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Quick Quality Forage for Spring

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The fall of 2016 was certainly not favorable for growing fall and winter pasture. Fall rains came too late to produce much forage growth. Many producers want options for producing good quality spring pasture. Here are some points to consider for spring of 2017.

1. There are some winter annual forages that can be winter- or spring-planted to offer spring forage. But make sure to clean up the field first to get the most from that planted forage. If planting into an existing bermudagrass sod, spray it in February with glyphosate to kill the buttercup, little barley and other weeds that would out-compete what you intend to plant. Spraying winter annual weeds in bermudagrass fields also promotes earlier bermudagrass growth where no winter annual will be planted. Heavy infestations of winter weeds can delay bermuda growth by three to four weeks.

2. Plant cereal rye or annual ryegrass. Rye and ryegrass are normally planted in the fall, but for emergency forage, either can be planted in late winter or early spring. The primary growth will be later than that for the fall-planted counterpart, but it can offer forage where other options are not available. Plant in late February to March 15. Make sure to apply 50 to 60 pounds actual N per acre to promote forage growth. Choose a cold-hardy ryegrass variety. Gulf ryegrass or VNS (variety-not-stated) ryegrass would not be good choices for this option.

3. Plant spring oats or brassica. Some producers have had good success with planting spring oats and forage brassica in early March to provide spring grazing. The oat variety "Jerry" is the most common spring oat choice. Plant it at 100 pounds per acre. Forage brassica includes forage turnips, forage rape and hybrids of those two species. All are good choices. Plant at 5 pounds per acre if planted alone or plant at 2 pounds per acre if mixed with oats or ryegrass. Again, apply 50 to 60 pounds actual N per acre with P and K by soil test recommendation.

4. Promote volunteer ryegrass. Volunteer ryegrass emerged late when fall rains finally came, but so far has not produced much grazeable forage. However, volunteer ryegrass can produce substantial spring pasture. To help ensure early grazing, apply 50 to 60 pounds actual N fertilizer per acre by mid-February. Valentine's Day is a good target date to fertilize the pastures where you need early grazing. Apply P and K according to soil test. If no soil test is available, apply 300 pounds of 17-17-17 per acre to make sure the grass has the basic nutrients. But, take a soil sample before applying fertilizer so you can adjust when the results come back. Ryegrass will grow well into May with April being the month of most active growth. Two producers used this strategy in February 2016 and had nearly 2,000 pounds dry matter of ryegrass per acre by mid-March and had basically quit feeding hay.

5. Fertilize fescue. While Ky-31 fescue has a problem with the toxic fescue endophyte, it can provide needed forage before other summer forages are available. Fertilizing some acreage in mid-February can promote early grazing and cut out the last few weeks of hay feeding in March. Overseeding other fescue acres with red or white clover will improve pasture quality and help dilute the toxic fescue effect after the clover is established. Make sure fields to be sown with clover have a pH over 6.0 and medium or higher P and K to support good clover growth.

Soil Sampling Vital to Soil Health and Fertility

Dirk Philipp, Associate Professor - Forages

Fall is soil sampling time, and the reasons are simple: It keeps pastures healthy, your land and animals productive and farm economics in good shape.

The forages we use on our grazing lands are mostly improved and developed to fit the specific purpose of providing high yields and high nutritive values. Whether cool- or warm-season grasses or broadleaf plants such as legumes, their in-bred high yield potential requires optimal soil fertility conditions to thrive and deliver the yields needed to make grazing or dairying cost-effective. Optimal soil fertility will also make wanted plants more competitive with unwanted plants. Typical weeds often depend on a niche characterized by specific pH and/or fertility ranges. Uptake of macro- and micro-minerals is greatly influenced by the prevailing pH, and deficiencies in any nutrient hamper overall performance.

Taking soil samples is quick and easy, and analyses are cost free if sent in via the county extension service. You don't need professional sampling equipment, although this will make the job easier and more efficient. All you need is a soil probe or a little spade, a bucket to mix the subsamples in and a soil box provided by the county extension service to submit your composite sample or samples from your place.

The most important thing to keep in mind is to obtain a "representative" sample. As you sample only a very small amount of soil and soil fertility is spatially highly variable, the quality of your sampling techniques will determine fertilizer recommendations and ultimately affect your business. In general, the higher the number of subsamples, the lower the variability within your overall composite sample. This means that you should subsample at least 15 to 20 times per area you want fertilizer recommendations for.

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The area to be sampled will be determined by the purpose for your operation. Is it a single 5-acre patch with winter annuals? Is it a 40-acre track of cool-season forage? In fall, there may be less need for N fertilization, but this time of year is ideal to check pH and other macronutrients such as K, P, Mg or S. Designate the area you want to sample to crisscross the area taking your samples. Push the probe 6 inches deep into the ground and place the sample into the bucket. Proceed along the zigzag line to the next location and so on. Stay consistent with sampling depth.

There are a few things to remember. Expect high nutrient concentrations in areas where your animals congregate, such as water and feed troughs, gates, shade structures, travel lanes, etc. Exclude those areas entirely or include them carefully by not over-representing them in your composite sample. Across pastureland, soil fertility and pH may be vastly different. Make sure to subdivide your grazing ground into bottomlands and hill sites, that is, your specific management units. Sample all the areas at least every two years to stay current. It may take six months or longer to correct pH levels.

At the end of your sampling, thoroughly mix all the soil in the bucket, break up small clots and remove gravel or little stones, if any. Place the soil sample in the soil box and submit it to your county extension service. After a couple of weeks, you will receive the results with fertilizer and liming recommendations. If unsure, contact your county extension agent to help you interpret the data.

Cattle Traffic Areas: Thinking and Planning Ahead for Wet Weather

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Winter is upon us, and cattle traffic areas that in the summer are bare, hard-packed soil will, with the wet weather, become muddy. While muddy areas can't be completely avoided, they can be managed to reduce mastitis and production concerns associated with dirty cows and muddy conditions.

As the primary ingredients to mud are soil and water, the key concept to minimizing muddy conditions is to keep the amount of soil and water that mixes to a minimum.

The first step is to lay out and size cattle traffic areas and lanes so cattle can move around the farm as needed, while at the same time keeping the areas where grass does not grow due to cattle traffic as small as possible. Of course, this will likely require appropriate fencing to direct cattle traffic. When laying out fence lines and gates, consideration should also be given to equipment and human traffic patterns.

Depending on soil conditions, some situations may require steps to increase the load-bearing capacity of the soil. While concrete is often an option, its expense may make other options, such as gravel, with or without a geo-textile, or the use of coal plant fly ash, attractive. As with most decisions, initial cost, useful life and maintenance costs should be considered. Proper layout and management should minimize, and potentially avoid, the expense of increasing the load-bearing capacity of the soil.

A key component in traffic area layout is to divert as much water as possible away from areas such as travel lanes and loafing lots. Berms and surface drainage can be used to redirect surface water runoff. For roof runoff, some combination of gutters and surface drainage might need to be considered. In some cases, it may be appropriate to use culverts to direct clean water flows under traffic areas.

Even after appropriate water diversions are put in place, it will rain directly into the traffic areas. This means the traffic areas should be designed and managed to minimize water ponding and surface erosion. Ponding will increase mud problems. Erosion tends to increase the time and cost of traffic area maintenance. Ideally, the traffic areas should be sloped enough so that water flows off but not so much that erosion is a problem. The slopes should be oriented in such a way that water flows minimal distances while in the traffic area. In addition, the slopes should be designed and maintained to avoid low spots that will pond water.

Runoff water from traffic areas will likely contain some microorganisms, nutrients and sediment from its contact with manure and soil. The commonly accepted method to address environmental concerns is vegetative filtering. Ideally, this runoff water is directed to flow as a broad, uniform sheet of water into a vegetated filter strip. In other cases, shallow vegetated channels can be used to direct runoff water away from direct discharges into streams and ponds. The vegetation filters solids and provides opportunity for plants and the soil to treat the runoff water to protect downslope streams and ponds.

Traffic areas should be designed and managed to minimize water ponding and surface erosion.

Often mud-related problems can be corrected with modest changes. The trick is to not only see the confinement and traffic areas as they are but also what improvements can be made. This is followed by deciding the order and timing of any improvements.

As with many farming practices, proper maintenance is important. The condition and effectiveness of diversions, fencing and vegetated filter strips should be monitored and maintained. Periodic scraping of the traffic areas may be needed to remove excessive amounts of manure solids. When scraping, care should be taken to maintain slopes and avoid creating low areas where ponding will occur. Any scraped material should be thinly applied as a soil amendment to growing vegetation well isolated from downslope water bodies. Ideally, to avoid handling the material twice, it should be left in place until suitable conditions exist for land application. If it must be stored prior to land application, it should be protected from the weather to avoid runoff to avoid being subject to liquid manure regulations.

For additional information, the publications *Runoff Water Management for Animal Production and Environmental Protection* (FSA1036), *Reducing Mud Problems in Cattle Heavy Use Areas With Coal Combustion By-Products (Fly Ash)* (FSA1043), and *Beef Cattle Management for Water Quality Protection in Arkansas* (MP375) are available at www.uaex.edu/publications.

Effect of Altered Steroid Hormone Metabolism on Fertility in Lactating Cows

Rick Rorie, Professor, Animal Science

Over the past 30 to 40 years, the conception rate in lactating dairy cows has declined, while conception rate in heifers has remained relatively constant. Currently, the conception rate in lactating cows is in the range of 25 to 40 percent compared with 70 percent or greater for heifers. It is estimated that every day a cow remains open after 115 days in milk costs producers about $2 per day. Industrywide, the economic loss due to low fertility is hundreds of millions of dollars annually.

Numerous factors can contribute to low fertility, including reproductive tract infections, infectious disease, reproductive tract defects, poor oocyte quality, ovulation failure, fertilization failure, early embryonic loss, fetal death and endocrine disorders, among others. In the absence of known causes, low fertility is often associated with high milk production. Recent research indicates that high milk production can cause low fertility in cows by increasing the metabolism (removal from circulation) of the steroid hormones estrogen and progesterone, resulting in inadequate concentrations for normal reproductive function.

During the estrous cycle, follicles within the ovaries grow in response to stimulation from follicle-stimulating hormone (FSH) and luteinizing hormone (LH). Follicles produce estrogen that induces standing estrus and stimulates a massive release of LH leading to ovulation of the oocyte. After ovulation, the cells in the ovulated follicle transform into a corpus luteum that produces progesterone. If the cow conceives, the corpus luteum is maintained and produces progesterone throughout pregnancy. If conception does not occur, the corpus luteum regresses and the estrous cycle repeats.

So, how does milk production increase steroid hormone metabolism? High feed intake by the cow during lactation increases blood flow to the digestive system. Increased blood flow to the digestive system in turn increases blood flow through the liver. The liver contains enzymes that metabolize and remove substances like steroid hormones from circulation. The amount of steroid hormone in circulation is a balance between how much is produced and how much is removed by the liver. If too much is removed, the normal function of the reproductive cycle is disrupted.

Several reproductive problems have been attributed to increased steroid hormone metabolism by the liver. Low circulating progesterone during the time of follicle selection results in elevated FSH, increasing the chance of double ovulations. Lower estrogen in circulation reduces the length of standing estrus (reducing detection rate of estrus) and may result in ovulation failure. Cows with low progesterone for a period of time before estrus and AI may not undergo complete corpus luteum regression, resulting in low conception rates, possibly due to altered sperm and oocyte transport, reduced fertilization and reduced embryo development. Low progesterone a few days after AI can result in failure of pregnancy recognition or pregnancy failure due to early embryonic death.

Ideally, progesterone in circulation should be elevated during follicle selection and maturation, low during estrus and ovulation and again elevated a few days after estrus and AI. An estrous synchronization protocol such as Ovsynch in conjunction with a CIDR progesterone insert can be used to help ensure progesterone is elevated during follicle selection and maturation before AI. Two injections of a prostaglandin F2 alpha product 8 to 12 hours apart could help ensure complete luteal regression and low progesterone at estrus. Numerous studies have evaluated methods of elevating progesterone after AI to improve conception rates but with varying success. Cows have been treated with either human chorionic gonadotropin (hCG) or gonadotropin-releasing hormone (GnRH) 5 or 6 days after AI to elevate progesterone in circulation by inducing accessory corpus luteum formation, but improvement in conception rates has only been 5 percent or less.

The most practical approach to reduce the adverse effects of rapidly metabolized steroid hormones on fertility is to use a CIDR progesterone insert in combination with an estrous synchronization protocol like 5-day Ovsynch to ensure progesterone is adequate during follicle selection and maturation and ovulation occurs at AI. Explanation/description of this synchronization protocol can be found at http://www.dcrcouncil.org/protocols.aspx.