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Rotation vs. Mob Grazing

Missouri producers become more profitable and improve the environmental quality of the land they manage when implementing a grazing system. Rotational and mob grazing each boast specific benefits. Rotational grazing allows for frequent grazing events and high-quality forage but can put significant strain on pasture longevity if grazed too frequently. Mob grazing events allow for substantial forage accumulation of forages in later stages of maturity, but causes extensive defoliation and trampling.

A four-year grazing study was conducted at the Hawbecker Research Farm in Bellefonte, Pennsylvania. The study was done in collaboration with Pennsylvania State University and the USDA-ARS Pasture Systems and Watershed Management Research Unit. The study set out to investigate how rotational and mob grazing influenced pasture composition, and forage yield and quality. The plots were a mixture of alfalfa, white clover, orchard grass, tall fescue and buckhorn plantain.

In this study, cattle were allowed to graze a paddock for several days before moving to a new one for the rotational grazing treatment. The rest period was at least 30 days or until the forage reached an ideal height before the next grazing. Rotational grazing consisted of five to six grazing episodes per year. The mob grazing treatment consisted of high-stocking-densities at 250,000 to 300,000 pounds per acre. Mob grazing events occurred twice a year on each tract.

Published results included:

Pasture Composition

- Rotationally-grazed plots typically had greater proportions of orchard grass and tall fescue compared to mob-grazed, likely because these grasses respond well to repeated grazing events
- The proportion of alfalfa in the rotational plots began to steadily decline after the first year, reaching almost zero by year four
- Alfalfa and other large legumes were much more persistent in mob-grazed paddocks, where they did not experience such intense grazing pressure
- Neither management strategy was consistently superior in terms of weeds or proportion of dead material

Forage Yield

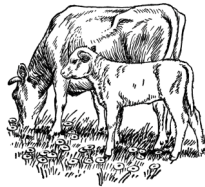
- Cumulative whole-season dry matter yield was slightly higher in rotationally grazed plots in the first year, and the two strategies were relatively similar in years two and three
- By the final year, the rotational plots produced 1.3 tons per acre more than the mob-grazed plots
- These results suggest repeatedly subjecting pastures to long periods of growth with no grazing events, could negatively impact productivity in the long term
- Mob-grazed plots provided most of their forage mass at the first grazing event, with

subsequent harvest yielding only about half the original quantity

Forage quality

- Forage acid detergent fiber (ADF) and lignin content were consistently higher under mob grazing
- Total digestible nutrients (TDN) was higher in rotational grazing
- Crude protein was greater in the mob-grazed paddocks until the final year, probably due to greater persistence of alfalfa and other legumes
- These differences in forage quality were expected since forages in rotational paddocks were harvested earlier in maturity, resulting in higher nutritive quality

While there are benefits to both rotational and mob grazing, producers should keep in mind the grazing management style affects pasture composition, and forage yield and quality. For more information, contact the local livestock specialist.



Source: *Heather Conrow, livestock specialist*

Estimating Winter Hay Needs

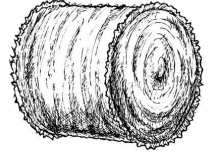
Last summer's drought was followed by a harsh winter and had many producers scrambling for hay this spring, using up all hay reserves on the farm. Now is the time to do some quick math to insure there is enough hay for this winter. To estimate the required amount of hay, producers will need to know the number of head, average body weight, and number of days on feed.

A cow will eat 2-2.5% of her body weight in dry matter (DM) daily. To calculate daily DM intake, simply multiply the average body weight by 2.5%. For example, if the average weight is 1400 lbs per cow, each cow will eat 35 lbs of DM daily. Since hay is about 85% DM, intake needs to be divided by 0.85 to arrive at the total amount of hay on an as fed basis per cow. Using the previous example, 35 lbs of DM equals 38 lbs of hay on an as fed basis.

The as fed amount of hay can then be multiplied by the total number of head and approximate number of days on feed to estimate the total amount of hay needed for the year. The equation is as follows:

Total lbs of hay needed = (Ave. cow body weight x 2.5% x number of head x days on feed) ÷ 85% DM

Some hay will be lost due to spoilage and waste, therefore it is a good idea to add 10-15% to the final figure. Producers should consider performing a hay test this year with decreased hay quality as a result of delayed harvest because of the wet spring. Intake amounts and hay needs may need to be adjusted or a supplement fed to make up for poor quality hay. Contact a livestock specialist with further questions or assistance with calculations.



Source: *Jenna Monnig, livestock specialist*

Terminating a Farm Lease in Missouri

The United States Department of Agriculture (USDA) reports that 35 percent of Missouri farmland is rented. This amounts to about 9.8 million acres. Farm leasing arrangements will continue to grow as landowners get older and want or need to back out of the day to day farming operation. Land values are holding strong and lower interest rates continue to make land an attractive investment for many who may not be familiar with agriculture. Simultaneously, lower crop and cattle prices are causing cash flow challenges for many producers. Having a stable and fair lease arrangement helps both landowner and tenant manage income and expenses.

So what happens when one party wants to end the lease? The process will vary depending if the lease is verbal or written and if there are any pre-notice requirements in the written lease. A well written lease should include an exact beginning and ending date, such as January 1, 2019 to December 31, 2019. Most leases include a pre-notice clause indicating the lease will continue unless written notification by either party is given a specific number of days (30, 60, or 90 days) in advance of the ending date to terminate the lease. If the lease does not include a pre-notice clause, the lease will terminate on the written ending date. Communication in advance of the ending date promotes good relationships between tenant and landowner.

In the case of a pre-notice clause, the timeframe must be honored or the injured party can force the continuation of the lease. In Missouri, there is no specific required length of time for termination of a written lease. Most written leases stipulate the pre-notice of termination must be given in writing. It can be sent by regular mail, certified mail, or both. If both are done then there is a record of the notice and due

diligence has been performed to inform the other party.

Verbal leases are a little more of a challenge. Verbal farm leases in Missouri require 60 days written notice prior to the date the agreement was made. For example, Bob and Tom made a verbal agreement on January 1, 2019, but Tom did not do any fieldwork or move his equipment in until April 15, 2019. Bob, as the landowner, decides on December 1, 2019 to rent the same ground to his son-in-law in 2020 so he gives written notice to Tom. Since Bob did not give Tom at least a 60 day written notice of his wish to terminate, Tom can force his tenancy. It does not matter that he did not begin working the ground until April. This example shows a very recent agreement period, but most verbal agreements have been in use for many years and the details may have become less clear over time. In verbal agreements, if either party wants to terminate, give notice well in advance. For example, the agreement was made sometime after harvest in the winter, but the exact date is a little foggy. Since harvest is usually September through November, it would be reasonable to give the notice 60 days prior to November 1st, but earlier would be beneficial.

Ending a lease agreement, especially a long-term lease is often difficult as a business decision. Since farming is more than a way to pay the bills for those involved, ending a lease may cause feelings of frustration, anger, sadness, or anxiety on both sides. Recognize and respect generational differences. Consider developing a written lease. It is not a matter of trust, but rather a sound business decision for all parties, including spouses and possibly heirs. Clear communication by all parties throughout the lease period helps to continue fair lease agreements.

Source: Darla Campbell, ag business specialist



Soybean Plants Killed before Maturity Possess Grain that Remains Green

Delayed planting of soybean in the spring and early summer resulted in delayed maturity this fall. Late maturing soybean plants are vulnerable to freeze and cold temperature damages. Parts of Missouri experienced several episodes of temperatures cold enough to damage soybean plants.

Plants that had expressed noticeable signs of maturity including yellow leaves and leaf drop will not be affected by temperatures below

freezing. The rest of this article is focused on those soybean fields in which plants had expressed no or only slightly the normal maturity process.

"Killing freeze" has many definitions, but usually includes a low temperature such as 28F and a time amount such as 4 hours. The freezing point of water within leaves is lower than 32F because of the dissolved compounds such as sugars. But, even temperatures too warm to cause ice can affect plants. Life processes are mediated by enzymes and some of these enzymes can be damaged by cool, but not freezing, temperature. For example, photosynthesis rate may recover slowly after temperatures below 40F.

When temperatures drop quickly below freezing, ice crystals form inside plant cells. Because water expands upon freezing, plants cells and their membranes are literally torn apart. As temperatures rise and plant tissues thaw, cell contents leak outside the cells. Leaves are most susceptible to freeze damage. Damaged leaves or portions of leaves will die and will not proceed through normal change in color. If temperature is cold enough, the entire plants will be affected and die.

Damage may not be uniform throughout the field. Cold air is heavy and drains down slopes. It pools in lower portions of the field. Even small depressions can catch and hold cold air. Soils are still relatively warm and they lose temperature more slowly than air. This may create differences within the canopy for damage with leaves, stems, and pods near the top of the plant most vulnerable.

Predicting the effect of freezing temperatures on soybean plants is difficult because of all the variation within a field and within plants. But, even partially damaged plants may not mature normally and normal signals of approaching maturity such as yellowing of leaves and dropped leaves may be changed. Any leaf or portion of leaf killed by a freeze will not yellow, but will turn brown. Also, the sequence of maturity among leaves, seeds, and stem will be changed. Dead leaves may remain on the plant and stems may remain green long after seeds are mature. Harvest timing should be based on seed moisture not the appearance of the plant. Waiting too long to combine freeze damaged plants could result in grain shattering.

If soybean plants are killed before physiological maturity, seeds on those plants will not mature normally. Immature soybean seeds contain chlorophyll and are green because of this pigment. After plants reach physiological maturity, chlorophyll production in seeds ceases.

Chlorophyll that is present in seeds and pods is broken down through natural metabolism. Premature death stops this natural degradation of chlorophyll and the seeds remain green. The extent of the green color depends on timing of premature death. If death occurs late in seed-filling, the green color is usually confined to the seed coat. This color may lessen over time with field drying or in storage. If death occurs during earlier in the life cycle, the green color remains throughout the interior of the seed. This color will probably not disappear even with long term storage.

Frost damaged soybean grain should store almost as easily as normal soybean grain, although aeration is recommended. Usual precautions of foreign material and damaged seed coats apply to all stored soybeans. Plants killed by frost will retain leaves and stems may remain green. This can add moisture to grain or make grain difficult to separate from other plant parts. Prematurely

killed soybean seeds will shrink to smaller than normal size and the shape will be more oblong than normal. Combine settings should be adjusted to account for these differences.

Nearly all USA soybean grain is classified and sold as yellow soybeans according to the "Official US Standards for Grain". Seeds with green seed coats should be classified as yellow soybeans and not docked. However, seeds in which less than 90% of the cross-section is yellow will likely be classified as "soybeans of other color". If the grain lot has more than 10% seeds of other color it may be graded as "standard" and may receive substantial dockage.

Source: *Dr. William Wiebold, extension soybean specialist*

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**Northeast Missouri
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