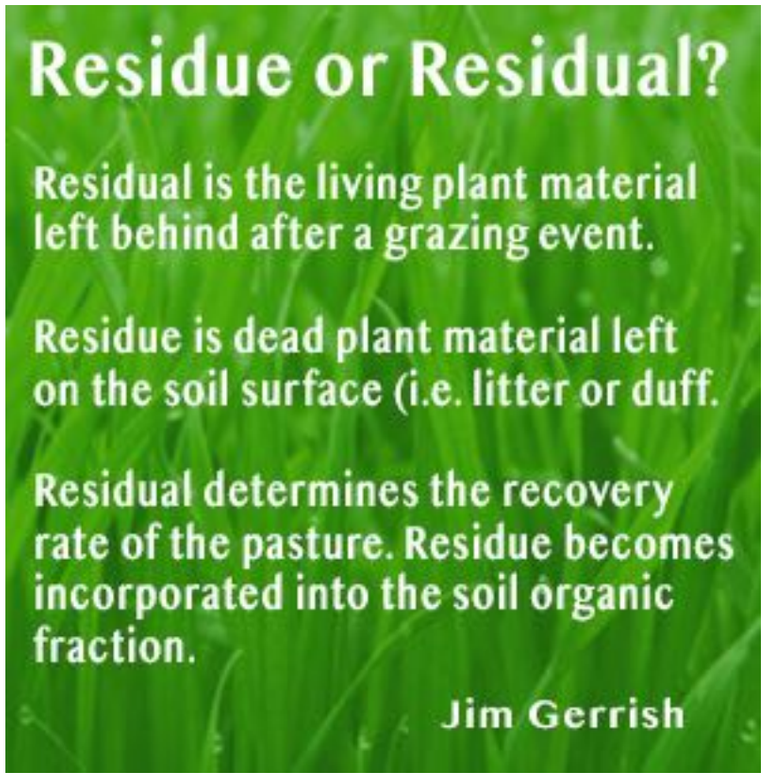
- Keep mechanical and hoof traffic off wet soils as much as possible.
- Maintain pasture swards with lots of vegetative density and leave enough residual vegetation at the end of each grazing event. This will help cushion the surface of the soil.
- Use short grazing periods and allow pastures to regrow to the proper stage before you re-graze a paddock.
- Monitor your soil fertility to keep plants growing as vigorously as possible. Good plant growth, earthworm activity, and other soil biological processes can restore good soil structure over time.
- Finally, if you’re tempted to haul out the subsoiler or plow, consider research from Ohio State University that found that **plants are better than steel at reducing compaction**. When comparing long-rooted cover crops and subsoilers, they found that plants created more pore space, collected more water, and yielded more bushels of corn per acres.

2. Keep the soil covered.

Plants, whether as cover or residue, protect the soil – keeping it cool in summer, and warm in winter. Cover also provides soil microbes with the food they need to do their jobs for us, whether through root exudates plants trade with them for nutrients, or from surface plant residue that microbes break down and eat. Cover also prevents the invasive weedy species most folks dislike.

For a grazier, keeping the soil covered depends on managing for both residual and residue. Though the two

terms sound similar, they provide very different services for your pasture's health. According to Jim Gerrish, "Residual is the living plant material left behind after a grazing event. For clarity we often say 'post-grazing residual'. 'Residue' is dead plant material left on the soil surface. It is synonymous with litter or duff."

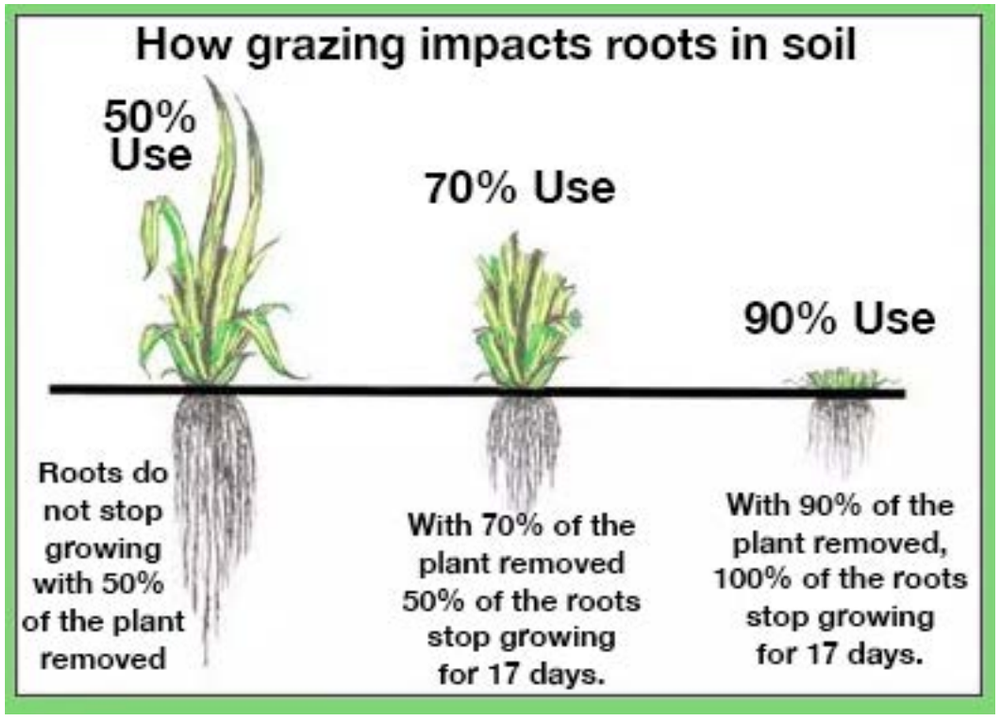


3. Keep live roots in the soil.

Through photosynthesis, plants create carbon-based sugars. A sizeable portion of these sugars are transferred into the soil via the plant's roots where it feeds the 1-2 tons of soil microbes living in the soil. In return, as they process the carbon found in the soil, the microbes help make needed nutrients available to the plant.

Roots in the soil then, mean more soil life and more soil organic matter. Soil structure is also better so water infiltrates more readily, creating better growing conditions for plants. Roots also reduce compaction.

In order to maintain healthy roots, we need to leave grazed plants with adequate leaf area, and we need to give them enough time to recover after being grazed.



4. Promote diversity.

Diversity is one of the most important services pastures provide. Research demonstrates that **diversity increases long-term carbon sequestration**. It provides wildlife habitat, something that is increasingly important as large landscapes are broken up. Diversity is also important to the grazier, providing resilience in drought, and **as one On Pasture author noted**, it also improves animal productivity.

So how do we manage for diversity? We can start by making sure we don't graze the same place at the same time every year. Time grazing to increase what you want, or keep what you need. As an example, **check out how these graziers successfully adjusted their grazing** to increase warm season grasses in their pastures.

You can use your livestock to manage for increased diversity, but it requires ongoing, careful observation. We need to include differences in growing conditions across years as a result of drought or wet cycles, loss of forage to wildlife or insects, and other changing conditions. It means basing our management on the growth of our pasture forages, not a calendar date.

In many cases, changing your grazing management from year-round use to rotating through pastures can also increase diversity. If you've ever attended a workshop or presentation by Greg Judy, he'll tell you that simply improving his grazing management dramatically increased diversity in his pastures.

Of course you can always add to diversity by seeding. **Here are some ideas for approaching pasture improvement with seeding and pasture mixes**.

5. Integrate livestock.

Plants, soils and animals evolved together, and all are essential to a properly functioning ecosystem. Livestock convert high-carbon material to low-carbon material that feeds the soil food web. Manure provides a home and food for beneficial insects that help cycle nutrients and can reduce pest issues.

Our goal as graziers is to improve soil health through good grazing. That means growing more grass and using our livestock to convert it into nutrients that feed microbes.

Kathy Voth

Take the Drudgery Out of Soil Testing

With everything else you have to do, soil testing may not be high on your list. Here's a way to get it done and have a little fun too.

Remember when you were a kid and it was the best thing in the world to spend an afternoon playing in the dirt? We made dams, dug tunnels, made little roads for our trucks, filled them with dirt and made piles. And then we grew up, and dirt became soil, and we turned it into a job.

It doesn't have to be that way. Soil testing can be fun. Here's how.

1. Get ahold of your state or local Extension office to find out where you can submit soil for testing and where to get the forms. Many are downloadable. Worried about the cost? ***Soil testing is cheaper than investing in the wrong soil treatment***.

2. Pick a nice day, and a pasture that doesn't seem to be performing as well as you'd like. You've been thinking about ways to improve its fertility, but you know in the back of your mind that you ought to find out what's under all that vegetation before you throw money on it. You're going to be taking a little walk in this field, so keep it between 1 and 5 acres.

3. Gather your supplies. You'll need a soil probe, a small pipe, or a small shovel, and a plastic bucket to collect all the samples. Carry all that in one hand and a cooler with

your favorite beverage in the other. Take some friends, your spouse or your kids.

4. Stroll across your pasture, zig zagging here and there. When you were a kid, you probably would have imagined that you were a race car driver, swerving to avoid other cars and pedestrians. You're older now, so imagine what makes you happiest. Stop here and there to gather soil samples.

You want to collect the top 6 inches of soil. This is important, because that's the depth soil labs assume is being collected. Why? Nutrient levels are higher in the upper part of soil. If you collect less than 6 inches your report will show higher nutrient levels, and more than 6 inches you'll show less. Both will make it harder to know what's happening in your soils and what improvements are required.

When you've got your sample, remove all the above ground plant material and/or thatch and dump it in the bucket. If you're a prankster, take time to shove this down the shirt of the folks with you.

5. Hang out, enjoy the weather. Pause for some refreshment from your cooler.

6. After you've collected 15 to 20 samples, mix it up in the bucket. (We suggested plastic because sometimes metal can interact with the sample, but this isn't a huge concern.)

6. Fill a zip-style sandwich bag with a softball-sized scoop from your 15-20 sample mix. Now you're thinking, "Really?! I collected all those samples for this little bit?!" Well, you got a representative sample so the soil tester will be able to give you better results.

What should you do with the rest? If you were a kid you'd make mud pies and fling them at your friends. You choose what's best.

7. Have another beverage while you fill out the soil testing lab's form. Tell them that you are using this as pasture so that they can give you the right recommendations. Don't forget to write down the name or number of the field you sampled so that you can match your results to the right place.

9. Write your check, post the sample(s) and form(s) and wait for your results.

10. When you get your results, if you have questions, call your local Extension Agent or the number listed on your test results.

Happy Sampling!

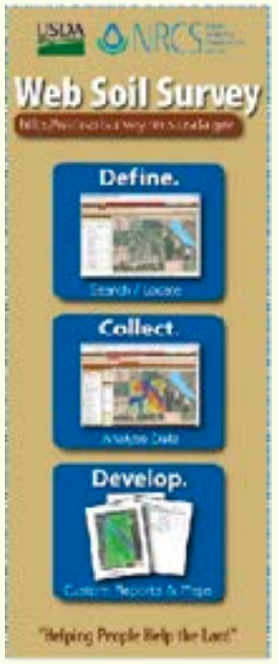
Resources - Use the NRCS Web Soil Survey to learn about your soils

Not all soils are created equal.

You can improve your soils to a degree, but it's always a good idea to set your expectations based on your soil's capabilities.

The Natural Resources Conservation Service's Web Soil Survey site can tell you what you're working with and give you an estimate for forage production per acre.

In the United States, we have been collecting information on and mapping soils ever since Congress appropriated $16,000 to send Milton Whitney into the field on May 3, 1899. One hundred fourteen years later, the U.S. has the largest soil data base in the world, with soil maps and information available for over 95% of the nation's counties. Now, all that information is at your fingertips and ***you can use it to get a detailed look at your own soils!***



The Natural Resources Conservation Service's **Web Soil Survey** provides anyone with computer access a wealth of free soils information along with soil maps, properties and interpretations to help you with land use decisions. You can download the NRCS's instructional brochure to the right, or follow along here as I show you what I learned about my little property using this online tool.

The Home Page shows you the 4 basic steps. They are summarized here with examples to make it easy for you to get started.

1. First define the “Area of Interest.”

Enter your address under “quick navigation.” Then click the “View” button, and it will appear in the map. Click on the magnifying **+** box and then on your property to zoom in. (That’s the first arrow in the picture below.)

Now draw a line around the area you’re interested in. You can do this by clicking on the square box tool (the second arrow below), or the polygon box (the third arrow). The polygon box allows you to draw more precisely along your boundaries. Zoom in to create a more precise boundary.

2. Click on the Soil Map tab to view and print your soil map.

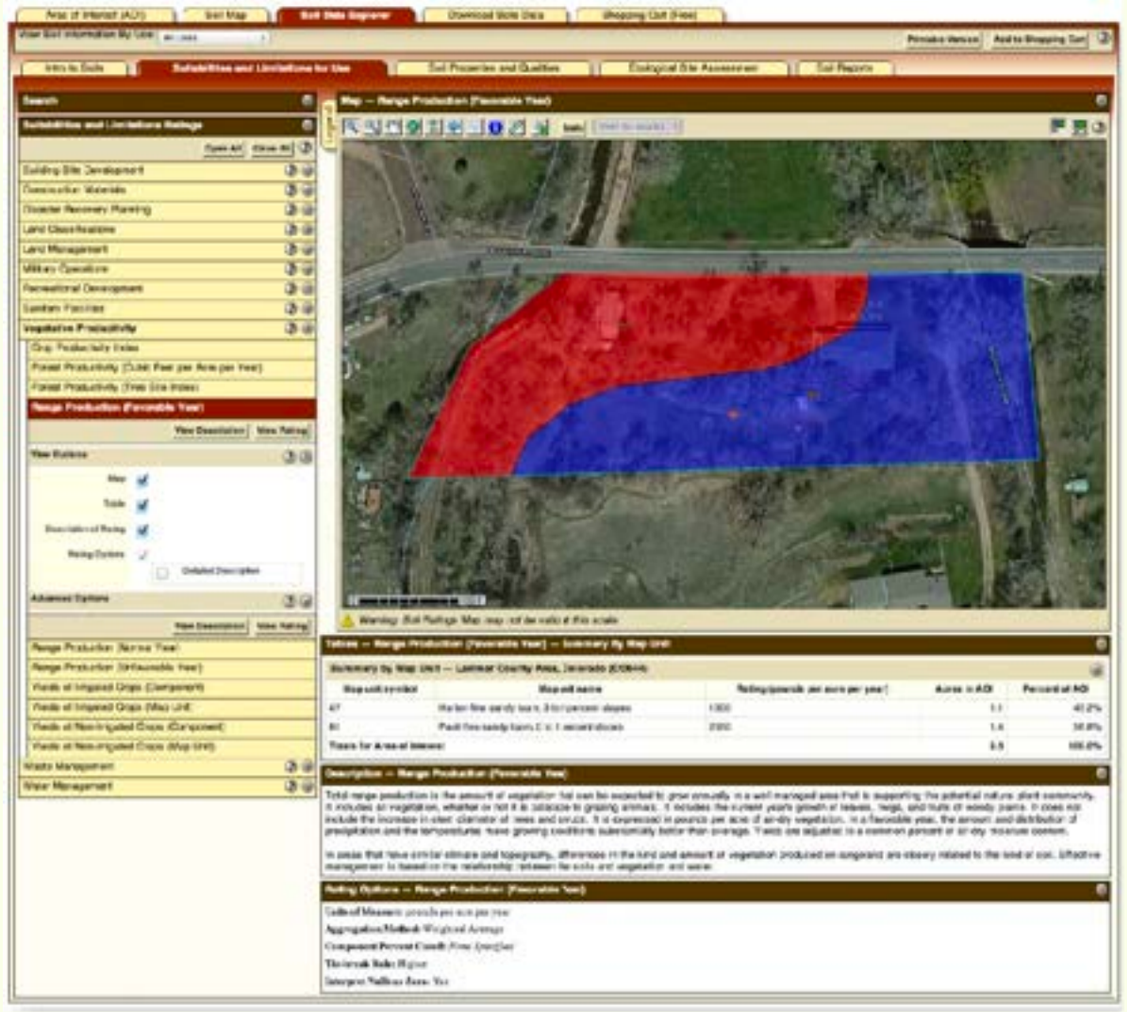
Here’s what mine looked like. I have 2 different soil types, which are described to the left of the map.

3. Now click on the “Soil Data Explorer” tab to get interpretations of what this soil map means about what I can grow here.

For example, under the tab “*Suitabilities and Limitations for Use*” I can find out how my soil types rate as a building site, or under “*Disaster Recovery Planning*” I can learn that my soil types aren’t the best for pit disposal in case of catastrophic large animal mortalities. I was most interested in what my soils say about vegetation production for grazing. So I clicked on its double arrow to open it and look closer. What I learned is that in favorable years I can expect 2550 pounds of forage per acre in the area I typically graze with my 2 pet goats (shown in blue in the picture on the next page). In drier years I can only expect about 1275 pounds.

Under “*Land Classifications*” I can find out if I have good farmland. I learned that when not irrigated, I need to watch out for erosion and understand that my possibilities are limited by my extremely dry climate.

The “*Soil Reports*” Tab provides information specific to your soils under a variety of categories shown on the lefthand side of the map. Just click away and explore a bit. It’s fun to see the wide variety of information included about your soils!



Here's the report showing my potential vegetation production in a good year.

4. Last but not least, get a free, downloadable soils report by clicking on the shopping cart tab.

If you want items from step 3 to appear in your report, be sure to click on "add to shopping cart."

As with any tool that has this many functions, it may seem a bit complicated to use. There is a wealth of information here, so explore, press buttons! And if you have questions about soils, click on the "Intro to Soils" tab where many of your questions will be answered. I think you'll love this resource! **Give it a spin!**

Pastures

Guiding Principles

“In the operation of a livestock enterprise it is more useful to understand how grass grows than to know how to operate a hay baler. The simple truth is that you cannot bale what is not there. Put things in some order that is workable. Your first priority is to grow grass.”

~Don Ashford

- **Paying attention to, and understanding what your plants are telling you leads to better management.**
- **Leave more leaves to grow more grass**
- **Adequate rest is the most important thing you can give your pastures.**
- **Diversity in your pasture plants means more resilience in response to weather extremes.**

A note from Don

I believe that I have learned a lot about folks in the years that I have lived. How can you not learn if you pay attention at all?

One thing that has never failed to amaze me is how some old boy will buy the highest dollar bull the bank will allow him to buy. He takes this new bull home and turns him out and goes to the house and waits for the miracle.

Now understand there has been nothing different done on this place, but the bull is sure to be the cause in a year or so for the outbreak of the sounds of" Happy days Are Here Again." But when the time has passed and the new calves start to hit the ground and it is evident that no miracle has occurred the new bull you can be sure will get the blame.

These same folks will do dumb stuff on their places for 364 days and are disappointed when on day 365 the market does not save their dumb behinds when the calves are sold. But folks do it all the time, buy the best genetics that they can afford and bring them home and turn them out in a pasture that the army worms would have to pack a lunch to cross and then wait for all the big, old calves to make their debut.

Your cows and that bull will need something to help them to create that miracle you are looking for and the most help you can possibly give them is to provide them with good grass, clean water and a stress free place to do their work. You do that and it may be possible, if you listen real close, some quiet evening your`ll hear strains of" Happy Days Are Here Again" from the back pasture.

Wayne Burleson

When your plants talk, listen!

Plants have “body language.” Here’s how you can tell what they’re saying with a little observation.

"Ouch," says the once tall range plant that was just bitten off for the fifteenth time. It says, "If you don't stop, I'm going to die."

Interestingly, plants don't talk with words, but they do communicate just by their appearance. After all, don't people also communicate with body language?

This plant talk thing is a very simple method of monitoring plant health. Just walk into a home and listen to/ communicate with your wilting house plant that you forgot to water. It says, "I'm thirsty, please water me."

Many academia-type range people monitor plant species as an indicator of departure from some state of historic plant community diversity –– as stated in a benchmark, climax plant community. This method does tell part of the story, but for speedy practical purpose by the time a plant community has changed species types to "poor condition," we well-educated humans are way too late in suggesting management change. I sometimes wonder about traditional rangeland monitoring methods. They have their limitations.

Here is another option.

Take a pair of field glasses or a video camera with a good zoom lens and walk out into your herd of livestock and try to get as close to them as you can.

You may have to use a little of the tactic the now famous Bud Williams does – his zig zag walking method. Don't look the cow in the eye, don't walk straight toward her, be slow, walk quietly, and avoid the direct approach. Stop often so the animals think you're not a threat and not going to chase them off somewhere.

As you now do this, stop in the middle of the animals somewhere and just be very quiet for a while not looking at them. They will settle back down and go back to doing what they all naturally do: eating, lying down, pushing each other, nursing, chewing their cud, etc.

Now zoom in on what they are eating. You will need to get at an angle to closely watch their mouths. I have done this often enough, and then walk over to closely examine the plants they were munching on.

This is where the plants, soils, and land start to talk and tell you their story. Just like the house plant, look very closely and start asking questions like: At what height of plant growth are the animals grazing? What are their roofs doing? What stage of active plant growth are the plants in? Is there any re-growth or tillering going on? What is covering the soil surface between the plants? How wide and green are the leaves. What is the situation with the soil moisture? Are the plants growing straight up or are the active growing leaves growing low and sideways––an indicator of over-grazing. What is the climatic stress doing, like wind, or no shade for small plants, or is the soil hard or cracked open?

Answers to these and other questions start to tell you what the plants are saying.

Here is a list of what some plants may be saying:

—"I'm tired of getting bitten off so many times--I need rest until I can fully recover my root system."

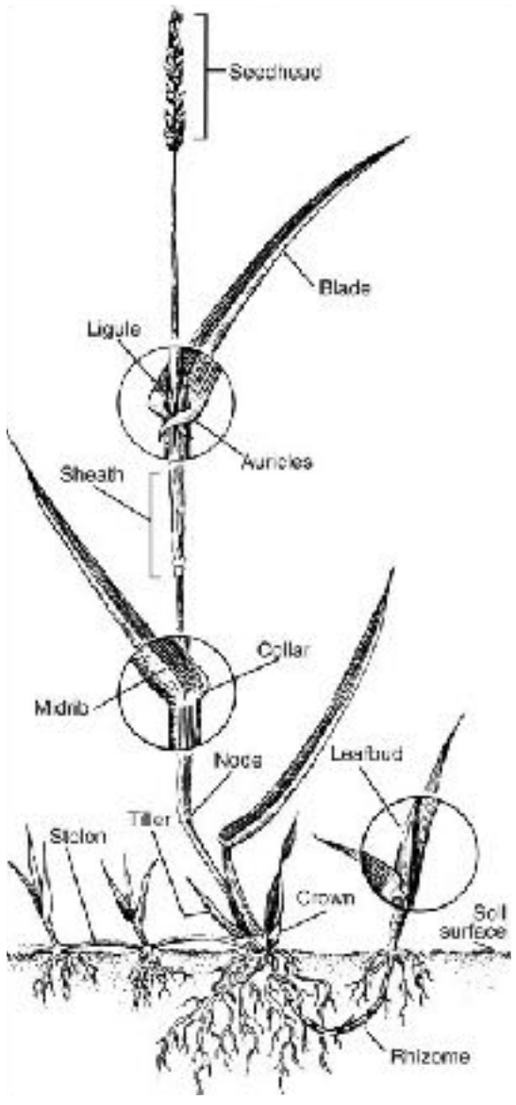
— "I'm just starting to recover from the first grazing. See all my nice new short green leaves. Don't bite me now, because I have no reserve energy left."

— "I'm too short and very hot, could you please shade me?"

— "I'm way too dry, see all the bare soils around me, please cover the soils with dead plant parts which will also feed all those soil critters that help me grow to full potential."

— "I'm getting way too old and stagnate, see all those old dead gray colored plant parts, please step on me, so I can grow some new, healthier leaves."

— "Look at my now narrow leaves, that's because I now have a shortened, weakened root system. I need rest and mulch with some phosphorus, please."



— "I'm just starting to send up brand new tillers, let me regenerate my off-spring before being grazed again."

— "I feel short and it's way too windy down here, please watch me more often, and leave more grass behind when you move all those skinny cows off to the next pasture."

— "I don't like all those brushy plants invading the neighborhood. Please increase the stock density and step on those nasty old bushes that showed up in our once healthy grasslands."

You will learn and discover more information if you will monitor individual plants, along with the area around them, and especially if there is a fence line difference.

Listen to what plants have to tell you.

I just went on another pasture walk with my wife and one of my granddaughters. We circled about two miles in a couple of pastures and the land told us its story: "Thanks for the increased rest periods; we are just starting to build back our energy."

This ranch pooled all animals into one herd of about 1,000 head. They carefully planned the entire grazing season to go through each pasture fast, trying not to go over a maximum of 10 days of grazing in their larger pastures. They are now moving away from the old, peeled look, a negative energy flow that was robbing them of about 50 percent of their total forage production.

I find it more exciting to walk pastures now, and when the plants, soils and land start talking, I listen better. I try hard to come up with a management change suggestion to help the decision-makers move the land and all its components toward a pre-determined goal.

This is a very important step in pasture management and monitoring. That is, to have an agreed to target that all the people can easily see in their minds, or off you go, half-cocked in too many directions. Learning to hear the voice of the land is a good pro-active land monitoring method that will keep things on track and prevent train wrecks.

Learn more about how grass grows and grazing impacts on plants in the **free online course**.

Kathy Voth

Leave more leaves to grow more grass

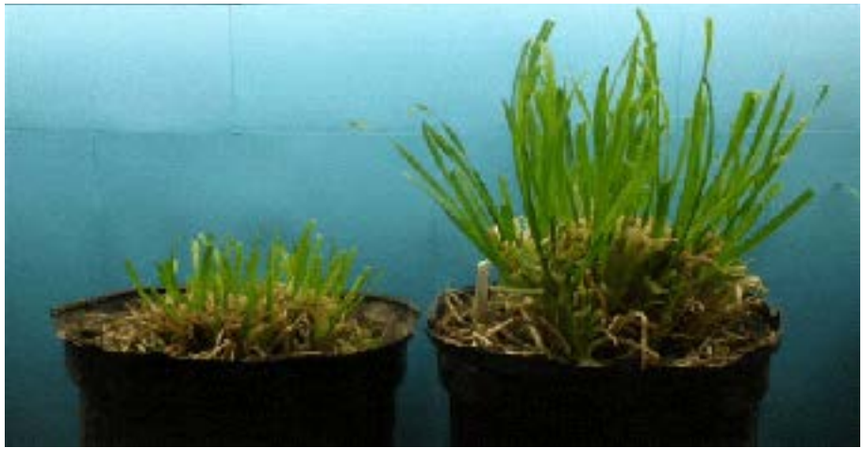
One of the best things you can do to grow more grass and more livestock is to leave more leaves. When you do this, plants recover more quickly and quicker recovery means more forage for your livestock. Since seeing is believing, here are some videos showing this concept in action.

You'll notice that both plants seem to double over time, but that's no reason to graze shorter. When you start with a larger number/height and double that, your forage is increasing more quickly than when you start with a smaller number/height, as in 2×2=4 and 4×4=16.

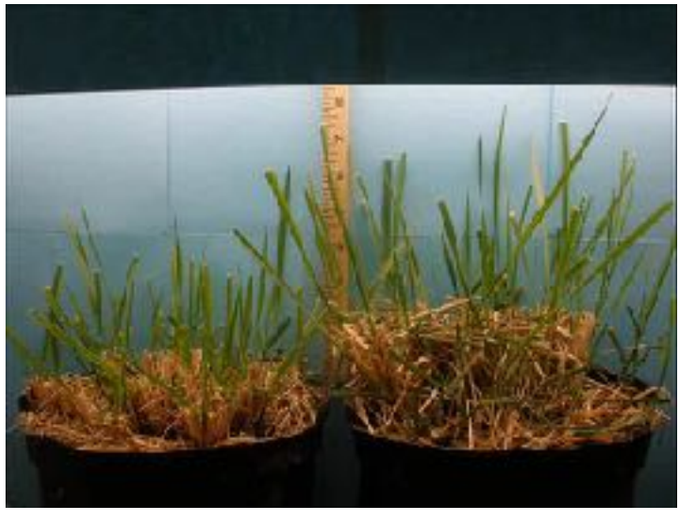
This first video is a comparison of the difference in response between orchardgrass continuously grazed to about 1" height and rotationally grazed orchardgrass left at 3.5 inches tall. It's taken over a 5 day period.

Click on the video to play.

Here's the last picture in the series to give you a closer look:

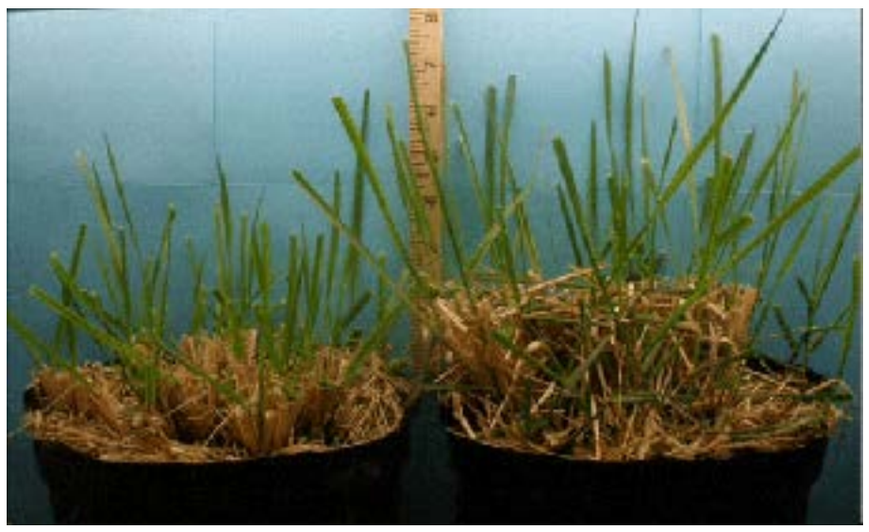


This second video does the same comparison with tall fescue. The grass on the left was grazed continuously to 1". The grass on the right was rotationally grazed to 3.5 inches.

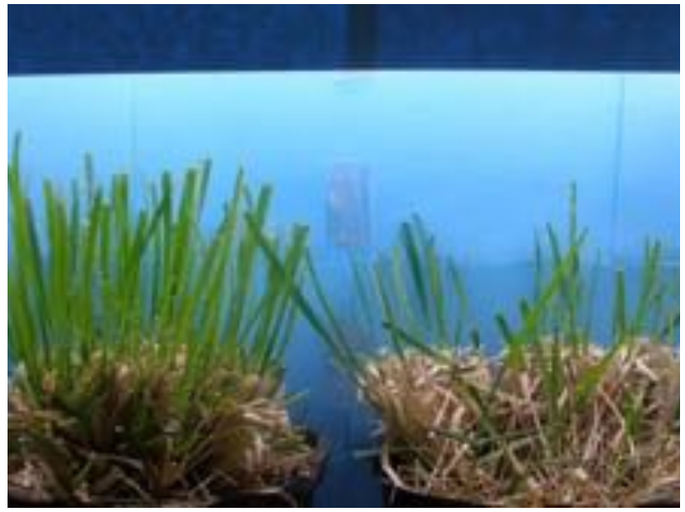


Click to start the video.

Again, here's the final picture in the timelapse:

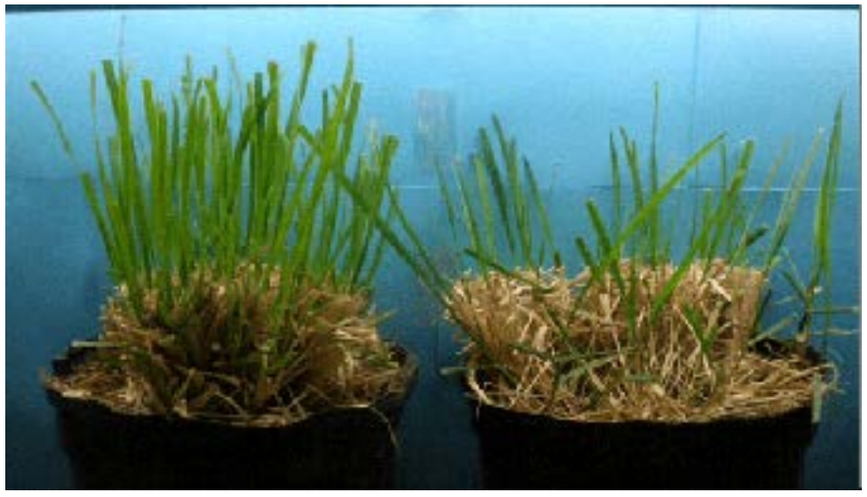


It's also interesting to compare the responses of different grasses. This last video compares orchardgrass on the left to fescue on the right. Both were "grazed" to 3.5 inches once a month. The video takes place over 7 days.



Click to start the video.

Once more, here's the last picture from this timelapse series:



Dave Pratt

Rest is NOT a four-letter word

Well – technically it is a 4-letter word, but we shouldn't use it like it is one.

Here, Dave Pratt talks about why it is one of the most important words in a grazier's vocabulary if you want to build capacity on your farm or ranch.

The biggest mistake people make in grazing management is providing too short a recovery period for plants after grazing. Of course too much rest isn't good either. In drier environments excluding animals from a pasture long after it has recovered will lead to reduced productivity, dead grass and bare soil. In wetter environments it can lead to brush encroachment.

The basic rule is: When growth is slow, we should use long recovery periods. When growth is faster, recovery periods should be shorter. This invites several questions, including: "How long is long enough?" "How long is too long?" and "How short is too short?" The only responsible answer to each of these questions is, "It depends."

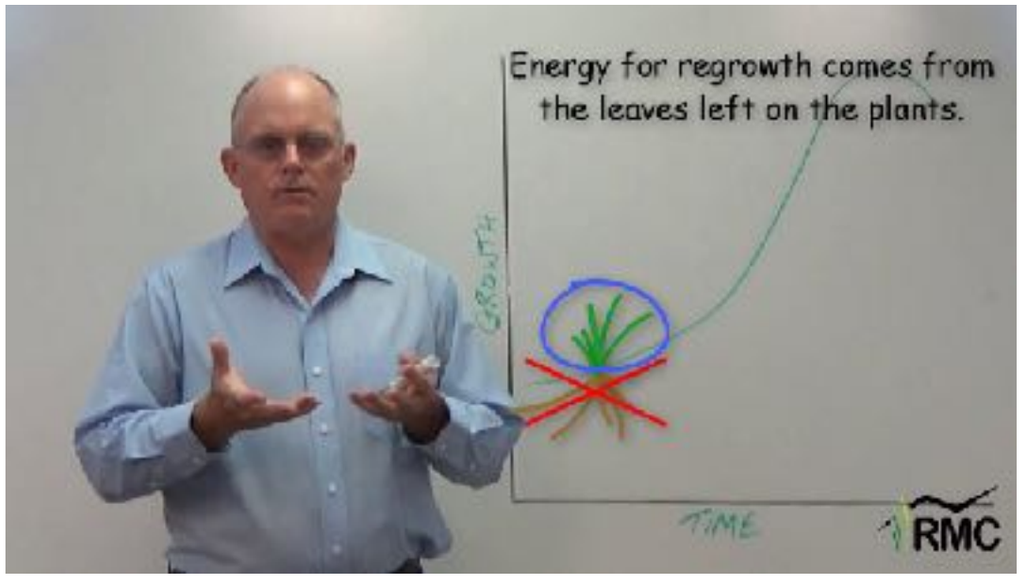
It depends on the time of year, the type of plants we have, and on our goals – like stockpiling or other management objectives.

The Rule of Thumb:

Slow Growth = Longer Rest Periods

Fast Growth = Shorter Rest Periods

It also depends on how severely the pasture was used the last time it was grazed. The more severely it was used, the longer it will take to recover. In this 3:47 video, let's look at what happens to the amount of rest a pasture needs when it gets grazed more severely.



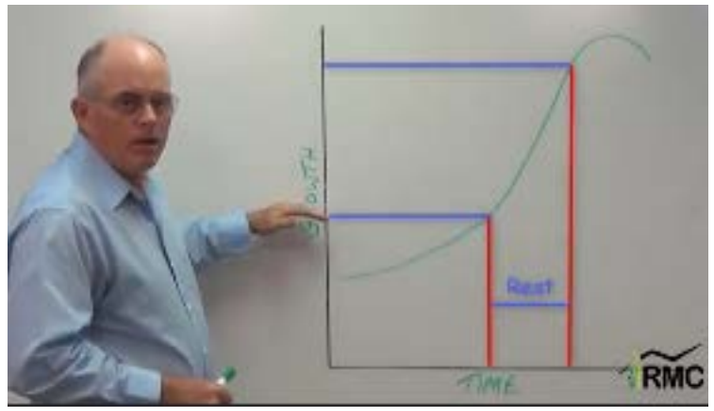
Click to start the video.

Leave More Leaves

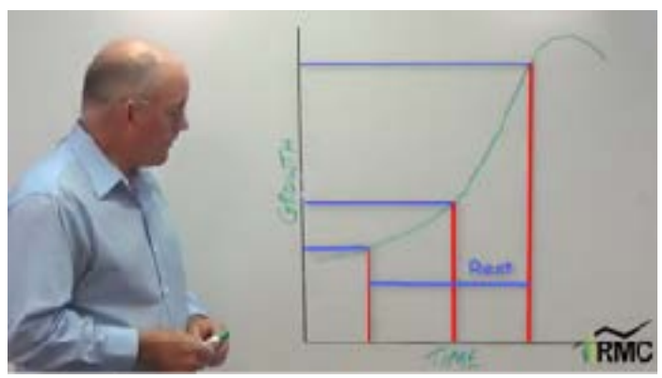
Severe grazing isn't necessarily bad provided you give plants a lot of time to recover, and they will need a lot of time to recover, at least in comparison to plants that weren't severely grazed.

> *"Most ranchers would benefit from leaving more leaves.*
>
> *Maybe that's why they're called leaves. We're supposed to leave some of them!"*
>
> *Dave Pratt*
> *Ranch Management Consultants* RMC

Healthy roots are what give plants the strength they need to break dormancy in the spring. After that, the speed of regrowth depends on leaf area available for photosynthesis. The growth curve also changes through the growing season, with a steeper curve in the spring, and a shallower curve in late summer. Here we see how much rest plants need to recover after grazing them.



If we graze another 25% further down, does that add another 25% to the recover period? As you can see, the answer is no. The recovery period actually increases by 50% or maybe even 75%.



In general, the more leaves we leave, the faster a pasture will recover.

Focus on Building Capacity, Not Utilization

Where we get into trouble is when we look at utilization. We might look at our pastures, see that they're grazed down, and that we've gotten efficient utilization. But efficient utilization is not nearly as important as building capacity. Profit minded ranchers know that to build capacity they need to graze less severely and **leave more leaves**.

Video Transcript - Rest is NOT a four-letter word

In cell grazing we base the recovery period we give pastures on the growth rate of the plants. The rule is:

Slow growth – Long rest periods
Faster growth– Shorter rest periods.

The biggest mistake we make in grazing management is not given your pastures enough rest.

Slow Growth = long rest.

But how long is long? It depends.

It depends on how severely we graze our pastures. It depends on the season. Things grow more rapidly in the spring than they do in late summer. It depends on the type of plants we have - warm season grasses or cool season grasses. It depends on whether you want to stockpile grass for the winter and other management objectives.

For now, let's look at one thing: how severely we graze our pastures.

A lot of ranchers seem to think that a grass plant's energy for regrowth after grazing comes from energy stored in the roots and crowns. But that's pretty much when a plant breaks dormancy at the very beginning of the growing season. Most of the energy for regrowth after grazing comes from photosynthesis. It comes from whatever leaves we leave. Most ranchers would benefit from leaving more leaves. Maybe that's why they're called leaves. We're supposed to leave some of them.

Most people don't leave enough leaves. They graze their pastures too severely.

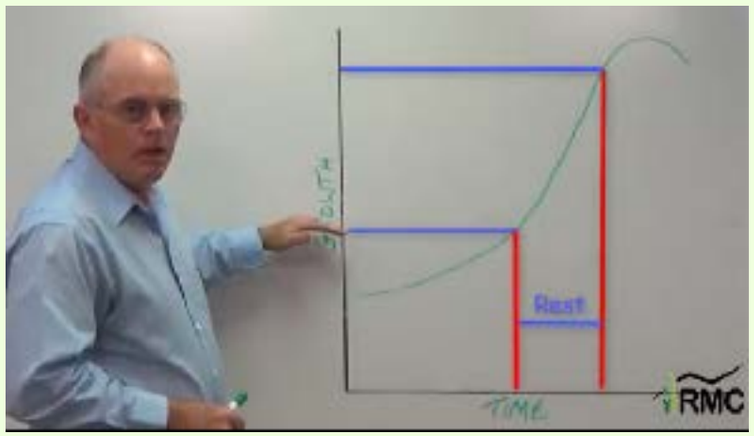
Now severe grazing isn't necessarily bad provided you give plants the time they need to recover. And they will need a lot of time to recover at least relative to plants that weren't severely grazed. The pastures that are severely grazed will be less productive. The bottom line is that by grazing less, you'll be able to graze more. Or maybe it would be better to say, "By leaving more, you'll be able to graze more."

Let me show you why. When plants are grazed, their recovery tends to follow an "S" pattern.

After a plant's been grazed, it's growth is relatively slow, especially if it's been grazed severely. Energy for this regrowth comes from whatever leaves are left to capture energy. Now as leaves grow a little more and roots start to recover, plants will start to grow more rapidly. If we stay out of a pasture too long, the growth will slow down. Older leaves are less efficient photosynthesizes and leaves will start to shade one another.

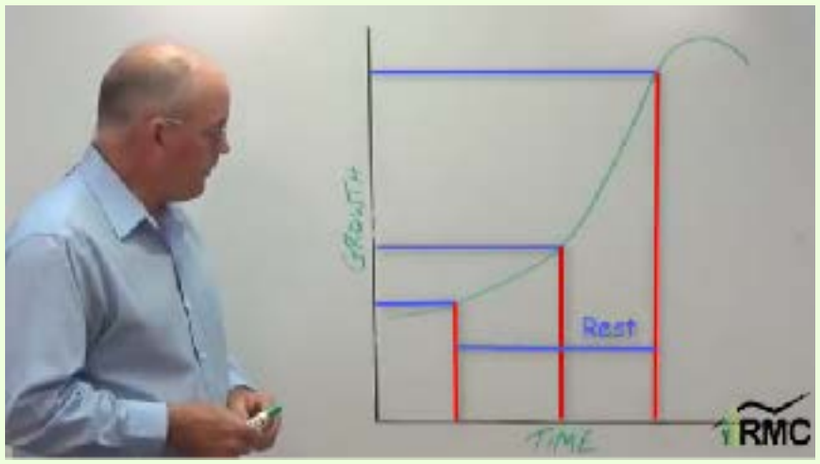
In spring when growth is fast, the slope of this curve will be steep. In late summer, when growth slows it will be more gradual. Now however fast the growth is, let's say that this curve describes the pasture today.

If we graze the pasture here, and graze it down to say here, this is how long it will take to recover.



Let's see what happens if I graze this pasture just a little more severely. Let's we say we take it down to here, maybe another 25%. Now, what happened to the recovery period?

Grazing 25% more severely didn't increase the rest we need by 25% did it. It increased it by more. A lot more! 50%? 75% It might even double it. Maybe even more.



In general the more leaves we leave, the faster our pastures will recover. Now I think one reason a lot of ranchers graze a pasture too severely is they're focused on utilization. When they see that all the grass has been grazed down, they think it's been used efficiently. But they're putting the emPHasis on the wrong syLABle,

Profit minded ranchers are much more concerned with building capacity than they are with utilization. They know that to build more capacity, they may need to graze less severely and leave more leaves.

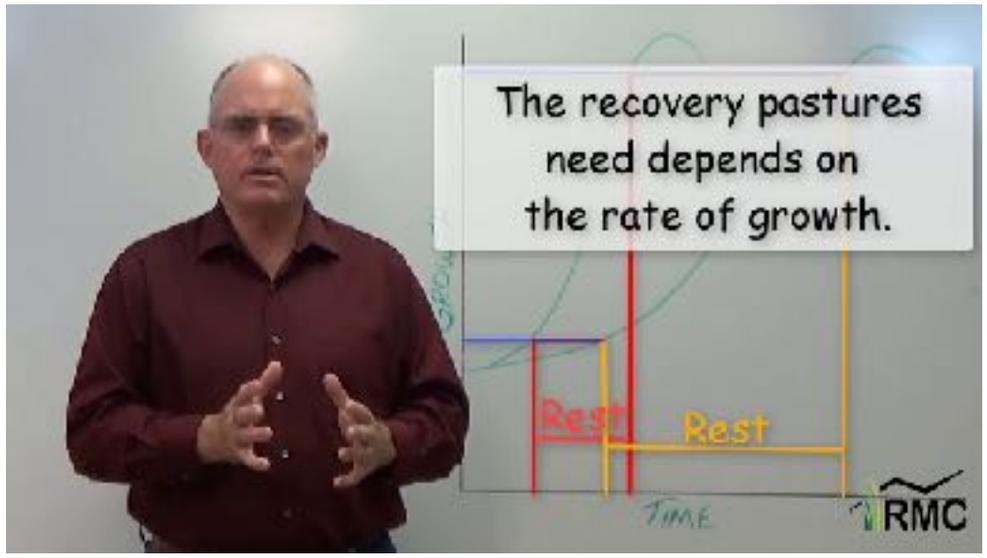
Dave Pratt

How long is a pasture recovery period?

Now, let’s apply the principle of "leaving more leaves" to show how this works as forages change through the growing season.

The biggest mistake people make in grazing management is providing too short a recovery period for plants after grazing. How long recovery takes depends on a number of things including the type of plants we have, on our goals - like stockpiling to extend the grazing season or other management objectives - and how severely the plants were grazed in the past.

The recovery time needed also depends on the season. In late summer or in the dormant season when plants are growing slowly we need longer recovery periods than we need in the spring when we have rapid growth. (There are exceptions. In some drier environments the fast growth period is so short that by the time we recognize it’s happening, it’s over. In those places producers may opt for relatively long recovery periods year-round.) In this 3:14 video, I talk about how the growing season affects recovery rates, and what we can do to adapt our management plan based on what we see happening.

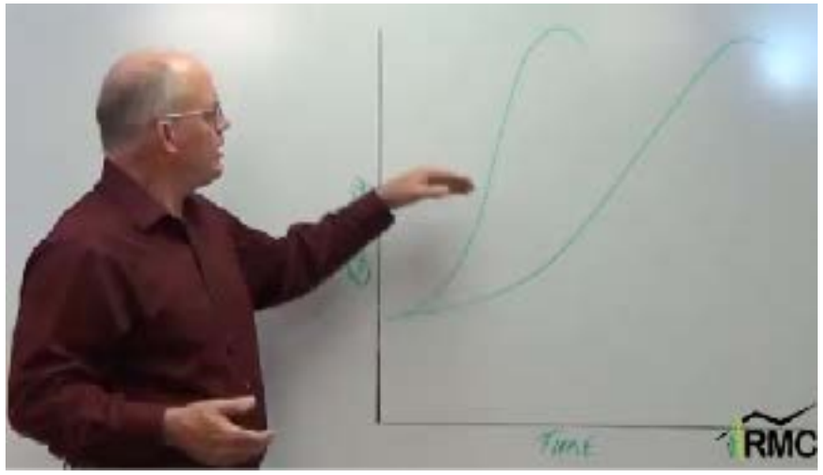


Click to start the video.

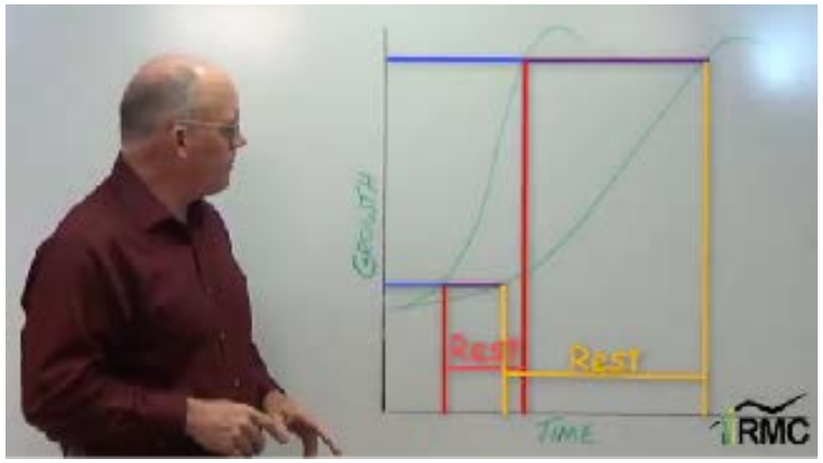
Identify Your Growth Phase and Growth Speed

The "sigmoidal" or "S" curve describes the growth rate of grasses in pasture. Having sacrificed roots and leaves after being grazed, at first regrowth is very slow. We call this **Phase 1**. Once the roots have started to recover and we have more solar panels, more leaves to support rapid growth, we enter **Phase 2**. This is the fastest growth we're going to get. If we let things go too long, photosynthesis becomes less efficient, and growth slows. This is **Phase 3**.

Phase 2 is the sweet spot, where we'd like to stay, but that's not so easy because the slope of the growth curve changes through the growing season. The curve on the left shows the curve during the spring growth season. The curve on the right shows growth rates in the late summer when recovery is much slower.



As you see here, the amount of rest the pasture needs depends on the rate of growth of the plants.



This is the foundation of the first rule of cell grazing:

The recovery that we need to give our pastures is based on the growth rate of plants.

Slow Growth = Longer Rest Periods

Fast Growth = Shorter Rest Periods

How Long is Long and How Short is Short?

It's pretty rare, even in areas with really fast growth, to find a place where the minimum recovery period wouldn't be at least 4 to 5 weeks. There are exceptions, but, if you're giving your pastures less time to recover than that, you're not doing your pastures or yourself any favors. And how long is long? It could be several months in some areas, and if the pasture as severely grazed, it could be as long as a year.

How Can You Tell What's Happening? Take a Walk in Your Pastures!

Unfortunately, there is no formula for calculating what the rest period ought to be. There is no recipe that says, “Graze 2-days, add water and minerals to taste, rest for 60 days. Repeat.” There is as much art as there is science to knowing when a pasture has recovered and is ready for grazing. Recovery has as much to do with root regrowth as it does the regrowth of leaves. You can’t go digging up your pasture to see how the roots are doing…although digging up one or two plants might be a good idea.

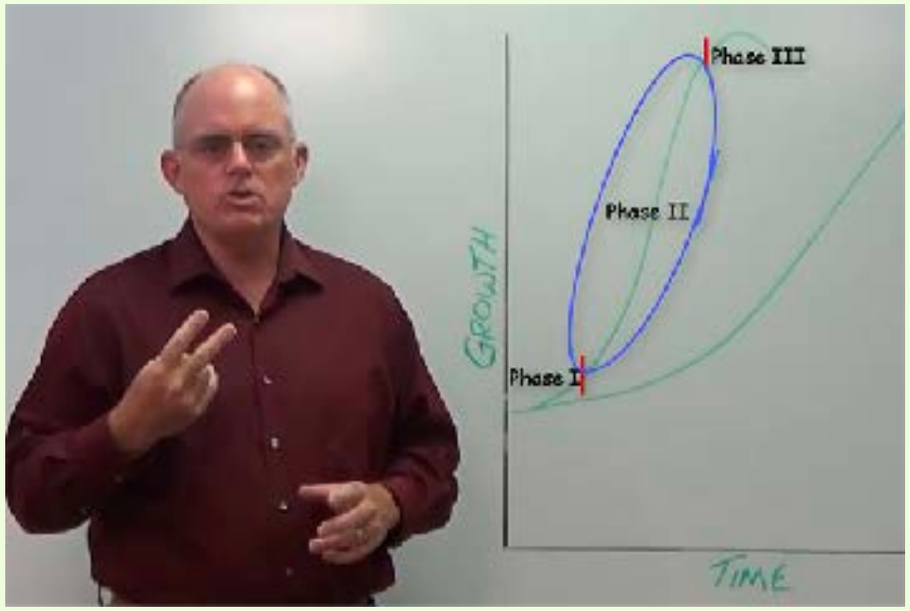
Your only recourse is to make an educated guess. Here's how to do that: look at your pastures to see how things are growing. Check the paddock you planned to move the herd into BEFORE checking the paddock that the herd is in. I also encourage you to make one other stop. Before you check either the paddock the herd is in or the one you plan to move them into, take a look at a paddock that was grazed 3 or 4 weeks ago. Ask yourself, “Is this pasture recovering as rapidly as I thought it would?” If there’s less growth than you anticipated, you need to lengthen the rest period. If there’s more than you anticipated, you can move the animals a little sooner. When in doubt, give pastures a little more rest.

Video Transcript - How long is a long recovery?

You've seen this sigmoidal or "S" shaped curve that describes grass growth after grazing. Having sacrificed roots and leaves growth is relatively slow after grazing. We call this **Phase 1**.

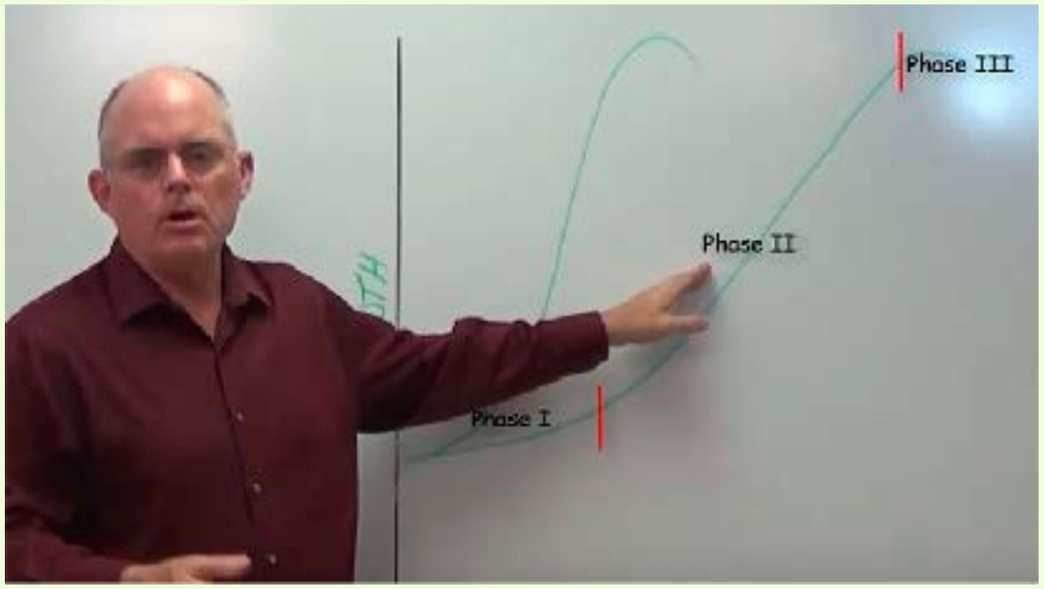
Once the roots have started to recover and we have more solar panels, more leaves to support rapid growth, we enter **Phase 2.** This is the fastest growth we're going to get.

Then if we let things go too long, photosynthesis becomes less efficient and the rate of respiration can actually exceed the rate of photosynthesis. This is **Phase 3**.



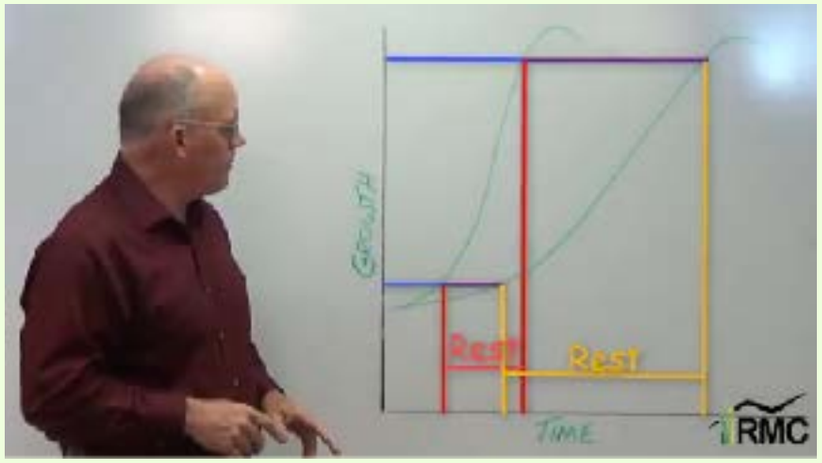
Now, it should become clear that Phase 2 is the sweet spot. We should try to stay in Phase 2. But that's not as easy as it might sound because the slope of this curve changes as the season changes. This curve describes spring time conditions when things are growing really fast.

This curve would describe later in the season, say late summer, when things are growing much more slowly.



If we come into this pasture during fast growth and graze it from here down to say here, this is how much time the plants in this pasture are going to need to recover.

Now look what happens when things are growing more slowly. Let's say I come into the pasture here again and graze it down to here, grazing with the same severity, leaving the same amount of forage behind, but look what happened to the recovery period. It needed more rest. It needed a lot more.



This is the foundation of the first rule of cell grazing. The recovery that we need to give our pastures is based on the growth rate of plants. If things are growing slowly, they need a long recovery period. If things are growing rapidly, they need a shorter recovery period.

It boils down to this:
Slow growth = Long Rest
Faster growth = Shorter Rest

But how long is long? And how short is short? Well it depends on a lot of things. But it's pretty rare, even in environments that have extremely fast growth, to find a place where the minimum recovery period wouldn't be at least four or five weeks. And that's if things are growing really fast for an extended period.

There are a few exceptions to that, but most people who give their pastures less rest than that are not doin their pastures or themselves any favors.

And long recovery? Well long recovery could be several months in some places. Depending on the severity of grazing it could be a year.

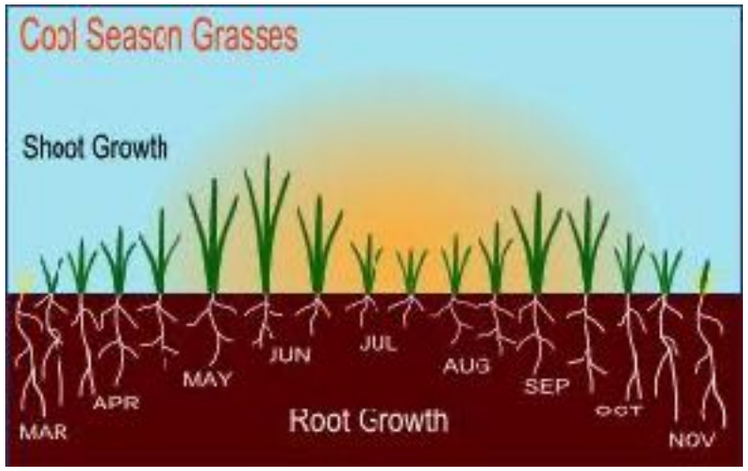
To get a handle on how fast pastures are recovering and the rest periods that you should be providing, take a walk. Take a walk in the pastures that the herd was in two weeks ago, or a month ago, and maybe two months ago. Are they recovering at the rate that you'd anticipated. If they are, great, stick with your plan. But if there's more growth than you'd anticipated, you might consider shortening the recovery period just a little, maybe moving just a little faster. But if the growth is behind where you thought it would be, you need to lengthen the recovery periods.

At the risk of sounding like a broken record, the most common mistake people make in grazing management is not giving pastures enough time to recovery after grazing. That recovery time depends on the growth rate of the plants.

Joe Trlica

A mix of cool season and warm season grasses makes resilient pastures

Some grass species grow during cooler times of the year (various wheatgrass, needlegrass, bromegrass, bluegrass, orchard grass, fescue). These grasses are commonly called **cool-season or C3 species** and grow when temperatures are 40 to 75 degrees F.

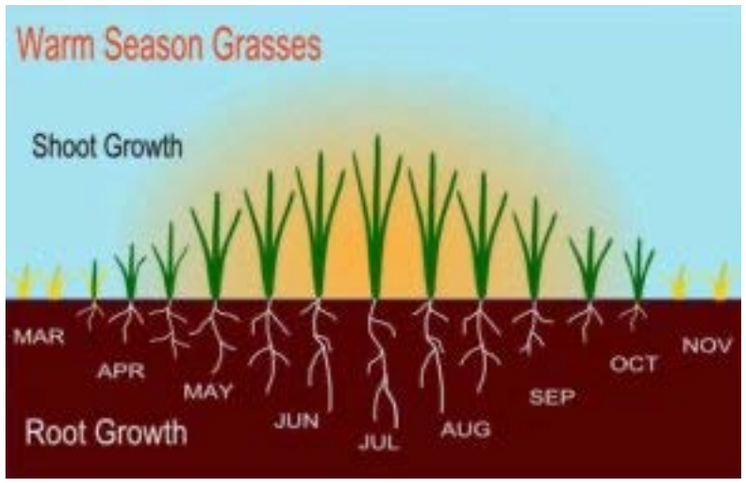


Illustrations courtesy of the Department of Geography and Environment, City University of New Yorksoils.chap.4.soil.climate.htm.

These grasses begin growing in early spring as soon as the soil is above freezing and daytime temperatures are conducive to growth. They produce high-quality forage early in the growing season, but by midsummer they've stopped growing and often become semi-dormant. They may grow again in the fall as temperatures cool and late summer precipitation replenishes soil moisture. Thus,

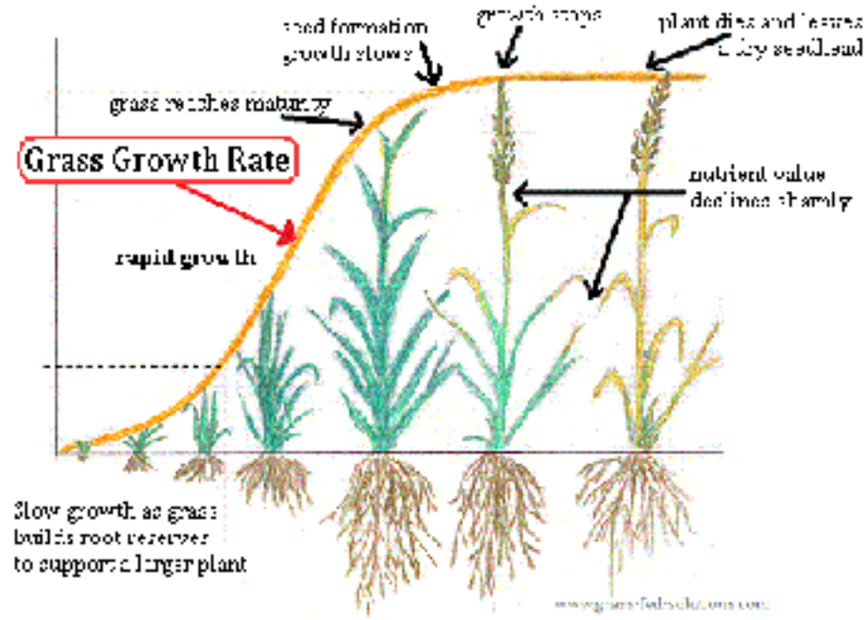
there may be two growing periods for these grasses: early spring and late summer or fall.

Warm-season or C4 species (blue grama, buffalograss, blue stems, maize, sudangrass, pearl millet, Indiangrass, bermudagrass and switchgrass) grow during warmer periods when temperatures are 70 to 95 degrees F.



Warm-season grasses use soil moisture more efficiently than cool-season species and often can withstand drought conditions. The C4 grasses have different leaf cellular structure that cause them to be more fibrous, contain more lignin, and be less digestible. Therefore, livestock normally prefer C3 grasses if they are at the same growth stage as C4 species.

However, because C3 grasses often enter the reproductive period at about the time that C4 grasses begin growth, livestock normally seek out this new growth from warm-season species. New foliage is always more digestible than more mature foliage, whether it be from a C3 or C4 species. Protein content declines throughout the growing season in both C3 and C4 species. Grasses, even when dormant, are fair to good sources of energy for ruminant animals, but other nutrients, especially crude protein and carotene, are likely deficient when plants are dormant.

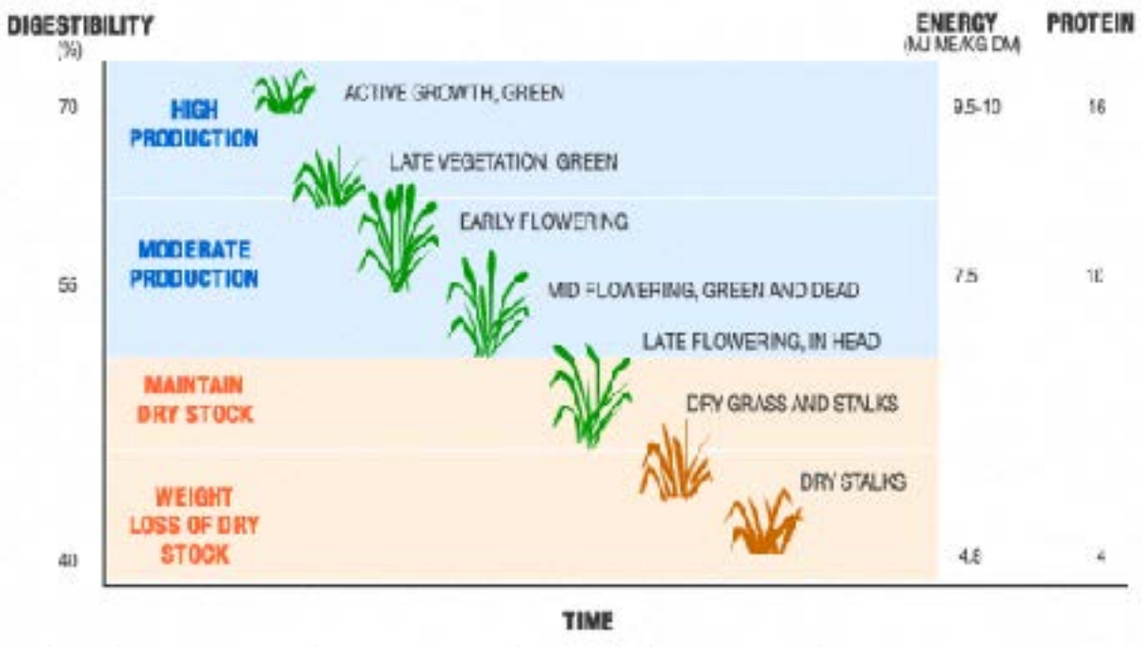


This illustration courtesy of grass-fed-solutions.com shows the growth curve and rate, and when nutritional value begins to decline.

A rangeland or pasture that has warm- and cool-season species has a longer season of green vegetation than if only one of these classes is present. High-quality, nutritious forage is available throughout the growing season with a mixture of cool- and warm-season species. If

only cool-season species are present, these species are the most nutritious during spring and possibly again during late summer or fall if regrowth occurs. There usually is a period during midsummer when cool-season grasses are less palatable because of stemmy reproductive structures and older leaf material. On the other hand, a pasture that contains primarily warm-season grasses does not provide very nutritious forage in early spring, because these grasses grow better during late spring through midsummer.

Different growth habits and requirements of cool- and warm-season species can be used to your advantage in a grazing program. For example, you may want to establish cool-season grasses in tame pastures to use in early spring or fall when these species are most nutritious. Livestock can rotate to pastures with warm-season species during late spring and summer.

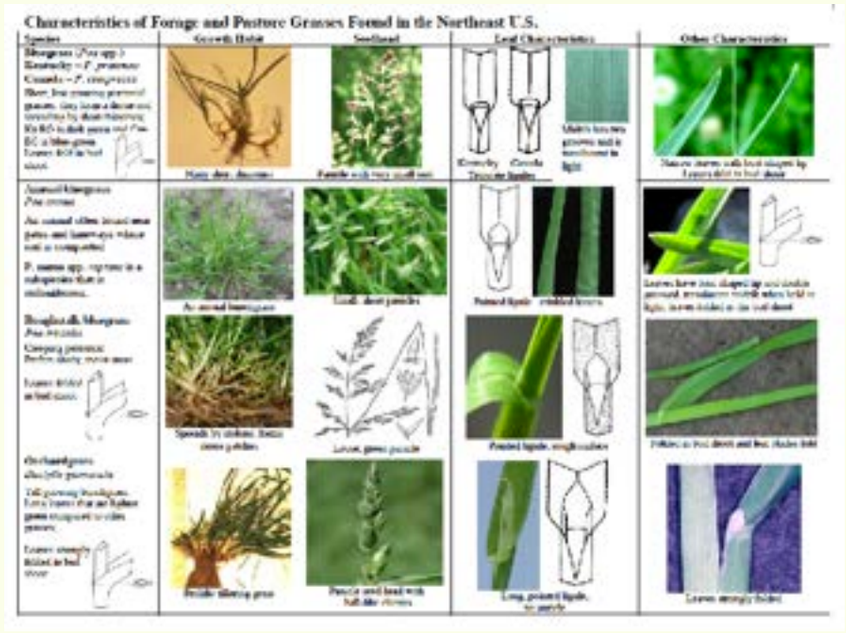


Here's an illustration of production and nutritional value of grasses to consider as you plan your grazing management.

Resources - Downloadable Grass ID Guides

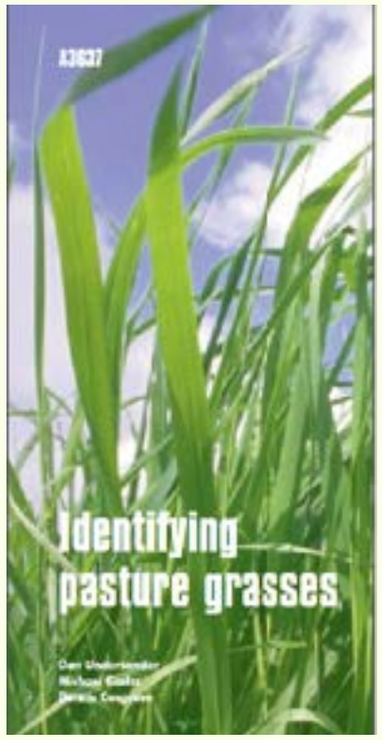
Here are some downloadable resources you can use to get started. And remember, identifying grasses is not an easy thing to do. You can find help at **your local Natural Resources Conservation Service Office**.

Northeast U.S.
This is a short and sweet handout with pictures and descriptions from Sid Bosworth, University of Vermont Extension. It's especially helpful because it points out the little identifiers separating one kind of grass from another.



Click here to download

Midwest U.S.
From University of Wisconsin-Extension, this full color booklet is great for folks in the midwest United States. The pictures and the table at the back describes growth habit, weed suppression ability, drought tolerance, how it holds up to traffic, and how you can plant it. If you want a hard copy, you can **order it online here**. Or just download it and keep it on your computer for reference.



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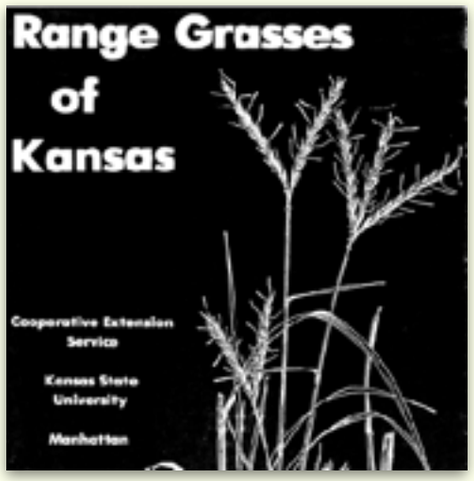
UW-Extension also put together a booklet to help you identify legumes. **Click here to download it.** For other plant, **this website** supported by K-State Libraries is a good resource for wildflowers, grasses, sedges, rushes, trees and shrubs.

Rangelands of the U.S.
Different rangelands have slightly different plants as well. These guides gave a good representation of what's you might find growing on ranges.

The first half of this guide from Colorado State University includes information about managing grazing. If you're just interested in identification, jump to the back half of the book for pictures and information on grasses of the west. There are also nice tables at the end listing plants and their moisture requirements, yield potential, drought tolerance and more.

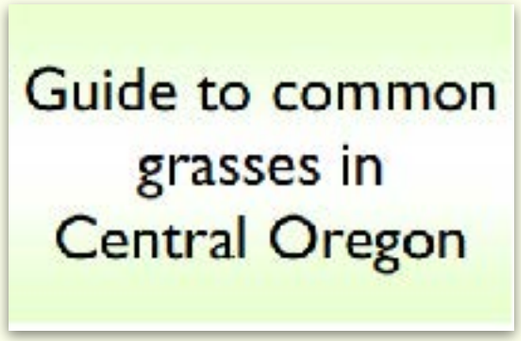
Click here to download

This one from Kansas includes many of the plants I've found on arid rangelands and may work well for folks working in the midwest area. It's an older resource (1983), with drawings instead of photos.



Click here to download

The color pictures in this booklet from Oregon make it a nice addition to your online library. Each plant comes with information about growth form, plant height, habitat, use and more.



Click here to download

California and other west-coast rangelands have some grasses that aren't found in other places. This booklet from USDA ARS has great pictures and includes information on management and habitat.

Click here to download

Southern U.S.
This guide covers native grasses in Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Tennessee, Alabama, Georgia, North and South Carolina and Florida. The illustrations are good and if you're not quite sure, you can google a color photo once you've got your grass I.D. narrowed down.

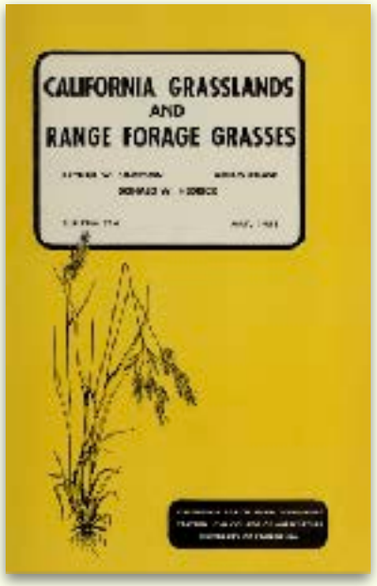
Click here to download

From University of Tennessee Extension comes this nice book on native warm-season grasses. The pictures are excellent, and the narrative includes information on the varieties of a particular grass. It also includes a lot of great information on using these grasses as forage for livestock. Though it says it's for the mid-south, the maps included show that many of these grasses grow throughout the U.S.

Click here to download

California

This is an oldie, but a goodie. It was written in 1951 by Arthur Sampson (sometimes called the father of range science), Agnes Chase and Donald Hedrick of the California Agricultural Experiment Station. In addition to drawings of grasses from the region, this book includes information on where and how grasses grow and managing them as forage.



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Great Basin

This guide from the Bureau of Land Management. The illustrations point out the parts of the plant that help make identifications. The descriptions point out where the plant grows and what it would look like full grown. There is also seeding information for some varieties.

Click here to download

Canada

This includes many plants you'll find on U.S. rangelands as well.

The Rest of the World

Finding online, downloadable resources for the rest of the planet is difficult. Here are a few links to try.

This website provides pictures of grasses, rushes and sedges in the U.K. You can use it as a place to start when trying to find out more about a plant.

For New Zealand, choose what you're interested to see plant pictures. Clicking on them provides additional information.

Read "Grasses of Southern Africa" online here.

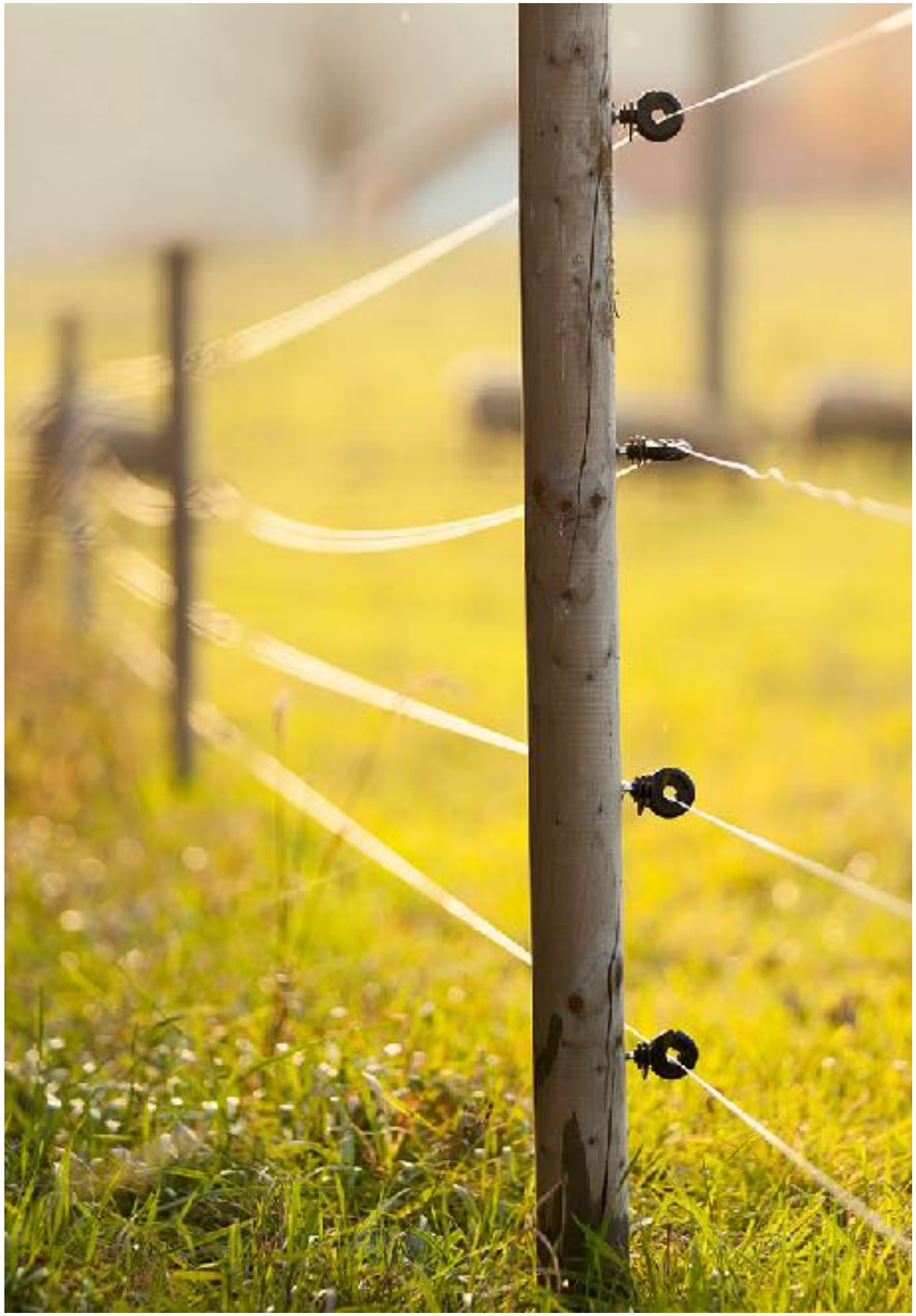
Fencing

Guiding Principles

“If you look at the cost of electric fence it is very very cost effective. It gives you more management possibilities.”

~Don Ashford

- **Shoot for a strong perimeter fence with temporary or modest interior fences.**
- **Don’t choose the cheapest materials.**
- **Train animals to the fence before you put them in.**
- **Talk to folks in your area to get good fencing tips. Your Natural Resources Conservation Service and Soil and Water Conservation District staffs can provide guidance and possibly financial assistance. And Cooperative Extension agents are also very knowledgeable and there to help.**



Kathy Voth

Some electric fence basics to get started

When it comes to fencing, every operation is different. So, I can't tell you where to put your fences or what kind of fencing materials you should choose. But I can give you some pointers for getting started.

Go to a class or work with a fencing expert to learn about how to set up electric fence.

Invest in yourself and you'll be ahead of the game from the start. There' so much to learn, and there's no need to reinvent the wheel.

Don't Be Cheap

Your time is valuable, and there's a limit to your energy. Cheap materials break and you waste time and energy fixing them, not to mention chasing your animals to put them back where they belong. Do yourself a favor and don't skimp on fencing materials. You'll be more productive and happier.

Yes, spend the money on a good charger

As Wayne Burleson says, "A wimpy fence charger gives you a wimpy fence. Don't skimp here because animals will think a smooth wire fence is a joke without a strong bite, and they'll walk right through it."

Wayne recommends choosing a low-impedence fence charger from a dependable supplier, with a warranty and replaceable components. He says, “Buy one that puts out lots of power. During a rainy year, you may have lots of pressure from plant growth touching the wires. That's when you will need extra power to shock through the heavy, wet vegetation.”

He also suggests finding folks with an extra charger you can borrow while yours is being repaired. Expect some breakdowns, especially from lightning. Certain fence suppliers offer lightning protection with their warranties. You can also install lightening protectors.”

Fence Pressure

is created by vegetation or anything else touching fence wires and drawing charge from your fence. When you’re shopping for a charger, a salesperson can help you best if you tell them both the acreage you’re running and how much pressure you anticipate.

Voltage & Joules

Voltage is what gets the electricity through the skin and hide to the nerves. Joules are the horsepower to move the voltage down the fence line.
A fence charger has to have enough joules to push the voltage down the fence and through any pressure along the way.

For more on selecting chargers, here’s a video from Greg Judy talking about what you're looking for:

Click to start the video

Solar vs. Plug-in Chargers

In two decades of running both solar and plug-in chargers, I would choose one I can plug in. They are more reliable, and more powerful. Unfortunately many of my fences were in remote areas where plugging in wasn’t possible. I learned to use marine batteries, with one in the charger and another charged and on hand to swap in at a moment’s notice.

If you can’t plug your charger in read the section on the system that Bell Rule Genetics is using to power miles of fence even with a heavy weed load.

Finally, it seems like a no-brainer, but do be sure that solar panels are facing the sun. Read the instructions, don't guess.

Buy a Good Fence Tester

When I started working with electric fence back in 1997, I didn't even know fence testers existed. As a result, my partner in the goat project often had to touch the fence to make sure it worked before we put goats in them. He did not appreciate this. Don't be like me. Get a fence tester.

Fault finding testers can point you in the direction have arrows that point in the direction of the problem. So if you have a lot of fence to manage, they can be quite helpful.

Invest in reels

Again, I've gone the cheap route, and I can tell you that it's no fun.

Here's a great video from Greg Judy on what makes a good reel and things he's learned along the way about taking care of them. He even covers how to fix something that happens to everyone: the polybraid jumps the reel and tangles around the handle. ARRGH!

Click to start the video.

Ground rods are your friends

Again, we all want to skimp here because it's just no fun pounding a ground rod 6 to 8 feet into the ground, let alone the three that most folks recommend. Do it anyway. Poor grounding gives weak shocks.

Train your animals to the fence before putting them in it.

Electric fence is a psychological barrier, not a physical barrier. If an animal has never seen an electric fence before, she's likely to walk right through it the first time

she sees it. So give your animals a “shocking experience” before hand so they never want to test the fence again. Read on for Don Ashford’s explanation of his training method.

Larger wire is better

Polytape, wire and braid work because they have small wires woven in to carry the charge. Some versions have more wires than others. The more wires, the better the charge on your fence. Choose accordingly.

Wire placement is important

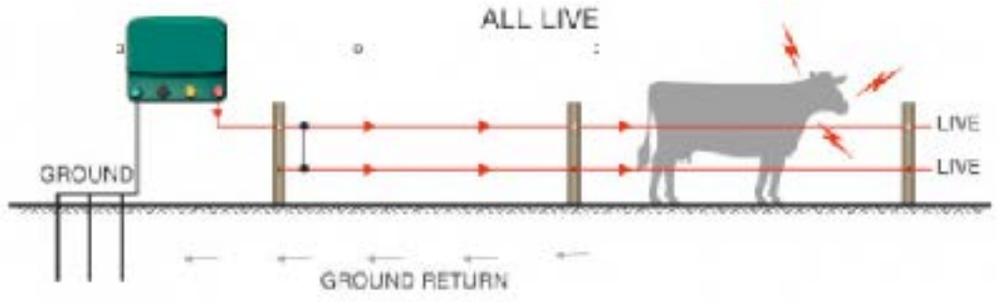
A hot wire at nose level to a walking animal ensures that they’ll touch that with their noses first and back up. If the animal’s nose is beyond the fence when they get shocked, they’ll jump forward, taking your fence down.

For additional wires, consider the size of the animals head and place them close enough together that the animal cannot get it’s head between the wires. You can also place a second wire at the nose level of offspring to encourage them to stay inside the fence.

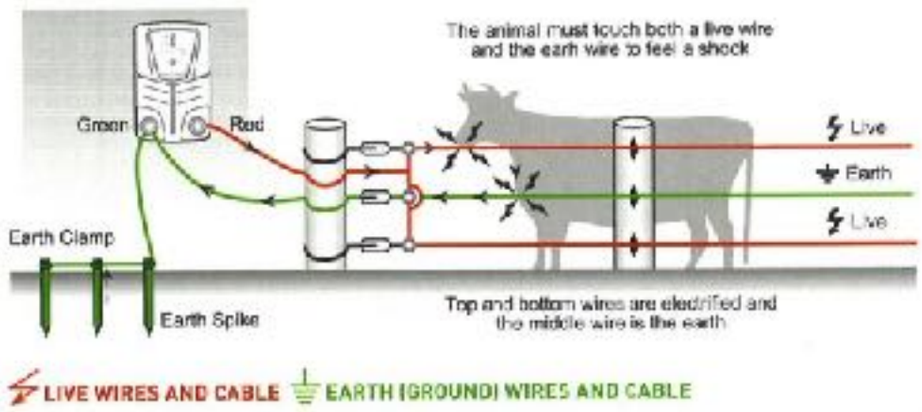
Keep wires at least 5 inches apart to prevent arcing and shorts.

Dry soils will reduce fence charge.

There are two different ways to set up an electric fence. The most common is where all the wires on the fence are hot (live). It relies on soil moisture to carry the charge through the ground and complete the connection to shock the animal.



When the ground becomes very dry, or when you’re working on rocky or sandy soils, there is little to no moisture to carry the charge through the soil, back to the ground rod to complete the circuit. A “Positive Negative” set up can solve the problem.



With this set up you'll have a hot/positive wire (or more) attached to the charger, and ground/negative wires attached to the ground rod. When the animal touches both wires, it completes the circuit and it gets shocked.

Another option in this situation is to increase the number of ground rods along the length of the fence. This reduces the distance the charge needs to move through dry soil.

One suggestion that comes up quite often is to wet down the area of the ground rod. But if we think about this for a minute, we'll see why this has little impact. While the area around the ground rods is wetter, we've done nothing to change the moisture levels in the soil all along the fence. That means, a wet ground rod area is not likely to change anything for us.

Check your fence often.

Watch for down limbs or heavy vegetation touching your hot wire. They can suck juice out of your system and make it less effective. Be sure it's working well so that your animals won't test it and decide they can leave.

Ask for help!

There's a lot more to know about using temporary electric fence, but if you keep these basics in mind, you'll get started on the right foot. When you run into problems or have questions, your best bet is to reach out to local Natural Resources Conservation Service or Soil Conservation District staff, or to get in touch with a Cooperative Extension agent in your area. If they can't solve your problem they'll know the right person to talk to.

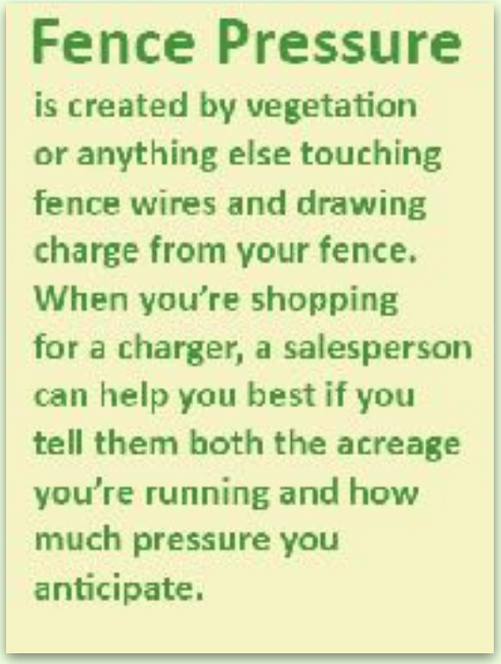
Good luck!

Video Transcript - Greg Judy talks fence chargers

Good morning, folks! This is Greg Judy at Green Pastures Farm.

This morning we're going to be talking a little bit about chargers. I get this a lot: "What kind of charger do you use? And how big a charger?" and all of that.

This one is the Stafix. This is an N36. One thing you want to remember on chargers is the joules. Look at the joules. This one has 54 joules stored energy and 36 output. That means it has a horsepower of 36 joules onto your fence. This is one heck of a charger. They say this one will power up 2500 acres. We don't have that many acres underneath one charger. But we do have a lot of pressure on our fence.



Folks, everybody says, "Ah we tried that electric fence. It didn't work. It shorted out."

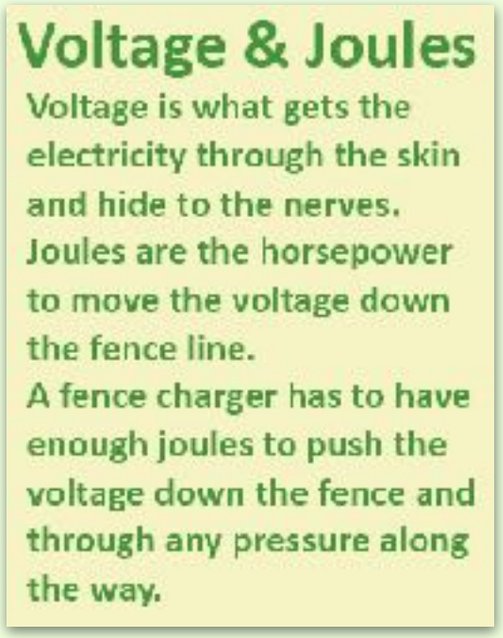
You didn't have the right charger. Probably had some steel post in your fencing. Eliminate the steel posts. Do not have steel posts in your fencing system because every steel post is a potential ground rod. Just remember that.

Go with high voltage, low impedence chargers.

How big a charger do you want to get?

If you're going to be running sheep fence or netting for your chickens, or pigs - pigs root dirt up onto your fence and that's going to put some pressure on your fence - or if you're running 5 or 6 wires out here through the brush and a lot of grass and brush grows up on that, you need a pretty good size chargers.

Now if you had only 40 acres, don't go buy this Stafix charger for 40 acres. It's too big. You need something like a 10 joule or something.



I will say this. When you get a long rainy period and you get a lot of rain and you've got vegetation touching your fence, that's when it tests the horsepower of your fence.

To manage vegetation touching your fence, never shut your fence off.

I made that mistake early on. I had these shut off switches all around my farm and as the cattle moved through the farm, I'd shut that switch off, so I could put all the power forward onto the what the cattle were on. Don't do that. It's the worst thing in the world to do, because now, what you've done, you've taken the voltage off that section of fence, you're not going to be back for 30 to 60 days and all that vegetation grows up on your fence. It's not getting shocked. The sap is touching the wire. It's not getting shocked so that sap just grows up and that's what pulls your voltage down. It's the sap in the vegetation. Getting shocked constantly every 100,000ths of a second, it dries up the sap in the vegetation touching it. It will actually kill a multiflora rose bush that grows up on our fence.

We'll go through our fence maybe once every three years. You don't have to go out there every year and cut the brush off it. You don't have to do that. We don't do that. We've got 16 farms and we try to keep the trees off it, maybe every 2 or three years we'll go out and clear that stuff back. But it's not an every day or every week deal. If you have the right chargers.

Now when we're talking about chargers...I love the Stafix. That's number one and I'll tell you why. It's got a remote control on and you reach out and touch the fence and it shuts it off.

Ground rods are very important

Any time you talk about chargers, this is kind of over-kill but this is what I've got on mine - this is a 7 foot, one inch steel galvanized rod. Folks on the big chargers like this you need a minimum of six and I've got 10 to 12 on mine. If you have a problem with your charger and it's not shocking your animals, look at this - look at your grounds. Make sure your clamps are all tight. Make sure that your wire's not broken going from one ground to the next. And I use galvanized, high-tensile wire to carry it from one to the next.

When you drop this in the ground, you want to put it somewhere where you're not going to be mowing over it because you want to leave a couple inches sticking out. That's where you put your ground rod clamps. Get you a good galvanized ground rod clamp. Don't put copper to galvanized. You put a copper clamp or vice versa - a copper

ground rod and a galvanized clamp - you get corrosion at the interface. It's not good.

So ground rods, put in enough of them and put them in on the north side of your building where it's shaded that way it's going to stay damp, or underneath a gutter, where the gutter's coming out you've got water, or in a low spot around a pond. You got a sewer or a lagoon, you drive these in around that, you're going to have a good ground, even in a drought. That's when you get into trouble. When it's droughty, it doesn't hurt and you've been in a 3 month drought, go out and water your ground rod, make sure these things stay moist.

A Made in the USA Charger

Now I'm going to talk about the Cyclops. The Cyclops charger, I love Cyclops. They're a good charger. The one thing I don't like about he Cyclops is it doesn't have the remote switch on it so I can't walk out to the fence and go "Off" and it turns it off. The Stafix you can do that with the larger models. Now the smaller joule models with the Stafix it doesn't have that option. But I think starting with 12 joules and on up you can do that.

The Stafix is available through Powerflex. Cyclops, I get these from my friend - and you may have a dealer. These are actually made in the good old U.S.A. This is a heck of a charger. The good thing about the Cyclops is it's about 30% cheaper than the Stafix. This one here is about the same size charger. This is a 36 joule too. The stafix cost $1300. The Cyclops cost about $880.

"That's a lot of money Greg!" Yeah, it is, but so is an animal that gets hit on the highway because your fence didn't keep it in.

You touch one of these you'll feel it and remember it for a long time. You'll get really careful about not wanting to touch it!

So with that, I'm going to stop. Everyone have a great day!

Note, The mention of brand names does not denote endorsement by the National Grazing Lands Coalition.

Don Ashford

Training Animals to Electric Fence

Here's how Don Ashford has trained hundreds of stocker calves to the electric fence and I have been told that this works for sheep and goats as well. These are sale barn calves not home raised calves so it is fair to say that some of them have not been treated very well.

When the calves arrive at our place, we unload them into a catch pen with water and hay and are kept there for 24 hours.

The day that they are turned out of these pens they are released into what we call a trap. This is a gathering pen that funnels into the working pens. The calves are not driven out of the pens that they have spent the last 24 hours in. We just open the gate, walk away, and leave the calves on their own.

The trap has two rolls of hay, one at each end, and a water trough at the end farthest from the gate leaving the catch pen. We run a single poly wire across the trap, except for an opening on one side about 15 feet wide. Animals must be travel through this gap to get from one end of the trap to the other and with the water trough only on one end it becomes necessary to make this trip. The rolls of hay are placed close to the hard wire perimeter to cut down on fence walking.

The part of this whole process that makes it work is the fact that the cattle are allowed to move from the catch pens into the trap on their own. This cuts down on a lot of running and gives them the opportunity to explore their surroundings without being harassed. The fact that they

are satisfying their curiosity will cause them to discover the poly wire across the trap and come in contact with it on their own. Without question this will be a shocking experience, and it is seldom that a calf will try it more than a couple of times and then it will learn to walk to the end of the poly wire. From time to time there will be a calf that will jump into the poly wire and take it down. Then it is just a simple task to put it back up – no real damage. After a day or two the calves have learned that every fence plus the poly wire will shock so they learn to avoid all fences.

This isn't at Don's place, but it gives you the idea of what's happening.

Click to start the video.

Now it is time to turn the calves into the paddocks. We have learned that it works best to not make the first paddock any larger than it needs to be to allow for one day's grazing. This cuts down on walking and still gives the calves what they need. We want and need the calves to follow us so it will take some time for them to learn to come to call but the fact that they are going to fresh grass will, after a few days, make this an easy chore.

Dean Schneider

Successful solar electric fence

Like many of us, Dean Schneider of Bell Rule Genetics, wasn't satisfied with the performance of the typical all-in-one solar charged fencers he'd tried. But since there is no electrical power at the place he's running his cattle, solar was his only option.

Here, he shares more about his systems and how they're working to power miles of fence, even with a heavy weed load.

Our First System

The first installation was built with a DC 6 joule charger, a charge controller, battery, and a 100 watt solar panel. It is currently running about 3 miles of single strand wire. We live in a fairly high rainfall area, so consequently we have pretty good weed pressure on the fence through the summer. At the time of this writing, we've used it for 12 months. We have not had to do any mowing under the wire and it has kept power up around 7,000 volts routinely.

For this installation, we purchased a 6 joule DC powered fencer as we felt it would be simpler than trying to use an inverter to go to AC. The solar panel was mounted on the side of a hay barn that faces straight east and west. There is a tree to the east and more trees further away to the west. We thought the east one was far enough away that it wouldn't bother. But during the winter, it will shade the panel until 9-9:30. The trees off to the west will begin to shade the panel at about 4 PM in the winter. In mid summer, we found that the barn actually shades the panel for early morning sunlight. However we still get sun from about 8-8. This has led to our only problem we have encountered so far. Once every 1-2 months our charge controller will be kicked off and cut power to the charger. I think this is due to the battery charge and output voltage

falling too low, thus causing the controller to cut output power to protect the fence charger. We have the charger hooked to the output terminals on the charge controller and I think we can get around this issue by hooking the charger directly to the battery. Then it won't be shut off by the controller. As I said, this has been a minor issue. Thus, we haven't taken the ten minutes to change the wires and do something about it. Overall, we have been satisfied with this setup. At some point, we will probably move the solar panel to the roof of the barn to eliminate the sun blockage issues we are having.

Our Second System

The second setup uses a 110 volt 8 joule charger, charge controller, battery, DC to AC inverter, and a 100 watt solar panel. It was installed about 5 months ago and is currently only running about one and a half miles of single strand fence. However, it too has had significant weed pressure. In the future this system will be increased to 3-4 miles.

After talking to the salesman at the solar supply business, we decided to use an inverter and an older 110 volt AC charger that we already had sitting around. He told me that the new inverters were very efficient and trouble free, so this saved us from having to purchase a new DC charger.

We mounted the solar panel on a brace post out in the middle of the field to keep it a ways from possible thieves and vandals. The panel itself is mounted onto an old satellite dish frame which allows us to do some angle adjustments to maximize direct sunlight. Both setups were done this way and so far we have not adjusted either. This panel is in a wide-open area and thus there is no shading problem whatsoever. The setup has performed flawlessly and puts out 8-9000 volts consistently.

My only real suggestion is to spend a little time and map out your sunlight hours where your installation is going to be so that you avoid shading problems from the get go. We will definitely do more systems like this in the future if the situation and need arises. They have been a very cost effective and trouble-free part of our rotational grazing system.

We put this two minute video together to show you what it looks like. (Sorry for the wind noise.)

In summary, we are very pleased with our permanent solar electric fence systems. I wish I could say the same about our smaller portable units!

Click to start the video.

Video Transcript - Solar fencer set up

Finished hooking up another solar fencer set up. We've got a permanent solar panel up above, We set a 30 gallon barrel, cut 45 degrees out of it, and mounted it onto a board onto the brace pipe behind. This system has an old M800 Gallagher fencer that we had laying around. We did't go with aDC fencer this time because the had this one laying there so we decided to try it.

(*This is a charger that would typically be plugged into a wall. But with the inverter, they were able to power it with solar*.)

So instead we are coming off the solar panel into a charge controller, the charge controller is hooked up to the battery and then the battery is hooked up to an inverter which has the fencer plugged into it.

This system should work. Like I say, we just got it hooked up today. The people at Missouri Wind and Solar told me that the new inverters are very efficient, that they would have very little power drop in them. So that's why we went with the 110 fencer instead of getting a DC fencer. We had this one setting around and so we decided to go ahead and give it a try using a 110 fencer with an inverter.

This is the system we have set up and it's working right now, so hopefully it will continue to. We're putting out 7 kilovolts. That's showing a 15 amp draw down there so there may be some weeds and grass that are on the fence down there. Not sure, but I"ll have to go down and check it out.

(*They're using a fault finder fence tester. The arrow is pointing to the problem, and the 15.5 amp draw is showing that there is some kind of short on the fence. As he says, it's probably from grass touching the fence. To find it, he'll test periodically as he walks in the direction the arrow point. If it turns out grass isn't the problem, the fence tester will help him look for wires touching, or a cracked insulator. Also, notice that he's running an electric wire with insulators on metal fence posts. The wire is set inside the fence so that the animals will touch it before testing the barbed wire fence*.)

There you have it for today!

Kathy Voth

Fencing Experiment Has Expected Outcome

And now - here's some science and a little fun too.

We all know what's going to happen. Even so, it's funny to watch these folks demonstrate how electric fencing, insulation, and grounding works with the expected outcome.

Click to start the video.

From Angus Fowles, the video's creator:

"For the benefit of the wider science community, I thought I would explain the basic principles behind this video. The electric fence used was a pulse electric fence. It shoots an electric pulse every few seconds. Note the first in line is holding the electric fence for the entire duration of the film. He is standing on plastic which is an insulator, therefore the electric current couldn't travel through the plastic into the ground so it just keeps going down the wire and not into the human chain. However, when the last in line takes of his shoes, it means the electricity can run right through the chain through his feet and into the ground. I have heard from other sources that the closer you are to the end of the line the more resistance you cause and therefore you get the greatest shock. Poor guy! 🙂

Water

Guiding Principles

“You want a water supply that is clean, plentiful and dependable.”

~Don Ashford

- Water is required for rumination and grazing. Never let your animals run out.

- Lack of water will reduce animal performance more quickly and more severely than will any other nutrient (feed or mineral).

- Ask for help! Check with the Natural Resources Conservation Service or your local soil and water conservation district for assistance in setting up watering systems for your pastures.

Kathy Voth

How much water do livestock need and how big should the tank be?

Species	Amount of Water
Beef and Dairy Cattle Non-Lactating	10-15 gallons per day
Lactating Cows and Bulls	20 gallons per day
Young Growing Cattle (< 500 lbs)	5-10 gallons per day
Sheep	1-2 gallons per day
Goats	1-2 gallons per day
Llamas	2-5 gallons per day
Alpaca	2-5 gallons per day
Donkey	6 gallons per day
Mature Horse	12-15 gallons per day
Pigs	1-2 gallons per day

This table comes to us from Roger Ingram, University of California Farm Advisor (ret). He says, “In cooler weather, below 75 degrees, water consumption will be less.” But the last thing you want to do is run out of water on a hot day. So, in estimating demand, stay on the high side.

Using Roger’s table, you can figure out how much water your herd or flock will need on a daily basis and how much stored water you need. Here’s an example to get you started:

I have 10 beef cows with calves
Daily water requirement per cow = 20 gallons
10 lactating cows x 20 gallons per day = 200 gallons.

If my water is turned off for two days I would need at least 500 gallons of water in storage.

(2 days x 200 = 400 + 100 gallons in case of delays with water being turned on again.)

Livestock Watering Habits

Animal behavior can influence the layout of a watering system. These tips from the British Columbia Ministry of Agriculture and Lands can help with system design:

- Livestock drink individually when on small pastures (20 acres or less). In these cases small troughs (25 – 50 gallons) and low flow rates (2 – 4 gallons per minute) are adequate. Greg Judy describes an example of this kind of system on the next page. Pay close attention to his recommendation to use high quality parts!

- The greater the distance livestock have to travel to water the more likely it is they will move as a group (herd drinking) and need larger toughs and good flow/refill rates. Slow fill rates force livestock to wait and “boss animals” will dominate the trough. To serve up enough water, you need to have a large enough tank that 10% of the herd can drink at the same time, with a flow rate that can water the whole herd in 20 minutes.

- Troughs located inside fenced pastures encourage individual drinking

- Troughs located outside fenced pastures (alley access) encourage herd drinking.

Tank Height

Naturally, tank height will depend on your livestock. Mark Green, Lead Resource Conservationist for the Natural Resources Conservation Service in Springfield Missouri, provides these recommendations.

Ask for Help!

Staff at your local **Natural Resources Conservation Service** or **Conservation District** office have the expertise to help you get this right the first time. Just ask!

Kathy Voth

Greg Judy's Fail-Proof Temporary Waterer

There are as many ways to get water to animals in pasture as their are graziers. This is one idea from Missouri Grazier Greg Judy. The reason he calls it a "Fail-Proof" waterer is that Greg has made improvements to his system to solve all the problems he encountered along the way. They're tips that you can use when thinking through your own watering system.

Check out his set up and see if something similar might work for you!

To build his temporary watering system, Greg Judy uses hoses and 3/4 inch polyethylene tubing and high quality hoses to bring the water from the source to the tank in the pasture. Fiberglass posts hold the tank in place and keep cattle from knocking it over. Sidewalls from earth moving tires surround the tub to keep cattle from muddying up the ground around the tank. He's also "armored" the tub with a little bit of electric fence. It keeps the cattle from climbing into the tank and breaking valves, and keeps them from stepping on and harming the hoses.

Note that he uses the best valves and hoses he can buy because, though they're not cheap, they're cheaper than the $300 to $400 water bills he might get when cheaper versions break in the middle of the night.

Click to start the video.

Video Transcript - Greg Judy's temporary fail-safe waterer

Good day, folks. This is Greg Judy at Green Pastures Farm. Today we're down in a bottom. This has had about 60 days rest. It's cool season grasses, fescue, orchard grass, there is some reed canary grass down in here. You'll see it right here.

You get down lowlands, you'll some of that coming up. I like reed canarygrss, but you cannot depend on it for any kind of stockpile. It's the first cool season grass to go dormant in the fall and it will turn brown and it's just terrible feed for winter. You can't depend on that. Look how beautiful it is. Cows like that.

Alex is putting in the waterer right now. We've got 300 and some head going to be drinking out of that tank. There's only going to be about 70 gallons in there

- 80. You get 300 and some animals drinking out of an 80 gallon tank, if you don't secure that…We just use a 6 foot fiberglass pole on each side and you can see he put it in the ground about a foot. We haven't turned the water on yet, that's just gravity coming from up the hill. We turn that water on, it's going to crank.

That is a Job float valve right here. That's the best one made, and there's a Job float. Look's like a bathroom float. As the cows drink, this float drops down and when they stop drinking and it fills up, the float comes up and the water shuts off. You drop it, it comes out. It's a full flow valve.

I don't know of any valves that's any better than that one for pressurized systems. It's not a cheap valve. It's like $48

I think now. Used to be able to buy those darn things for $30 but with inflation, you know. It's going up.

And here's our side walls out of an earth moving tire. We are down in a bottom, we just got 2 inches of rain the other day, and it's kind of wet down here. So this where these sidewalls really pay huge dividends. We got one on each side. The cows come up there, they put their foot right there [on the sidewall] and they drink, there front feet - it's keeping them out of the mud, and when a cow reaches her house in there to drink, she always throws water around on the outside. That's just what they do.

But this water point here, this is kind of cool. We've got a 50 foot lifetime guaranteed hose here. One of those you get at Lowe's. Not that cheap polyester crap. This is a rubber hose. You got pressurized water, don't be skimping on your hose, get a good one! Get a late hose, you'll come out here and have a big old hole in the side, you're going to have a big water bill. This water here is coming off rural water.

Here's my snap coupler. I'm going to do it right now, I'm going to unplug it. See this fit lever right there, I just unplugged stand I'm going to pull that out of there.

Where I did that, there's no more water coming out of that tank over there. Look how easy that thing goes. It works like an air hose.

See that nozzle right there, I'm going to push that up there - better yet I'm going to have Alex push it up 'cause here he comes. I can show you how that works.

This doesn't have any pressure on it because we don't have any water turned on. But look at this. That's how easy it is.

When you get done, this yellow cap, put that yellow cap it seals the quick coupler to keep spiders and ants out. This is your female, this is the male. This is hooked to the lifetime guaranteed hose that goes to the livestock tank.

But check this out. All this is is a roll of polyethylene. I use 3/4 inch, get it at Lowe's or Menard's in 400 foot rolls. I just use hose clamps and use, always use 2 hose clamps. And this is one of those little fittings with barbs on it that goes up inside the hose. This has got male fittings on it. This is a PVC dopule that gets me back to my pipe threads. Male pipe thread goes on to here. Anyway, this one hose

goes from way up there on the hill. I think it's 1400 feet and it's all been laid above ground underneath the fence. It's been there for about 18 years. You can't find that hose anymore. It's buried under all kinds of vegetation underneath the fence line, so that keeps your water cool on a 100 degree day.The sun can't et to that black polyethylene pipe

If you lay black pipe on the ground you go 1400 feet and that water is going to be too hot for those cattle to drink. What Alex just did there is he put a predator.

We've seen cows that get their front feet in that. A hot day they'll be standing in there and they'll break that valve off. You break that off, you're down. So what Alex did is tie a piece of polybraid here. And I like doing this. Guard that hose. Don't let cattle walk on that hose. It's a $45 hose and if you don't protect it with the polybraid, the cows are going to stomp on it and then hose is going to last maybe a year, two years at the max. If you protect it, It may last you 10 or 12 years.

So we got a power source now, keeping that hot and keeping cows from climbing into that tank.

So we're going to put up a paddock in this field, probably going to split this three times. And I think there's 16 acres down here, and cows are going to really be happy in here. Al this beautiful new growth.

Note, The mention of brand names does not denote endorsement by the National Grazing Lands Coalition.

Luke Jessup

I couldn't see the forest...or the water, for the trees

Learning how to think through our problems can help us get where we're going. Here Luke Jessup provides an example of just how that works.

After digging a well and running polyethylene tubing all over the place, my intensive grazing operation was humming right along. Cows never needed to walk more than two or three hundred feet to water and things looked pretty sweet.

Then the water problem started.

During a dry spell my well struggled to supply sufficient water for the herd and as the drought deepened the well teetered on the brink of extinction. I tried everything to revive that hole. First, injections and changing pumps and plumbing. Then praying, cussing, incantations, tirades, stomping, and throwing things. No dice.

The enduring image of the American cowboy is a picture of self-reliance, resourcefulness, and rugged individualism. That's to say, a cattleman fixes his own problems. So, when faced with an issue we often rely on our own library of solutions.

My limited library provided no solutions, however, so contrary to my independent, self-reliant ways, I sought out experts for assistance to fix my water well. Not getting much traction locally for the answers I sought, I finally contacted someone with an online grazing magazine (a

woman no less!) and she talked me through the water issue before directing me to a few agencies that might help. (At that point I was still thinking “well problem,” not “water problem.”)

Now, when I ask someone to help me fix something, nothing steams me more than them finding the breaker tripped, or that I needed to shift the transmission to neutral first, or that something only works if you press the “release” and “start” buttons at the same time – simple fixes like that. So, before I called any expert at one of these agencies I decided to get all of my ducks in a row so I could avoid any of those ‘gotcha’ kind of scenarios.

What was the first thing I needed to do? I guess, initially, I would need to state my problem to these guys:

“My well doesn’t work.” A little generic.

Actually, “We need water for my cows.”

“We need water delivered to cattle in multiple locations.”

“We need *clean* water delivered to cattle in multiple locations.”

“We need *500 gallons per day* of clean water delivered to cattle in multiple locations across the ranch.”

Luke's system includes a forty-foot, low-volume well with a pump, a 300 gallon tank and booster pump to send water up to a mile away through about 3 miles of 1.25" polyethylene tubing. The tubing is laid above ground underneath a single strand of hot wire or buried at gates and internal roads. Part of the cost of the system was covered by a Farm Services Administration loan. Luke says they didn't really understand his project. They found it interesting but possibly without benefit. He says, "I believe they see me as their poster child for that crazy, revolutionary style of ranching."

Okay. That looked alright.

Next, they would probably ask me about sources of water on my place. Let’s see. There’s that 40-foot concrete hole that used to contain lots of water. Also, three stock tanks (ponds) sit on our place, but I don’t really cotton to using

those due to their cleanliness, or lack thereof. Hmmm. I remember reading someone saying they used water caught by terraces. Terraces cover a lot of this ranch. I add that to my list. Now, where else do I see water?

Think. Think. Think.

I suppose I could consider county water since lines run to the barn and the house. It wouldn't take much to hook that to my water line network although that water incurs an expense.

What about rain? Some folks capture rain off the roof somehow. One inch of rain on my barn makes a little more than 900 gallons. That requires some gutters, a tank and piping. But my aesthetics critic/wife gave that the thumbs down, so I'll table that for now.

And what about rain in the pasture? Grass doesn't use all of it does it? I saw a report saying that a ten foot mesquite tree drinks ten gallons of water per day, regardless of the weather. Within 300 yards of the water well I estimate upwards of 400 mesquite trees. Gosh, that's 4,000 gallons per day!

While looking for that one silver bullet I think I discovered a combination of issues and solutions. So, before getting any

further outside help I figured I ought to go ahead and put some of these ideas into play.

For starters, over the Winter I cut down hundreds of mesquite trees and treated the stumps to prevent regrowth. Shade from a mesquite tree? Like virtue from a pool hall. Not enough to cover a reel of polywire. Now, I just wait for all that water to roll in.

Meanwhile, I started grazing in the Spring with the cattle getting 17 days of drinking water from terraces. With all the terraces grass-bottomed it proved a pretty clean source of H_2O.

With a temporary fence I sort of controlled cattle access to my tanks and let them drink from there for a total of

around 14 days. My rather sloppy exclusion fence still resulted in muddy water, though.

Also, I decided to suck it up and connect my grazing water lines to the county water for a short time. An interesting side note: the county water line produces quite a bit more pressure than my well, revealing some weaknesses in my polyethylene grid. Once I repaired all the blow outs, things proceeded smoothly.

But, the real triumph? After many months my water well finally came back online even though we continued to wrestle with drought. Cutting all those trees really worked? Sometimes things just happen? Hand of God? Shoot, I don't know. I tell you, though; I'm vigilant making sure none of those trees grow back and I make certain to kick a little into the offering plate every Sunday.

Well, it turns out I ***could*** solve my own problem. Hmmm. You reckon that girl at the online grazing magazine just wanted me to think a little to see if…

Naaah.

Drinking water from the terraces.

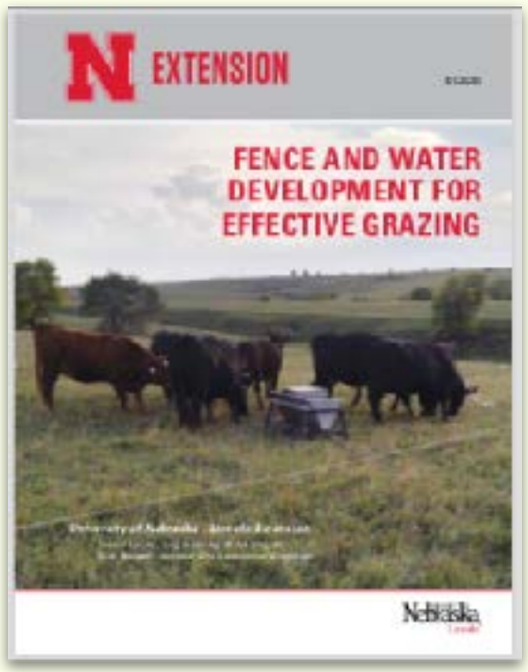
Resources - More stock watering ideas

There are as many different ways to get water to your herd as there are graziers. What we've tried to provide you here are just some examples to get you thinking innovatively.

If you'd like more ideas, here are a collection of On Pasture articles:

Solutions for watering from ponds
Two grazier solutions for watering stock
A $20 stock watering solution
Winter watering tips

In addition, University of Nebraska, Lincoln developed this fence and water development handbook. In Chapter 4, "Basic Water Supply System Design," you'll find a description of a portable tank and water tubing system that can be expanded to fit your needs without the expense of permanent fixtures. By choosing tubing and fittings made for the job, you can tow your tanks and tubing from pasture to pasture with an ATV. The authors take you through all steps of the process, from installing portable air/vacuum vents to figuring out pressure and water flow so that you're sure that flow capacity will match your livestock numbers. They include pictures of portable tanks being towed, and how to secure the tubing as you're making moves. They even show you how you can design your system to make water flow up hill.



Click to download.

If you're not an expert in water engineering there are folks nearby who could help you. Check in with your local **Natural Resources Conservation Service** or **Conservation District** office, or find an Extension Agent. Tell them what you're trying to do. Many offices have people who have the background and experience to help. They might also be able to point you in the direction of funding assistance. Remember, moving livestock as part of a grazing plan to improve your profitability while conserving and enhancing natural resources and wildlife habitat is a covered practice for many NRCS funding programs.

Dollars & Cents

Guiding Principles

“You don’t want to spend more than you can get back. Credit is a tool! Use it wisely and seldom.

~Don Ashford

- Reduce inputs and keep your money in your pocket
- Look at the margins and adjust your management accordingly.
- If you’re not making a profit, you’re not sustainable or regenerative.

A note from Don

I realize when we speak about low-cost production methods and the idea of doing something with less stuff and not buying a bunch of equipment that this flies in the face of everything we have been taught. The American addiction to buying things that we can't afford and brands that carry a status symbol with it has been called a characteristic contradiction of our times, the necessary consumption of the unnecessary.

This may be a plus for you if you are in the business of selling clothes or jewelry or automobiles. But if you are in the cow business every unnecessary dollar that you spend will come back to haunt you.

The first conclusion that each of us must reach before we start to plan any management strategies is why are we in the cow business? If it is not to make a profit say so at the get-go and call it what it is: "my cow hobby." Now you don't have to justify all of the money you spend. It's like when we buy a new set of golf clubs - it will make it possible to improve our game. If we buy that new bass boat it will allow us to spend less time getting to those honey holes. If you were to stand on Hwy. 19 going north out of Baton Rouge a few days before deer season you would witness the movement of much equipment. There have been wars fought with less equipment than is hauled up that road to the deer camps.

I have no problem with any of this, but understand these folks are not trying to make money.

I also realize that our economy cannot be maintained without a lot of unnecessary spending, but we are talking about putting together a sustainable and profitable cow outfit. What the profit will be spent on is of no concern in this discussion, but sometimes even if you know where you are going it is hard to get there. What you are trying to do with your cattle enterprise will change your whole perspective. You know what the little hen said about laying an egg, it may be a good breakfast for someone, but it's just a pain in the butt for me.

Don Ashford

Reducing inputs and the Graziers Vow

With over six decades of farming under his belt, Don has a lot of experience with how to run a profitable enterprise.

Avoiding too much "stuff" and keeping your money in your pocket are critical.

Yogi Berra once said, "***You can observe a lot by just watching.***"

I grew up in this business watching the old timers who believed the best dollar was the one you were able to keep. These old boys would patch an inner tube until there was nothing left to patch. I know this is extreme to most today, but the point is, and the lesson learned, was don't spend more than you can afford.

Most folks trying to get started can put themselves in a hole by spending too much getting started. If you are going to sell calves once or twice a year do you really need that big truck and trailer? You do not need to own a bunch of hay equipment, even if you are going to feed hay. Buy your hay which also brings in nutrients. If you have hay to bale, hire it done. Those are inputs that don't increase your bottom line.

Inputs that break even don't help

Once, when we were in the dairy business, we decided that our butterfat was not high enough. After much thought we came up with the idea if we fed some alfalfa hay it would be possible to increase our butter fat.

Any alfalfa used down here must be shipped in. It just will not grow in Louisiana. We contacted a hay broker and made a deal to have a load delivered.

The day that truck load of hay arrived may have been one of the hardest days I have ever worked in my life. We milked that morning, about 100 cows, and cleaned the barn, fed the calves, unloaded the truck of hay into the barn, milked the evening milking and then put out alfalfa hay for the cows. We gave them alfalfa hay every evening for a month.

The day the next milk check came we were all anxious to see if there had been any improvement in our butter fat. This little change had done exactly what we thought it would do. The butterfat was up to the point of making the milk check increase enough to make us very proud of ourselves.

BUT, and there always seems to be a but, after doing some figuring on the cost of the hay and the extra labor involved in putting it out every night, and being later for supper every night, this little project had broken even. In other words we had done all of this for nothing.

Watch out for the folks who want to sell you stuff

Industrial agriculture has been dumbing down how nature works for decades. It has all come down to adding inputs. Grass not looking very good needs fertilizer, livestock looking kind of rough needs feed and medicine, weeds looking too good need chemicals. It is not required that you think, just bring your checkbook.

One of the first things you learn in the business of selling is to create in the mind of your potential customers a need for your product. Listening to sales people, we begin to believe that all that stuff is necessary. It's a problem for many livestock producers when it comes time to start making decisions and choices about how we will run our

outfits. Most believe that we need much more stuff than is really required to run a grass farm.

Delbert McClinton has something to say about this. He is one of my favorite blues and honky-tonk singers and he sings a song about too much stuff that I really like. Maybe he'll help you remember this lesson.

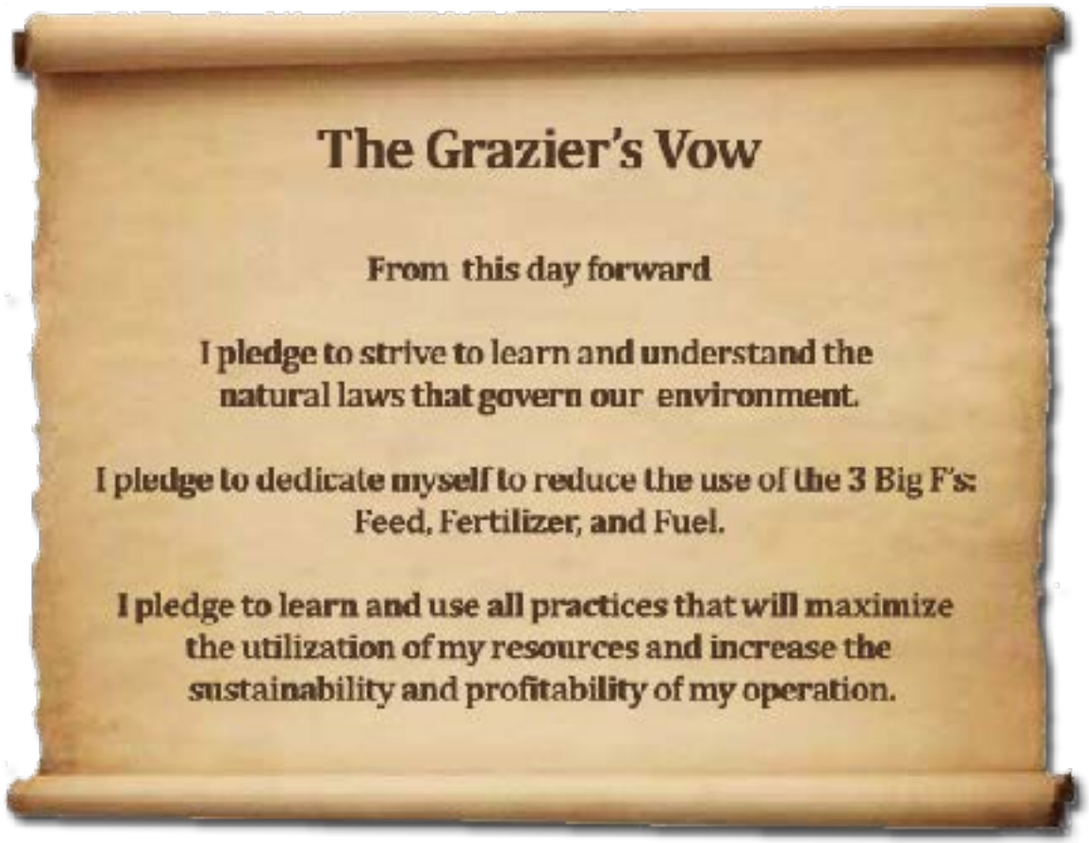
Click to start the video.

Knowledge is the Answer

If you don't want to get caught in the cycle of "too much stuff" the very best tool at your disposal is knowledge. When we begin to learn and understand the truth about grass production and how it applies to livestock production it becomes so much easier and we find that the need for a lot of that stuff disappears. Understanding basic principles makes decision making easier and more reliable.

Do not build your outfit with the idea in mind that the market will cover your behind when you make bad decisions. The one and only thing that will give you any chance of making it in this business is reducing the cost of producing a pound of beef.

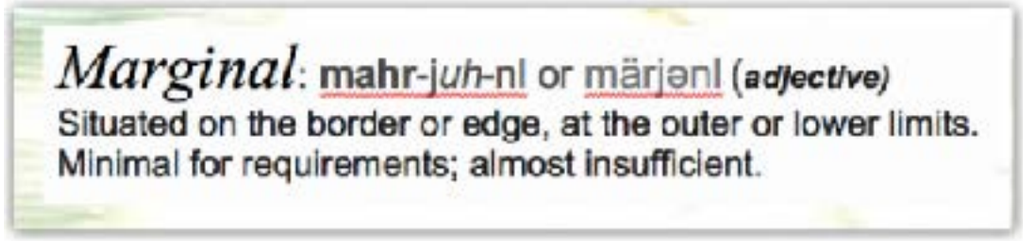
And with that, I give you the Grazier's Vow, something I wrote up to help us all remember how to succeed.



John Marble

Are you running a marginal business?

Margins - the difference between what you spend and what you bring in - can guide decisions about your operation.



Over the past few decades I've heard more than one ranching guru give advice regarding being careful about who you hang out with.

"Stay the heck out of the coffee shop. Ranchers just sit around in there and bitch about things they can't control, and brag about things that don't matter."

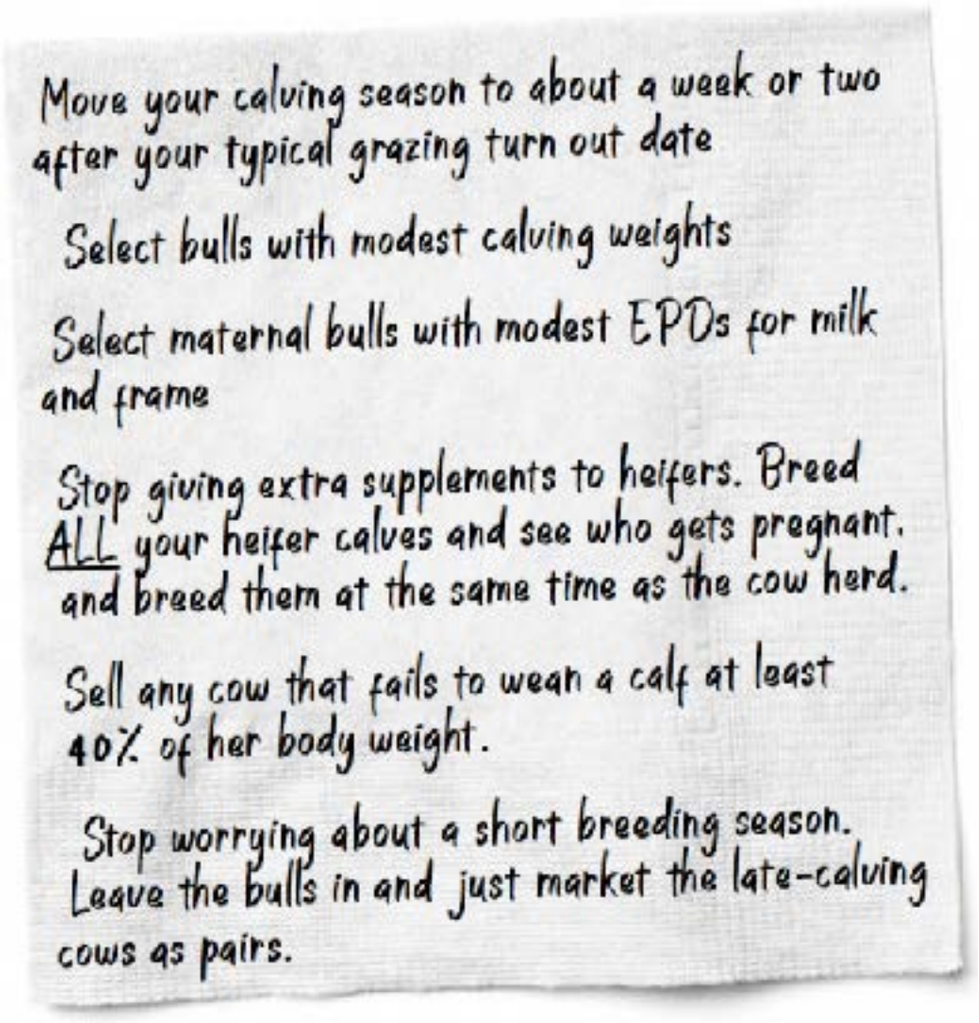
I know this is good advice. But in addition to coffee shops, it's too bad they didn't mention taverns too.

I recently found myself in a dimly-lit backroom at a local watering hole, hanging out with a couple of fellas in straw hats and pointy boots. Studiously avoiding politics and religion, the talk was mostly about markets, weather, and the government. After a while, one of my compadres noticed that I was pretty quiet. When he asked why I was adding so little to the conversation, I pointed out that it didn't seem to me that those topics deserved much thought, as we have so little opportunity to change them.

"OK, Mr. Smarty-Pants. What sort of things are you interested in? How are we gonna make some money in this

cow deal? What is it you think we should be trying to work on?"

I took a bar napkin and made a quick list of suggestion that I thought might help my pals increase profit. Here goes:



As my pals looked over the list, I could see the furrows growing deeper and deeper on their foreheads.

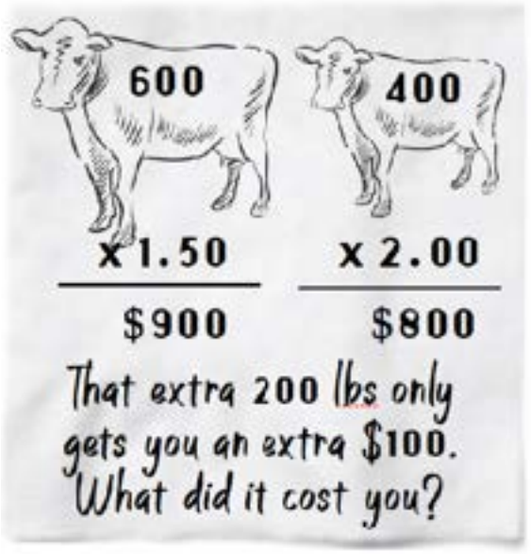
"Well for goodness sake, this stuff's all goofy! Every one of these ideas will wind up lowering my weaning weight, and making smaller frame cows, too! Who wants a bunch of 400-pound dink calves? My buyer wants calves with some bone, some frame, calves that might be ready to go to the feed lot right off the cow. ***And besides, we get paid by the pound, remember?***"

At this point I knew I should just order another round and forget about it, but I couldn't quite stop myself.

"Sorry fellas, but I have to disagree. We do not get paid by the pound. We get paid based on a thing called ***margin***. Margin is the difference between what that calf sells for and the amount it costs to raise it up. And hopefully, that will be a positive number. You are correct that weaning weight is important. Turns out, there is a direct correlation between higher weaning weight and profit. But most of the time, it is a ***negative*** correlation! In other words, generally speaking, the bigger we get these cows and calves, the less profit there is in it for the rancher.

"And there are some good reasons why it works that way. Turns out, 1,000 pound cows are just more biologically efficient that 1,700 pound cows. That smaller cow takes less input to produce a pound of calf, so your calves cost less per pound to produce. Plus, you can run a higher number of small cows on the same rangeland. Finally, take

a hard look at the difference in value between a 600-pound calf sold at $1.50 and a 400 pounder at $2.00. You're only getting 50 cents per pound for the extra 200 pounds. Can we raise a calf for 50 cents a pound? I don't know, but I don't really want to. Are you starting to get the point?"



"Well, all that might be true, but I run a reputation outfit here. We've been producing good calves — calves that the buyers really like — for a long time. I'm not about to go back to running those little mongrel cows like grandpa did. And besides, we get paid by the pound, you know."

Sigh.

So...Let's Talk About This

Truth be told, each of the ideas I suggested above (on the bar napkin) may well lead to smaller cows and lower weaning weights, and both of those things run counter to what we've all been raised up to strive for. But the point of those suggestions --the *purpose* of each-- is to increase the *margin*, to make the economic model work better, so the ranch actually makes more money.

There are plenty of worthy ideas floating around about ways to improve the economics of the cattle business, and it's hard to choose which one is most important. Personally, I believe this business of understanding the concept of *margin* is critically important to improving our economic outcome. The formula really is pretty simple:

We could spend an entire article dissecting the different "costs" associated with running the ranch, but for the purposes of this discussion, let's simply try to agree that it costs a certain amount of money to support a cow and her calf for a year. These costs fall into two categories: ***Direct Costs and Overheads.***

Direct Costs are the inputs we spend on the cow herd, things like hay, minerals, medications. Sometimes I find it

easiest to think about it like this: If I add another cow to the herd, what costs go up? Those costs, then, are Direct Costs.

Overheads are related to Land, Labor and Management. Adding another cow probably won't mean hiring another employee or buying another tractor. And it won't change your mortgage or land taxes.

When we add up all of our sales for the year (Sale Price) and deduct the amount we spent on taking care of the cows (Direct Costs) we are left with the Margin. The ***margin*** is the amount of money we have available to pay for our Overheads.

Some folks out there are probably thinking that this is all mumbo jumbo; a cost is a cost. The only thing that matters is how much money is left in the checking account at the end of the year. (Besides, as my buddy says, we get paid by the pound!)

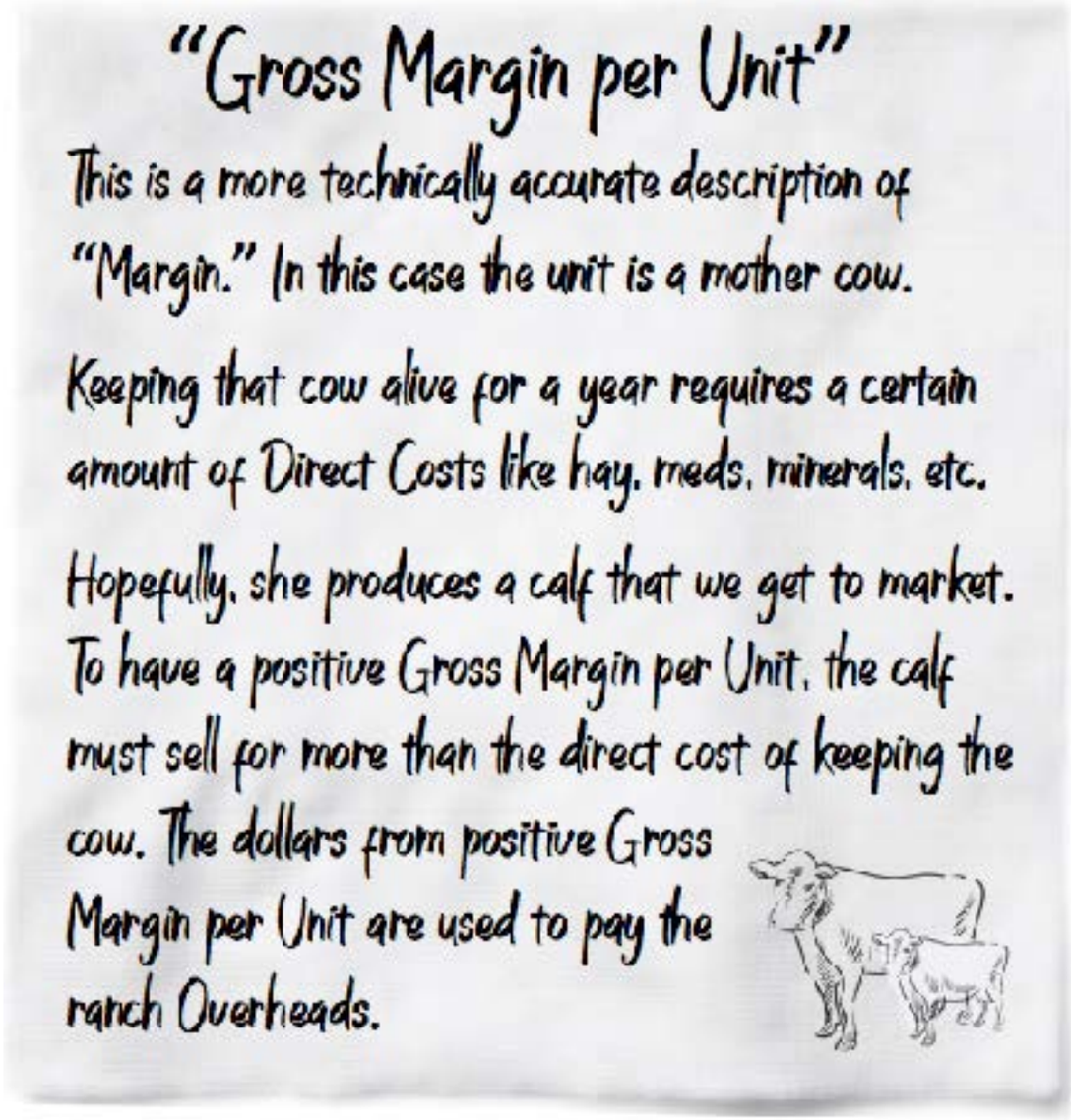
But here's the real bottom line:

In order to recognize where you need to make improvement in your economic model, you need to be able to identify where you are spending your money, which enterprises are working and which ones aren't. Identifying Direct Costs allows you to calculate ***margin*** for each enterprise, and knowing your ***margin*** tells you if you can afford to pay for the ranch Overheads. If you can't do that, you need to make a change to the enterprise, in order to

improve the ***margin***. Or - and this is generally more difficult - make a radical change to the Overhead structure of the ranch (i.e. get rid of land, your mortgage, your help etc.)

So, do we get paid by the pound? Well, sort of. Actually, I think ***we sell our product by the pound***. But the real payday comes when we are able to take the "left-over" money from the sale and use it to pay the mortgage. If you don't have any leftover money (margin) you won't be living on that property for much longer. And as for weaning weight, well, I think it's pretty clear that every increase in weaning weight comes with an attendant cost, and often that increase in weaning weight costs the rancher more than the additional sale value of the weight. In other words, even though bigger calves might bring a higher sale price, they may actually bring the ranch a lower margin. Since it is the ***margin*** that makes the land payment, maybe it's our ***margin*** that we should be bragging about!

Happy grazing!



Labor

Guiding Principles

“You can’t build a sustainable operation on an unsustainable effort. Plan your operation from the start so you’ll be able to operate it efficiently 25 - 30 years down the road.

~Don Ashford

- Work smarter, not harder.
- The right tools make life easier.
- Your brain is the strongest “muscle” you have. Use it first.

A note from Don

Mr. Webster defines labor in three ways:

1) The physical or mental exertion - work

2) To move slowly and with difficulty.

3) The process of childbirth.

Now I have a little experience with numbers 1 and 2, but only as a spectator as far as number 3 is concerned.

But seriously, just how hard do you want to work physically or mentally with your grass farming outfit? You can rest assured that number 2 of this definition will come, so it would behoove all of us to plan for it. There is no question that opening a wire to move stock to fresh pasture beats the heck out of unloading hay or feed. With a little more of that mental exertion we can, 9 out of 10 times, cut down on physical exertion. And we just might put off that day the "slow moving with difficulty" arrives.

Don and Betty through the years

Tom Krawiec

Ranching like a 12-year-old.

Tom Krawiec is a seasoned rancher in Alberta, Canada with an excellent philosophy about how to make life easier and more fun. He describes it in this excerpt from Fencing so a 12-year-old can run the ranch.

If you set up your day to day operations so a 12-year-old can run things, your level of enjoyment will be greatly enhanced. You will have more time to think, plan, and recreate. Further, if a 12-year-old can look after the ranch, then so can an 80yr old.

Getting to this point takes a shift in thinking. It really comes down to asking yourself, '*Can a 12-year-old do this?*' about everything you do, right down to what type of tools you buy.

An example I use when explaining my philosophy deals with a pipe wrench. There are two types of wrenches, a steel pipe wrench and an aluminum pipe wrench. If your place is set up for a 12-year-old to run, you will buy the more expensive aluminum pipe wrench. Certainly a 12-year-old can use the heavier steel pipe wrench, however, it is more difficult to carry and use than an aluminum one. When things are awkward and difficult, there is less motivation to properly perform a task.

It has been my experience that when jobs are simple and easy, they get done better and with less complaining. Over the course of 20 years, this thinking has helped me to reduce labor in all aspects of my ranching life. Over the course of 20 years, this thinking has helped me to reduce

labor in all aspects of my ranching life. A big part of that is the template I have developed for fencing. I know many people disagree with how I fence citing less expensive materials, that I'm over doing things, I have too many gates, etc.

Those concerns certainly have merit. In fact, we started out fencing very cheaply. Our first fencing was with rebar posts because they were half the price of step-in posts. We were building and taking down two-acre paddocks every two days, dragging the rebar around in a modified manual golf cart. We were in great shape, but we were exhausted! What we forgot to factor into our cost analysis was labor.

Labor costs more than just the time it takes to perform a task. The hourly rate can easily be tracked. The part that is hard to calculate is the mental and emotional cost of labor. Ranching should be fun and easy. When we are run off our feet and always exhausted, our thinking becomes impaired. When I am in an extended period of high labor, I get tunnel vision and my creativity is severely impaired. Plus, it’s not that much fun!

Once I realized the hidden cost of labor I became obsessed with reducing labor. I want everything to be simple and easy and the best way to accomplish that feat is to ask the question, ‘*Can a 12-year-old do this?*’

Work smarter, not harder!

Paying attention to the hidden costs of labor, and adjusting your work to make things easier, makes life better for you and everyone around you.

Handling Facilities

Guiding Principles

“It’s very frustrating to be a livestock owner and not be able to do for your animals what you need to do because you don’t have a place to restrain them. It doesn’t have to be a high dollar, expensive thing. Just Something you can use to keep you and your animals from being hurt

~Don Ashford

- Handling facilities – a catch pen and something to safely contain the animal are critical for your safety and the animal’s well-being.

Sandra Kay Miller
Painted Hand Farm

Portable panels for inexpensive handling options

Sandy Miller is an incredibly innovative farmer who run her multi-species grazing operation on her own. Here's her farm hack for using portable panels to create inexpensive handling facilities.

My very first ranch job was for a crusty old cowboy named Jack who made us haul corral panels from ranch to ranch, setting up catch-pens, and sorting and branding arenas, then breaking them down and stowing them away when they weren't in use. When I asked him about what appeared to be tedious work, he responded, "These ranches are leased and I'm not building something on someone else's land or paying for the same thing over and over."

His words echoed in my ears for many years, especially after I purchased my own farm. Although his philosophy was about using the same equipment for multiple locations, I've taken his advice a step further and applied it to different species as well.

Equipment for handling livestock doesn't have to be expensive. Contrary to what you may believe, a fancy squeeze chute with an automatic head gate is completely unnecessary, particularly for someone with only several head. Even for larger operations, a simple swing chute built from a pair of 10' corral panels, lengths of chain and interlocking spring snaps will do the job. Best of all, this infrastructure is one hundred percent portable and can be utilized for other purposes, including a corner catch pen, loading chute, and milking stanchion. For anyone just getting started with livestock, especially cattle, this is the best money you will ever spend. Plus, that fancy (and

expensive) squeeze chute will only work on a particular size of a single species where as corral panels will work with full-sized cattle, calves, pigs, goats, sheep, horses and camelids.

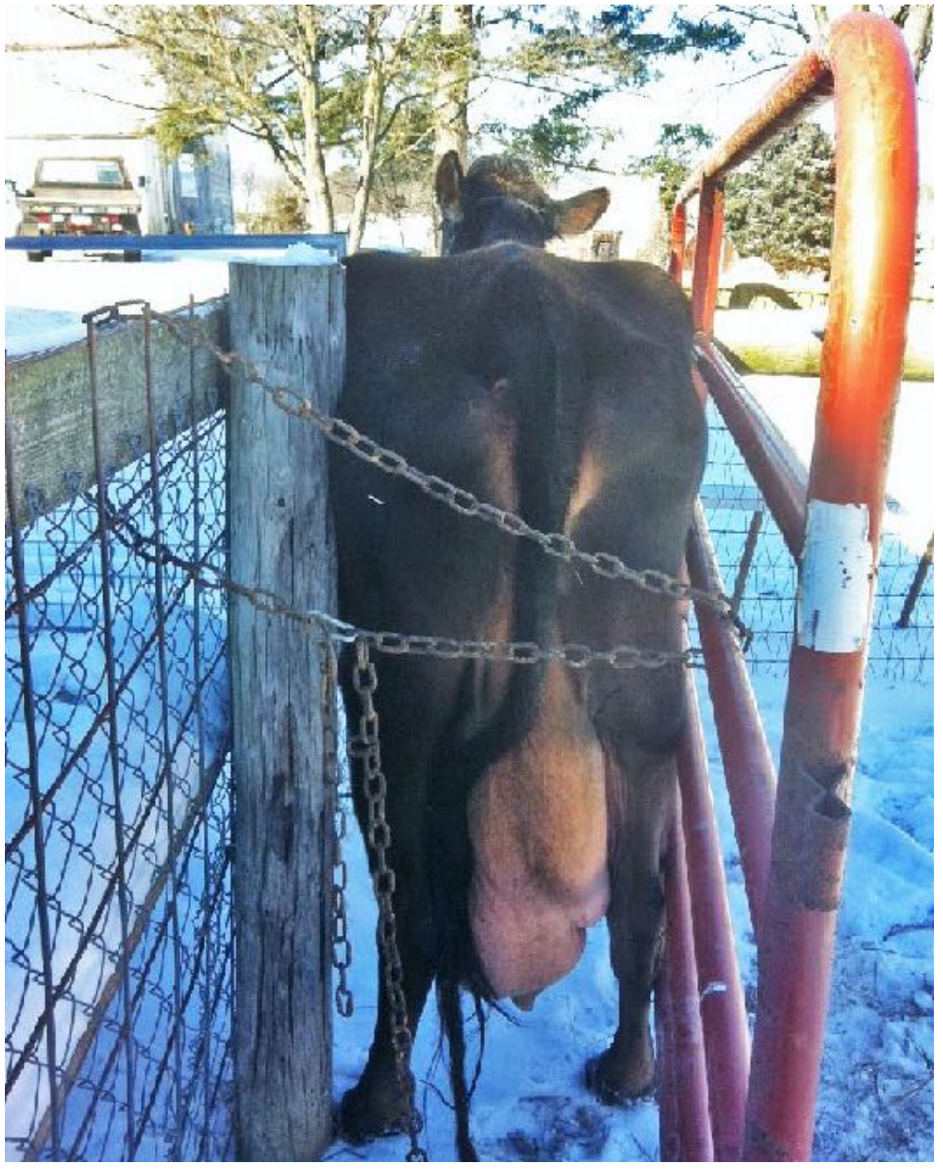
Keep It Simple

Yes, we all like to look at the glossy farm supply catalogs with the slick panels, chutes and gates customized to each species, but unless you're starting out your livestock venture extremely well-funded, this coveted infrastructure is out of reach as their price tags can easily reach several thousand dollars. Instead, start looking to your local farm supply stores.

The two most commonly used pieces of equipment I have are 10' x 5' corral panels and 16' x 50" feedlot panels. If you are only handling small ruminants and/or swine, the 16' x 34" feedlot hog panels will do the trick.

Corral panels are constructed of steel tubing and are typically six bars high. One end has a pair of pins and the other a receiver to quickly latch together. While the same construction style is also available in 12' and 16' lengths, I've found the 10' panels are easier to handle alone. Corral panel gates come in two sizes—4' and 6'—each side with the same type of pin and receiver construction to match the panels. One of the configurations of panels and gates I've found to be of most use is two gates on opposite ends of two panels creating a 10'x 4' catch pen. For working with larger stock, a 6' gate is safer and more efficient.

Corral panels work great for tasks that need a rigid structure. For instance, I have routinely used a panel in the corner of a woven wire or railed fence to quickly build a squeeze chute containment area for cattle and horses.



To do this, attach a panel perpendicular to the fence with a set of chains, using the cross-brace as an anchor. I keep four 3’ lengths of 5/16” chain with an interlocking spring snap handy just for such a purpose. Make sure the attachment to the fence is not much wider than the animal being confined.

Swing the panel open to allow easy access for the animal to face the fence with its head in the corner. For added safety, I will tie the animal to the corner post with a halter. Slowly swing the gate toward the perpendicular fence, securing it with a length of chain. The animal will either be confined in a small triangular area unable to turn around or for larger stock, there will be a butt chain preventing the animal from backing out of the chute. It is imperative that the rear chain not be too high or low lest the animal try to back out over or under it if not tied at the head. This configuration works for castrating, milking cows prone to kicking, especially one with a painful case of mastitis, vaccinating and other veterinary care.

For smaller livestock, a sheet of plywood or even an old door with holes cut in each corner works well, especially inside the two-gated structure mentioned earlier, as a means for isolating and immobilizing a single animal for body scoring, parasite assessment/treatment and vaccinating.

The second style of panel that comes in handy is the welded wire 16’ feedlot panel. These panels are flexible and can be configured into a curve, if needed. Used more for directional control than permanent confinement, most often I simply hold them in place with a rubber strap with S-hooks on each end.

Three or four of these style panels can be easily hooked together with the interlocking spring snaps (use 3 per side) to create a temporary or portable holding pen.

Another advantage of feedlot panels is they can be cut down to a custom size using a pair of bolt cutters. For example, by cutting one 16'x34" hog panel in half, it can be installed on either side of another panel bisecting the center of four other panels arranged in a square, thus creating four 4' square "jugs" for kidding and lambing for the cost of what a single custom built pen would cost from a handling equipment manufacturer. Each pen can easily be opened at each corner for access.

Feedlot panels are also extremely useful for more than just livestock. Hooked over a T-post at each end and in the middle creates an instant and sturdy trellis for vegetables.

Handling Integrated with Fencing

For anyone building out their livestock operation from scratch, here's an idea that has worked well for me. The major alley lanes through which livestock accesses multiple permanent pastures are 16' wide, the posts are placed directly across from each other and the high-tensile electric wire is on the pasture side. This allows me to quickly attach a feedlot panel to posts in the alley lanes creating holding/catch pens in an environment familiar to the livestock and thus, reducing handling stress. Similarly, at the end of each lane are two 8' gates instead of a single long gate which can be swung out to create a natural funnel for loading stock on to a trailer.

Placing gates within the lane directly across from each other allowing animals to cross from one pasture into another will also create a natural funnel within a lane when opened in unison.

Rick Machen and Ron Gill

Build A Bud Box to Make Livestock Handling Easier

If you're considering larger facilities, this portable set up is something to look at.

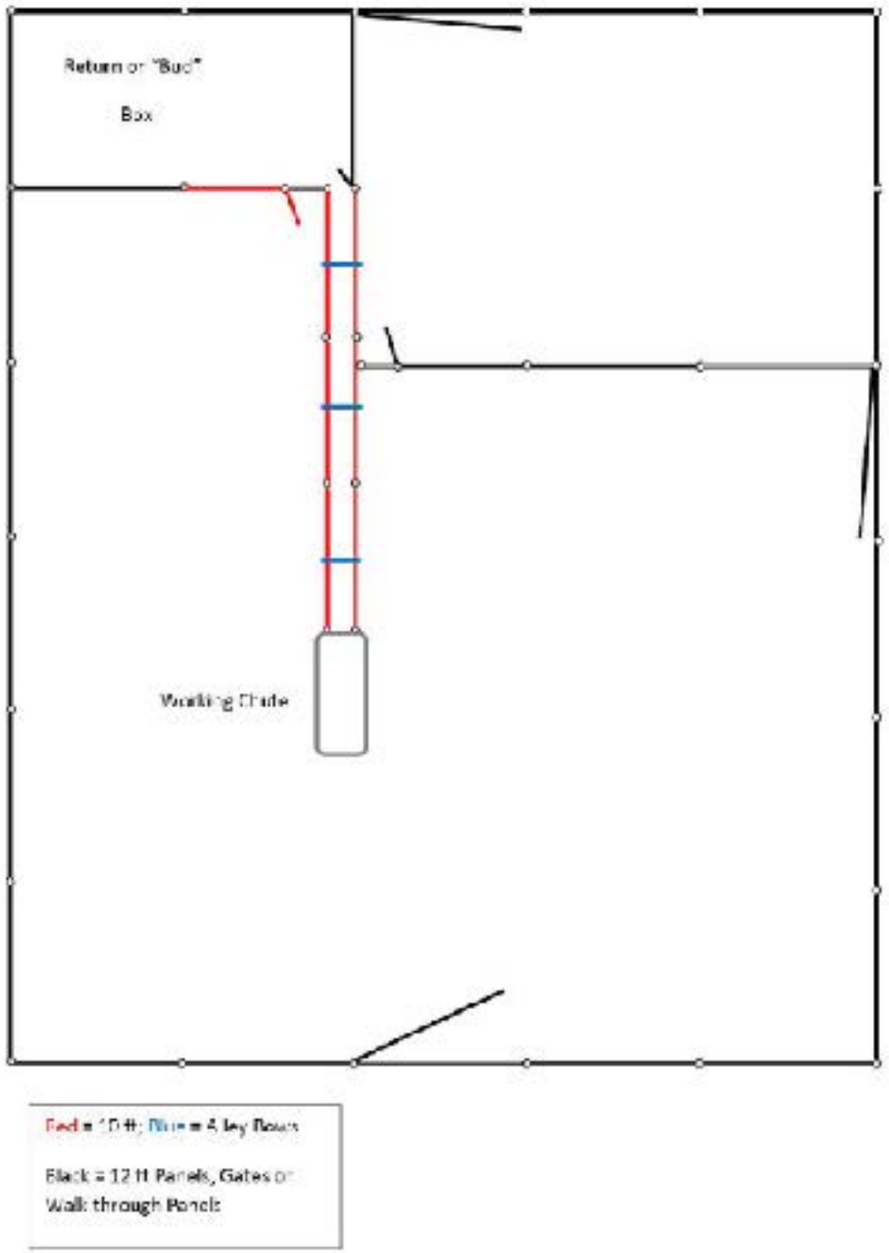
The term "Bud Box" describes the kind of handling facility preferred by low-stress livestock handling expert Bud Williams. By moving animals quietly and standing in the right spot, you can quickly and easily move animals into a chute for treatment, weighing or loading. Here's information on how to build your own, including a video showing how it works.

There is nothing magical or mystical about a Bud Box. It is a facility design that allows the handler to position themselves correctly to facilitate cattle flow out of the box into either the crowd alley leading to a chute or to a trailer load out. Always keep in mind that the Box is a flow-through part of the facility. Cattle should never be stored in the Box waiting to be sent into the crowd alley or to a trailer. Bring them in and let them flow back out immediately.

Dimensions are important to successful use of a Box but not as critical as handler position in relation to the stock leaving the Box. Without proper position and attention to detail a Box will only confuse the stock and frustrate the handler.

The Box should be large enough to accommodate a volume of cattle to fill the crowd alley or fill a trailer compartment. A crowd alley to a squeeze chute should hold a minimum of

4 cows and might need to hold 20 head depending on the speed of processing. Crowd alleys on cow-calf operations will typically hold 5 to 6 cows. Facilities working calves or yearlings routinely need crowd alleys for 12 to 20 head of cattle.



Remember, the crowd alley will normally not be empty when additional cattle are brought through the Box. To maintain flow it will be necessary to add additional cattle while one or two stand in the crowd alley awaiting processing. Consequently the length of the crowd alley is important. Ideally the crowd alley would be long enough to hold an adequate number of cattle for processing while more cattle are brought through the Box - without disrupting flow. A short crowd alley may result in frequent interruptions of cattle flow and processing.

For some reason the industry has migrated toward the crowd alley starting to curve at the entrance from the tub or Box. The exit from a tub or a Box and entrance into the crowd alley should be straight for at least two mature cow body lengths. This allows flow to become established without the appearance of entering a dead end crowd alley. Keep it straight for at least 12 feet and then start a curve if warranted (ex. space is limited). Otherwise a long straight crowd alley works very well for processing cattle.

How Big Should a Bud Box Be?

Most cow-calf operations will need a Box that is at least 12 feet wide and 20 feet deep. It can be 14 feet wide and should be if the handler will be horseback. Depending on the size of the cattle being worked it could be 16 feet wide if the handler in the Box will always be horseback. Both the

14 and 16 foot widths are too wide for comfortably working most stock on foot.

A Box can certainly be wider than an alley leading up to it. In fact, going from a 10 or 12 foot alleyway into a 14 foot wide Box will normally allow the cattle entering the Box to do so faster setting up the transition even better. Do not let the width of an alley dictate the width of the Box.

The length/depth needed is determined by the size of the group handled. Again, group size is dictated by the capacity of the crowd alley or trailer compartment being loaded. The Box needs to be deep enough to allow the cattle to flow to the back of the Box, let the handler close the gate and get in position before the cattle transition out of the back of the Box. Just like a tub system never overfill the Box. Success depends on the flow into, transition, and flow out of the Box.

For most crowd alleys a 20 to 24 foot Box is adequate depth. Any deeper may force the handler working in the Box to move too deep in the Box to initiate flow. As the handler returns to the correct position, their movement with the cattle will stop flow and turn the cattle back. Going with movement slows it or stops it. Neither response is desirable in getting cattle to flow out of the Box.

Here are some suggested sizes for your whether you're on foot or on horseback.

Bud Box Dimensions

Handler	Width	Depth*
Always on foot	12′	minimum 20′
Afoot and horseback	14′	20-30′
Always horseback	16′	maximum 30′

*Dictated by size of groups handled.

Other aspects of a Box design that are critical to success relate to whether or not the sides are enclosed. It is absolutely essential to have the end of the Box open sided so cattle are going to light and will build speed as they enter the Box. Entry speed facilitates the transition and correct flow out of the box. Solid (opaque) panels should be limited to the Box's entry gate and the sides of the box closest to the crowd alley and load out exits. Note - solid sides in these areas are not required but may minimize

distractions. Load out and crowd alley exit gates must open back flat against the sides of the Box.

A Box used in loading semi-trailers may require additional depth (30 feet maximum) to facilitate filling compartments quickly. If using this same large box for a crowd alley, the addition of a block gate in the Box to shorten it might be a good solution.

In summary, a Box needs to be 12 to 14 feet wide for most operations and 20 to 30 feet deep depending on the number of cattle needed to flow through the system at any given time. Leave the back open (translucent); cover the sides and entrance gate if necessary.

Check out the video to see a flexible Bud Box being put together. Ron Gill will talk you through how to use it to your best advantage.

*****

Bud Williams, inventor of the Bud Box, trained many people in what became known as "low-stress livestock handling." It's a way of working with livestock behavior to quietly and easily move them from place to place. If you'd like to learn more about these techniques, On Pasture has a library of articles to explore.

Click to start the video.

Video Transcript - Building a Budbox

Ron Gill: This is a system that anybody could use whether you had a few head of cattle or a lot of cattle. The neat thing about is it it's all flexible in design. If you decide you need to change something due to topography or number of cattle you're going to be working, you can add to it, subtract from it. It allows you to basically build whatever kind of system you need wherever you need it.

The lower cost of it is very appealing to some smaller operators. You're not running cattle through it very often you can set it up next to an adjacent shut and put a box on it. But it's very portable. That's one of the things we really like about the BudBox system.

You can set it up anywhere, you can use panels to do it and it allows you to work. You can build additional corrals, you can build sorting pens out in front of the chute, however you want to do it. So it's completely flexible from that stand point.

Curt Pate: I see so many pens that you build and they sit there probably 11.5 months out of the year without being used. With this deal you can take it down, if youir'e going to start some horses you could use it as a round pen. It's got a lot of different uses. These panels, you can keep the cow out of your wife's yard, whatever.

Ron Gill: The size of the Bud box in some respects depends how many cattle you're going to need to send up the crowd alley to the chute. You don't ever want to bring more into the Bud Box than what you'd put in that crowd alley. So if it will hold five or six head, you want a Bud Box that will handle five or six head and be able to bring them in there, get them turned around and out very easily. That will normally take some where around 20 to 24 foot deep Bud Box. We're talking about length from the gate that closes the Bud Box off to the back of the Bud Box being 20 to 24 feet. If you get one of them too deep and too long, then you only have 5 or 6 year, you have to go too far in the box to get the cattle to flow out. So it basically puts you in a position of being behind the cattle if you're not careful. It's better to have a Bud Box that is too short than too long.

Curt Pate: So the whole principle of the Bud Box, really it works with all the things we work on in training our cattle. They come into the box, they found out they can't go somewhere, so naturally they want to go back where they came from. But if the human positions himself the way the eye works, they go right around us. And by stepping back towards th ehip of the cow, it draws their eye right up the chute. If you don't position yourself right they're going to keep lookin gout the back of the chute.

Ron Gill: The lead out to the chute - there are several features to that I think are really important. That's the alley frames, that keep it from bowing and giving too much. Always put enough of them where it will support the panels that go with that chute.

Curt Pate: One of the big advantages of the Bud Box set up in an alley is we have our lead up to our chute here. If you had a gate on the other side the exact opposite side, you could load a truck, or trailer right there.

Ron Gill: This is 24 foot long attached to the chute, and so that allows you to bring 4 or 5 or 6 cows depending on the size. If it will hold 6 bring five that way you don't have to force that last one in there. She's trying to get in there but if there's not quite enough room you wind up putting too much pressure on her. So I always try to bring one less than it will hold.

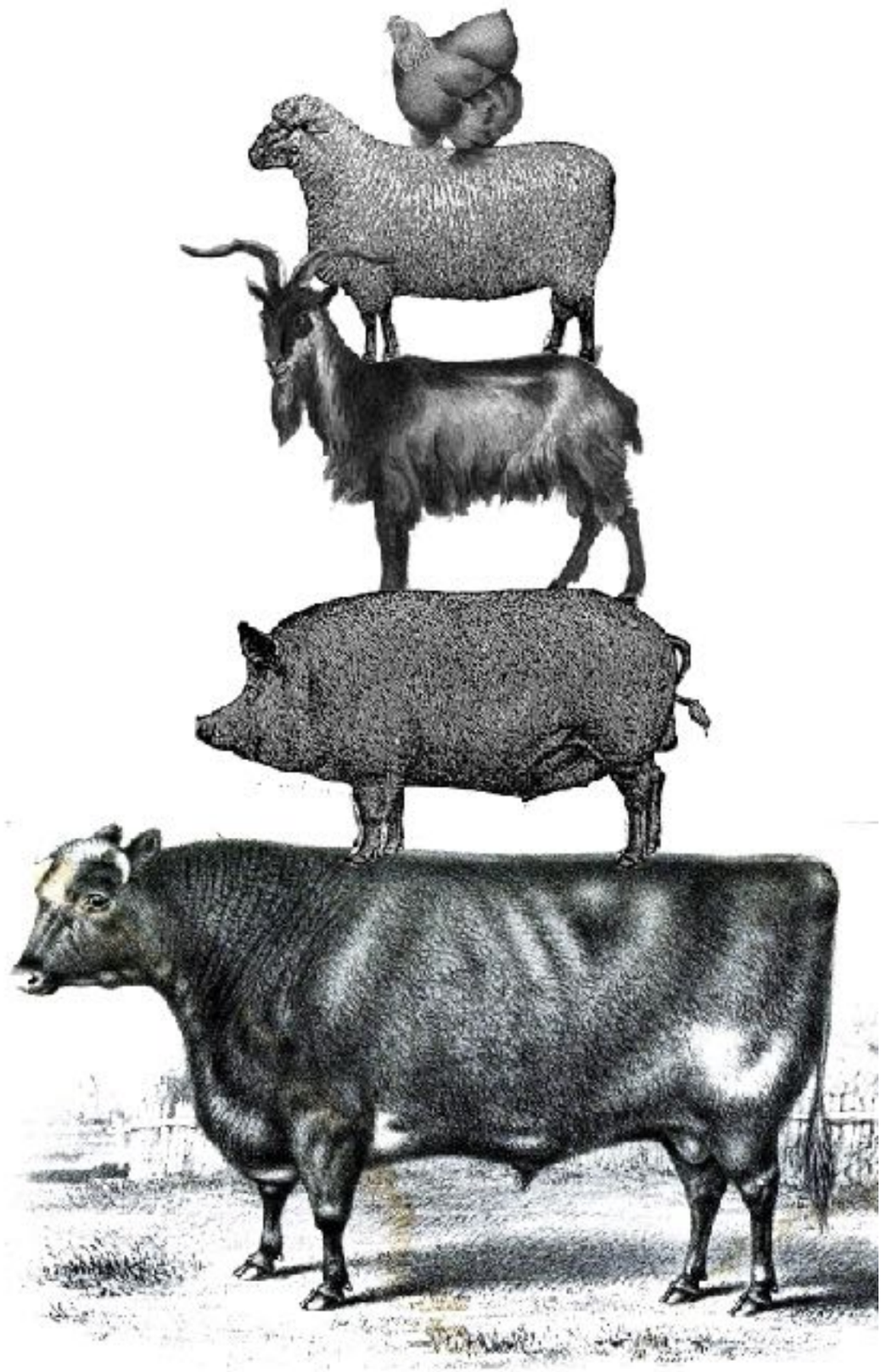
To make a Bud Box work effectively, cattle need to enter it at a pretty good speed. In facet if they go in at a trot it would be a good thing. Because they faster they go in, the more inclined they are to come back out and establish that flow. Whereas if you just ease them down the alley into the Bud Box, you don't have enough momentum and speed to get them to come back out. So the same principles apply here, but it may be even more critical because we're using body position and flow to get cattle out of the box and into the crowd out.

Livestock

Guiding Principles

“Buy the kind of animals that you like, that you feel comfortable with, because you’re the one that’s going to have to work with them.

~Don Ashford



- Answer these questions:
    1. What is my product?
    2. Where will I sell it?
    3. Who will buy it?

- Factor in your experience and abilities.

- Develop a good relationship with a veterinarian.

A note from Don

Our whole outfit is based on buying good, solid cows that are not that expensive, put a terminal cross bull on them and sell every calf that hits the ground.

If a cow for whatever the reason leaves the herd she can be replaced with another cow. With a limited amount of pasture it is not in our plans to use any of it raising heifers. We are looking for return on investment and producing beef for the least cost possible.

To do this we have found that good grass, fresh water and a good Charolais bull on a set of mixed breed cows works very well. Now this is not an endorsement of Charolais bulls, but we have learned that these bulls will produce calves off of mixed breed cows that are more uniform than any other breed that we have ever used. And it is a fact that we have used most of them.

I will readily admit that this is not the only way to do it and there are many who will disagree with all or most of it, but we are producing for the commodity market and it works for us.

Ashford livestock through the years

Kathy Voth

What livestock should you choose?

As Don Ashford says, this is a personal choice based on your interests and experience. But it's also highly influenced by the market for your product. Before you choose, first consider how and to whom you will sell your product. You can be the best grazier in the world, but if no one buys your beef, lamb, chèvre, pork, chicken or eggs, you won't be able to do it for long.

There are lots of things to consider when choosing the animals you'll raise. Here are just a few of them:

Cow-Calf Pairs

This is a year-round operation with cows year-round. Calves can be sold after weaning as stockers for other operations or raised for sale later.

Winter feed costs are a factor in the success of this kind of operation. Feeding hay increases expenses and reduces profit. Consider what you can do as a grazing manager to stockpile forage, taking a close look at the role your local climate will play.

Stockers

These are purchased weaned calves raised to weight and then sold.

On Pasture author Blake Allen **made the switch from cow calf pairs to stockers** because it was difficult to cover the costs of the cows with calf sales. He likes this set up because it fits well with the seasonality of his grass and also gives him time off to pursue other business interests.

He says, “You have control over what you buy each year. You can buy small cattle and grow them into big cattle. You can buy singles and group them into load lots. You can buy bulls and castrate them and sell steers. You can buy heifers and keep them nine months and sell them as guaranteed open, or breed them and sell replacements.”

He’s also found that “it takes a lot less time to recoup your up front investment for a group of stockers than it does a herd of brood cows, making it an excellent option for someone who wants to get started in cattle but doesn’t have the money to buy a herd of cows and pay the expenses until their calves are sold. In addition to all of this, you can keep about two calves on the same amount of land required by one cow.”

Blake says that the biggest challenge with stockers comes early on. “Young animals are likely to get sick during the first few weeks you have them, especially if they weren’t weaned or vaccinated when you bought them and if they came from a sale barn. With good animal husbandry, good nutrition, a good vaccination program, and judicious use of antibiotics when necessary, you can usually manage to get them healthy and gaining weight pretty quickly. If you are interested in a program that doesn’t use antibiotics, buying weaned, vaccinated cattle straight off the farm is probably a good idea. Other risks, such as the market can be managed. I believe the benefits of running a stocker operation far outweigh the challenges.”

Blake provides additional thoughts on how to successfully raise stockers in these two articles:

Planning for a Stocker Operation: Homework to do if You’re Considering this Option

Making the Business of Backgrounding Work for You

Veal

Here’s an option that not many think about, but Sandy Miller says, “Raising veal is a way to maximize profit (and reduce risk) on smaller acreages.” It can be an especially good option for graziers living in dairy country.

Veal requires less acreage and reduced expense for handling facilities and other equipment. Their smaller size also reduces potential injuries to the farmer.

To explore this further, **here's Sandy's five part series** in On Pasture covering:
• breed types,
acquiring calves,
transportation, equipment and facilities,
• handling, care and feeding,
• harvest, processing and packaging,
• sales and marketing, and
• getting it on the plate.

In one season, this two-teated Jersey cow reared three calves who yielded approximately 1,100 live weight from only her milk and pasture.

Dairy Cows

Raising dairy cows and producing milk comes with a wide variety of challenges from the cost of the equipment, to milk prices, to grazing in a way that provides the high quality nutrition necessary for good milk production. That's beyond what we can cover here. You can find links to more information in **Additional Resources and Links**.

Small Ruminants - Goats and Sheep

Their are many benefits to working with small ruminants:

- Pregnancy times are shorter than for cattle, and twins are not uncommon. That means you can grow a herd more quickly.
- Because they eat less, you can graze more animals on the same acreage. So you have more animals to market
- Lambs and goat kids are ready for market much more quickly than beef steers.
- Their smaller size makes them easier to handle and handling facilities are easy to construct.
- You can produce a variety of products with goats and sheep including fiber and dairy. Sandy Miller shares some great ideas in **Squeezing every drop of profit from your small ruminant herd**.
- Both are popular for vegetation management. Using **sheep to graze vegetation in solar arrays** is a growing industry.

Dr. D.E. Larsen

The terrible breech

If you're going to have livestock, you need a veterinarian – someone you can develop a relationship with, who can help in emergencies, and who will help you become a better stockperson.

This true story by retired vet, Dr. Dave Larsen, is a good example of all of that.

"Doc, this is Peter, out on Brush Creek," Peter says on the phone. "I have been working on trying to pull this calf for two hours now. I am not getting anywhere. Do you have time to run out here and give me a hand?"

"Sure, I can come right away," I said. "You caught me just at the right time. What is going on with her?"

"This morning, I noticed her with her tail up and sort of standing around a little odd," Peter said. "When I ran her into the barn and got her tied up, I saw this tail hanging out of her. I cleaned her up like you always do and started working. There is just this butt of the calf in the birth canal. I can't get ahold of anything."

"Sounds like you have a calf in a full breech position," I said. "I should be able to take care of that with little problem. At this point in time, almost all of these calves are dead. I mention that just so you know. When the calf is in a full breech, there is nothing to engage the cervix. The cow doesn't usually go into hard labor for a day or sometimes two."

"I can understand that," Peter said. "But we have to get it out of there. I would guess you might have to do a C-section."

“That all depends. Most of the time, I can get the hind legs up and just pull the calf. If not, I usually do a fetotomy. I don’t like to do a C-section on a dead calf unless there is no other option.”

In a fetotomy, the dead baby is cut in pieces while in the uterus so that it can be removed, saving the life of the mother.

“I have her in the barn. There’s no need to stop at the house,” Peter said.

Peter and his young son, Tom, were waiting at the barn door when I pulled up in my truck. Peter was in his late 40s and usually looked too well dressed to be a rancher. Today, that was not the case. His hat was sitting crooked on his head, and it failed to conceal his uncombed hair. He had a swab of blood and mucus across his forehead. Both sleeves of his shirt were bloodied to his shoulders.

“Tom, it looks like your dad has been working hard this morning,” I said.

“He’s pretty tired,” Tom said.

“I don’t know how you guys do it,” Peter said. “I have been at this for two hours, and the only thing I have accomplished is to wear myself out.”

“There are a few tricks to learn,” I said. “The most important thing to learn in bovine obstetrics is to set a clock on yourself. If you haven’t accomplished anything in 20 minutes, you need to do something else. That means you should have called me about an hour and a half ago.”

“That’s what Mom said,” Tom said.

“Well, that’s enough of the storytelling. Let me get a look at what we have going on,” I said.

Working on a cow that the owner has struggled with for two hours has its own set of hazards. The untrained hands can do all sorts of damage. I have seen ruptured uteruses, broken legs on the calves, and gross contamination of the whole track. That meant I had to check for all of that first, or it would fall on my shoulders.

“I see you have her cleaned up well. That’s a good thing.”

“I’ve watched you before,” Peter said.

I washed the cow one more time and ran my hand into her vagina. The vagina and what uterus I could easily reach were intact. The calf’s rear end sort of worked like a cork in the birth canal. I stuck a finger in its rectum. No response; this was a dead calf.

“The calf is dead like I explained on the phone,” I said.

“How did you determine that so fast?” Peter asked.

“I stuck my finger in his butt. If he was alive, he would have responded to that. No response equals a dead calf.”

I ran my hand down under the calf. I could reach the hocks with no problem. Peter had stretched out the birth canal in his earlier efforts. I had no trouble getting down and grabbing a cannon bone. With a firm grip on the middle of the cannon bone, I pushed the hock forward to provide room to pull the hoof up into the birth canal. In one motion, I pulled the leg back, and the foot popped out of the vulva. I quickly reached in and repeated the process on the second leg. Now it was a simple extraction in posterior presentation.

“Doc, you embarrass me,” Peter said. “I have been working on her for two hours, and you come along and have the feet out in two minutes, and that includes time for some idle conversation.”

“It's just a matter of knowing a few tricks of the trade,” I said. “Give me a hand. I think we can pull this guy out of here with no problem.”

Tom was quick to jump in to help. At twelve, he was getting strong enough to consider himself almost a man. With the two of us, we quickly pulled the calf. It flopped lifelessly on the ground, and the membranes followed with a splatter of fluid. Tom jumped back, trying to avoid the mess, but it was too late. His pant legs were covered with fluid and mucus.

“One more lesson for today,” I said. “You always want to go back and check the cow. You check for another calf, and you check for any injury to the birth canal. Today, because you worked on her for so long, I will put some antibiotics into that uterus. That probably makes me feel better than it does her any good. Whatever I put in will drain out in a couple of hours.”

I finished up and cleaned up, and we turned the cow out.

“You want to watch her closely for a day or two. Just in case she develops an infection in her uterus.”

“And Tom, it was a good experience for you to be surprised by that splash of fluid. When I was in the delivery room with our first baby, I was surprised at the gush of blood that came with the membranes.”

Tom didn’t say anything but looked at his pant legs with a frown.

“Can I put another calf on her?” Peter asked.

“Sure, most cows will take another calf,” I said. “If you have an orphan or buy one at the sale. There are all sorts of tricks. Keep them in a small pen for a few days. Maybe take the skin off that dead calf’s back and tie it around the new calf, or smear the new calf with the membranes.”

“I will give it a try,” Peter said. “And thanks, Doc. You are good at the things that you do.”

Resources - How much food does your animal eat?

As a manager, this, combined with how much forage your pastures produce, tells you how many animals you can sustainably raise. In general, an animal eats between 2 and 3% of its body weight each day. So, as they grow, they'll eat more and you'll need to factor that into your management as well.

An Animal Unit Equivalent is a term used mostly in the West. One AUE is a 1,000 pound cow and her calf. A 1100 pound cow and her calf is 1.1 of an AUE. A heifer is .86 of an AUE. If all that is confusing, don't worry. This chart will tell you how much an animal eats per day, month and year. Figures are based on a daily air-dry matter intake of 2.2 to 3.0% of body weight, depending on the nutritional demands for the type and class of livestock and wildlife. Wildlife values are based on the nutritional needs of average-sized breeding females.

ANIMAL KIND / CLASS	ANIMAL UNIT EQUIVALENT (AUE)	NO. OF ANIMALS EQUAL TO 1 AU	AIR-DRY WEIGHT OF FORAGE CONSUMED (lbs.)		
			DAY	MONTH	YEAR
Cow, dry (1000 lbs.)*	.85	1.2	25.5	765	9180
Cow (1000 lbs.), with calf to 6 months	1.0	1.0	30	915	10,980
Cow (1100 lbs.), with calf to 4 months	1.1	.91	33	990	11,880
Cow (1200 lbs.), with calf to 4 months	1.2	.83	36	1080	12,960
Cow (1300 lbs.), with calf to 4 months	1.3	.77	39	1170	14,040
Calf, 4 months to weaning	0.3	3.3	9	270	3240
Yearling cattle, 7-12 months	0.56–0.65	1.5–1.8	17-19.5	510-585	6120-7020
Yearling cattle, 12-17 months	.75	1.3	22.5	675	8100
Heifers, 18-24 months	.86	1.2	26	780	9360
Bulls, 12-24 months	1.2	.83	36	1080	12,960
Bulls, mature (1850 lb. average)	1.5	.67	45	1350	16,200

*Add 0.1 per additional 100 pounds of body weight for dry cows.

ANIMAL KIND / CLASS	ANIMAL UNIT EQUIVALENT (AUE)	NO. OF ANIMALS EQUAL TO 1 AU	AIR-DRY WEIGHT OF FORAGE CONSUMED (lbs.)		
			DAY	MONTH	YEAR
Horse, yearling	0.75	1.3	22.5	675	8100
Horse, 2 year old	1.0	1.0	30	915	10,980
Horse, mature (1100 lbs.)	1.1	.91	33	990	11,880
Sheep, mature lactating ewe (150 lbs.), with lamb, less than 2 months	0.17	5.9	5.1	153	1836
Sheep, mature non-lactating ewe	0.15	7.1	4.5	135	1620
Lamb, 2 months to weaning	0.06	16.7	1.8	54	648
Lamb, weaned to yearling	0.12	8.3	3.6	108	1296
Lamb, yearling	0.15	6.7	4.5	135	1620
Ram (200 lbs.)	0.17	5.9	5.1	153	1836
Goat, mature	0.15	6.7	4.5	135	1620
Kid, yearling	0.10	10.0	3.0	90	1080
Llama, mature female	.23	4.3	6.9	207	2484
Bison, lactating cow, yearlong average	1.1	.91	33	990	11,880
Bison, lactating cow, spring	1.0	1.0	30	915	
Bison, lactating cow, summer	1.22	.82	36.6	1098	
Bison, lactating cow, fall	1.65	.61	49.5	1485	
Bison, lactating cow, winter	0.65	1.54	19.5	585	
Bison, bull	1.5	0.67	45	1350	16,200
White-tailed deer	.19	5.3	5.7	171	2052
Mule deer	.19	5.3	5.7	171	2052
Elk, mature	.70	1.4	21	630	7560
Moose	.81	1.2	24.3	729	8748
Bighorn sheep	.16	6.25	4.8	144	1728
Antelope	.13	7.7	3.9	117	1404

Resources - How do you know if your animal is sick?

It's not always easy to tell if you have a sick animal in your herd. That's because, as prey animals, they don't want predators to know that they're sick, so they've become pretty good at masking symptoms. That means that you have to know what normal looks like so you can watch for small differences in behavior.

That's where this video comes in. In just 8:52, Dr. Lisa Lunn of the University of Alaske – Fairbanks points out all the little cues that tell you an animal needs help. While she uses a cow to demonstrate, this information works well for all ruminants.

Click to start the video.

As Dr. Lunn points out, animals that separate themselves from the herd, are dirty from spending more time laying down, have droopy ears and snotty noses are giving you cues that they're not feeling well. Animals also quit eating when they're not feeling well. Since you may not see if an animal is eating, Dr. Lunn shows how to look for evidence. If the triangular area that overlays the rumen is sunken, that animal hasn't been eating enough. If it is swollen, the animal is bloating and you should call your veterinarian immediately. She also shows how to check for dehydration with a skin pinch test or by looking at the eye of the animal.

Other cues Dr. Lunn covers are stretching and difficulty urinating, indicating a potentially fatal urinary tract obstruction, issues with loose or runny manure. How do you know if an animal might have pneumonia? Check out it's nose and watch it's chest as it breathes and then compare the result to the chart on the next page.

When you do need to call the vet, it's helpful to be able to have the animal's vitals ready. Dr. Lunn tells you how to take its temperature and get it's heart rate.

One last pointer – a good relationship with a veterinarian is much more valuable than any advice you can get from your favorite Facebook group. Every time I see someone posting "my animal is doing this…what should I do?" if you listen closely you can hear me screaming, "Get away from the computer and call your vet!"

Species	Temperature		Heart Rate (Beats/Minute)		Respiratory Rate (Breaths/Minute)
	°F ± 1°F	°C ± 0.5°C	Average	Range	
Beef Cow	101	38.3		60-70	30
Dairy Cow	101.5	38.6		60-70	30
Goat	102.3	39.1	90	70-135	12-20
Horse	100	37.8	44	23-70	12
Pig	102.5	39.2		55-86	8-18
Sheep	102.3	39.1	75	60-120	19
Rabbit	103.1	39.5	205	123-304	39
Dog	102	38.9		100-130	22
Cat	101.5	38.6	120	110-140	26

Chart courtesy of Texas A&M Agrilife

Video Transcript - How do you know if your animal is sick?

Raising livestock can be challenging. Even with the best management, animals can become sick. Knowing when you have a healthy animal is easy. They're bright, alert, responsive to their environment, have a shiny hair coat and have a good appetite.

But, do you know when your animal's not doing well? Do you know when you should call your veterinarian?

Hi! I'm Dr. Lisa Lunn, extension veterinarian for University of Alaska Fairbanks.

Knowing your animal's normal behavior and vital signs are an important step in knowing when they're healthy or not healthy. It's also crucial that you have a good working relationship with the local veterinarian. They can come out when you need them to assess your animal. Together you guys can put together a great working relationship for good herd health and overall productivity and longevity of your herd.

How do you know if your animal is sick? Generally speaking, any time they're behavior is off you should investigate. Ask yourself, "Are they separating themselves away from the rest of the herd?" Animals that are sick spend a lot of time by themselves. They may not come up to the feed bunk to eat, they may be seeking solitude in the woods. So you need to check those animals out. Also, look at their general appearance in terms of cleanliness. Animals tat are not feeling well spend a lot of time lying down and they may have their flanks covered with dirt and manure. And if they're the only animal that looks like that, it's a good indication that they're not feeling well.

If you have an animal that cannot stand, and they're recumbent, that needs immediate veterinary attention. Similarly, if you're seeing any neurologic signs, if the animal is laying on its side and paddling its legs, if its having a seizure, or if it appears blind, you should contact your veterinarian for advice.

Also, if you have an animal that can stand, but its non-weight bearing on one limb, that requires immediate attention because there's a serious lameness issue going on.

Eating and drinking is an important part of over all animal health. But sometimes when you have animals out on pasture, you may know if they've been eating. Luckily for us, ruminants have designed an easy way for us to tell. If you go to the left side of the animal, there's a little triangular area called the paralumbar fossa. And we've

outlined this with some tape. It starts at the last rib, goes across to the hip bone, and then forms a nice little triangle. The rumen or the big large fermentation vat compartment of the stomach, lies directly below this paralumbar fossa. If the animals has been eating, there'll be food in the rumen and this paralumbar fossa will be distended to about the level of the last rib. If the animal has not been eating, this area will become sunken and there'll be a very visible triangular indent in the side of the animal. Again, this is on the left side because that's where the rumen is on the body.

If you notice that your animal has this triangular indent, pushed greatly out, and they're having trouble breathing, that indicates that we've got a condition called rumen bloat, where there's too much gas accumulating in that rumen. That's a medical emergency. You need to call your veterinarian right away.

So, when in doubt, if you're not sure if your animal's been eating, look at the triangular area of the paralumbar fossa and that will tell you.

Animals that are not drinking enough soon come dehydrated. And as an owner there's an easy way for you to check to see if your animal's becoming dehydrated. If we grab the skin on the neck, and retract it, just pull it gently and let go, it should bounce right back to it's normal position. If the skin stays tented after you pull it, that indicates that the animal's dehydrated. You can also do this over the eye and grab the skin over the eye and it should bounce right back. And then with ruminant animals, animals that chew their cud, there's also a special thing that happens with them when they become severely dehydrated. They eye will retract away from the skull and kind of sink back into the head. Some farmers refer to this as being sunken-eyed. So if you see that the eyeball itself is sinking back into the skull, that's a sign of severe dehydration and your veterinarian should be contacted so the fluids can be administered to your animal.

It's always important to monitor urination and defecation in the animals. If you have a male animal and you observe them stretching out with their back legs behind them, straining to urinate, you may or may not see urine actually dripping from their prepuce, but if it's not a full, constant stream of urine, that's a problem. That indicates that they have some sort of urinary tract obstruction and they need immediate medical attention, because without it their bladder will continue to fill with urine and it could potentially rupture.

In terms of defecation, it depends on what kind of ruminant you have. For sheep and goats, they have pelleted feces and it should remain a normal pellet. If the pellet becomes loose, clumped or watery diarrhea, that's a big problem. For cattle, if it becomes a projectile diarrhea, it's most definitely a problem that warrants having your veterinarian come out. If it's looser than normal manure, and the animal's losing a lot of weight, again, that indicates that you need to contact your veterinarian for an investigative work up.

Pneumonia can be a common problem in farm animals. One way that you can tell if your animal's having some respiratory issues is to take their respiratory rate. If you stand back and watch their chest move, each time that it moves will count as one respiration. Count that for a minute and that will give you the respiratory rate. (See the chart earlier for vital signs.)

Another part of looking to see if your animal's having respiratory problems is to check out their nose. A normal, healthy animal will have a small amount of clear moisture around both nostrils. And the animal will also be licking their nose a lot to keep it clean. Farm animals like to keep food and dirt off of their nose. So if you see a lot of feed stuck to the nose, if you see thick mucous coming out or blood coming out, that indicates that we have some sort of respiratory problem and your veterinarian should be contacted so that they can work up the issue for you.

One of the best things you can do as an owner is to get the vital signs of your animal before you call your veterinarian. That gives them a better idea of what might be going on before they come to your farm. We talked about how you can get the respirations of the animal by counting the chest movements. The other thing you can do is to take a rectal temperature. Using a regular digital thermometer, insert it into the rectum. When it beeps, pull it out, read the temperature and record it on a piece of paper.

You can also get the heart rate back here. There's an artery that runs in the middle of the tail. So if you put your hand above the level of the rectum, let your fingers fall into a natural groove that falls in the middle of the tail, wrap your thumb around to hold your fingers in place and then gently put a little bit of pressure and count for 30 seconds or 15 seconds to get the heart rate per minute.

If you have trouble because the cow's moving it's tail too much or they're a little bit nervous having you hold it, you can also get the heart rate by listening to the heart. To do that, you're going to need a stethoscope. And you can buy an inexpensive stethoscope online or you may be able to buy one at your local coop.

The heart is located behind the elbow of the animal. So you find the elbow at the top of the leg and you're going to take the head piece of the stethoscope and press it deep under that elbow and hold it in place. And again, count for 15 seconds, or 30, and you'll be able to get the heart rate.

You want to make sure that you tuck this in deep because if you don't, you're not going to hear the heart. So once you get it in there, and you hear the rhythmic beating of the heart, again counting for 15 or 30 seconds. Get the heart rate, record it and then you'll have some good information to give your veterinarian.

Remember working together, you and your veterinarian can put together a good herd health program for the longevity and production of your herd.

Management and Planning

Guiding Principles

“The dream comes before the plan, but to make that dream reality we have to have a plan.”

~Don Ashford

- Identify your goals for yourself and your operation.
- Know what your pastures can produce and what your animals need. Do the math.
- Take time to observe what’s happening in your pastures, and to your animals. Make changes accordingly.

A note from Don

Two of the goals that all producers should work toward with their grazing operations are sustainability and balance.

In a sustainable operation, renewable resources are harvested in a way that allows their inherent regeneration and continued ongoing supply. In the forestry industry this involves selective cutting and replanting. In our case we are talking about grass and what this means is that, given the opportunity, the grass will grow back after it is grazed. This is what grass does and this regrowth is the ongoing supply of forage for the cattle.

The magic word here is opportunity. The grazier creates this opportunity for the regrowth with skillful management. What we are trying to do with our grazing management is to take advantage of this inherent regeneration process, while not not creating any lasting damage to the forage's ability to continue the process.

This is where balance comes into play. Balance in this context means the capacity of an operation - the amount it can produce without diminishing its ability to produce. Ideally if an operation is in balance the production will be more or less constant.

The problem is not so much getting the operation in balance but keeping it in balance. A gallon bucket works fine until you try to put more than a gallon in it.

Cattle producers do this all the time. They will load a pasture down with more cattle than it can possibly carry and then the hay and lick tanks and range cubes show up and more likely than not any chance of profit is gone. With proper management, if the stocking density is in balance with the paddock size and the forage supply, and the grazier works to keep it that way, it can go on and on and on.

Kathy Voth

How much forage do I have?

Knowing how much forage you have is critical to success, but it's not an easy number to figure.

Here are four different methods to get started.

Using a grazing stick

Estimating how much forage you have available in a pasture is easy when you've got a good grazing stick. Here Grass Whisperer Troy Bishopp shows you how to use one. (Different areas require different measurement sticks. Contact **your local Natural Resources Conservation Service** office to find out if there is one for your area.)

Click to start the video.

Using a yard stick

Jim Gerrish shared this method with On Pasture readers. It is based on measuring the height of the pasture and

understanding that an inch of pasture can provide a somewhat predictable amount of grazable forage.

Jim writes, “We can bypass measuring the actual pounds per acre of available forage and jump right to an Animal Unit Day/acre yield per inch of forage grazed.”

Here are the values per inch Jim uses:

- **5 animal unit-days/inch of grazable forage per acre for fair pastures,**
- **10 AUD/inch for good pastures, and**
- **15 AUD/inch for excellent pastures.**

Now, measure the height of the forage, choose a target residual height and do a calculation.

Jim writes, “Let’s say we come up with 14 inches. We decide we want to leave 6" which means we plan to remove 8" of available forage. If we called this a ‘good’ pasture, we would be hoping to remove 80 AUD/acre.”

(8” x 10 AUD/Inch = 80)

That means you could graze eight 1,000 pound cows for one day on one acre.

But what if you’re not raising 1000 pound cows? Let’s say you have a flock of ewes with lambs instead. When you look at the **AUD chart** you’ll see that one ewe is .17 of an AUD.

So how many sheep can you graze on that same acre of pasture?

80 ÷ .17 = 470.58

Remember that you are ESTIMATING. Sources of error include not really having 14 inches of forage, or grazing more or less than 8 inches.

Clipping and weighing

This is the most tedious way to determine how much forage you have. It involves clipping and collecting forage in within a hoop in several sample areas, weighing it, and doing the math to get a pounds per acre estimate. Kiley Whited shows us how in this video.

Click to start the video.

Ask an expert

If you're just starting out, working with someone who's done this before is a great idea.

Your local Natural Resources Conservation Service or Conservation District staff can give you some good starting estimates, and can even help you develop a grazing plan. Cooperative extension service agents are also available in most counties in most states. The extension service is usually associated with a state university and their job is to help folks like you. All of these are free services and many times they can help you learn about other technical and financial assistance.

Another option is to join a state grazing or grassland coalition. You'll find links to a list of these groups in the Resources and Links section at the end of this ebook. Some of these organizations have established mentoring programs to help fellow graziers. If they don't have a mentoring program, you'll at least find experienced graziers who can answer questions and give you an idea of what to expect from forage in your pastures.

Yvette Gibson describes how to determine forage supply and demand across a variety of grazing areas and for a variety of livestock in this section of the **free online course**.

Video Transcript - How to use a grazing stick

Good morning! I'm Troy Bishopp. This is Bishopp Family Farm. My accomplice, Mike Fimia is doing a little video. We thought we'd talk about measuring some grass here, kind of in a raw state.

We've got basically 70 head of 900 pound heifers on an acre to an acre and a third. I wanted to talk about this grazing stick and just try to figure out how much forage is actually here.

So if we rake some of this grass that has been resting about 90 days, you can start to see there's actually quite a bit of it. We've got this fancy NatGLC stick. The pink, we want to show our breast cancer awareness even in the grazing world.

So this forage here is about 16 and 20 inches. I'm sure there's a lot of open up here, but down here it's pretty dense. So we've got this 12 inches of forage. And now we've got these dots. These dots represent density. So if we slide this pasture stick through all this dense forage, and we look down you can't see any dots.

Can you see any dots?

You can't see any dots.

OK, if we pull that out, it has a thing here that says if you can't see the dots there's 250 to 300 pounds of dry matter, dry feed, per inch of forage per acre. So if we have this 12 inches of forage that we talked about back here, and let's say there's 300 pounds of dry matter, you've got 12 inches of it, that's 3600 pounds of dry feed per acre.

Now some would argue there's less, there's more. This just gives us a ball park. It all depends on how much you want to take. If you take it all, you have 3600. But we're going to leave a 4 inch residual, so we're looking at taking 3,250 dry feed off this and then leaving the residual for the earthworms and to collect snow. But it does give you a sense.

Now these dairy heifers will be eating about 2000 pounds of dry matter, maybe 2200, os that acre does give you a good ballpark of what you're trying to feed these animals. And if you don't have grass like this, you just have to make an adjustment. If you see more dots, then you have to change your score.

The math does work. Come on out here, take a stick and have some fun. It's a beautiful cold day in New York. What could be better?!

Video Transcript - Clip and Weigh Method

So another common way that we use to estimate annual forage production is called the clip and weigh method.

What I've done is within my key area I want to use this standard size hoop and clip and weigh all of this year's vegetation that's inside of it. So what I've got is a hoop. This one happens to be 1.92 Square feet which is just a nice standard number for me to multiply and get a pounds per acre basis.

I'm going to use these clippers and clip everything that's above the ground, down to the ground surface. I'm going to put it in a bag and I'm going to weigh it. Then I'm going to take the hoop, within my key area again, and throw it between 2 and 4 more times and then do the same thing and I'm going to end up averaging those numbers.

So, again, I've clipped all species of forbs growing within the hoop. It's important to make the distinction between those plants that are rooted within the hoop and those that are rooted outside. If the plants are rooted outside the hoop, you don't include those.

Use a standard, 100 gram scale or something similar. Try to get the weight in grams, and when the wind stops, I'm looking at about 44 grams. I know this bag weighs. I know it weighs about 15 grams. So I want to subtract that. That would give me about 29 grams.

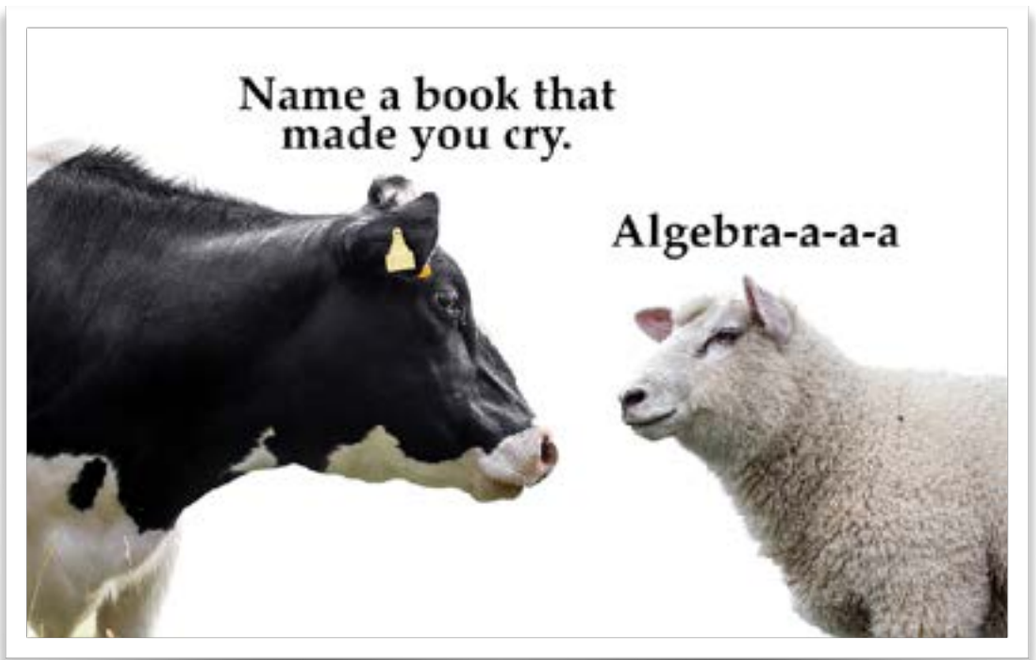
Now randomly throw the hoop again and do this again. You take that number and this size hoop, you multiply times 50. That give you a rough pounds per acre of your forage production in this key area. And then you're saying that is representative of the pasture as a whole.

Some adjustments that need to be made are, how much of the forage growth for this year has been completed, how much is dry weight of the green weight that I have, and if it's been grazed, how much of it has actually been grazed.

If you need help coming up with any of those numbers, it's best to check with your local extension office or your **your local Natural Resources Conservation Service Office** for help with that.

Krista Ehlert

Math and the Art of Grazing - Figuring Your Stocking Rate



Like many of us Krista Ehlert has a love hate relationship with math. She says, "Growing up, I remember asking the question, “Why do we need to learn this?” The “this” being math, and I posed the question to my algebra, geometry, calculus and statistics teachers from grade school all the way through high school. All I ever received for an answer was, 'You’ll use it someday.'” And sure enough, they were right! Math became very important for managing her bank account to save up for special trips, to provide for retirement or to add infrastructure to the ranch.

”But you also have another bank account," she says, "The one full of grass out on your land, and it might be one of the most important accounts you have." Here she lays out why, as graziers, we need math, and then she shows us how to use it to make the best use possible of our grass account.

I’m here to tell you that, while there are scientific principles that guide grazing management and ecological interactions, grazing itself is also an art — one that has a bit of math to it! One way to perfect that art is by understanding how much:

1) You want to leave in your ‘grass account’,
2) How much you can take from your account,
3) How long you can leave your account ‘open’ and when you need to ‘close it’ for the year and
4) How many animals you can support without irritating the (grass) bank.

Math Example

Let's walk through an example to put the math into perspective:

You know the following:

- Number of acres in the pasture
- Forage production (in pounds per acre)**
- Number of animals and their associated class (pairs, stockers, bulls)
- Average weight of the animals

**** The average forage production per acre can be obtained through several methods. The USDA NRCS Web Soil Survey website is a great start, or you can use a "clip and weigh" method, or a Grazing Stick. Your local NRCS service center or Extension Agent can get you started with any of these methods.**

You want to know:

- **How many grazing days that pasture can support**

Step 1. Calculate 'total forage production.'

400 acres × 2,000 pounds production per acre** = 800,000 pounds total forage

Step 2. Calculate 'forage allocated for consumption.'

This is where "take half, leave half" comes in. You want to leave half of that total forage behind. This is for several reasons. Leaving approximately 50% behind means that in a normal year, there's enough leaf structure and root growth to allow for adequate regrowth of your bank account next year. Although we leave behind 50%, your cow will not *consume* the entire other 50%, instead it is *utilized*. This means that 25% of that will end up in the cow's stomach and the other 25% is beneficially "used" through trampling, manure coverage or insects. Figure 1 demonstrates this concept.

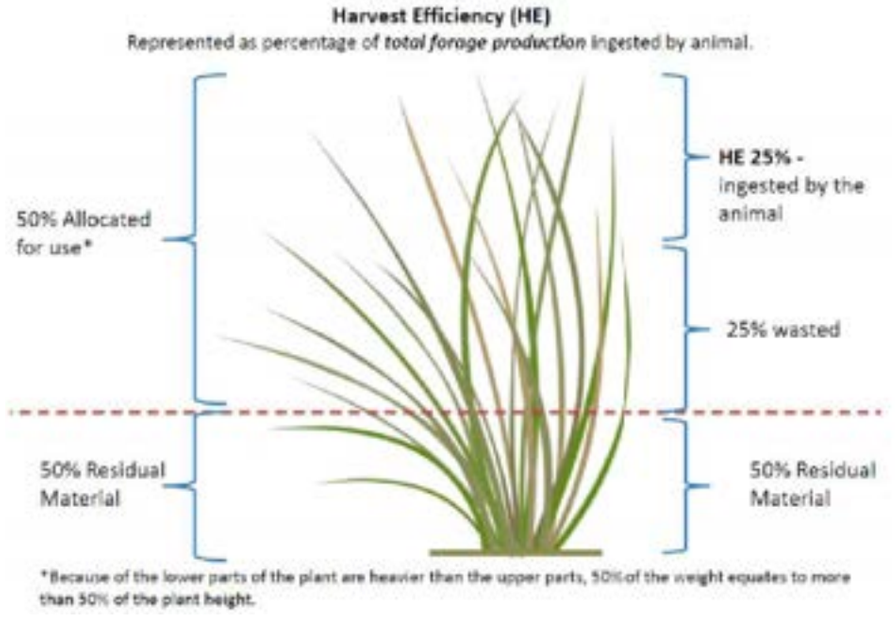


Fig. 1: Depiction of "take half, leave half rule of thumb courtesy USDA Technical Note No. 73 (2012)

Now because you are leaving half behind (50%) + about 25% is beneficially used = 75%, leaving us 25% to put into our cattle. ***This 25% is known as the grazing efficiency.***

The math becomes:

800,000 × 0.25 (25% grazing efficiency) = 200,000 lbs allocated for consumption across that 400-acre pasture.

Step 3. Calculate 'forage demand.'

This is where you must know your pastures and the state of production your animals are at. A general rule of thumb is that a lactating cow with a calf at her side requires close to 3% of her body weight (2.7% to be specific) based on dry matter intake.

Forage quality, though, adjusts the amount a cow will consume. For example, high quality forage (> 59% TDN (Total Digestible Nutrients)) equates to high digestibility, meaning that the cow will intake about 2.7% of her body weight if she is lactating. In contrast, low quality forage (< 52% TDN) equates to low digestibility and that same lactating cow will consume about 2.2% of her body weight.

In the table, you can see how forage intake on a dry matter intake (DMI) basis cand is presented as a percent of body weight (BW) (Hibbard and Thrift 1992, Lalman 2004).

Forage Type and Maturity	Animal Stage of Production	Forage DMI, % of BW
Low quality forage (<52% TDN) Examples: Dry winter forage, mature legume and grass hay, straw.	Dry, Lactating	1.8, 2.2
Medium quality forage (52-59% TDN) Examples: Dry summer/fall pasture, late-bloom legume hay, early-bloom grass hay	Dry, Lactating	2.2, 2.5
High quality forage (>59% TDN) Examples: Early-bloom and mid-bloom legume hay, pre-boot stage grass hay, lush pasture, silage	Dry, Lactating	2.5, 2.7

For this example, we are going to use the 2.7% and assume that we have high quality forage.

Our cows weigh approximately 1,300 lbs and we own 200 head. Each pair we have requires 35.1 pounds of forage per day.

1,300 lb × 0.027 (2.7% body weight consumed) = 35.1 pounds.

But wait! As you are reading this, it is a bit into the fall (August/September), so the calves are grazing some on

their own and mom is still lactating. The majority of the calf's nutrition comes from grass now. Thus, we should account for what the calf will be eating. If our calves are approximately 450 pounds, then our math looks like this:

450 pounds × 0.027 (2.7% body weight consumed) = 12.2 pounds forage required per calf per day.

This means that about 3 calves will eat as much as 1 cow per day at this time of year!

Now we can figure the intake per pair adjusted for this time of year:

35.1 pounds (cow) + 12.2 pounds (calf) = 47.3 pounds.

Now, we calculate the forage demand for the entire herd per day. We own 200 pairs so here's the math:

200 × 47.3 pounds per day = 9,460 pounds of forage is needed to feed the entire herd for one day!

This is important! If we only accounted for the cows, and not the calves, the forage demand for the entire herd would equal 7,020 lbs for one day. ***This is a difference of about 2,400 pounds per day!***

Step 4. Calculate 'grazing days' in this pasture.

To calculate the grazing days we have in one pasture, we take the forage allocated divided by the forage demand per day to arrive at the number of grazing days. In our example we have 200,000 pounds of allocated forage and we know that we need 9,640 pounds of forage, so here's our math:

200,000 pounds allocated divided by 9,460 pounds forage per day = 21 days of grazing can occur in this pasture.

Again, if we only accounted for the cows, then 200,000 pounds allocated divided by 7,020 pounds forage per day = 28 days of grazing. ***That's an entire week of difference!*** If you only calculated for what the cows are eating and not the calves, you would have kept them in for 7 days longer, which might not sound like a lot, but it is something that can make a difference in a year that is droughty.

Simply put, 21 days of grazing can occur in that pasture, feeding your entire herd, and keeping the land managed in a way that soil and rangeland health are protected

Step 5. Record it and keep track!

Do you ever try to go to the grocery store without a list written down? How often do you get home and realize that you forgot the milk? I know this happens to me quite a bit! That's why a written record is the best record! Be sure that you are writing down your calculations (so you remember how you did the math and can double check for mistakes) and so that you can see any patterns or changes in your stocking rate that have occurred over time.

And We Have a Calculator for You!

The grazing calculator eliminates the guesswork and mess associated with doing calculations by hand. It requires a few inputs on your end, and you'll be able to save a downloadable Excel file for your record keeping. **Click here to get started**, or view the following information and **instructional video** to learn more about using the calculator.

In Summary

It might seem a bit silly to check in on your stocking rate calculations, but it is something that is undoubtedly worth your time whether you're a seasoned rancher or you're still trying to get your feet under you. Calculating these as we approach fall and early winter are worthwhile, so that you have an idea of what you should be looking at for spring turnout and beyond. A new grazing season will be here before we know it!

Sources:

Hibbard, C.A. and T.A. Thrift. (1992). Supplementation of forage-based diets: are results predictable? J. Anim. Sci. 70 (Suppl. 1):181. (Abstr.)

Lalman, D. (2004). Nutrient requirements of beef cattle. Oklahoma Coop. Ext. Serv. E913.

Yvette Gibson shows the math for a variety of grazing scenarios in this section of the **free online course**. She also covers the grazing planning process. **Here's the first** of seven lessons to get you started.

Kathy Voth

Figuring pasture size

In **"What Does Light, Moderate and Heavy Grazing Look Like?"** you get a visual of different intensities of grazing so you can take a quick look at your pasture and decide if you should move to the next pasture. But what if you'd like to plan ahead for the rest of the season to make sure you're going to have what you need to feed?

While Sarah's video targets dairy graziers, anyone raising livestock on pasture can benefit from spending 5 minutes watching. You'll learn how to do the quick and easy math to figure out how big your pastures should be to meet your animals' needs, and how much land you'd need, factoring in fast or slow regrowth through the grazing season.

Click to start the video.

Video Transcript - Figuring pasture size

Information brought to you by University of Vermont extension and eOrganic with funding from USDA Organic Agriculture Research and Extension Initiative.

My name is Sarah Flack and I'm a grazing consultant and I also do organic farm inspections. Today we're going to quickly run through how you can figure out how large your paddock needs to be to feed a herd of animals for a day. Then you can go on and do some stocking rate calculations and figure out how many total acres of pasture you need in order to provide the amount of dry matter from pasture to your animals that meets your farm goals.

Let's use an example here. Let's assume it is a herd of dairy cows and there are 50 in the herd and this farmer's goal is to provide 30 pounds of dry matter per cow from the pasture per day. This is a farm that's providing the majority of the dry matter from pasture and they're supplementing just a little bit of grain in the barn.

The first thing we need to do is determine what the total dry matter requirement is of the herd for the whole day. I'll use my calculator and take 50 animals x 30 pounds and I come up with 1500 pounds of dry matter per day. That's the requirement of that whole 50 cow herd from pasture.

The next thing, is now that we've already used this grazing stick and we've gone around the pasture and measured how much available grazeable dry matter there is in the whole acre, we came up with 1200 in the example we did before. The next thing that we're doing to do is to dived the 1200 into the 1500 and so we get 1.25 that's an acre and a quarter. That's how much you need to provide the 1500 pounds of dry matter. That means if you're putting out 24 hour paddocks, each paddock would need to be an acre and a quarter in size.

So each paddock is providing 1500 pounds of dry matter for that day.

You can go on later with those numbers once you know how long it takes each of your paddocks to grow back up to the full pre-grazing height of about 8 or 9 inches in this case, you can figure out how many total acres you'll need to graze the whole herd.

So now that we know that the herd needs 1.25 acres to feed them for 24 hours, let's figure out how many total acres we need to feed that herd at different times of the year.

In the spring, when the grass is growing very rapidly here, it's going to take about 18 days for the pasture to grow back up to the correct pre-grazing height. In this case the farmer's goal is to graze it when it's about 8 inches tall.

So we take the 18 days and multiply it by the 1.25 and we know that that farmer needs to have 22 and a half acres in the spring to rotate through. That's giving the cows a fresh paddock every day that's an acre and a quarter in size.

Later in the summer when the speed that these plants are growing at slows down, you'll need to add more acres into the rotation so that when you bring the cows back to the paddock, it's always at the correct grazing height.

So instead of taking 18 days fr the plants to grow back, it's going to take 28 to 30 day sin the middle part of the summer here. And on some farms that will be significantly longer than that. You need to use the numbers that are appropriate for your area.

But assuming that the farmer is putting them into this 1.25 acre paddock every day and it's a 30 day regrowth period, we take the 1.25 and multiply by 30 and the farmer now needs 37.5 acres to rotate through to provide the same amount of dry matter to the cows.

So you can see that the farm has gone from needing 22.5 acres to 37.5 acres during the summer, and there may be times when the regrowth periods are even slower than that you would need even more acres.

This is just a way to give you a ballpark number of the acres you would need at different times of the year for this particular 50 cow herd.

Kathy Voth

What does light, moderate and heavy grazing look like?

- Shoot for moderate grazing (40 - 60% utilization.
- Remember to factor in wildlife grazing in the area.
- Choose areas that are representative of the pasture as a whole when making decisions.
- If you over graze (and mistakes will happen) avoid that area next spring so plants have time to rebound.

If you're wondering if it's time to move the animals, and need a quick look at what a pasture looks like under different degrees of grazing pressure, take 5 minutes with this video from grazing experts at the University of Wyoming Cooperative Extension Service.

"Uh -oh," you say. "I'm not from Wyoming. Does this apply to me?" Though rest and recovery periods are different for different parts of the country due to soils, precipitation and forage species, the principles for measuring grazing pressure described here apply no matter where you live.

Click to start video.

Video Transcript - What does light, moderate and heavy grazing look like?

D: Hi. My name is Dallas Mount with the University of Wyoming Cooperative Extension Service.

R: And I'm Rachel Mealor.

D: Today we're going to discuss how to know when it's time to move your animals from one pasture to the next.

R: We're going to be discussing moderate grazing, light grazing and heavy grazing and maybe what those look like.

D: When it's time to move your animals from one pasture to the next, you really want to have grazed that pasture at a moderate level. What does that look like? We're going to show you.

R: So as you can see behind Dallas and I, this pasture has experienced some heavy grazing. So, when we're looking at heavy grazing, what we want to do is look a little bit closer at your grasses that have been grazed.

D: So as we're looking at this pasture, we want to ask ourselves how many of the grasses we're looking at have been grazed this year. Is it just a few, is it half of them, or is it a majority of the plants? In this situation obviously the majority of the plants have been grazed. And the next question we want to ask is how severely have they been grazed? Have the animals eaten most of this year's growth, only a little bit, or have they barely touched it? Well again, in this situation, most of this year's plant growth has been eaten almost to ground level so this is definitely heavy grazing.

R: And it's not uncommon to see heavy grazing take lpace around a watering facility or a tree area or some place your animals like to hang out and loaf for some time period. So, this isn't uncommon in areas that you should check on a regular basis are those areas where animals like to hang out.

D: So if you do have a pasture that has seen some heavy grazing one year, things to consider for follow up management would be a deferment of grazing next year, especially in the spring months until the plants you're managing for, generally the cool season plants, have an opportunity to complete their life cycle and put out a seedhead. And you can either come in later that summer and graze or graze after killing frost that winter and it will

help that pasture recover from heavy grazing the prior year.

R: Now that we've looked at a heavy grazing situation, why don't we move on and take a look at what a moderate type grazed situation might look like.

D: So now we're standing in an area that's seen moderate grazing. So we see plants that have seen almost no utilization on them, and other plants that have seen pretty good utilization and then we see plants that have some bites taken out of them, but they sure haven't been bitten down to the ground.

R: Moderate grazing usually encompasses about 40 to 60% utilization. So if it looks like 40-60% you're probably in that moderate category.

D: Lot of folks have heard the term "graze half and leave half," well, if we're taking 50% and leaving 50% then that's moderate grazing.

R: Another thing to consider is not only the grazing done by your livestock but by wildlife as well. If you're in an area that's heavily impacted by wildlife, you may only be able to take 35-40% depending on your wildlife herds that come through that area. So, you definitely want to take half and leave half and that's encompassing wildlife use as well.

D: So, again, this is what we're targeting.

R: Now we're in a pasture that has experienced light grazing.

D: This part of the pasture is further removed from the water tank and as we look at these plants there are lot that have not been grazed at all and there's some that have seen just a little bit of grazing. So really, this area has seen light grazing. Another thing to do is look across the fenceline at an area that has seen almost no grazing and compare the two. There's very little difference between across the fence and the area where animals have access.

R: Fenceline contrasts are a great way to gauge where you're at.

D: Sometimes even without a fenceline you can find an area where animals don't graze, where there's prickly pear or some yucca around, or where some terrain features make it inaccessible to animals. Light grazing those types of plants that aren't being grazed. If you're managing for productive grasses that are going to continue to produce, sometimes you don't want to avoid grazing entirely. Sometimes those grasses can become tall, dormant and decadent and really not be the best health for your pasture. So I think moderate grazing overall is a good thing to shoot for.

R: Yeah, like Dallas said, a thing to keep in mind is not grazing your pastures at all can be as detrimental and over grazing.

D: To summarize, we've looked at areas that have seen heavy grazing, moderate grazing and light grazing. Well, there's a problem when you do this at a landscape scale. Where do you take the measurement? Do you look at the water tank, say it's heavy grazing and it's time to move or do you go to the far corner of the pasture that sees light grazing and decide I better stay there longer?

R: I think a good rule of thumb is to pick an area that is representative of your pasture. Obviously, you can probably section this pasture off a little. The places by the tank are more utilized than the places away from the tank, or those loafing areas for livestock. But if you can find an area that is representative of your pasture, I think that's going to give you the best reading of your overall grazing pressure.

D: If you do have some areas that are really having a hard time getting your animals to go out to, it's probably an indication that you need to split your pasture up into a smaller size, concentrate those animals a little bit more, limit their selectivity and you'll even out the utilization in that pasture.

So hopefully we've given you some ideas about how to know when it's time to move your animals. Remember grazing intensity is just one part of the whole equation of intensity, opportunity and frequency of grazing and how that impacts the health of these plants we're looking at.

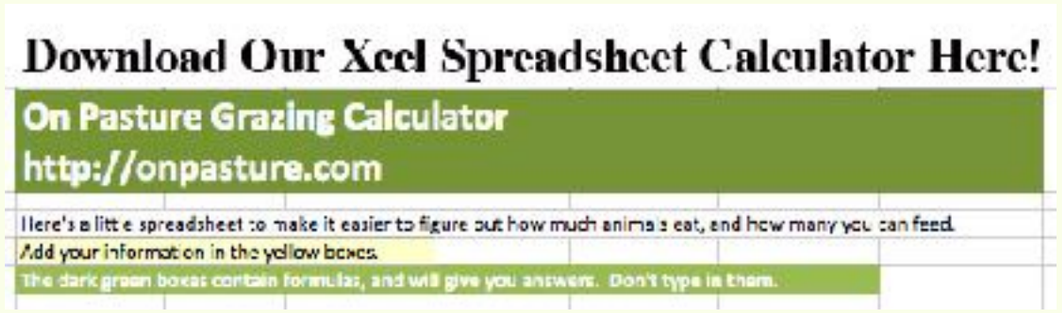
From the University of Wyoming Cooperative Extension, I'm Dallas Mount.

R: And I'm Rachel Mealor.

Resources - On Pasture Forage/Stockpile/Animal Feed Calculator

Here's an Xcel based spreadsheet you can use to figure how much available forage you have, how much your livestock need, your carrying capacity, and how much hay/stockpile you'll need for winter.

To use it, you'll plug numbers into the yellow boxes. The answers you're looking for will show up in the dark green boxes.



Click to download.

There are several different part to the calculator, depending on the questions you're asking.

The first section **figures spring/summer grazing season forage**. The "Total Forage Available" answer it gives you assumes that you'll be leaving at least 50% behind to prevent overgrazing. If you use this answer, consider adjusting it when you figure winter stockpile because once the grass is dormant, you can graze shorter because the plant is not actively growing.


How Much Forage Do I Have?

The final answer is 50% of the total forage growing in your pasture. We did it this way to help you make sure you don't overgraze. Remember, if you're barefoot in your pasture, if the grass doesn't touch your ankles you are overgrazing.

Tons of Dry Matter/Acre	Number of Grazeable Acres	Total Forage Available
3000	20	30000

The next section of the calculator helps you figure out how much forage your animals eat. The first thing you'll notice is that it uses a measurement called "AUMs." This stands for Animal Unit month. This is a measurement that is more often used in the west where government agencies lease rangeland. One AUM is the amount of forage required for one cow/calf pair, because that was what was most common on rangelands. All you have to do is enter the number of animals you have in each category. You'll get

answers for how much that group eats, and then figures for daily and monthly rates for the whole herd.

How Much Do My Livestock Eat (or How Many AUMs Do I Have?)

AUM = Animal Unit Month. This is the amount of forage that one animal will require per month. It is standardized to a 1000 lb cow with calf because they were most prevalent on the range. All the other animals are converted to an "Animal Unit Equivalent" or AUE of the cow and her calf, as shown below. Because it is easier to say/type, we've translated it into Daily Forage Requirements.

Type of Stock	AUE	Daily Forage Requirement	Enter the # of animals for each category	Total Forage Required per Day	Total Forage Required per month	Total Forage Required for Herd Per Day	Total Forage Required for Herd Per Month
Cow, 1000 lb, dry	0.82	24.5	20	490.67	14720.00	490.67	14720.00
Cow Calf Pair	1	30.0		0.00	0.00		
1200 lb Cow w/calf	1.2	36.0		0.00	0.00		
1400 lb Cow w/calf	1.4	42.0		0.00	0.00		
1600 lb Cow w/calf	1.6	48.0		0.00	0.00		
Bull, Mature	1.35	40.5		0.00	0.00		
Heifer 1 year old	0.6	18.0		0.00	0.00		
Heifer 2 year old	0.8	24.0		0.00	0.00		
Horse, Mature	1.25	37.5		0.00	0.00		
Sheep, Mature	0.2	6.0		0.00	0.00		
Lamb, 1 yr old	0.15	4.5		0.00	0.00		
Goat, Mature	0.15	4.5		0.00	0.00		
Kid, 1 yr old	0.1	3.0		0.00	0.00		

We also included a tool to help you estimate carrying capacity.

What Is My Carrying Capacity?

Note that the results of this part of the calculator are for estimating purposes only.

For this step you need to consider your **rotation length**. Typically this is the amount of time it takes for grazed forage to fully recover. Recovery time depends on your location, the amount of rainfall you receive, or whether or not your pasture is irrigated. If you are unsure what to expect, contact your local NRCS or Extension Office to see how many days you might use as your rotation length.

Use the Daily Pounds of Forage from the table above to complete this calculation.

Rotation Length	Pounds of Forage Available per Day	Daily Pounds of Forage 1 Animal Requires	My Sustainable Carrying Capacity
120	250	26.7	9.363296

First you enter your rotation length. This is the amount of time you anticipate it will take for the forage to completely recover. (If you're using this to figure out how long your stockpile will last, your rotation will be the amount of time before you have new spring growth.) The calculator divides your rotation length by the total forage you have available from the first section. You can use the chart of daily forage requirements to enter the amount of food one animal eats so that the calculator can tell you how many animals you can feed.

Now, how much forage do your animals need over the winter? Well, it depends.

How Much Hay Do I Need For Over-Wintering?

Depending on your location and operation management style, you may or may not have stockpile to feed livestock over the winter. You might also feed hay along with your stockpiled forage to speed up Spring green up. Choose the calculator option that works best for your operation. Experiment with different scenarios to see how they might affect your profitability. Plan to adjust your hay purchase up to cover unforeseen situations.

Calculator Option 1:

I have stockpile. I feed 50% of my livestock's Dry Matter needs while on stockpile to help with Spring green up.

Number of Days I'll feed Livestock	Number of days Grazing Stockpile	Daily Pounds of Forage 1 Animal Requires	Number of Animals to Overwinter	DM Required While Grazing Stockpile	DM Required When Not Grazing Stockpile	Total Hay Required in Tons (Assuming 88% DM/Ton)
100	75	26.7	10	10012.5	6675	9.48

Calculator Option 2:

I don't have stockpile, or I don't feed hay along with my stockpiled forage.

Number of Days I'll feed Livestock	Number of days Grazing Stockpile	Daily Pounds of Forage 1 Animal Requires	Number of Animals to Overwinter	Hay Required When Not Grazing Stockpile	Total Hay Required in Tons (Assuming 88% DM/Ton)
100	75	26.7	10	6675	3.79

In this spreadsheet we've given you two options based on how different people prefer to manage their animals. Option 1 includes feeding 50% of your livestock's Dry

Matter requirements. Some folks do this because they want to speed up spring green up. You can use Option 2 if you don't have stockpile and will only be feeding hay, or if you don't feed hay with your stockpiled pasture. For either option you'll need to fill in the number of days you'll feed livestock, how many of those days will be covered by stockpile, daily forage requirements, and how many animals you anticipate overwintering.

Keep in mind that this calculator is somewhat generic because we wanted it to work for as many people as possible. ***All the numbers you get from it are estimates and you'll have to use your experience and that of the extension specialists and Natural Resources Conservation professionals in your area if you have questions.***

Closing Thoughts

A note from Don

T. S. Eliot, who is a poet and essayist wrote," Sometimes the end of all our exploring is to arrive where we started and to know it for the first time."Eliot is saying, I believe, that sometimes we search and search for something and finally realize that we had it all the time.

I believe this applies to us in livestock agriculture, we have searched and searched for ways to make our operations most cost effective and profitable, but in the process have overlooked the obvious: Cattle are grass eaters. More to the point they are grazers.

This simple fact seems to cause untold hand wringing and teeth gnashing among some folks who call themselves cattlemen. The plain unvarnished truth is we have built and perfected these production systems that do not allow cattle to be cattle.

If we will just learn to provide cattle a means to do what is natural for them to do - graze grass - it would be easier on the cattle and our pocketbooks as well.

It is very hard for a society oriented toward technology and industrialization to accept the fact that management of grass and the manipulation of foraging animals is the basic key to production. The mindset of planting and cultivating and harvesting with mechanical equipment has led many cattlemen to solutions that have proved to be very expensive and in most cases not solutions at all. The idea that production can be increased with grazing animals is being accepted by some but the application of this management has not become main stream by any means.

There is no recipe or blueprint that can guarantee success for a grazing operation. You must simply learn to use what is available to you.

When you begin to analyze your operation, the most important question you can ask is WHY? Why do I do what I do the way I do it? Peter Drucker one of the world's foremost management experts says, the most inefficient thing that you can do is to do efficiently that which does not need doing at all.

As an example - A few years ago the Concorde flew its last flight. This plane was the best of the best. It could fly across the Atlantic Ocean in 4 or 5 hours. This thing was so sophisticated and technically advanced that it flew on the very edge of space at a speed twice the speed of sound. It was grounded not for any technical or safety

reasons, it was grounded because it could not be operated at a profit for its owners. Now we are not in the airplane business we are in the cattle business to put this in the context of our business how about this to think about, it is pointless to work to improve animal production through genetics if the real problem is too high production costs.

The dairy industry provides a similar example. When we were in the dairy business there was a lot of talk of feeding cows to make it possible for them to produce to their genetic potential. It was all about production, never about cost of production. We were led to believe that if we did what we were supposed to do the way we were being told to do it, the profit would be there.

This was in the late 70's and early 80's. At that time the rolling herd average production in Louisiana was about 11,000 lbs. of milk. In New York it was over 20,000 lbs. But less than half of the dairy operations in New York were able to maintain their debt load. How many dairies have gone out of business in our country following this idea of being very efficient at something that just doesn't pay? So it became clear to us that production was not the answer to all of our problems.

Now, not everyone will agree with this, and it would be foolish or at least naive to think that everyone will rush to embrace our ideas of grass farming and managed grazing. There are folks who are opposed to these ideas for no other reason than this is not the way it is supposed to be done.

This will not work for everyone, not because the ideas or methods are wrong but because we all have to find our place.

I read once written about finding our place. It was described as our deep gladness. If you need to be driving tractors and baling hay and putting out feed and doing all of the other things that most think is necessary to be in the cow business, this may seem too simplistic for you. But if growing grass and raising cattle in harmony with the natural world and striving to leave your part of it better than you found it helps you to find your deep gladness then there is no question you can become successful.

I hope you find your deep gladness.

Don Ashford
Ethel, Louisiana

More Tools for Your Toolbox

More Resources

The National Grazing Lands Coalition provides science-based technical assistance, research and education for ecologically and economically sound grazing management on private and public lands.

Check out our free online courses: Grazing 101 and Record Keeping.

State Grazing Land Coalitions

Providing mentoring and educational support to their members. **Find yours here**.

You can find similar support through **State Forage and Grassland Councils**.

On Pasture

Explore the library of over 3,000 articles to find answers to your grazing questions.

Natural Resources Conservation Service

This federal agency was created in response to the Dust Bowl and a need to protect and improve soil health. It has offices in almost every county of the United States and is dedicated to providing both technical and financial assistance to producers. **Contact your local office here.**

Soil and Water Conservation Districts

These locally led organizations were also born out of the Dust Bowl and to assist the NRCS with its work. **Find your nearest conservation district here.**

Small Ruminant Toolbox

Producer's Guide to Pasture Finished Beef

Dairy Grazing With Sarah Flack

This link takes you to Sarah's site where she's posted webinars on dairy grazing.

For even more resources, check out the list of contributors and the links to their websites and articles. It's like having access to some of the best mentors in the business!

Contributors

Our Contributors

In order of appearance

Don Ashford

Don shares his decades of farming experience as a member of many grazing organizations. He is also a regular contributor to On Pasture. You can find all his On Pasture articles **here.**

Kathy Voth

Kathy has been working with livestock producers for 3 decades. She's known for her work on developing a handbook on CD providing the logistics for using goats to graze firebreaks, and for creating a method to teach cows (and other livestock) to eat weeds. She is the founder and publisher and primary author of **On Pasture**, an online magazine that translates research and experience into practices graziers can use to be more sustainable and profitable.

Wayne Burleson

Wayne is a soil health expert who has worked with graziers and gardeners. Since his retirement he's focused on humanitarian food gardening including teaching gardening in South Africa, Malawi, Rwanda, Ethiopia, Jamaica, Mexico, Nicaragua, and Mozambique. His book, "Gardening for Life - No Money Required," is a fundraiser to help him continue this work. You can reach him at rutbuster@montana.net. You can read Wayne's On Pasture articles **here.**

Dave Pratt

Dave has worked with ranchers for more than three decades, helping them transform their ranches into successful, sustainable businesses. He's helped thousands of ranchers improve their land, lives and their profitability. In the 1990's he began teaching the Ranching for Profit School and when Ranch Management Consultants founder Stan Parsons retired in 2001, Dave and his wife Kathy, bought the business. In 2019 after many successful years they sold the company to Dallas Mount. You can read Dave's **On Pasture articles here**, and an excerpt from his latest book, "The Turnaround: A Rancher's Story" **here**.

JoeTrlica

After earning his PhD in Ecology and Ecophysiology from Utah State University, Joe served as a professor in the College of Natural Resources at Colorado State University (CSU) for 35 years. He and his students did research in plant ecology and ecophysiology in forests, rangelands, riparian areas, and mine land reclamation areas. He headed up the Colorado Riparian Research and Management Institute at CSU for 10 years and published

numerous research articles in scientific journals, book chapters, and reports. He is currently an Emeritus Professor at CSU and senior ecologist at KS2 Ecological Field Services.

Greg Judy

Greg and Jan Judy of Clark, Missouri run a grazing operation on 1400 acres of leased land that includes 11 farms. Their successful custom grazing business is founded on holistic, high-density, planned grazing. They run cows, cow/calf pairs, bred heifers, stockers, a hair sheep flock, a goat herd, and Tamworth pigs. They also direct market grass-fed beef, lamb and pork. Greg's popularity as a speaker and author comes from his willingness to describe how anyone can use his grazing techniques to create lush forage, a sustainable environment and a successful business. You can read all of **Greg's On Pasture articles here**. Visit **his website** to find out about additional learning opportunities and to order his three books.

Dean Schneider

Dean is part of Bell Rule Genetics, a family Ranching Operation in Northeast Oklahoma with 400 commercial cows and 100 registered Angus cows. They have been raising cattle for over 100 years with a focus on producing cattle that are efficient, productive and fit the needs of today's Beef Industry. They have built a Registered Angus Herd with the commercial cattlemen in mind - moderate framed, easy fleshing, maternal cattle with carcass capabilities. They also raise Registered Angus bulls, commercial bred heifers and cows, feeder cattle and fed cattle for local butcher shops and premium age and sourced programs. In addition, we have a select herd of Foundation bred Quarter Horses. You can **learn more at their website**.

Luke Jessup

Luke, a graduate of Western Kentucky University, runs a cow-calf operation in Kiowa County, Oklahoma and keeps a fulltime job at a paper mill. In a previous life he enjoyed vacations in Iraq and Afghanistan courtesy of your United States Army. His wife Kimberly, a nurse, sometimes performs as his veterinarian and, with daughter Amy, periodically helps Luke out of jams. They contend that he is not nearly as smart or as funny as he thinks.

John Marble

John grew up on a terribly conventional ranch with a large family where each kid had their own tractor. Surviving that, he now owns a small grazing and marketing operation that focuses on producing value through managed grazing.

He oversees a diverse ranching operation, renting and owning cattle and grasslands while managing timber, wildlife habitat and human relationships. His multi-species approach includes meat goats, pointing dogs and barn cats. He has a life-long interest in ecology, trying to understand how plants, animals, soils and humans fit together. John spends his late-night hours working on fiction, writing about worlds much less strange than this one. You can read all of **John's On Pasture articles here**.

Tom Krawiec

Tom, along with his wife Jan, started raising and direct marketing hogs, sheep, cattle, turkeys and chickens in 1999, the same year they completed a Holistic Management course. Their operation slowly morphed into custom grazing cattle on rented land and Tom's passion for managing grass grew in the process. Tom and Jan completed the Ranching for Profit school in 2003 and found the 'missing piece'. Since then, Jan has fulfilled her dream of being a nurse and Tom manages ranches in Canada. He has a book in the works, "How to Ranch Like a 12-Year-Old" and he is a regular contributor to On Pasture. **You can read his articles here**.

Sandra Kay Miller

Sandy is a female farmer, damn good cook and witty writer slicing her finger open on the cutting edge of sustainable agriculture. Visiting her Painted Hand Farm is like living a crash course on all that's right with food and farming today - taught by one of the most delightful people ever to rebuild an antique Babson Surge Milker (and use it!) or raise a goat from birth to curry pot. Sandra has served on the boards of many organizations and has been instrumental in developing farmers markets. She's a prolific writer and speaker sharing her knowledge and experience with others. You can read her On Pasture articles **here**.

Rick Machen

Dr. Richard Machen is on faculty at Texas A&M, Kingsville and is the Paul Genho Endowed Chair in Ranch Management, King Ranch® Institute for Ranch Management, Beef Production. For almost three decades he provided leadership to regional and statewide learning opportunities such as A Gathering of Goat Producers, the Texas Beef Quality Producer Program, Texas A&M Beef Cattle Short Course, Beef Boot Camps for Retailers, the TAMU Grass-Fed Beef Conference and Rebuilding the Cow Herd.

Ron Gill

Dr. Ron Gill is a professor and extension livestock specialist at Texas A&M and provides leadership in Extension programming related to animal well-being and low-stress livestock handling as well as working onstatewide programming efforts for Beef Safety and

Quality Assurance programming. Other interests include beef cattle and equine nutritional management and value added marketing. To see other presentations by Ron, search for him by name on Youtube.

Dr. David E. Larsen, DVM

Doc Larsen was a country vet for 40 years in Sweet Home, Oregon after graduating from Colorado State University in 1975. He shares his experiences on his blog, **Memoirs of a Country Vet**, and in a new book, "**The Last Cow in the Chute and Other Stories.**" Both the blog and the book are great reading for a new grazier as you'll get a flavor for what can happen to your animals and when you should call a vet.

Troy Bishopp

Troy Bishopp, aka "The Grass Whisperer" is a seasoned grazier and grasslands advocate who owns, manages and linger-grazes at Bishopp Family Farm in Deansboro, NY with his wife, daughters, grandchildren and parents. He custom grazes dairy heifers and grass-finished beef and backgrounds feeder cattle on 180 acres of owned and leased pastures. Troy also mentors farmers on holistic land management for the Madison County Soil and Water Conservation District and the Upper Susquehanna Coalition as their regional grazing specialist. He's an award-winning free-lance writer, essayist and photographer. **Visit his website here,** and read all his **On Pasture articles here**.

Krista Ehlert

Dr. Krista Ehlert grew up in the Midwest. She received her Bachelor's in Biology from St. Olaf College, and a Master's in Land Resources and Environmental Science and a Ph.D. in Ecology and Environmental Science from Montana State University. Her graduate work focused on ecologically based invasive plant management in rangelands. Krista has worked for SDSU Extension since fall 2018 as an Assistant Professor an Extension Range Specialist. Her focus is supporting producers through novel approaches such as educational programs that focus on "gate to plate" aspects of the beef cattle industry, educating younger professional agency staff about natural resource management, and researching up and coming technologies. Krista is also passionate about helping producers improve their own resiliency and that of their operation through farm and ranch stress management and adoption of conservation methods, such as rotational grazing. You can reach her by email at **Krista.Ehlert@sdstate.edu**. She works out of the West River Research & Extension Center in Rapid City, South Dakota.

Sarah Flack

Sarah Flack is an author and consultant specializing in providing practical information on grass based and organic

livestock production to farmers, organizations, institutions and individuals. She has a diverse background in sustainable agriculture, which includes both on-farm and academic experience. She is nationally known for her public speaking, workshops, books and numerous articles on a range of agricultural topics. **Visit her website** to learn more.

Dallas Mount

Dallas Mount has sat at hundreds of kitchen tables and delivered workshops to thousands of ranchers across the US, Canada, and Australia to help them improve the profitability and overall health of their businesses. He has hands-on experience working in cow-calf, yearling, feedlot and hay enterprises. He received his BS and MS from Colorado State University in Animal Science. Dallas cut his teeth working with the University of Wyoming Extension service beginning in 2001. Dallas started teaching the Ranching For Profit School in 2012 and quickly established himself as an elite instructor. Dallas, his wife Dixie, and their two teenage kids own and manage a cell-grazing operation near Wheatland, WY. In 2019 he purchased **Ranch Management Consultants** from Dave and Kathy Pratt. Dallas currently serves as CEO of RMC leading the Ranching For Profit School and the Executive Link Program creating profitable businesses, with healthy land and happy families. **Sign up for his Profit Tips Newsletter here**, and read his **On Pasture articles here**.