

Getting the most out of your pastures

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I) Build a better solar panel: Farming and ranching is really the business of capturing solar energy and turning it into a salable product. Nowhere is this more apparent than in pasture-based agriculture. If you think of every acre you manage as a 43,560 sq-ft solar panel, you'll easily begin to see how to improve your operation.

First think about what makes an excellent solar panel when it comes to maximizing photosynthesis. It is green growing leaves. Bare soil does not capture solar energy. Dead, brown plants do not capture solar energy. Only green, growing leaves take solar energy and make it into livestock feed. If you are using permanent perennial pasture plants, look at how much of the soil surface is covered by green leaves on any day of the year. In an high natural rainfall or irrigated situation, an excellent pasture should have at least 90% of the ground covered by green growing plants. If you are raising annual pasture crops, think about how many days the soil is left bare during the year or between crops. Timeliness of farming operations and rapid establishment are the key to successful annual pasture crops.

Bare soil means lost production and provides opportunity for weed invasion in both permanent and annual pastures. The most common cause of thin spotty pastures is grazing too short while staying on the same pasture too long. Leaves are the photosynthetic factory of the plant. If excessive grazing removes too many leaves too frequently, the plant cannot support itself and must either reduce its size or die out completely. All across the world, grass farmers lose significant production potential because they keep tearing down their factory. In most of North America, I believe most farmers and ranchers are losing at least 50% of their production potential due to grazing too short and not providing adequate recovery periods. Key principle is it takes grass to grow grass.

Letting pastures get over-mature is another significant loss of photosynthetic efficiency on high rainfall or irrigated pastures. While it might seem contradictory for what appear to be two opposite trend (grazing too short vs. pastures getting to tall) to be such significant problems, the two trends often occur in the same pasture side-by-side. An individual blade of grass may only have 3 to 5 weeks of effective solar capture. Letting irrigated perennial plants continue to grow much longer than five weeks without grazing lowers photosynthetic efficiency. Stockpiling pasture or range for deferred grazing is the only time we should let pasture plants reach full maturity.

Other tools for keeping your pasture an efficient solar panel include seeding only adapted pasture species, appropriate nutrient management, and timely weed control. Choose species and varieties that are proven in your environment. There are very few real wonder grasses. Don't expect a plant developed in a totally different climate to do well on your farm. If a grass or legume is growing in the road ditch, it should also grow in your pasture. Take care of the fertility needs of your pasture to keep green leaves growing vigorously. Soil testing is an important tool for pasture management whether you ever buy a pound of commercial fertilizer or not. Soil testing will help you decide where to feed hay or apply manure. It will help you decide which legume species you should be interseeding. Take care of your pastures and weeds will not be a problem. Remember weeds are opportunists that invade unhealthy pastures. If you do have a weeds, deal with the cause promptly.

2) Capture more of the water that falls on your land: Making more efficient water use should be an objective graziers think about every day and your daily management decisions should help create a functional water cycle. What are the key factors to be monitoring and what are the adjustments that can be made?

Keeping the ground covered is the number one consideration. Keeping the ground covered entails both the living, growing material as well as the dead plant litter on the soil surface. Obviously, the more new green material you can grow, the better the cover will be and the greater the opportunity to create plant litter. Almost every aspect of the water cycle comes back to this key point.

By leaving taller post-grazing residuals in both perennial and annual pastures, plants grow back more quickly thus creating new cover and leaving more material to ultimately become litter. One of the huge benefits of maintaining cover is keeping the soil cooler. Very often in midsummer, the soil temperature at 2" depth can be 20° or more cooler under sod compared to adjacent bare ground. This greatly reduces evaporative water loss from the soil.

If you use annual pastures and are not already doing so, consider using no-till seedings or interseedings to establish the annuals. Every time the soil is tilled not only does it cause evaporative water loss but it also collapses soil structure resulting in reduced infiltration and increased runoff. Water that leaves your farm as runoff is missed opportunity for growing more pasture. If you follow some fairly basic guidelines, no-till pasture seedings are just as effective as conventional tilled seed beds and come at a much lower equipment and labor costs as well as being much better for the soil and water cycle.

Soils with adequate available nitrogen and mineral content make much more efficient use of water than do soils with chronic nutrient deficiencies. If soil minerals or N is limiting productivity, then each inch of water will give you less forage yield. You can also think about this conversely, applying nutrients as fertilizer, manures, or feeding hay for soil enrichment only pay if you have a healthy water cycle.

3) Harvest more of what you are already growing: Livestock will only harvest 30 to 50% of pasture production with continuous grazing. In years with excellent growing conditions, grazing efficiency is closer to the 30% level because we usually don't change our stocking rate numbers to capture the increased production. Conversely, in dry years we tend to harvest a higher percentage as animals are forced to work a little harder for adequate forage. Using a management-intensive grazing strategy allows you to harvest a higher percentage of the yearly forage production.

High rainfall or irrigated pastures: Traditional rotations using 3 to 6 pastures only give a slight increase in grazing efficiency, allowing more consistent harvest in the 50% range. As grazing periods become shorter and recovery periods can be more closely managed, grazing efficiency increases. In very intensively managed systems under irrigation or in high rainfall environments, 80 to 90% of the annual forage production can actually be harvested by the grazing animals. This is as high or higher than mechanical harvest systems, at a fraction of the cost.

Remember, high seasonal grazing efficiency does not mean grazing each pasture to a high percentage in every grazing cycle. A 90% annual harvest efficiency can be accomplished without ever grazing off more than 50% of the standing forage in a single grazing event. The key is to leave ample residual and return to the pasture more frequently.

On annual pastures where only one harvest is expected, maximize utilization with very intensive strip grazing. Many annual crops are taller than perennial pastures and cattle will trample more than they consume if given access to large areas of pasture. Swath grazing is another useful tool to harvest more forage per acre from an annual pasture. Swath grazing can be used in either summer or winter in dry climates.

4) Balance use and recovery periods: We all know pastures need to be rested to restore CHO storage and plant vigor, but is that all the recovery period provides? In reality, most forages rely on residual leaf area for regrowth, not stored CHO. The recovery really is a time allowing new leaves to grow, which in turn supplies excess CHO for storage and helps maintain vigor and root growth. Determining appropriate recovery period length is a challenge graziers face on an ongoing basis. Animal and plant needs must always be balanced. Longer recovery periods provide healthier plants and ample forage, but reduced forage quality. While shorter recovery periods may supply high quality forage, they may stress plants and also leave forage supply short. Changing growing conditions dictate recovery periods need to be lengthened or shortened. One thing for sure is leaving more residual increases flexibility in recovery management while lower residual reduces management flexibility.

Soils that are severely trampled during wet conditions recover their tilth much quicker if animal pressure is removed and plant roots begin to rapidly grow back. Allowing adequate recovery period helps reduce soil compaction. A four-year study at the University of Missouri - Forage Systems Research Center found soil bulk density tended to be lower for rotationally grazed pastures compared to continuously grazed pastures for low to medium stocking rates. At high stocking rates, compaction was equally severe for both grazing management regimes but tended to be less for rotational stocking as recovery periods were extended.

The required recovery period may be as short as 20 to 25 days in springtime on irrigated and fertilized grasses during their peak growth period. The same species may require up to 45-60 days recovery during hotter, drier periods. Recovery requirements for tall grass prairie sites may vary from 30 to 120 days depending on growing conditions. In semi-arid rangelands, a single grazing period per year may be all that is appropriate followed by a full year's recovery. Recovery management cannot be calendar-based, but must be planned in response to growing conditions and planned use patterns.

Complete removal of grazing animals from a grassland ecosystem generally does not result in improved grassland condition. While some short term gains may be seen initially, long term livestock exclusion generally leads to downward trend in grassland condition. This is because grasslands evolved with grazing animals and almost all grass species require some degree of grazing to remain healthy. In a five-year research project in Missouri, we found stocking rates below the recommended level resulted in more rapid deterioration of grassland condition than stocking rates above the recommended range. To be healthy, grasslands must be utilized.

Several environmental and wildlife benefits can be attributed to providing planned recovery periods. Both stream bank stability and bird nesting habitat were improved in pasture areas when planned grazing systems were implemented according to research conducted in both Wisconsin and Oregon. Several studies in the western US have shown notable stream bank improvement where planned grazing systems have been implemented. It is the continuous presence of livestock in riparian areas that creates problems, not the managed use of a site by livestock. Native plant species tend to increase when appropriate recovery periods are provided. Appropriateness includes both timing and duration.

5) Grazed as many days of the year as possible: Numerous studies and producer experience have shown grazing is a much cheaper way of feeding livestock than feeding harvested forages such as hay or silage. Very often we find at least one dollar difference per day in feed costs for beef cows grazing stockpiled pastures compared to hay feeding. Just by adding a few weeks more grazing on the front and back side of winter can save substantial dollars.

Planning spring and summer pasture use to allow stockpiling some pastures for fall and winter grazing is key to success. If every acre is grazed too short by August, there is no opportunity to grow late season forage. The three principles already presented above are essential management strategies to ensure having forage available for winter grazing.

Year-around grazing is best accomplished by using a variable stocking rate that creates more grazing pressure in the spring and reduces it significantly in the winter months. In a cow-calf operation, just shifting calving season to late spring or early summer moves the peak forage demand away from late winter and into the growing season. The increased energy demand due to lactation may be anywhere from 30 to 80%, depending on cow type and her milking ability.

Combining a short-season stocker program is another way to significantly increase spring-summer forage demand while reducing winter feed requirements. We have used a 90-120 day custom grazing operation in conjunction with our cow-calf operation to eliminate the need for making and feeding hay. The ratio of stocking rate to allocate to each enterprise depends on your environment. We used 60% of our annual carrying capacity for grazing cows year-around and 40% as stockers concentrated in April thru July.

There are three major challenges to extending the winter grazing season in. The first one is attitude. We need to believe that cows can and should work for their living. If you spend over half of your time making hay and hauling it back out to the cows, you are working for the cows. Cows should be working for you. They should not be pampered pets. Cows were extremely good at being cows for thousands of years before we began altering their lifestyle with free handouts. If a cow knows she has to find forage under two foot of snow, she can and will do it. If she knows you are going to bring her a bale of hay at the first snowflake of the fall, she will become a welfare case.

The second challenge is ensuring there will be forage in the field in the winter. The first step to overcoming this hurdle is understanding the growing season and the grazing season are two completely different things. It will likely take significant changes in your spring and summer grazing management to make sure you have fall and winter pasture. It may take radical changes in your fertility program, in the composition of your pastures, and in the stock policy of your farm or ranch. It is difficult for many ranchers to accept, but running fewer cows and grazing more is often more profitable than running more cows and feeding hay. When every day of hay feeding costs you a dollar more per cow, feeding more cows can be a losing proposition.

The third challenge is learning how to deal with snow and ice. Cows will not graze through two feet of snow to find grass that is only three or four inches tall. Our job is to grow the grass, the cow's job is to harvest it. Our job is to make sure there is adequate grass below the snow level so that cows can find it and graze it. Standing pasture is generally the cheapest source of forage for a cow.