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AG CONNECTION

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Weed and Brush Control for Forages and Pastures

With weed control on grain crops coming to an end this season, it might be a good time to assess weed management in your forage crops and pastures. Weeds can be a serious detriment to nutritional value of forage crops unless proper management is practiced. Most weeds are lower in protein and less palatable for livestock. In some cases, weeds are poisonous to livestock. UMC Guide 4970, Plants Poisonous to Livestock gives more information: http://extension.missouri.edu/explore/agguides/crops/g04970.htm

Every space occupied by a weed is a space where quality forage could be produced. Weeds compete for sunlight, moisture and nutrition similarly to the way we think of row crops.

Management practices that promote healthy forage stands will improve the vigor and competitive edge. Weeds are typically more competitive in thin declining stands and in situations where soil fertility is below average. Even in closed systems, soil pH can decline over time due to the nitrogen cycle and annual precipitation. Good forage and pasture management practices include taking representative soil samples every three to five years.

If you have confidence in your management practices, there are still situations that require a look at herbicide applications. University of Missouri Extension publication MP581 "Weed and Brush Control Guide for Forages, Pastures and Noncropland" is a great resource to have on hand to improve your management practices. It covers management practices, herbicide application timing, forages, grass pastures, brush and woody plant control and much more. Included in MP 581 is a table of weed response to herbicides where a rating of poor to good can help you determine the best herbicide for your weed problem. It lists herbicide management practices for cool season and warm season grasses as well as forage legumes. It covers many of the common weedy species of perennials, biennials, summer-winter annuals and woody species.

To get your copy of MP581, contact your local County Extension Office. This 32 page publication is a cost publication and it is a must for your reference of good management practices.

Author: Todd Lorenz, Horticulture/Agronomy Specialist

Nitrogen Fertilization Strategies for Annual Ryegrass Pastures

Livestock operations as far north as southern Iowa are planting annual ryegrass pastures as an alternative to feeding hay in winter. Easy establishment, rapid autumn growth, and high forage quality are making annual ryegrass popular with dairy and beef farmers alike.

Annual ryegrass has several features that make it popular with livestock producers. When planted in late-summer, annual ryegrass can produce 2 to 3 tons of high-quality feed per acre before December and an additional 3 to 4 tons in the spring (Bishop-Hurley et al., 2001). Few other forage crops can produce this much forage for winter grazing. Annual ryegrass is able to achieve these yields in autumn because it continues to grow even after the first killing frost. Cold-tolerant cultivars can grow when average daily temperatures are below 39°F. In addition, the lack of true dormancy in annual ryegrass allows it to grow during warm spells in winter and to resume growth earlier in spring than many perennial cool-season grasses.

In addition to its rapid fall growth, the forage quality of annual ryegrass is outstanding. During vegetative growth, annual ryegrass has crude protein levels that exceed 20% and dry matter digestibility that approaches 75% (Dunavin, 1990). Because of its high quality, producers can successfully use annual ryegrass to feed both stocker cattle and lactating dairy cows. For example, stocker calf gains of 1.0 to 2.7 lb/day are common in the southern USA (Evers, 1995). In addition, milk yields of 85 lb/day have been reported for dairy cows grazing annual ryegrass pastures (Thom and Bryant, 1996).

Seed sales of cold-tolerant cultivars of annual ryegrass in Missouri have quadrupled over the past four years. However, we still have a lot to learn about the management of annual ryegrass for winter pasture in Missouri. There is little research about how to fertilize annual ryegrass that is grown outside the southern USA. Research from other regions suggests that annual ryegrass responds tremendously to N fertilizer, but proper fertilization rates and strategies for states outside the southern USA are lacking.

The **overall objective** is to determine the optimum rate and timing of N fertilizer for annual ryegrass in Missouri. Specific objectives are:

Objective 1: Determine the optimum N rate at planting to maximize fall growth of annual ryegrass for winter grazing.

Objective 2: Determine if N applications in late winter (March 1) are economical.

Materials and Methods

A three year field trial studying the impact of nitrogen rate and date of application on the yield and quality of annual ryegrass began in August 2002. This replicated (4x) experiment has 16 treatments: four N rates in autumn (0, 50, 100 and 150 lb/acre of N) followed by the either 0, 50, 100 or 150 lb/acre of N in early spring. The table below describes the rate and date of N applications for treatments.

Treatment	N in Autumn	N early spring
	N lb/acre	
1	0	0
2	0	50
3	0	100
4	0	150
5	50	0
6	50	50
7	50	100
8	50	150
9	100	0
10	100	50
11	100	100
12	100	150
13	150	0
14	150	50
15	150	100
16	150	150

Cultural practices: The soil type is a Huntington silt loam. Thirty lb/acre of 'Marshall' annual ryegrass was broadcast seeded into a prepared seedbed in early September of 2002 and 2003. Soil P and K was maintained at the levels recommended by the University of Missouri Soil Testing Laboratory for cool-season grasses.

Design: Each of the sixteen treatments were replicated four times in a randomized complete block design with 64 total plots (4 replications x 16 treatments). Individual plots were 21 feet x 15 feet.

Measurements:

Forage yield was measured when plant height in an individual treatment reached 8 to 10 inches. This is the recommended height to begin grazing annual ryegrass. Weekly measurements of canopy height were recorded to guide harvests. Once a treatment reached 8 to 10 inches in height, forage yield was determined by clipping two 2.67 feet x 15 feet strips in each plot to a 3 inch stubble height.

Forage quality [crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF)] was measured at the same time as forage yield. Samples were dried at 125°F for

72 hours in a forced-air oven before being ground to pass a 1 mm screen. Crude protein, ADF and NDF were measured using NIRS with appropriate wet chemistry calibrations.

Tiller density was determined in fall and spring each year. Tiller density was measured by counting the tillers on plants taken from ten 2.5 inch diameter cores from each plot.

Total soil nitrogen to a depth of 40 inches was determined prior to application of N and in early June (after the growing season for annual ryegrass) each year. Samples were split into three sections: 0-10 inches, 10-20 inches, and 20-40 inches.

Results

During the 2002-2003 growing season, total season yields were more than 12,000 lb/acre for the best treatments. While the highest N rates provided the greatest yields, it appears that 50 lb/acre of N in autumn followed by 50 lb/acre in early spring provides enough N for annual ryegrass growth. While more N fertilizer would increase growth slightly, economic analyses suggest that applying 50 lb/acre in autumn followed by another 50 lb/acre in spring would be the most cost effective rate.

Forage quality samples showed that annual ryegrass is excellent forage. Samples for 2002-2003 showed that annual ryegrass averaged 24% crude protein and had acid detergent fiber values less than 22%. In short, few other forages can produce such excellent quality feed for winter and early spring grazing.

Soil samples taken to a 40 inch depth in June of 2003 showed that soil nitrate levels, 0 to 10 inches from the soil surface, were nearly 6 ppm when 150 lb/acre of N was applied in both autumn and spring, while all the other treatments had about 2 ppm of nitrate or less. At deeper depths, (10 to 20 and 20 to 40 inches from the surface) soil nitrate levels were less than 2 ppm for all treatments. This suggests that little N is lost due to leaching from annual ryegrass pastures at the rates of N we examined.

Conclusions

1. Annual ryegrass can produce more than 12,000 lb/acre of high quality forage. This production level makes it an excellent choice for many livestock operations.
2. Annual ryegrass should receive 50 lb/acre of N in autumn followed by another 50 lb/acre in early spring. Applying more N fertilizer than that is probably not economic.
3. At all but the highest rates of N fertilizer tested, little N is lost from annual ryegrass pastures due to leaching.

Authors: Robert Kallenbach, State Forage Specialist, Matt Massie and Richard Crawford, Southwest Research Center, Mt. Vernon

High Impact Forage Management Field Day Scheduled For August 30

Producers who are interested in seeing first hand the impacts of various levels of forage fertilization and management should plan now to attend a field day scheduled for Thursday, August 30, 2007. The event begins at 6 p.m.

Several state and regional specialists with University of Missouri Extension have collaborated in this research / demonstration effort to show the impact of various fertilization programs on forage yield, forage quality, animal productivity and the economic consequences of these forage fertility decisions. Nine different fertility treatments are being evaluated in this multi-year study.

The program on August 30 will give producers a chance to walk through the forage plots and view changes that occurred based on spring fertilization. Since this research project was initiated in the spring of 2007, limited information is available at this time. However, yield data and other pertinent topics will be discussed following a free evening meal.

The plots are located on Highway 135, just West of Clifton City. The meeting will be held at the community building on the south side of Highway 135 in Clifton City.

Registration for this program is requested. Please register by contacting one of the following MU Extension regional specialists: Todd Lorenz, Cooper County, (660) 882-5661; Joni Ross, Morgan County, (573) 378-5358; Randa Brunkhorst, Pettis County, (660) 827-0591; Wendy Flatt, Howard County, (660) 248-2272; or Gene Schmitz, Benton County, (660) 438-5012.

This research project is being supported by the Fertilizer and Ag Lime retailers and University of Missouri Extension.

Controlling Intake Of Pasture Supplements to Grazing Cattle

As many producers know, salt can be added to feed to limit supplemental feed intake of grazing cattle, but how much is the question?

This could be especially important in dry years or late summer when the pastures decline significantly in nutritional quality and supplementing is necessary.

The Salt Institute is the world's foremost authority on salt and its more than 14,000 uses. Salt (Sodium Chloride-NaCl) is one of the few minerals cattle crave when it is in short supply: http://saltinstitute.org

Larry Berger, University of Illinois Professor of Animal Science wrote the booklet entitled "Salt and Trace Minerals for Livestock, Poultry and other Animals". He suggests that the "science" of using salt to regulate intake has been adequately researched but, the "art" of using this technology is still developing, as many producers can attest.

The proportion of white salt in a self-fed mixture can vary from 5 to 40%, which is a huge variation. Do not use trace mineralized salt at greater than 0.05% of the mixture.

Berger suggests if producers want to limit intake from 1 to

2 pounds per day of supplement, they need to add between 30 to 40% salt in the mix, especially for mature grazing cows. For yearling cattle use 5% initially to limit intake to a pound a day. As cattle grow and the grass matures and becomes limited, 20 to 30% may have to be added to the supplement to maintain desired levels of intake.

Besides desired intake, producers also should factor in age and weight of the livestock, the quality and quantity of accessible forage, the grind of the salt (the finer the grind, the less salt needed in the mix), salinity of the water source (the higher the salinity of the water source the less salt that should be added to the feed). As weather becomes more severe, more salt is required because the livestock are less prone to graze. Also consider that if your livestock are really hungry, more salt is going to be required in the mix to keep them from over-eating. The Salt Institute recommends hand-feeding for a week before allowing free choice access to the supplement.

When using salt to restrict feed intake, water requirements can easily increase by 50 to 100%, so make sure your livestock have a plentiful water supply. Livestock can tolerate high amounts of salt in their diets, but they have to have access to water. When winter arrives and the snow starts flying and the temperatures are below freezing, this becomes even more important. Livestock tend to increase their consumption of the salt mixture during these times, so producers need to be aware that placing the salt mixture right by the water supply will restrict grazing distribution.

Another option producers can use to restrict feed intake is adding ionophores such as monesin (Rumensin) or lasalocid (Bovatec) to the supplement mix. Adding an ionophore, according to research, allows the use of a salt concentration that reduces the animal to animal variation in intake, increases average daily gain of grazing cattle and decreases the number of adjustments in salt concentration by half. Muller et al, showed that self-feeding a salt-monesin-supplement gave the same improvement in daily gain (0.2 pounds per day) as hand feeding the monesin supplement without salt. Salt is already a proven intake regulator and can be made even better with the addition of ionophores. Using salt as an intake regulator of self-fed supplements on grass is one management tool that can increase the bottom line of cattle producers.

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AG CONNECTION

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