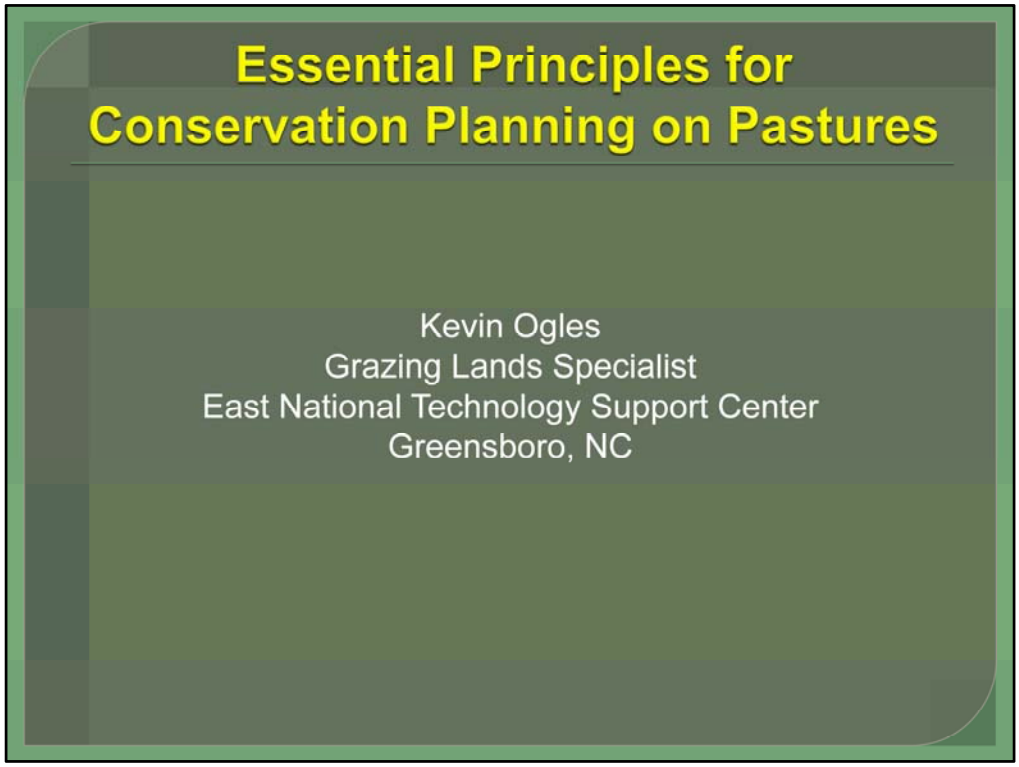
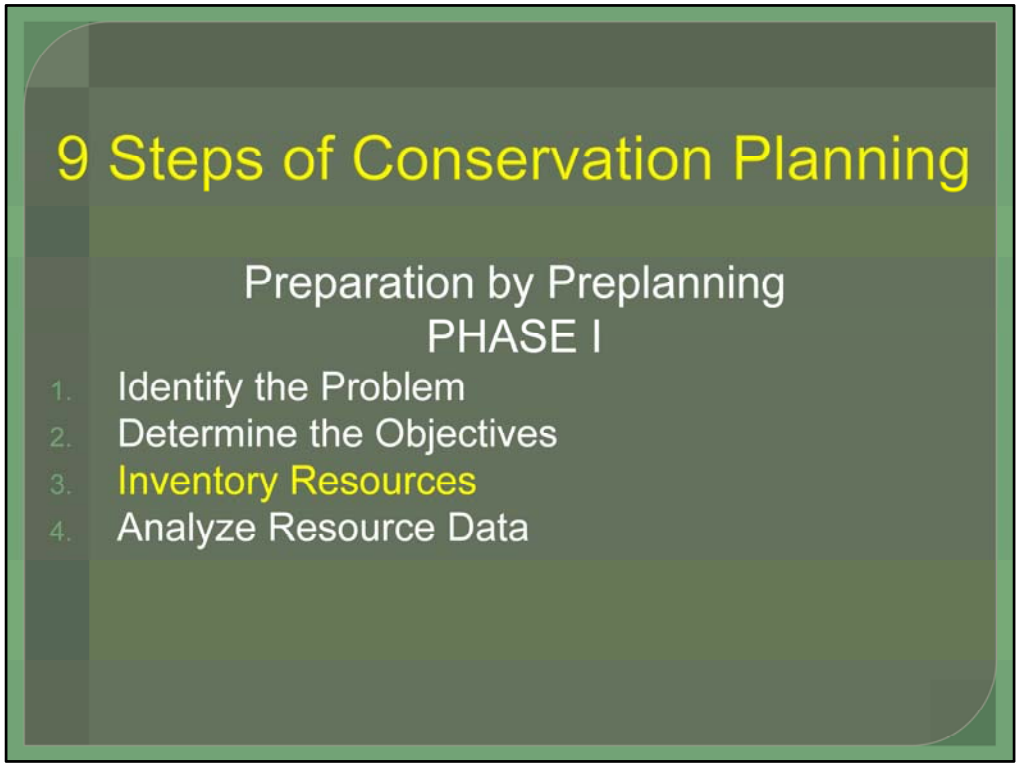
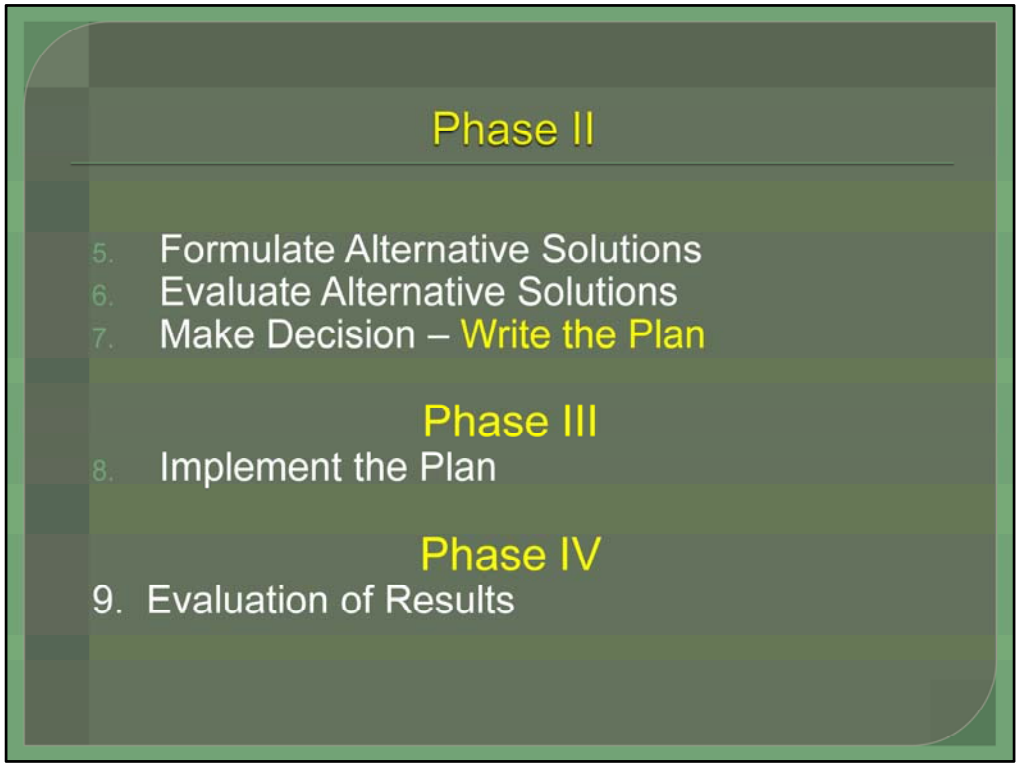

Essential Principles for Conservation Planning on Pastures
Kevin Ogles
Grazing Lands Specialist
East National Technology Support Center
Greensboro, NC

Title slide.




Read Slide. The Inventory process is extremely important to do a successful job of conservation planning.



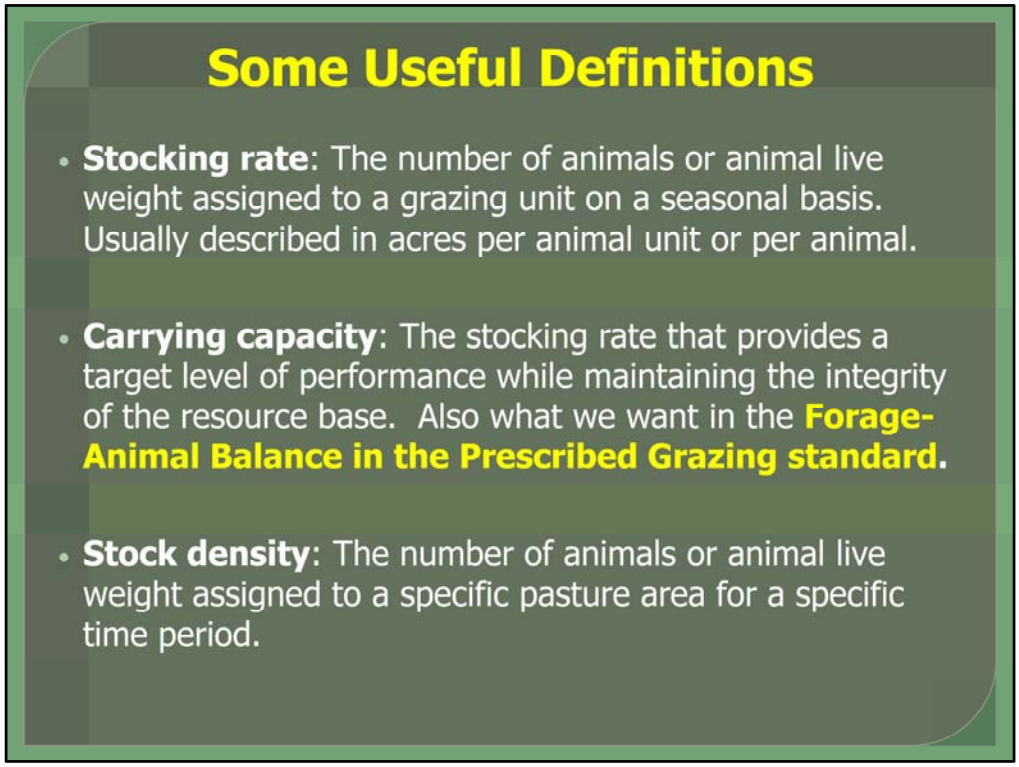

Read Slide. We will only be talking about the data we need to look at alternatives and play our a scenario where the livestock producer has made a choice (decision) on which alternative they would like to try.


We gather soils information as a major part of our preplanning.

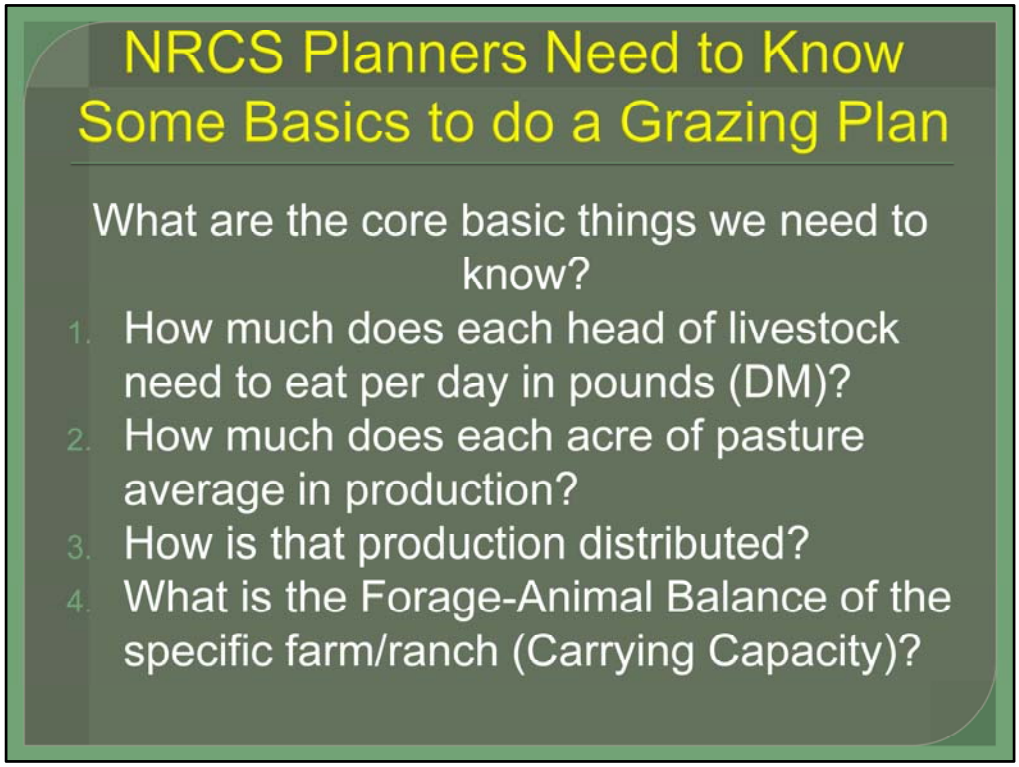

Our Goal:
Manage Pasture Plants and Soil in the Most Sustainable Manner given the Land Manager's Objectives

Read Slide.

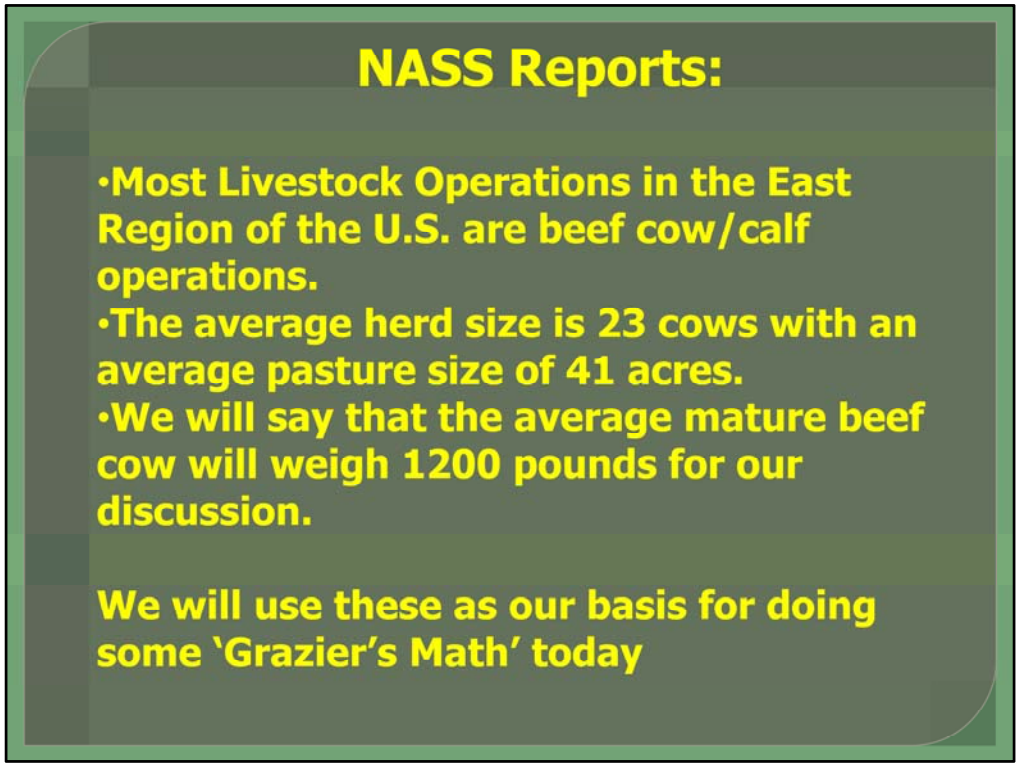

Plants and soil is what our 528 practice is trying to protect, enhance and conserve. We use several tools to use conservation of the plant and soil resource. These tools are fence, watering systems, livestock and managing nutrients (manure). We want to make sure the plants and soils in the pasture are sustainable.



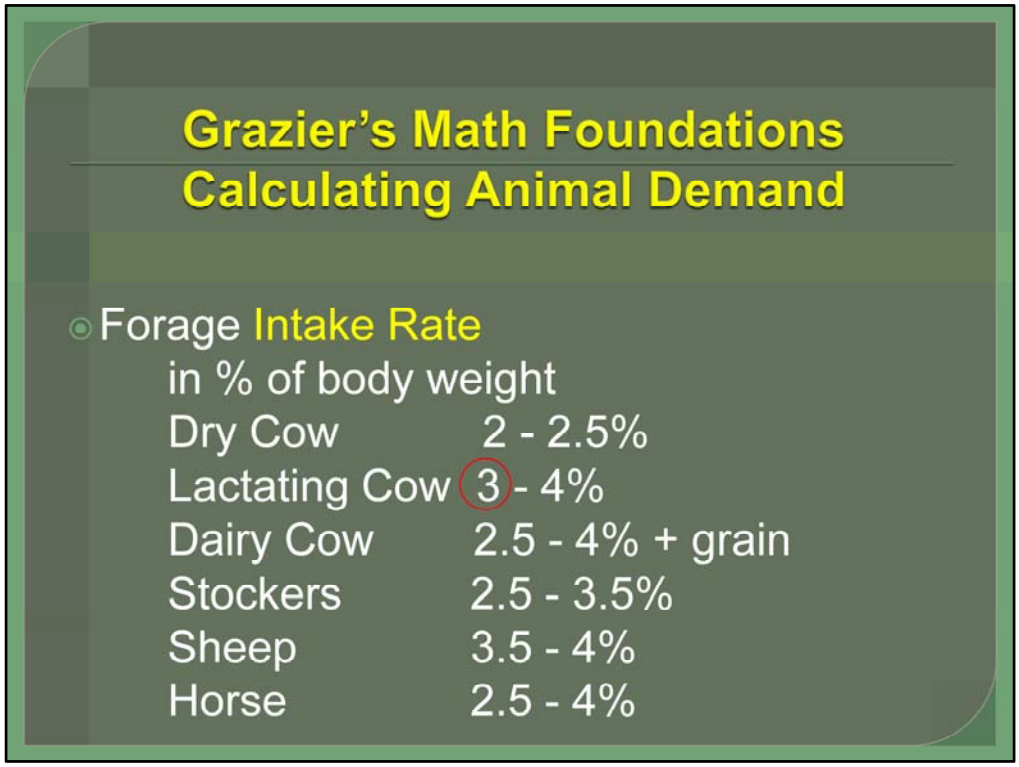

First we need to understand some terms used in grazing system discussions. Read Slide.


NRCS Planners Need to Know Some Basics to do a Grazing Plan
What are the core basic things we need to know?
1. How much does each head of livestock need to eat per day in pounds (DM)?
2. How much does each acre of pasture average in production?
3. How is that production distributed?
4. What is the Forage-Animal Balance of the specific farm/ranch (Carrying Capacity)?

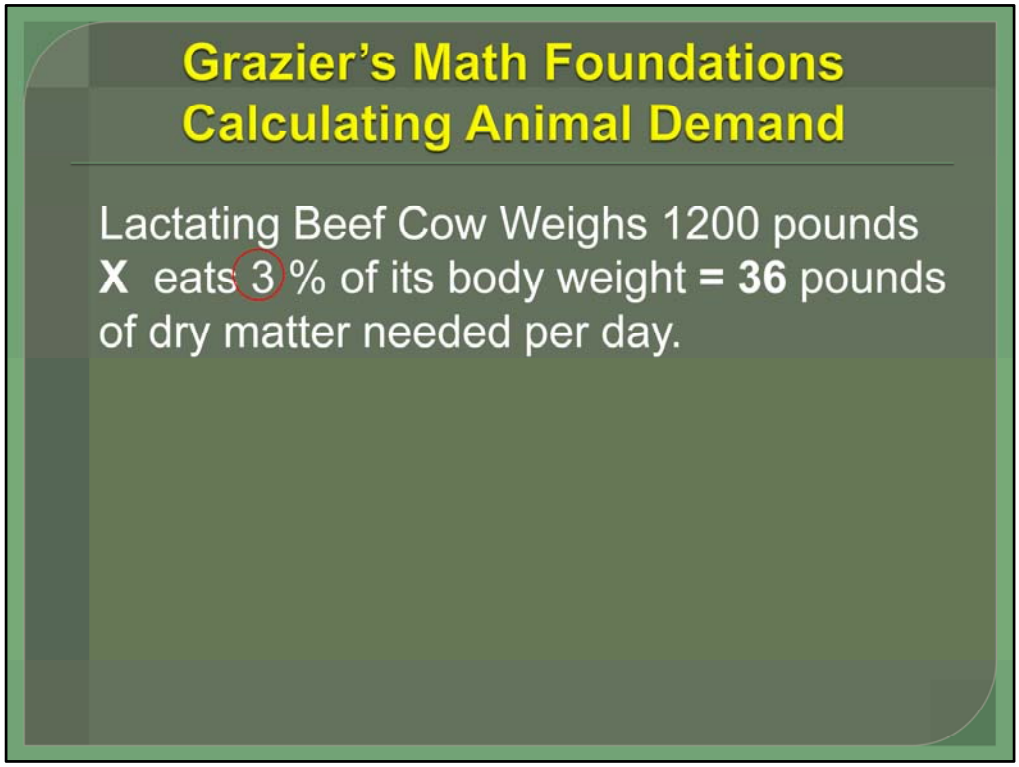
Read Slide.



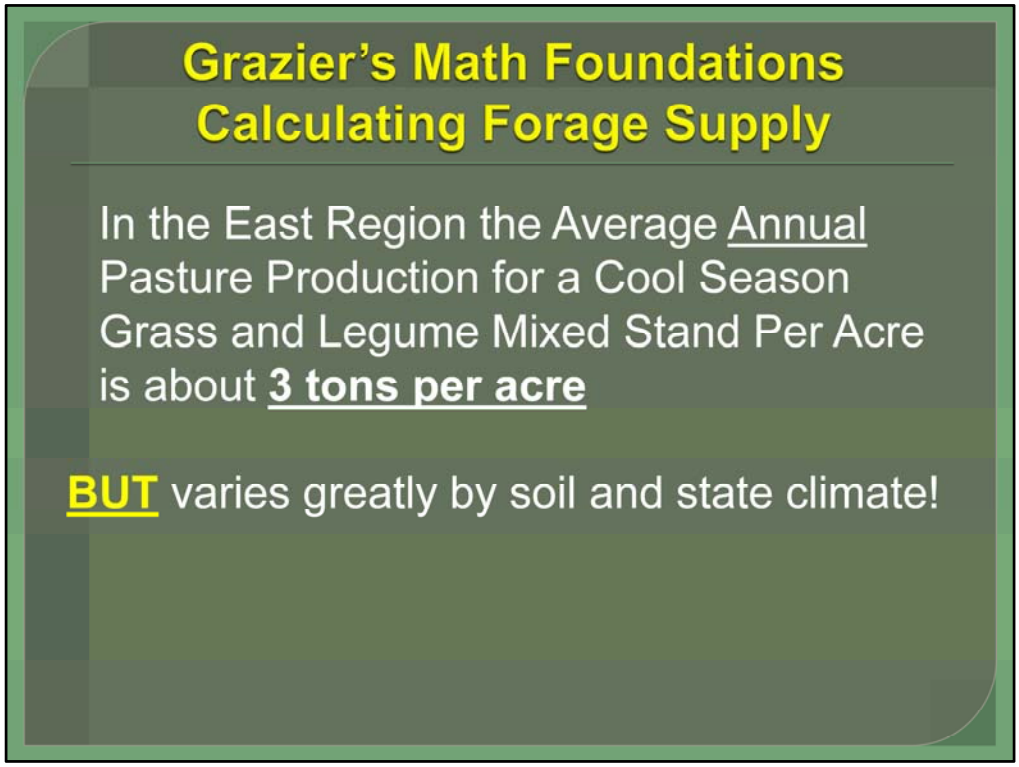

The National Agricultural Statistics Service (NASS) surveys agricultural producers nation-wide and gives us the reported numbers on all things agriculture and documents them in a census. The numbers I will be using come from the 2007 Ag. Census. Read Slide.



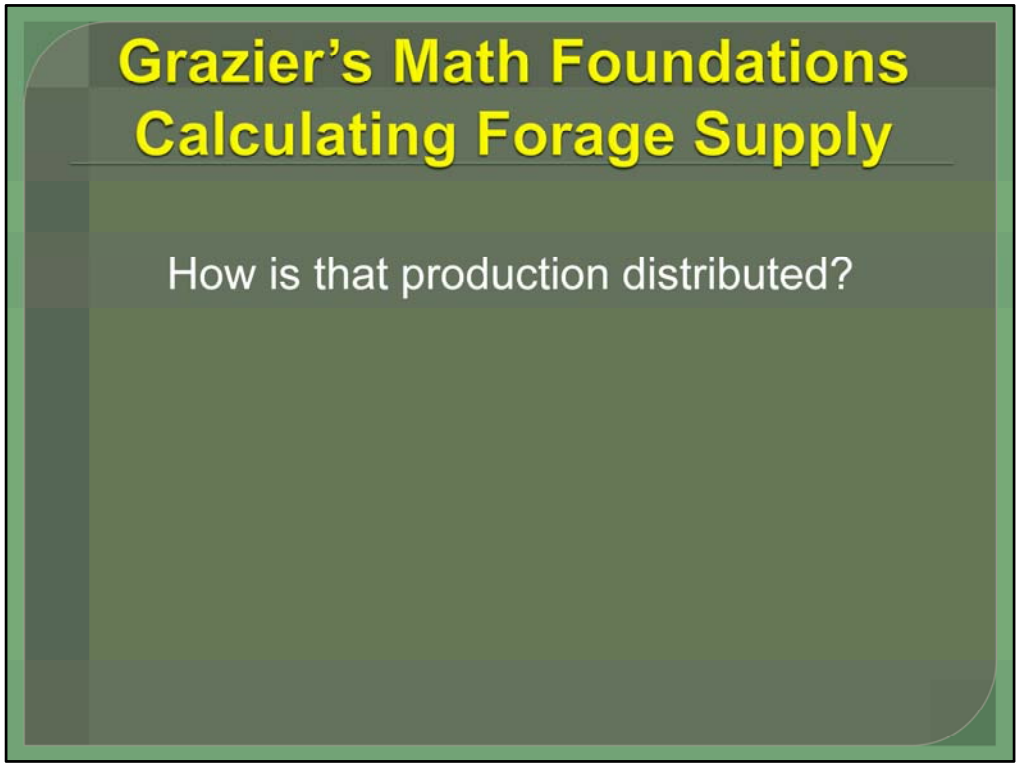

Here are some 'rules of thumb' that have been used by people in the grazing arena for years. For our lactating beef cows we will use 3%. Using this percentage is a little high if we are just considering a beef cow for the whole growing/grazing season but it helps take into account the nursing calf which will begin to eat more and more forage per day until it is weaned.



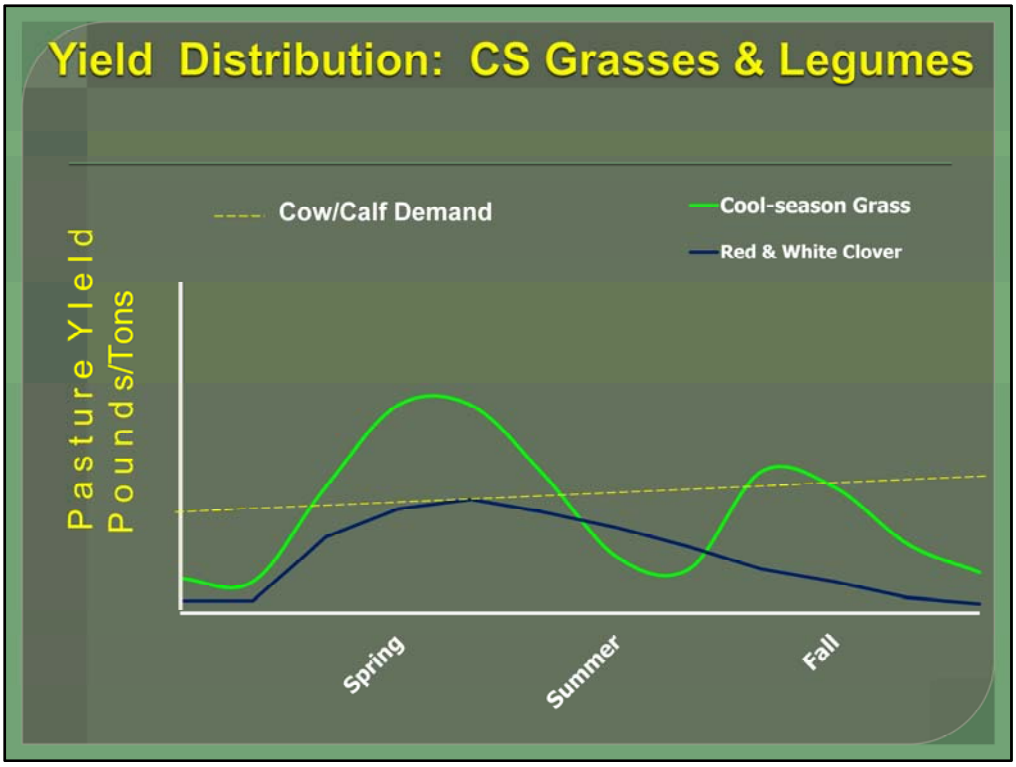

So if we know a – Read Slide.




And if we know the pasture supply – Read Slide. This is why we need FSGs! To use one production figure for pasture on all soils, all topographies, and all elevations is not very accurate.

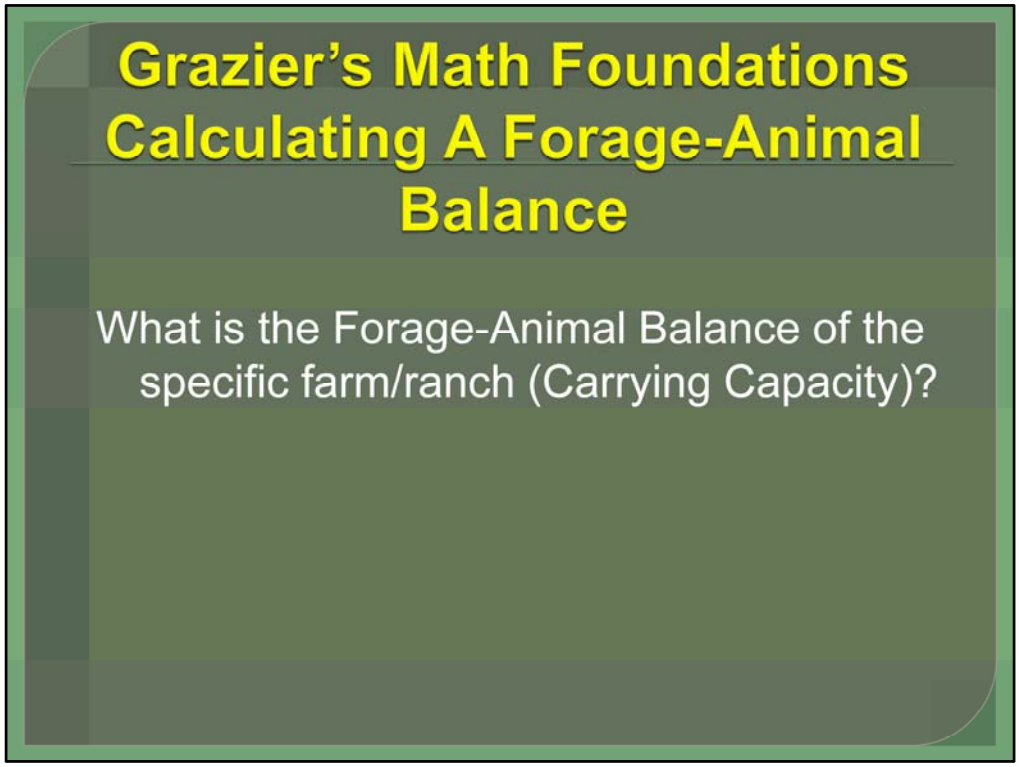

Grazier's Math Foundations
Calculating Forage Supply
How is that production distributed?

Read Slide.

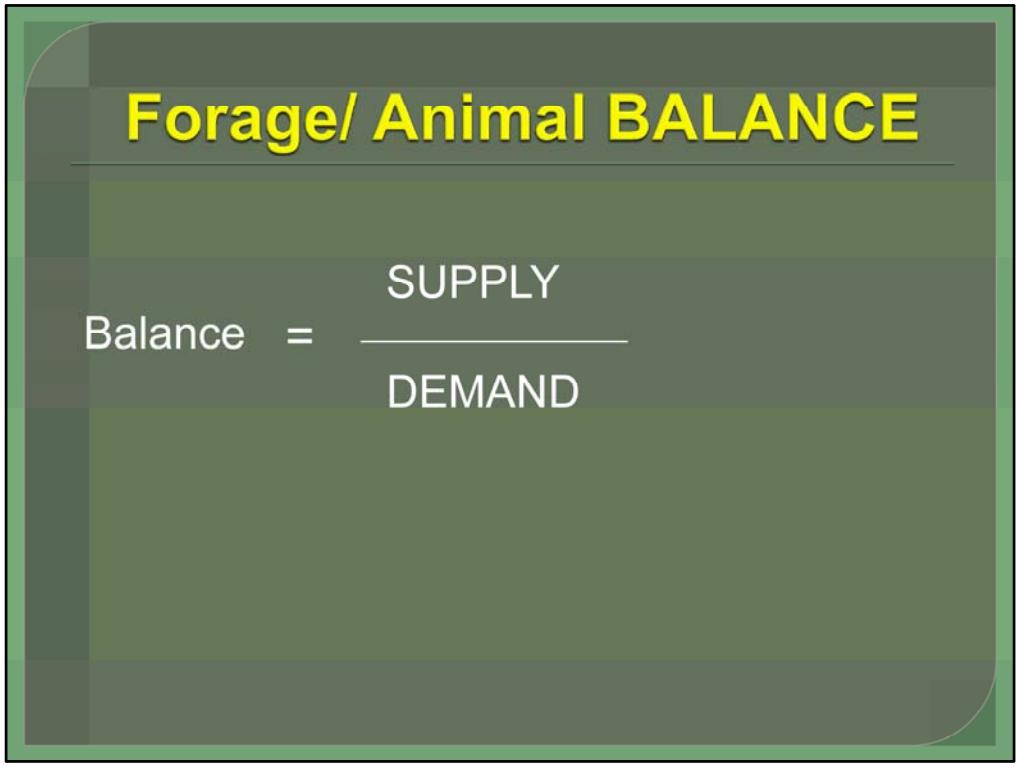



This is the typical cool season grass and legume yield distribution (sometimes called a growth curve). The yellow line is the normal animal demand line for cow/calf operations. Adding red and white clover increases diversity, adds N to the soil, and dilutes the effect of tall fescue endophyte toxicosis. To some extent, adding red and white clover also provides some forage in early and mid-summer. However, several other forages need to be added to provide forage in the summer, especially in July and August.

Slide and Narrative by Doug Peterson, MO NRCS Grazing Specialist.



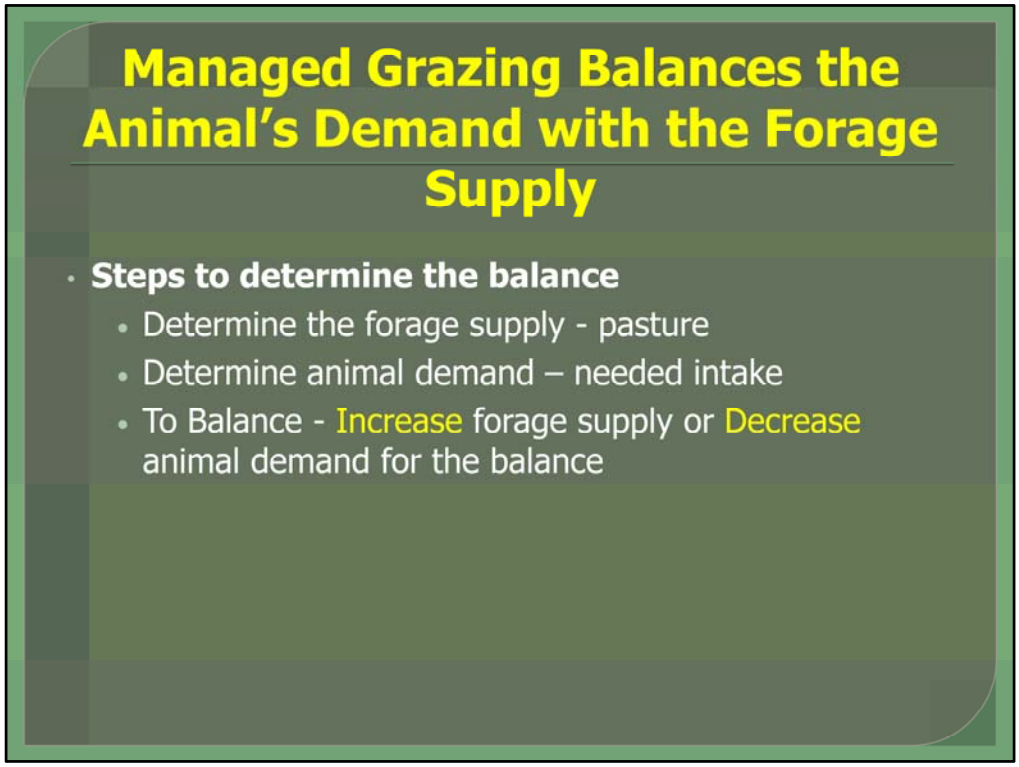

Read Slide. Here's how we find that out. . . . .



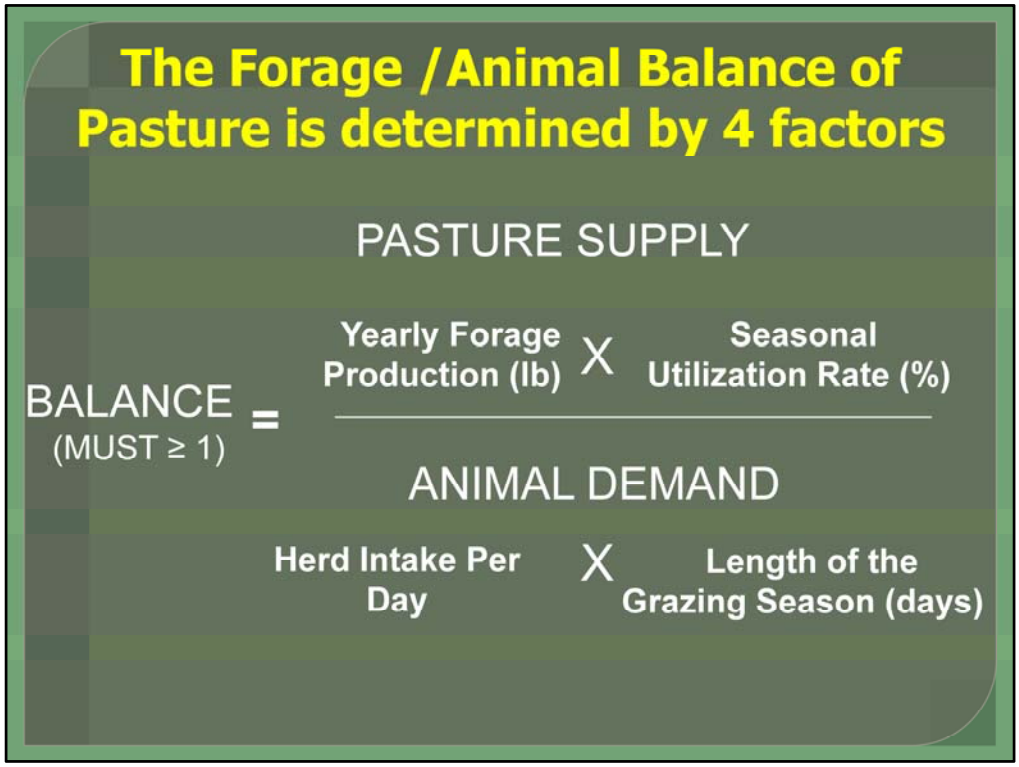

The basis of grazing management is to make sure that we have a forage-animal balance. This is the basis of our 528 standard also. Why is this important? When we have a supply and demand in balance they are equal. When these are equal the operation will usually be protecting and sustaining all the resources in the grazing system.


It really is a very simple concept. If the supply is equal to the demand the balance is 1. If the demand is more than the supply, the equation will be less than 1. So demand will be needing more supply. Why is that bad? (Next Slide)

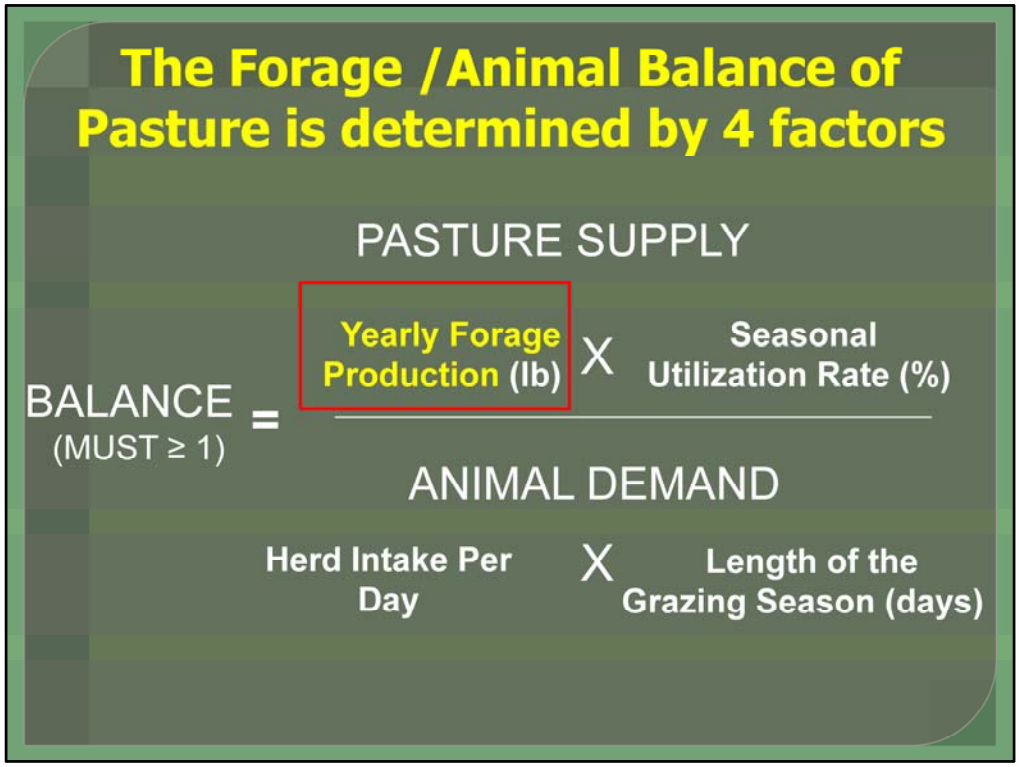

If the demand is an animal, like our Prescribed Grazing standard talks about, and there is not enough pasture supply, the animal goes hungry and its health will deteriorate and eventually starve in time without any other feed (supply) by this being out of balance. Or the animal will be fed hay to make the difference which is expensive, even if it was made on the farmer's own hay land.



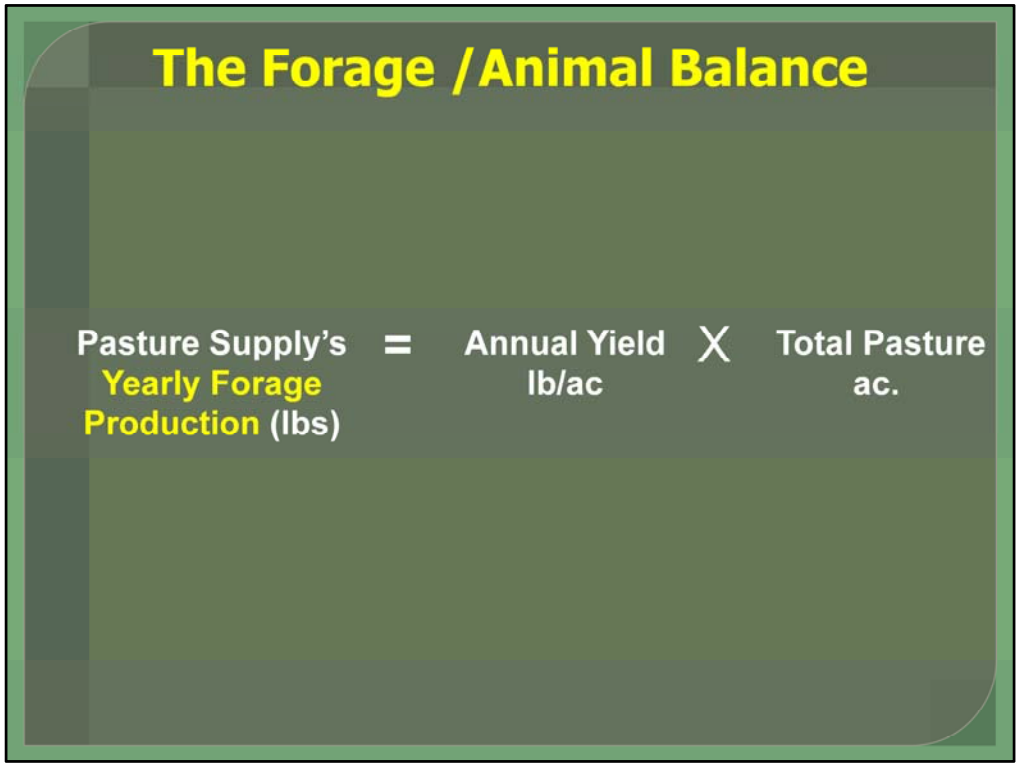

To calculate the balance we simply – read slide's first two bullets. When these are not in balance then we can do the third bullet. We may even do both of these things to get a balance. So how do we do calculate this Balance?




Read Slide. One advantage of having this equation for a farm/ranch is that we can leave out any one of the 4 factors and solve for it. For example, we can solve for the seasonal utilization rate that we need to put the equation in balance.

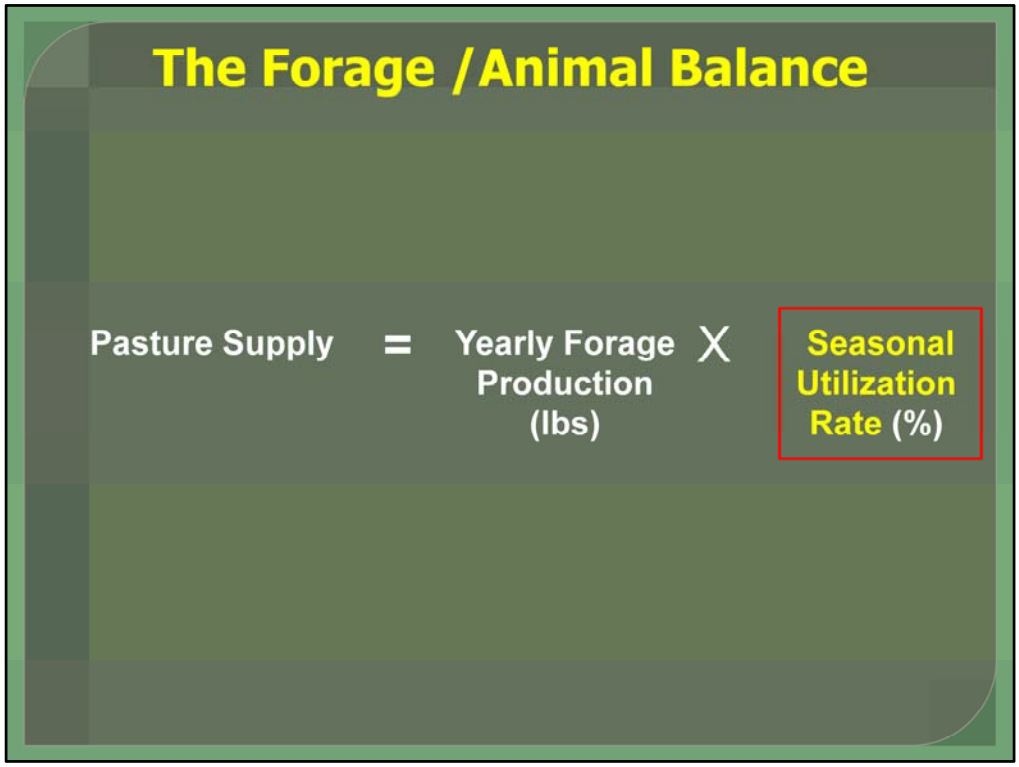



First, let's look at determining the Total Yearly Forage Production.



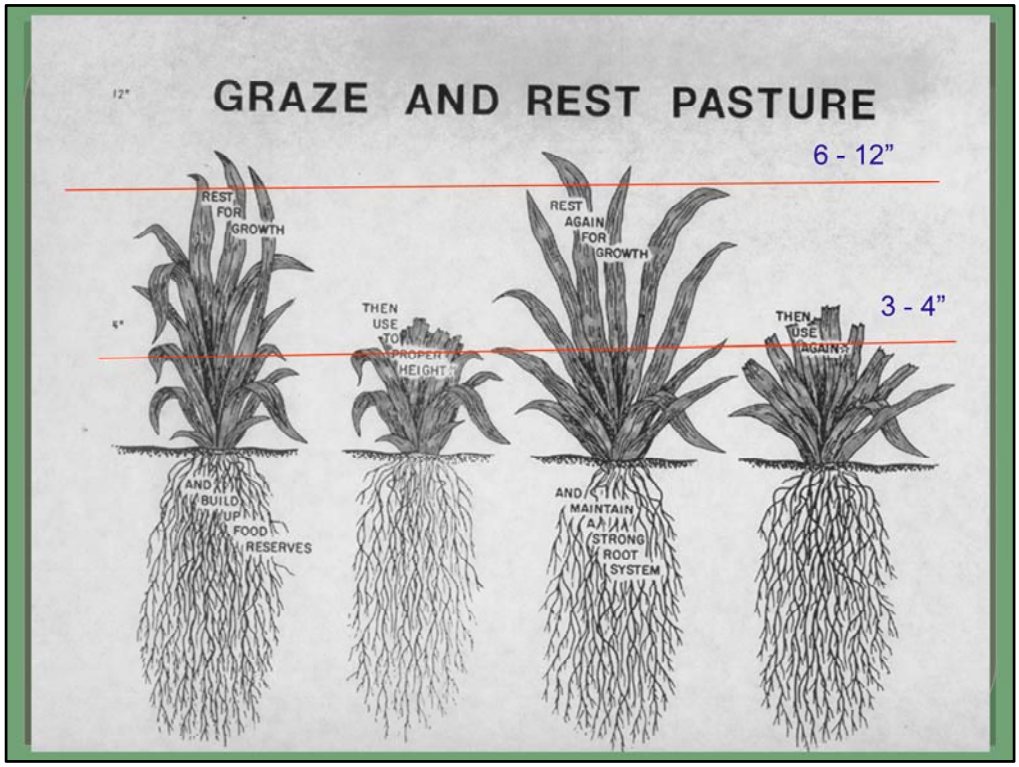

Read slide verbatim.

We determine our total yearly forage production in pounds by finding our our annual yield of forage per acre times the total pasture acres.

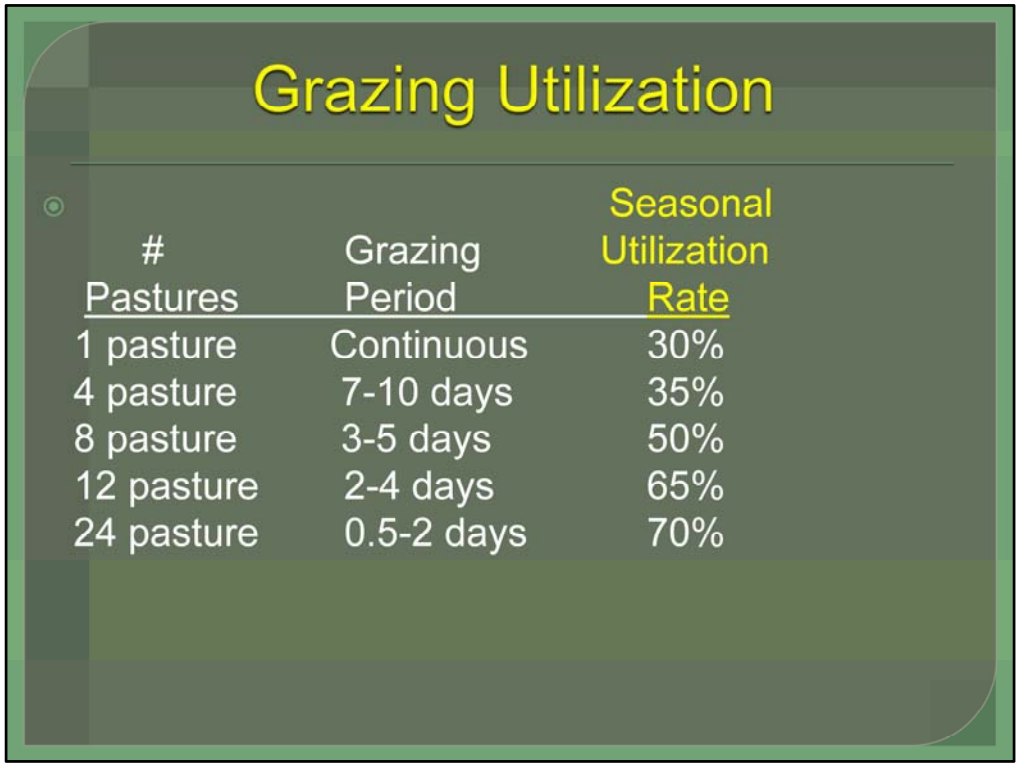



Then we take what we got from the Yearly Forage Production in pounds of dry matter and multiply it by the seasonal utilization rate, ONCE WE DETERMINE WHAT THAT IS!

We determine our total yearly forage production in pounds by finding our annual yield of forage per acre times the total pasture acres.



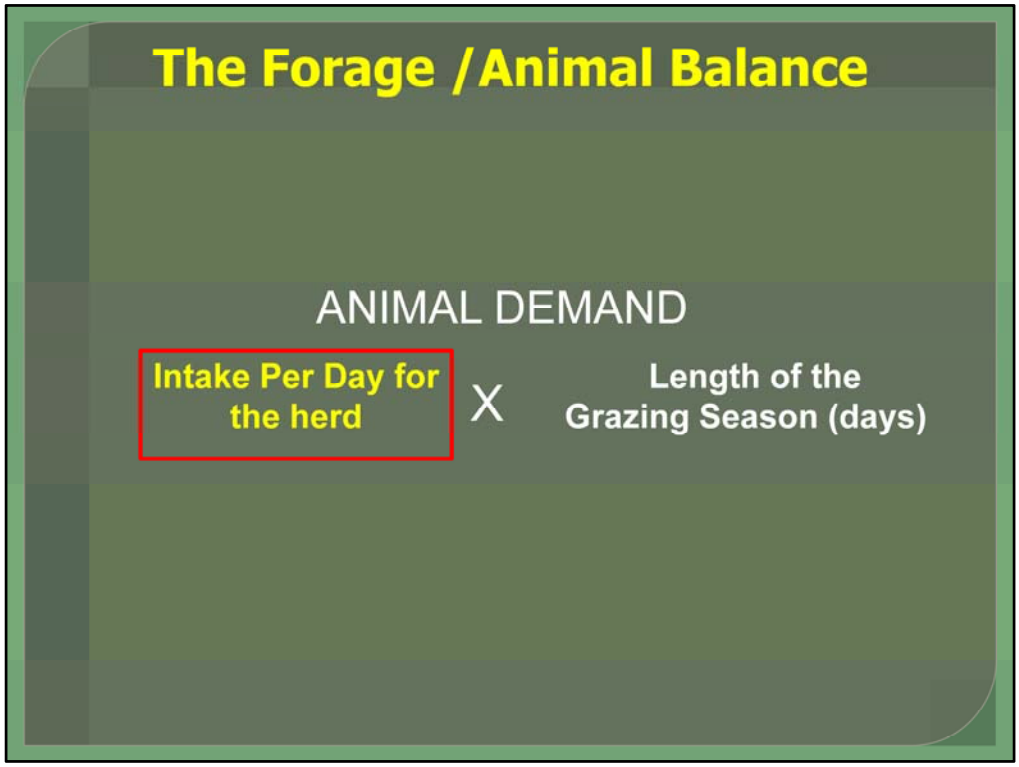

This is an example of the recommended begin grazing and end grazing heights on cool season grasses and legumes. The area between the 3 – 4 inch height and the 6 – 12 inch height is where the research on temporal utilization has been done by several land grant universities in the eastern U.S. with some of the most extensive research being done at University of Missouri by James Gerrish in the 80's and 90's. This area between the 3 to 4 inch height and the 6 to 12 inch height is what we manage the livestock to utilize at the percentage that is determined by the livestock manager's objectives.



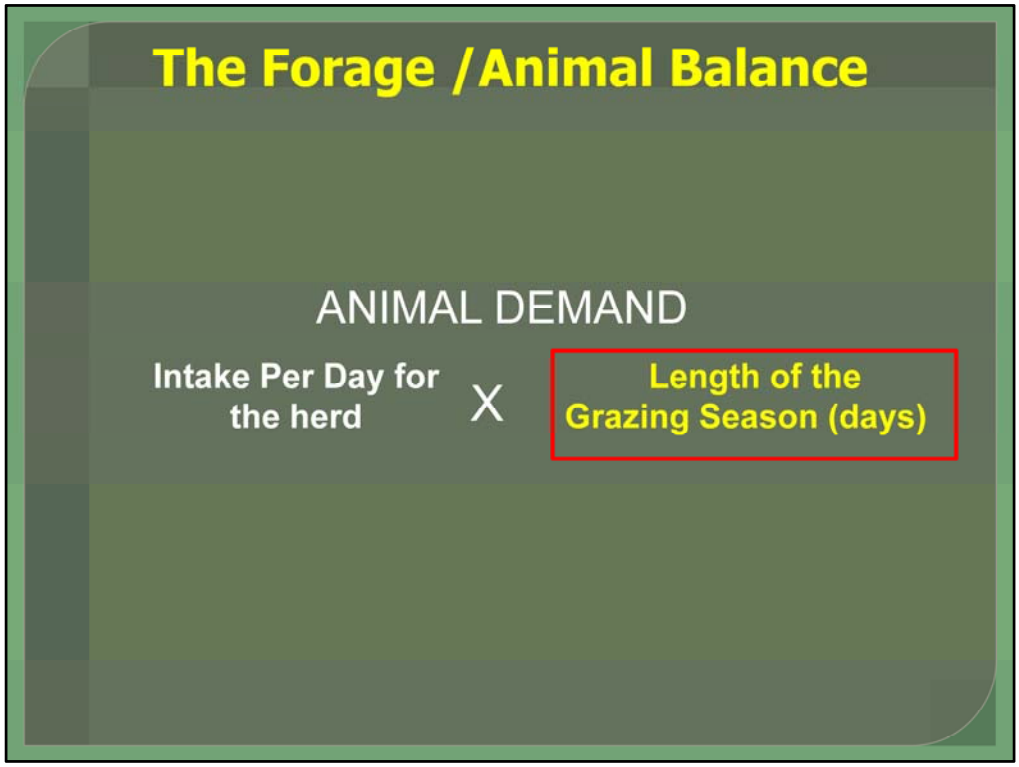

**We are not going to talk about paddock sizing now or how to determine the number of paddocks needed - But as the number of pastures (paddocks) increase, the size of those paddocks (pastures) get smaller. As they get smaller, the animal's utilization of the forage in the paddock increases. The animal behavior changes as the animals travel as a herd in a small area they are less selective in what they eat versus in continuous grazing the animals roam as individuals more and are more selective in what they eat. So as the number of days in the grazing period get smaller the days of rest of all the pasture plants in those paddocks (pastures) increases.**

So when we can give that plant rest by having several pastures or paddocks we can see some real positive results in the plants and soil. Here is some temporal and seasonal utilization rates that came from University of Missouri's research led by James Gerrish.

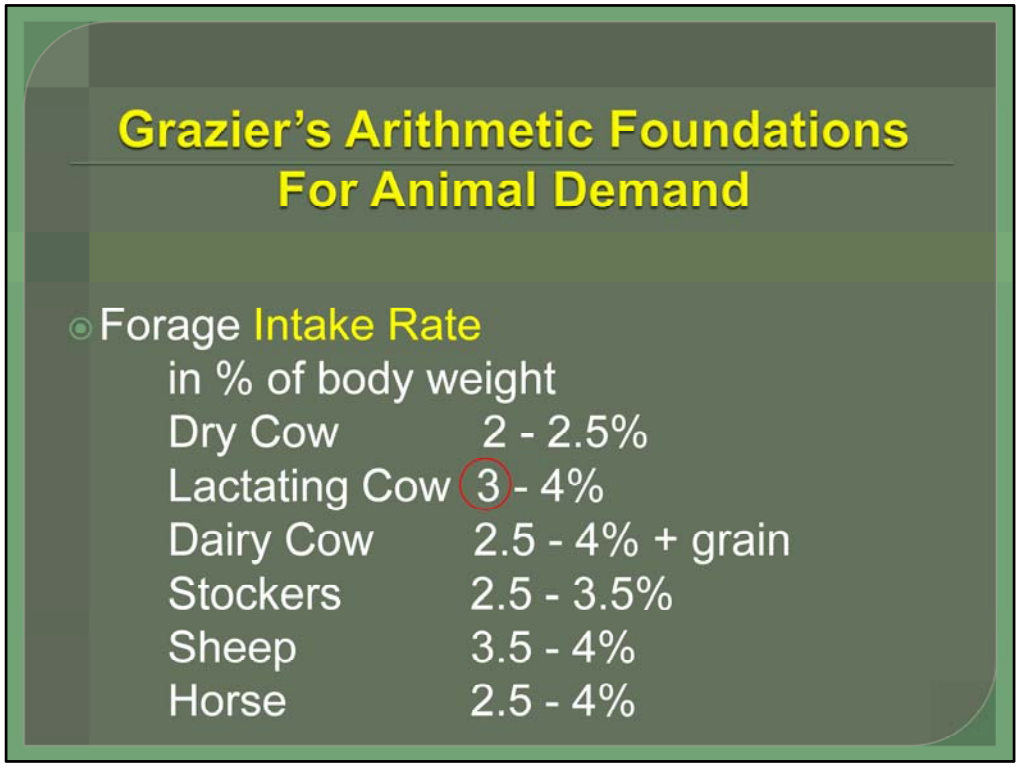

Remember this slide from earlier. We use these same tools to Help give us the utilization that we are planning for. We use the fence and water to give us the stock density that we need to accomplish the utilization we want, and of course, the livestock are the harvesters of the pasture plants. When we manage nutrients to optimum then the plants will take up and recycle most of the nutrients that the livestock harvested.



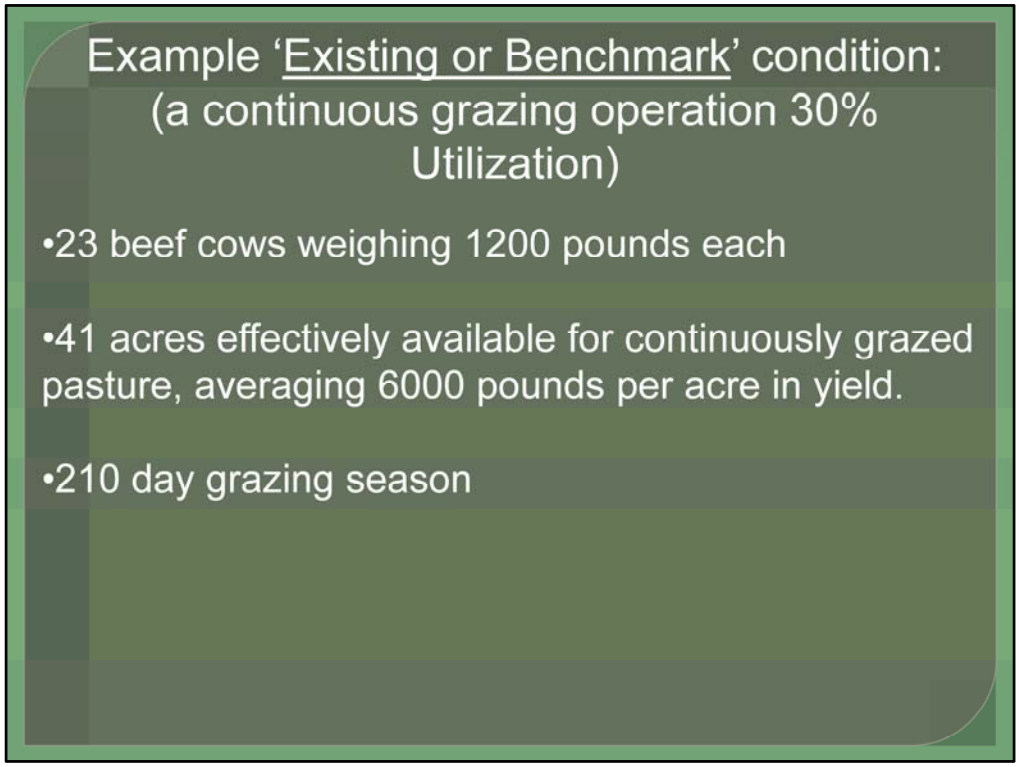

Our animal demand is calculated by taking the percent intake of average total body weight for the herd per day TIMES



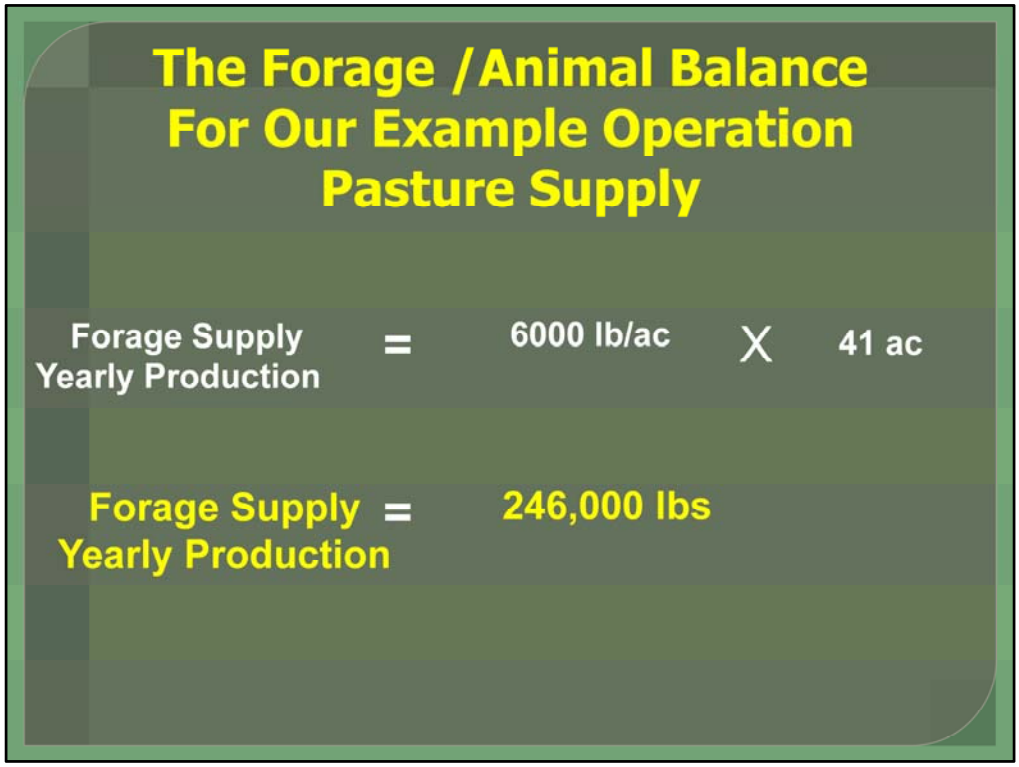

TIMES the total length of the Grazing season in days.



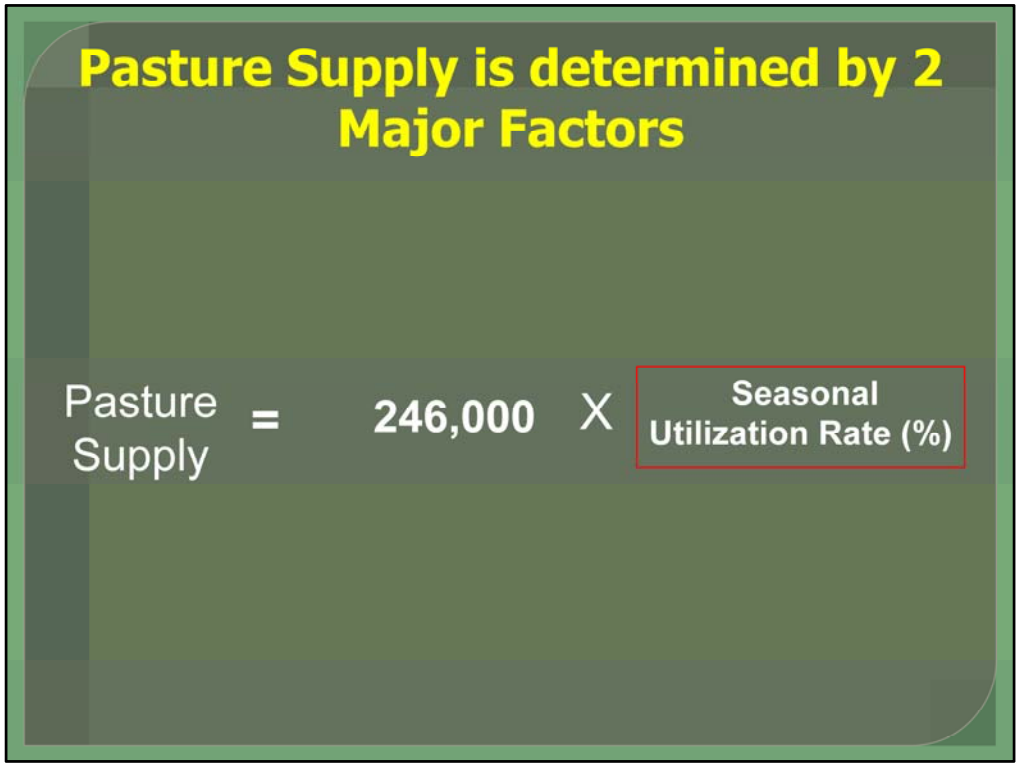

Remember For our lactating beef cows we will use 3%.



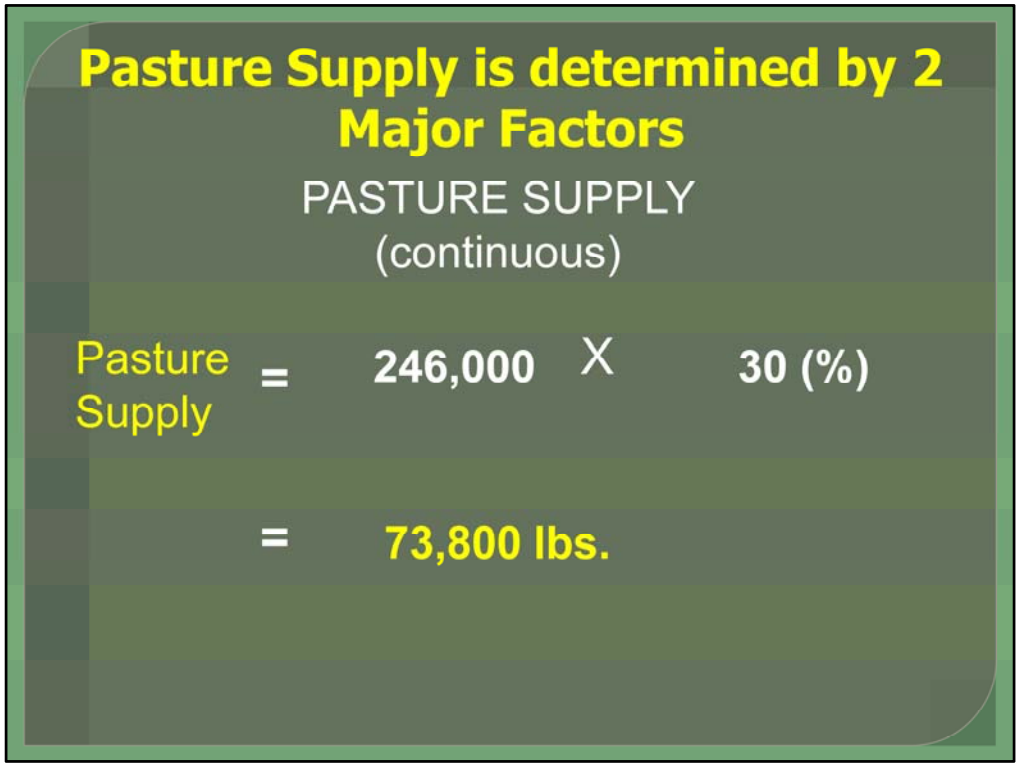

In our example today we will say we are using this inventory data from this farm/ranch (average for the east region of the U.S.). Read slide.




For our Example, Our total yearly forage production in pounds is obtained by the yield of 3.0 ton (6000 lbs. per acre of dry matter). In our example there was effectively 41 acres of pasture. What is our yearly forage production? **246,000 pounds.**

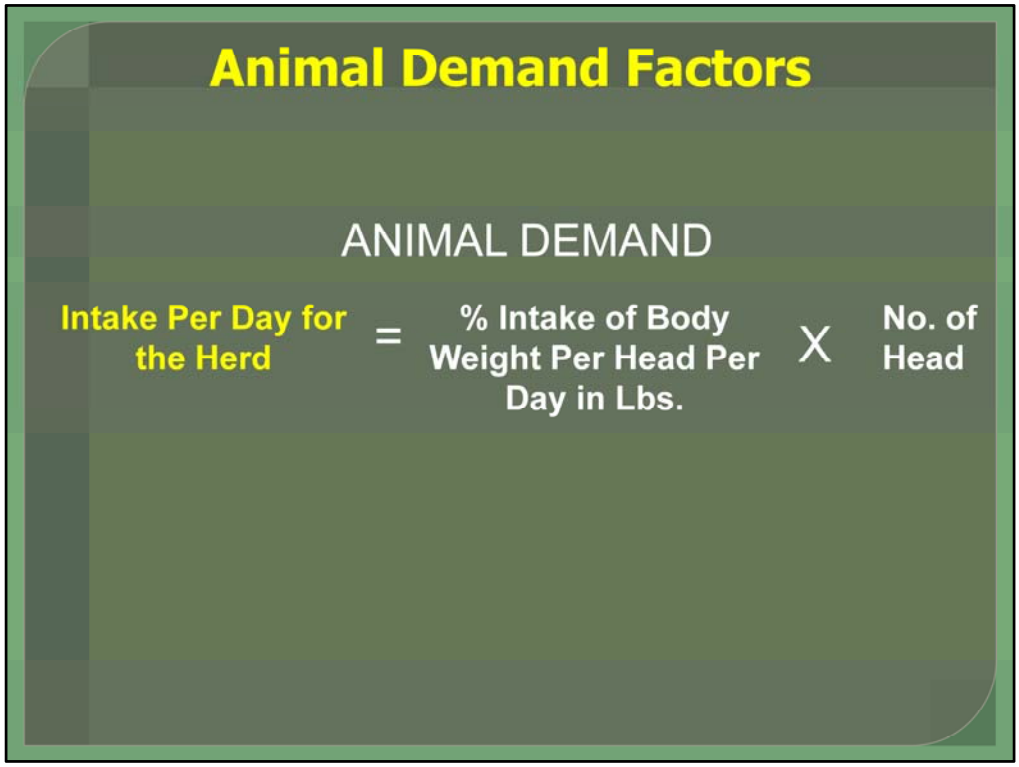



Remember the seasonal utilization rate is 30%.



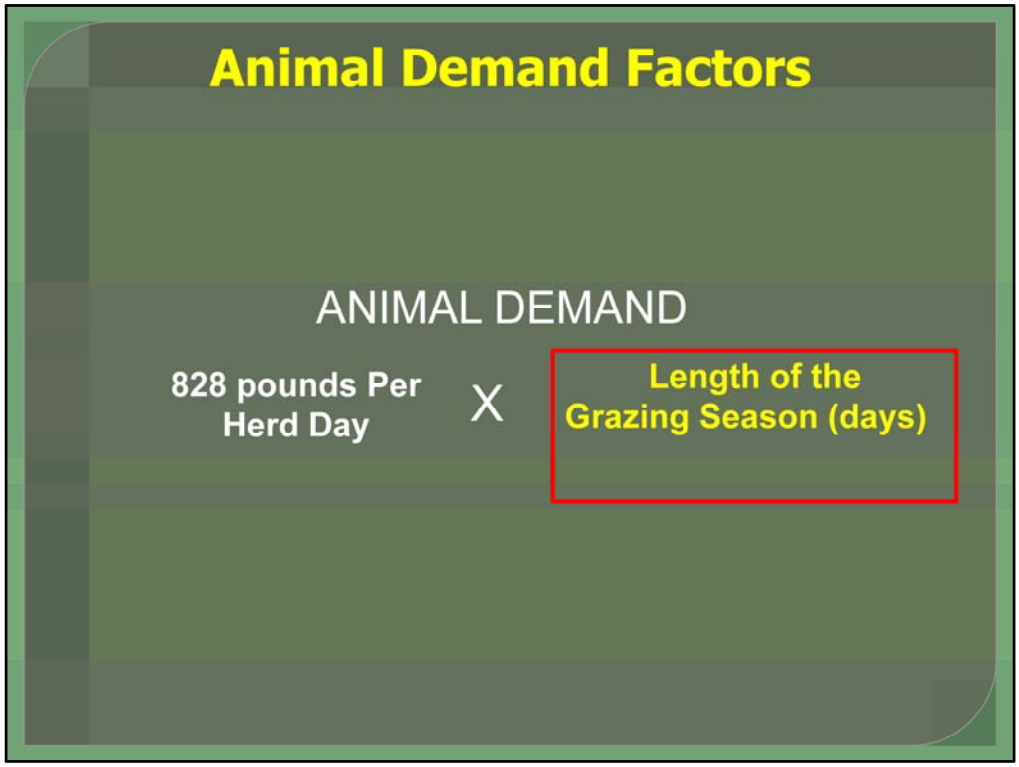

Now we have the top part of our equation done, the pasture supply!

Poor Pasture Condition and poor grazing management is what we see, like this farm, when we have an overstocked continuous grazing operation.



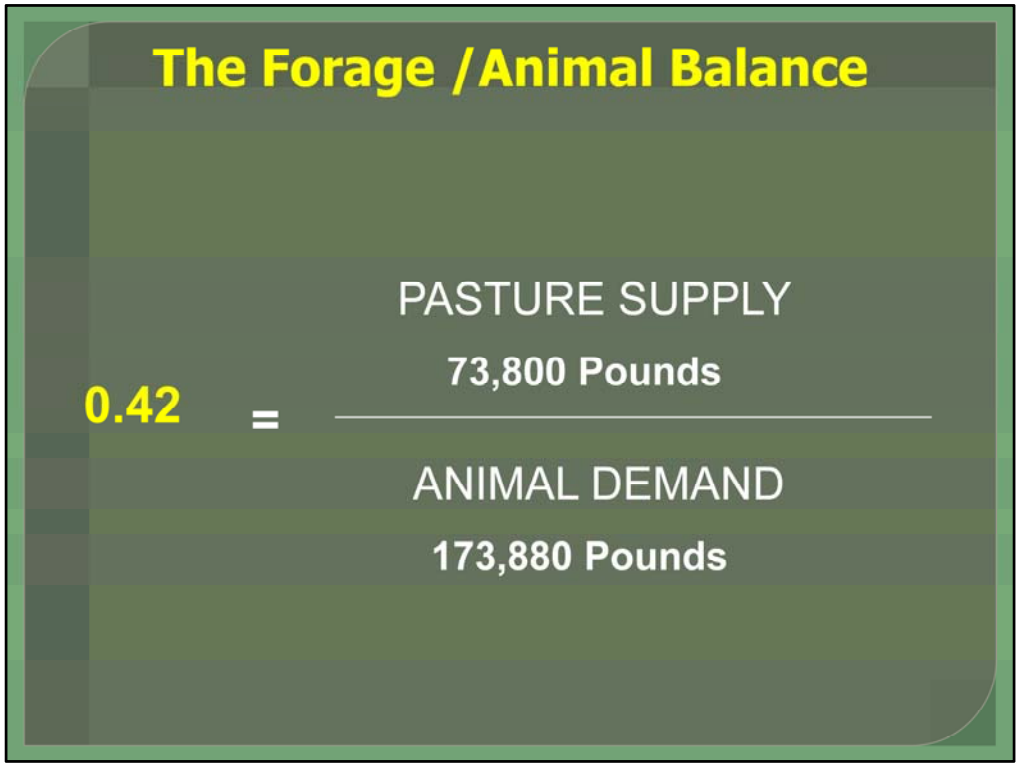

Now we need to figure out the total pounds that our herd/flock needs to eat per day, which = (read slide).


Now we need to figure out the total pounds that our herd/flock needs to eat per day. Let's say we have 23 head of beef cows with calves with the cows weighing 1200 pounds each. We will use 3% intake of each cows body weight per day. What's the demand per day? 828 pounds of dry matter!

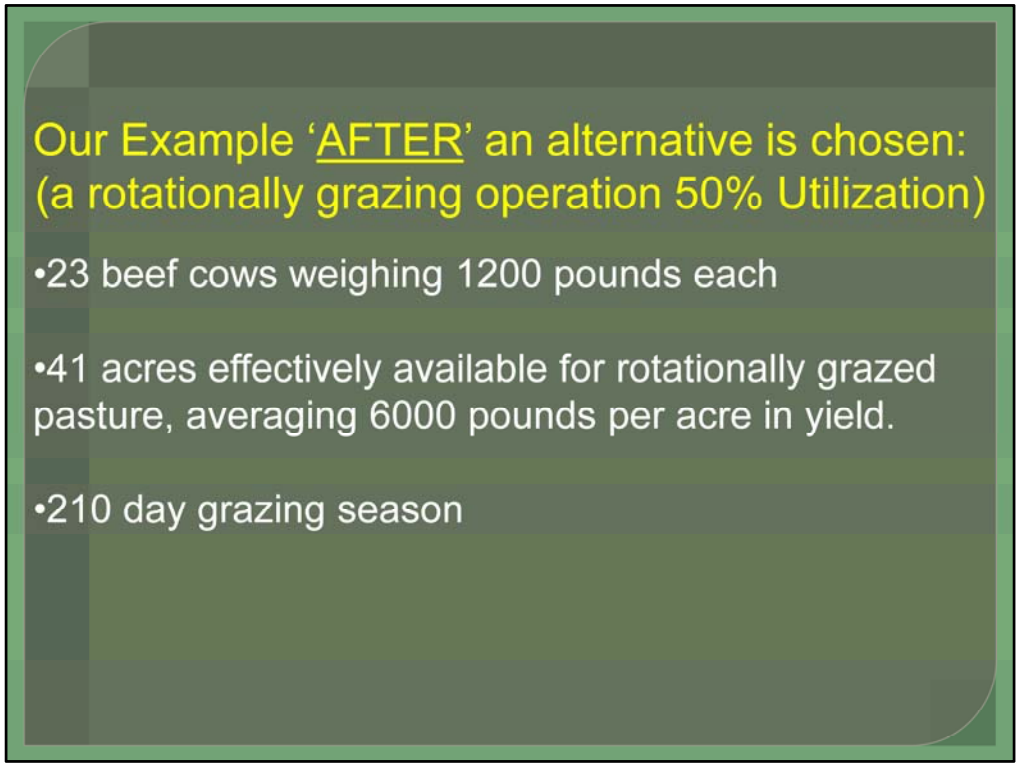



So our herd needs 828 Pounds per day TIMES the total length of the Grazing season in days.

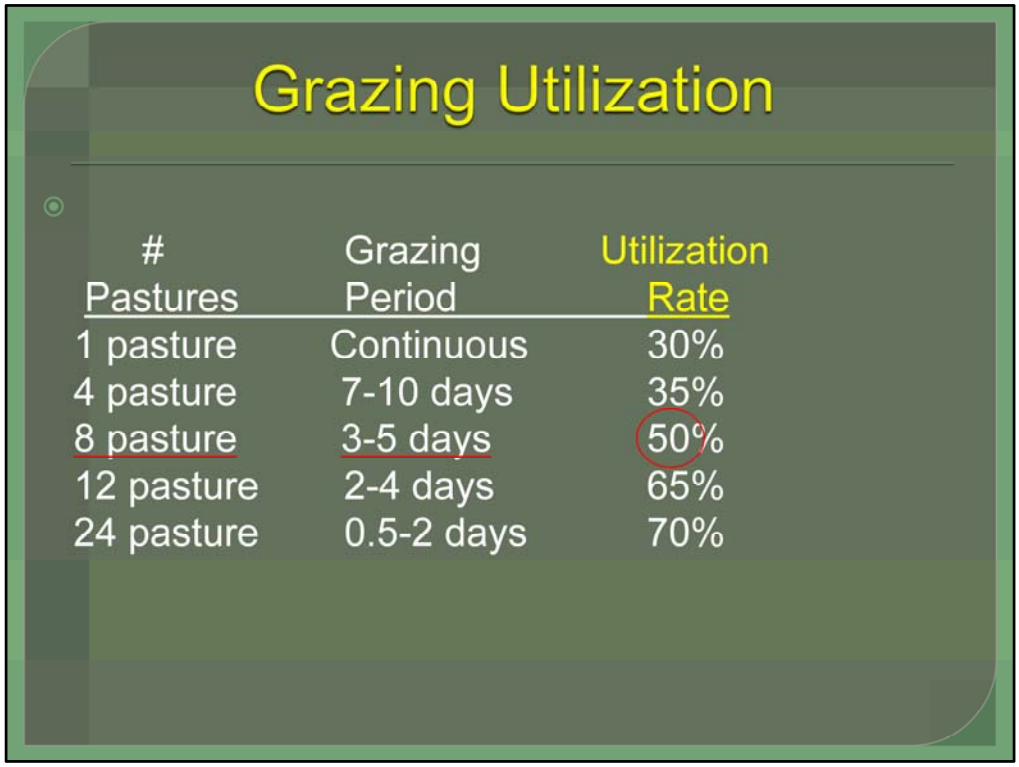

Which we said was 210 days. So now our bottom part of the equation is done – Animal Demand. We are ready to calculate our balance now.




What is the balance? **0.42! That's less than one!** So we are way out of balance! Resources are probably being damaged. What do we do now? So remember to get back in balance we must either increase pasture supply or decrease animal demand, or both. On the forage supply side we can increase it. We can gain acres by renting pasture, or converting cropland, hay land, or brush land to pasture. We can increase yield through management such as better manure distribution. Can we increase utilization rate? Yes! How do we do these things? Let's look at what our example farm could do to get back in balance.
We could also decrease animal demand by getting rid of cows. This is a hard one for most mangers of beef cow/calf operations. Can we have a smaller cow? – Kit Pharo story. That's why we need to look at the economics of these situations. Viewing our Webinar on "The Economics of Poor Grazing Management is worth viewing.




So our land manager/livestock manager does not want to increase the pasture supply or sell livestock. But asks "What if I rotationally graze my livestock. So we would still have - Read slide. But let's see what changes by increasing the utilization only by doing rotationally grazing - some management!

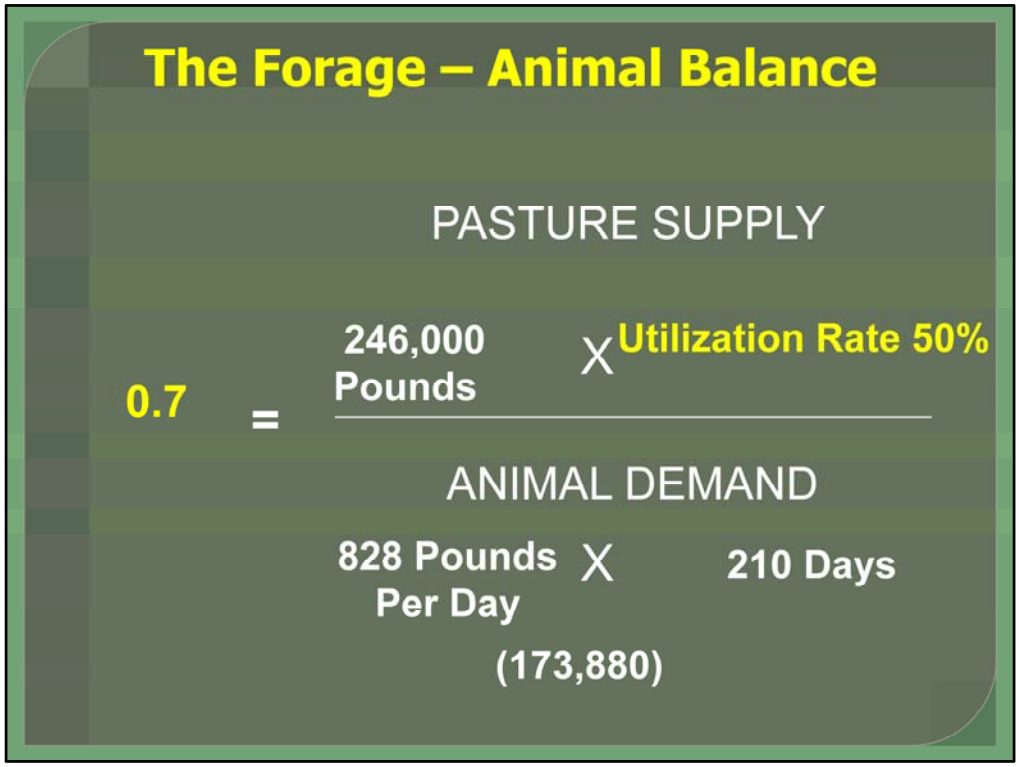



**The land manager decided they would rotate their animals to a new paddock every 3 to 5 days. Remember as the number of pastures increases the size of the paddocks (pastures) get smaller. As they get smaller, the animal's utilization of the forage in those paddocks (pastures) increases. And as the number of days in the grazing period get smaller the days of rest of all the paddocks (pastures) increases.**

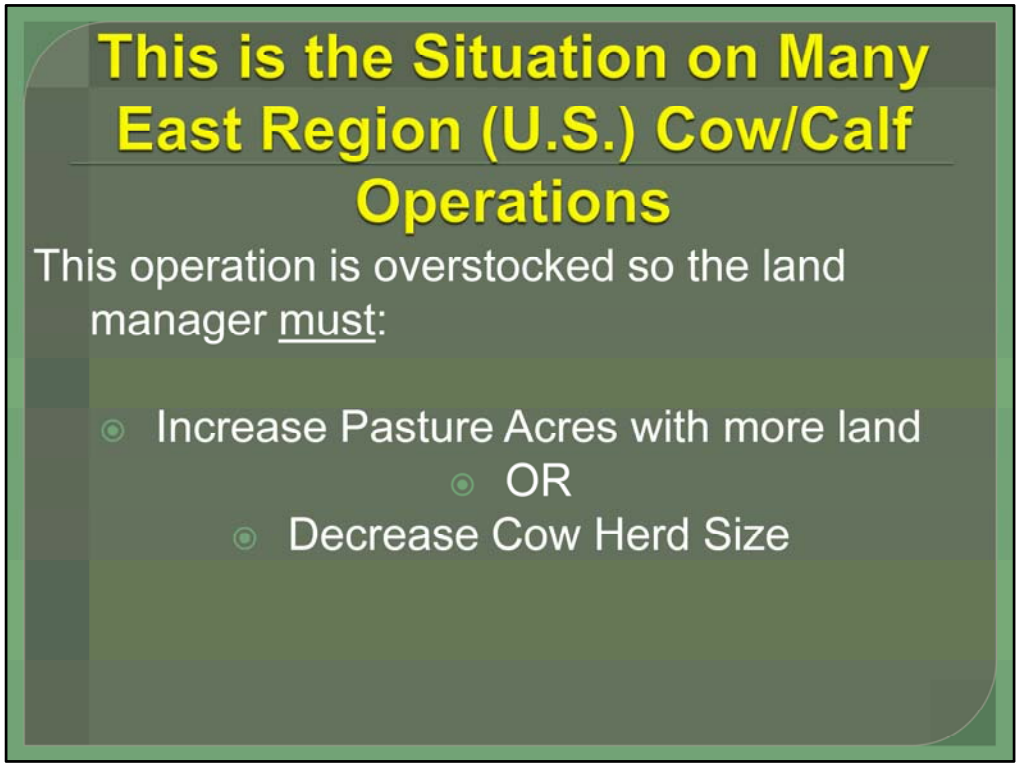
So when we can give that plant rest by having several pastures or paddocks we can see some real positive results in the plants. I have some other data that shows that in a continuous grazing system plants were bitten a second time by cattle every 7 to 9 days on average. And another set of data shows that the plants rested 28 days or more before being grazed a second time had the highest yield compared to only 7, 14 and 21 day rest periods for the grazing season. That's why I like to suggest that a livestock grazing operation have at least 5 paddocks (pastures) with a 7 day grazing period to give the plants at least 28 days of rest. Less than 28 days of rest on cool season forages cut yields by as high as 40 to 60%!

Jim Gerrish at University of Missouri had some trials that backed up these numbers.

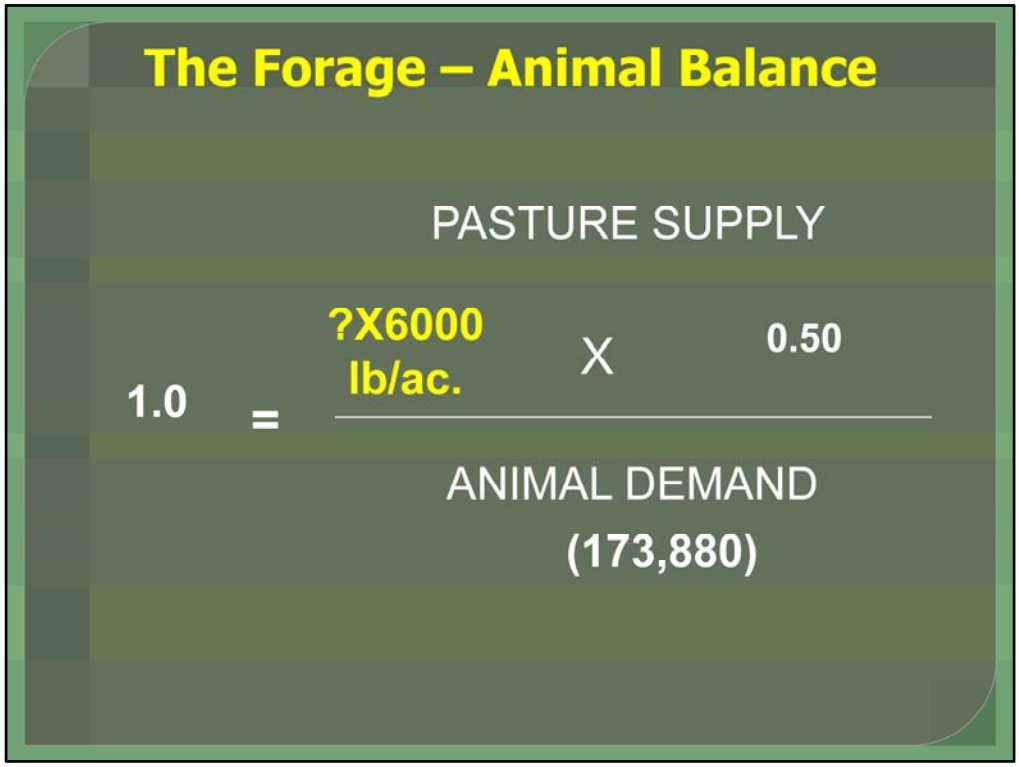
The pasture in the foreground is being utilized at about 50% Utilization.



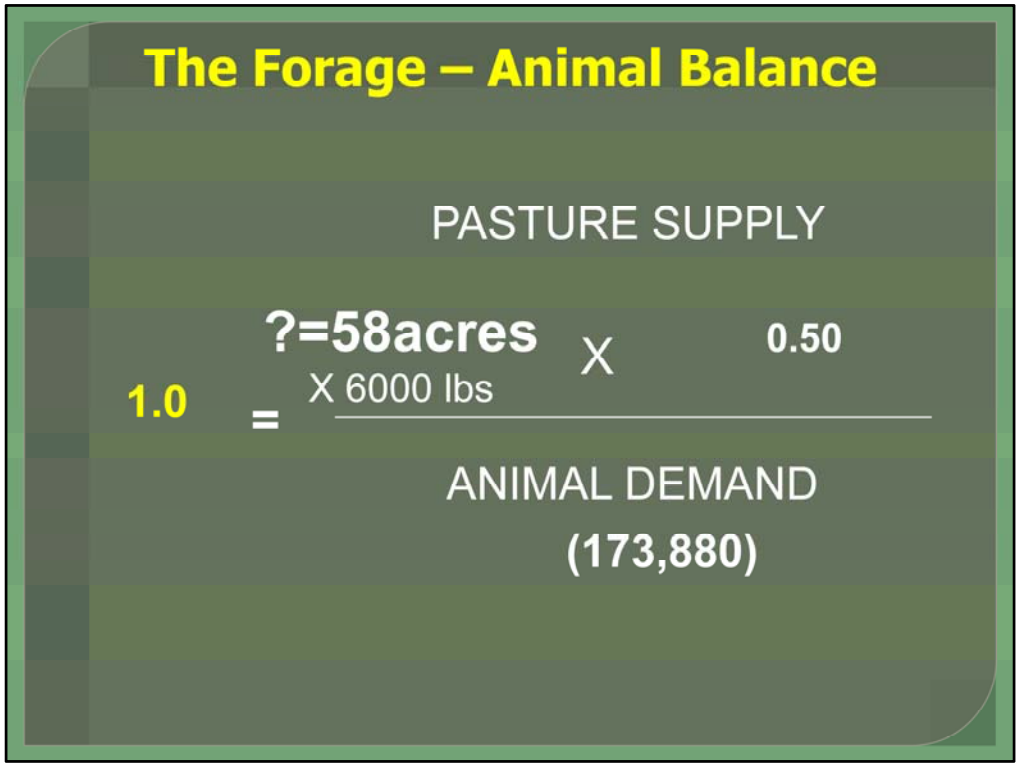

So by increasing the utilization rate to 50% by changing our grazing method – management - can this operation be in balance? NO! But it definitely helped get us closer to a balance.



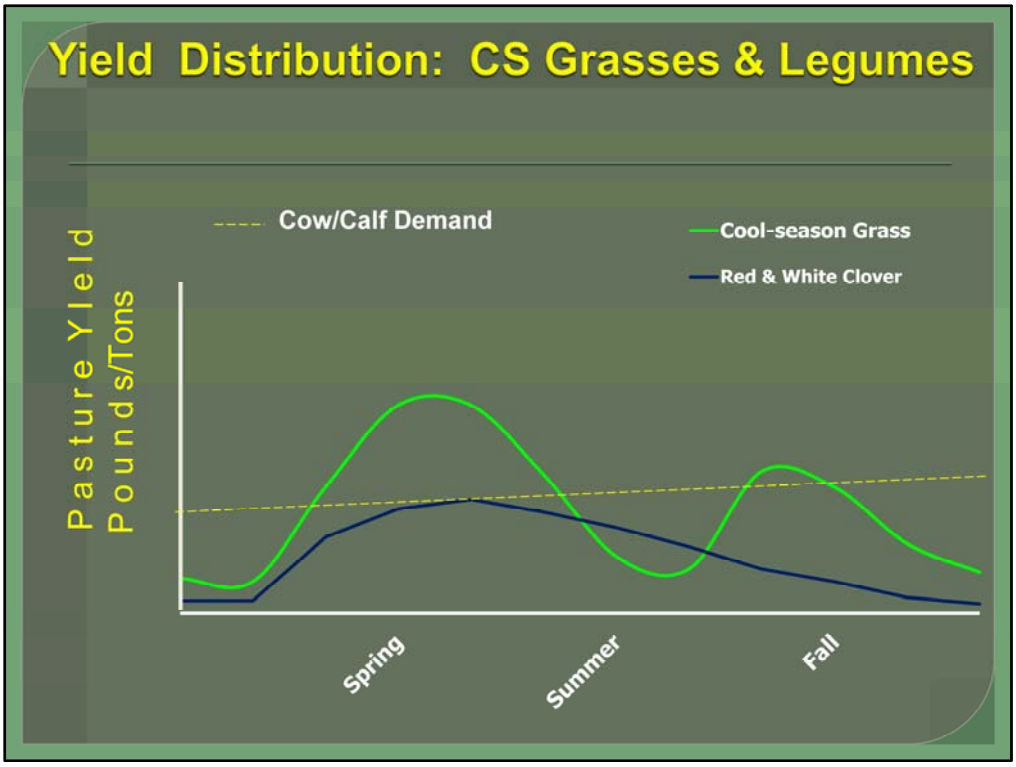

Read Slide. In the East Region, the average beef cow/calf operation's stocking rate is 1.78 acres per cow. So if we take 23 cows on 41 acres we simply divide the 41 acres and you get the 1.78. Anytime I see a stocking rate of less than 2 acres per cow in the East Region, I begin to look for signs of overgrazing – damage to resources and therefore resulting in resource concerns.




If we want to know how many acres we need, we can solve for the "?" By doing a simple algebra equation. I realize that most states have a spreadsheet or one of the NRCS software programs that figures this for you, but I just want you to understand how to think and know what is going on behind these electronic programs!




So if we had 58 acres of pasture instead of 41 acres of pasture we now have a Forage-Animal Balance, right? Probably not.

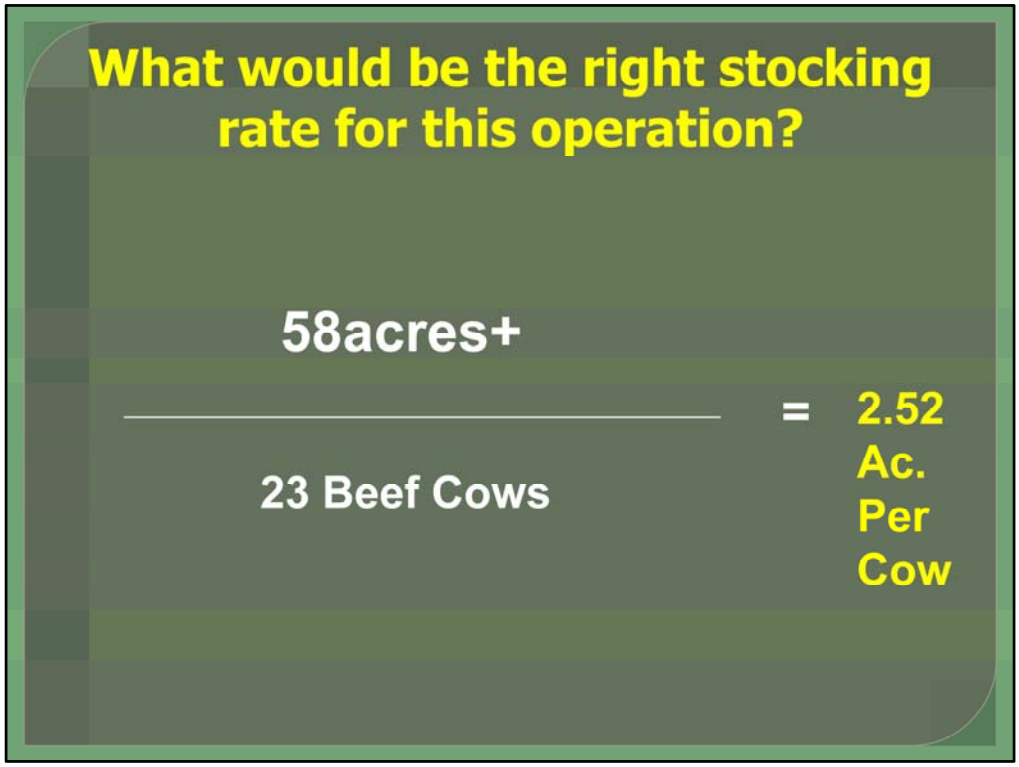



So even though we can have enough pasture for the year, it does not all grow at the right times. By adding red and white clover increases diversity, adds N to the soil, and dilutes the effect of tall fescue endophyte toxicosis. To some extent, adding red and white clover also provides some forage in early and mid-summer. However, several other forages need to be added or pasture acres increased to provide forage in the summer, especially in July and August.

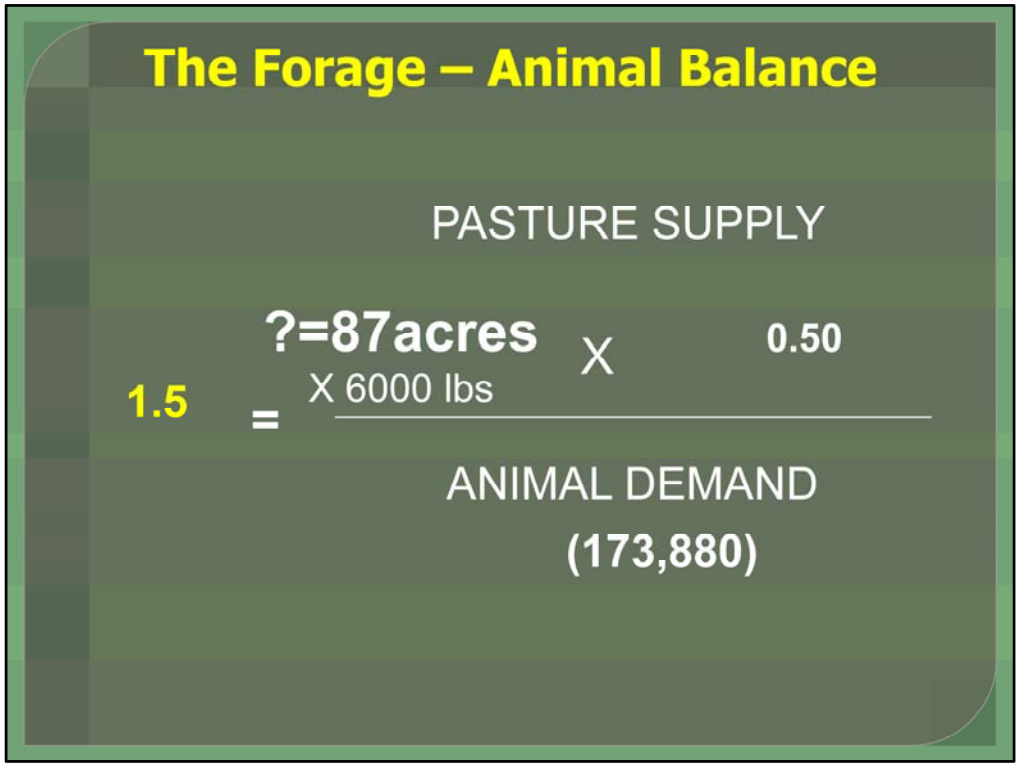
Slide and Narrative by Doug Peterson, MO NRCS Grazing Specialist.

Here we see that we get our 6000 pounds at variable times of the growing season. If we got it evenly over the 210 day growing season, which is 7 months, then we should get about 860 pounds of Dry Matter growth each month (about 0.4 tons/A). But as we can see here, we do not.

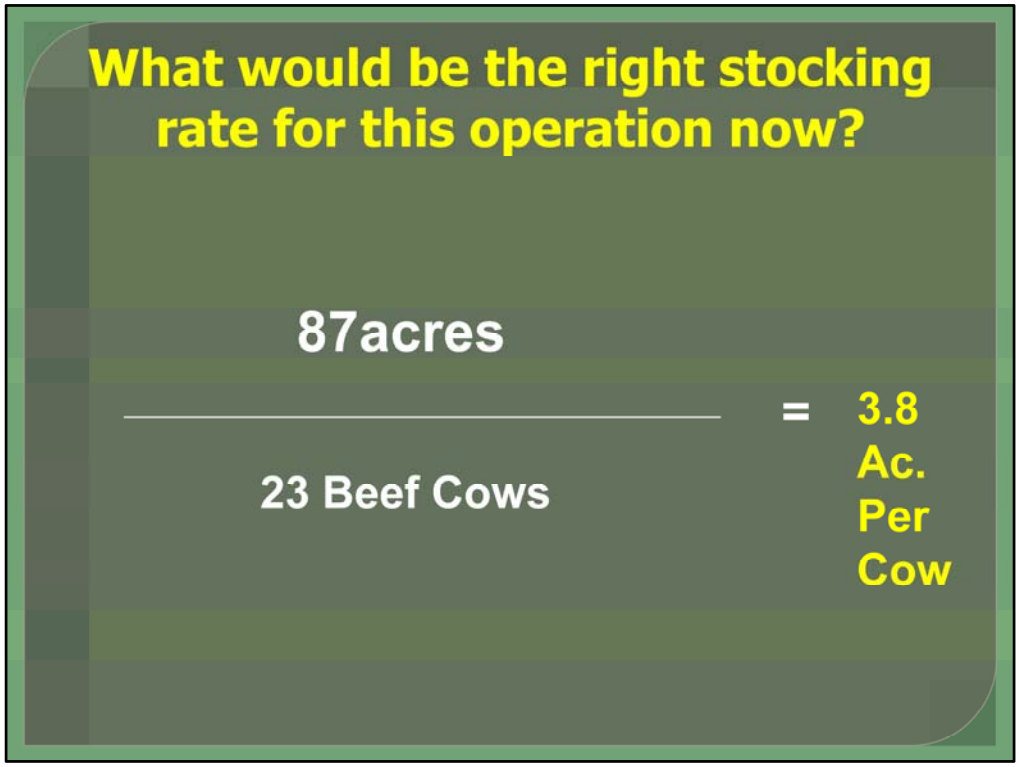
Slide and Narrative by Doug Peterson, MO NRCS Grazing Specialist.




So let's play this out some more so we can learn some things we can use in our planning. The stocking rate would now be – (read slide).

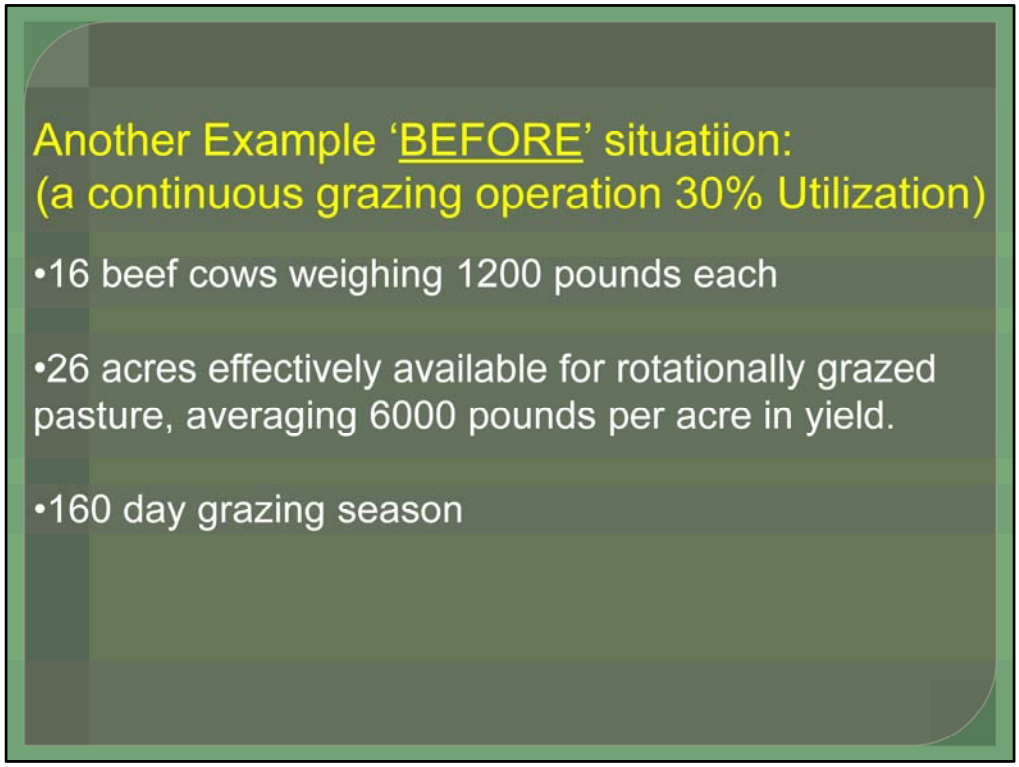



So if we use what some grazing specialists do and use 1.5 for our F/A Balance then our acres would be 87 acres of pasture instead of 58 acres of pasture we now have more than a Forage-Animal Balance, right?

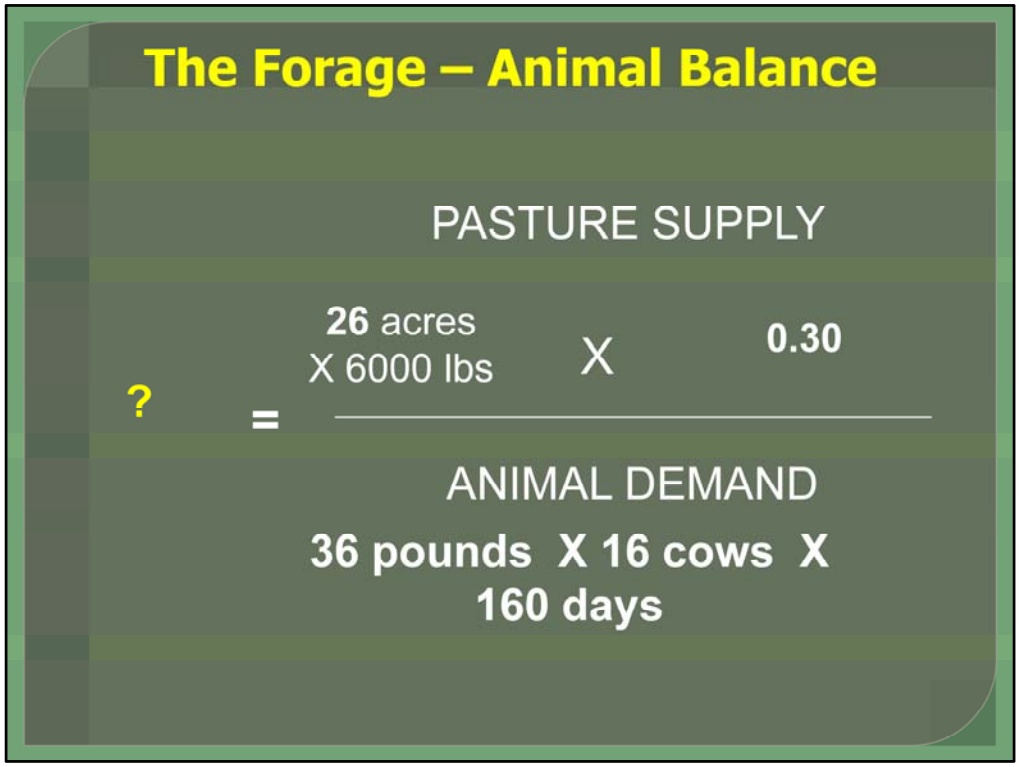



Now let's look at the stocking rate!  Almost 4 acres per cow!

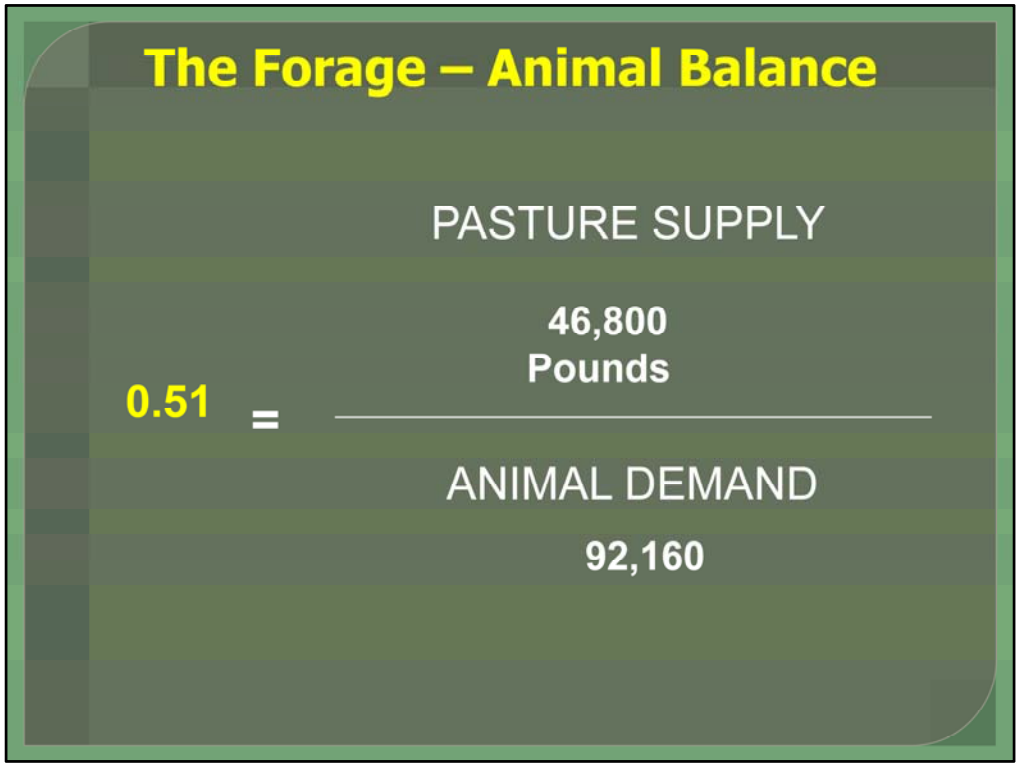

When you view the grazing portion of this video, you will notice most of these very successful livestock producers or 'graziers' will have a stocking rate of 2.5 to 4 acres per cow.



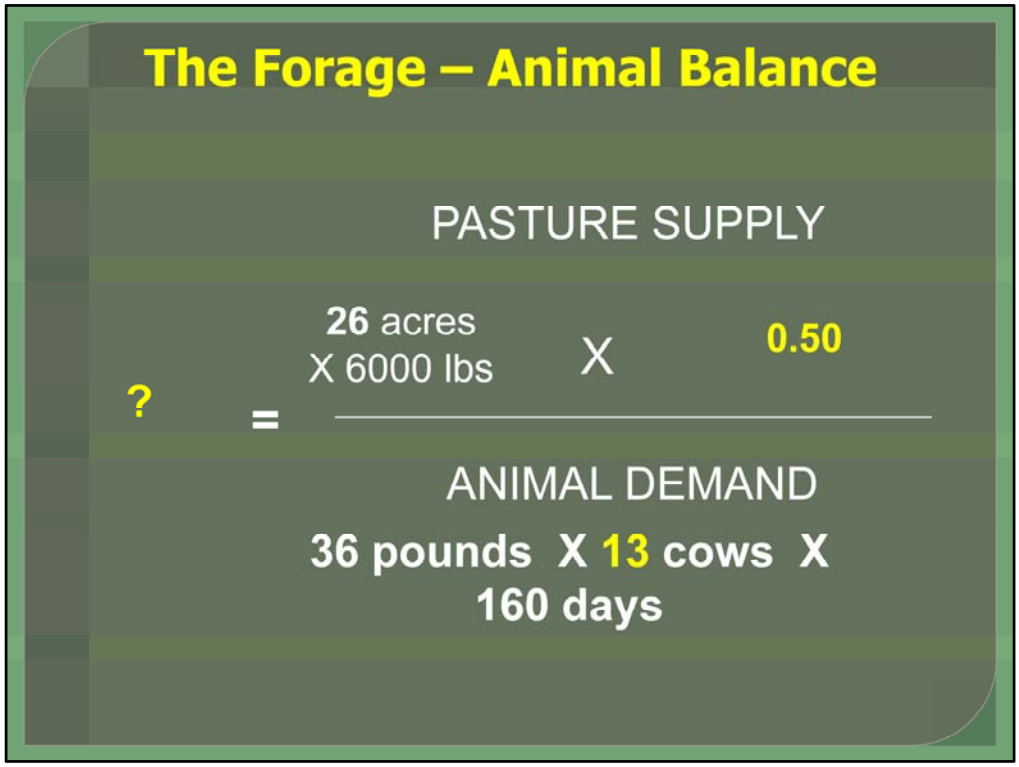

Here is another grazing operation (Averages by NASS for the Northeast part of our region). Read Slide. So here is what our ENTSC specialists that work with grazing will do when we go onto a farm/ranch while e are doing inventory. I start to do the animal balance in my head. I also try to carry a calculator with me but sometimes I forget that!! So I am telling myself – "OK, this farm has 16 cows, at about 36 pounds a day of dry matter needed, this herd would need about 600 pounds a day (be liberal on animal demand). The growing season here is about 160 days so 160 times 600 is . . . .about a 100,000 pounds for the entire grazing season. Now once I know that there are 26 acres of pasture and they tell me that they get about 3 ton of hay from there hay fields (which have similar soils as their pasture field) I multiply 6000 times 26 . . . . . Which is about 150,000 (be conservation with pasture supply). They told me earlier that they are doing continuous grazing right now but might be interested in doing some rotational grazing in the future. So I use 30% utilization for continuous grazing. So 30% of 156,000 is . . . . .about 45,000. So I am way out of balance."



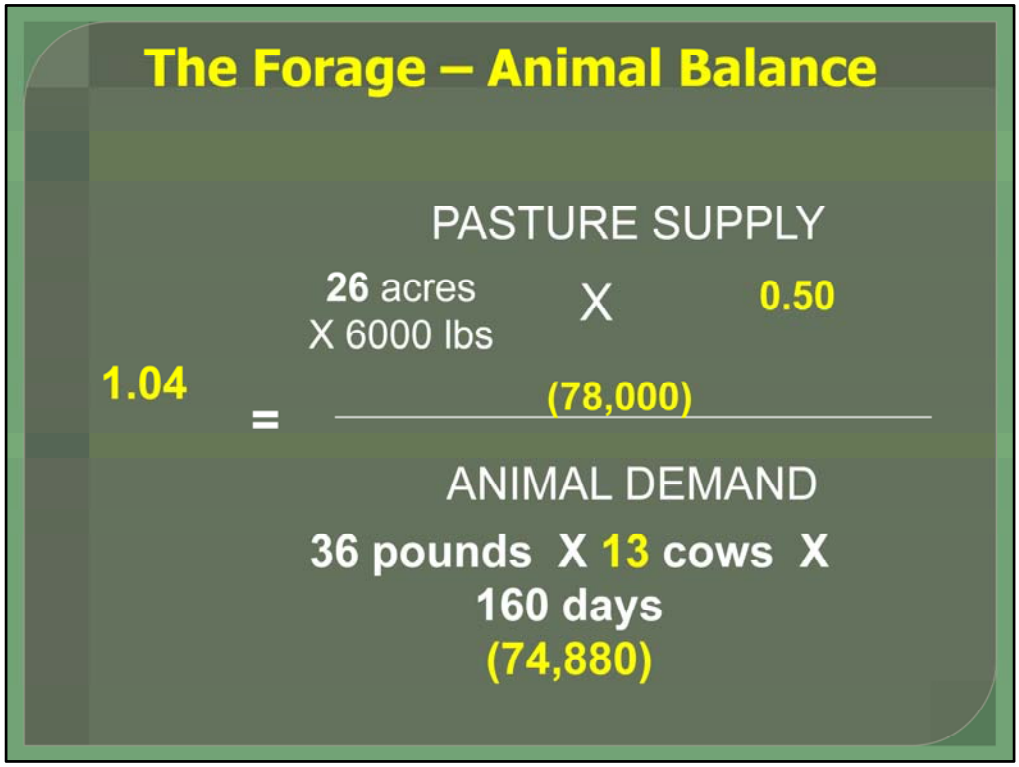

So what is our Forage-Animal Balance?




So we only have about half as much pasture as we need!




So what happens if we increase the utilization rate to 50% by changing our grazing method – management - can this operation be in balance? NO! But it definitely helped get us closer to a balance. But what if the livestock manager agrees to sell 3 cows? So what is our Forage-Animal Balance now?




We can reach a balance! We still need to remember that during the hot, dry time of summer (the summer slump) if it occurs on this farm in the northeast, we may still be short of pasture. If this occurs, we should move animals off of the pasture and feed hay in a area chosen to not damage resources, until the pasture begins to grow again.