Pasture Weed Walk Coming Up

Anyone that has pastures has weeds. Sometimes it is not economical to control them but many times it is. Whether it is mowing, fertilizing, reseeding or using a herbicide, many options exist for controlling weeds in our pastures.

Join us on Tuesday June 19th, at 7:00 pm in Berea for a pasture weed walk. Dr. JD Green, UK Extension Weed Control Specialist will be leading a program about pasture weed control. Topics include identification, control options and proper timing for best results.

Our walk will take place at the Seals Farm (Preston and Gaye) located at 119 Galloway Lane, Berea, 40403.

Please give me a call if you plan to attend, 859-623-4072, so we can prepare enough materials. Light snacks and drinks will be available.

Brandon Sears
County Extension Agent
for Agriculture & Natural Resources
859-623-4072 or brandon.sears@uky.edu

Forage Timely Tips: June

- Clip pastures for weeds and grass seed heads as needed.
- Protect round bales of hay from weather damage to minimize storage losses of yield and quality.
- Soil test for late-summer seedings.

We continue to offer free soil testing year round. Bring at least two cups of dry soil for each test. If you have questions, call 859-623-4072.

Agricultural and horticultural samples from Madison County residents will be accepted. There is a 10 sample limit per farm or home per calendar year! (Please note: Commercial lawn care companies submitting samples do not qualify for free soil testing; call 859-623-4072 for pricing.) We would like to thank our sponsors for making this possible:

Madison County Extension District Board and Madison County Conservation District
As livestock producers we know how important proper rumen function is for the health and profitability of our beef cattle. I came across this interesting article online from the Noble Research Institute that gives a more in depth look at rumen microorganisms, their function and what research scientists may be able to do to help beef cattle producers.

**AN INTRODUCTION TO THE RUMEN MICROBIOME**

*By Ryon Walker, Ph.D., Livestock Consultant, Noble Research Institute*

The discovery of the microbiome has allowed scientists over the last 10 years to understand the functions, processes and mechanics of how microorganisms work.

**What is a microbiome?**

A microbiome is the genetic material of a collection or community of microorganisms in a particular environment. Ruminants, beef cattle for example, have a highly competitive community with a complex microbiome that consists of bacteria, archaea, protozoa, fungi and viruses. These microorganisms, bacteria for example, can either be symbiotic and work with one another or be competitive against each other to complete a specific function. Microorganisms can either be symbiotic and work with one another or be competitive against each other.

**What types of microorganisms live in the rumen?**

The rumen microbiome is very complex, and the diversity of ruminal microorganisms can be affected by diet composition, genetics and environmental factors. There are approximately 7,000 bacteria species and 1,500 archaeal species in the rumen. Rumen protozoa is present when animals are fed high-grain diets, and rumen fungi represents approximately 10 percent of the total rumen microbiome at any given time.

![Four parts of the ruminant stomach](image)

**Four parts of the ruminant stomach**

1. **Reticulum** - Moves chewed-up food particles from the esophagus to the rumen and omasum.
2. **Rumen** - Acts as a fermentation vat where larger food particles are digested by microbes.
3. **Omasum** - Receives smaller food particles directly from the reticulum. Absorbs nutrients and water.
4. **Abomasum** - Produces and receives enzymes that help with protein absorption in the intestines.

**Why are rumen microbes important?**

Rumen microbes play an important role in rumen development in young, nursing calves. They also play important roles in the nutritional (such as feed and digestion), physiological and immunological functions of its host. They oftentimes support each other to ferment plant structural and nonstructural carbohydrates and proteins.

**How does diet affect the microbes?**

Diet affects the rumen microbiome population, and a rapid change in the diet can drastically change the microbiome population. These populations are different for nonstructural carbohydrates (concentrate diets: starch versus non-starch) versus structural (forage: annuals versus perennials) carbohydrates. Rapid changes can cause delayed animal response (body weight gain, immunity, etc.) to a specific diet.

*Continued next page...*
What are some examples of the roles microbes play in the rumen?
Bacteria dominate the gut and contribute mainly to the production of volatile fatty acids (VFAs). Some bacteria species (*Eubacterium ruminantium*) are responsible for converting unsaturated fatty acids to more saturated fatty acids in the gut, which is necessary for fiber breakdown. These are more common from animal to animal. Some species (*Megasphaera elsdenii*) take up lactic acid to reduce the incidence of acidosis in the rumen. These vary in concentration from animal to animal. Archaea's main responsibility (approximately 90 percent) is tying up the extra hydrogen in the rumen to convert it to methane production.

What are scientists doing to better understand the rumen microbiome?
Scientists now have the ability to genetically sequence the genome of specific microorganisms. This sequencing would allow for future research into the discovery of targeting specific microorganisms and changing the outcome of specific responses to diet, environment and health challenges.

How could rumen microbiome research help livestock producers?
The biggest impact this discovery could have on the beef industry is during the pre-weaning phase and through the stocker phase, before entering the feedlot. This period is when the biggest change in diet occurs during a calf’s life (for fall-weaned calves in the South, the diet changes first from milk to hay plus supplement then to cool-season grasses). Approaches to engineering the early rumen microbiome to promote rumen development and function would improve the negative effects of transition during the weaning process. Other impacts of this discovery could include inhibiting rumen methanogens, which could mitigate methane emissions in ruminants, as well as discovering new genes with fiber-degrading activities that enhance forage efficiency. For example, research out of New Zealand focuses on understanding rumen function to find a balance between food production and greenhouse gas emissions.

What does the future hold for rumen microbiome research?
Expect to see new technologies to identify species and their roles in the rumen ecosystem. By identifying the species that make up the rumen microbiome and their roles, researchers will have a better understanding of rumen function and the roles these microorganisms have on improving animal productivity and decreasing environmental pollutants.

The rumen holds about 40 gallons and one milliliter of rumen fluid contains:

10 Million protozoa
Protozoa - Protozoa are almost visible to the naked eye at 100 microns in length. Nearly 10 million protozoa populate just 1 milliliter of rumen fluid. Protozoa digest bacteria, starch granules and fiber.

100 Billion bacteria
Bacteria - Bacteria are 100 times smaller than protozoa. Bacteria digest sugars, starch, fiber and protein.

10,000 fungi
Fungi - Fungi produce powerful cellulolytic enzymes key to breaking down fiber in grass and hay, making forage more easily digestible. Comparatively, this is a smaller population, however, fungi are influential in nutrient delivery to cattle. (Source: Beef Magazine - Read the full article online at bit.ly/ rumen-microbes)

For more information visit:
By Dr. Dan Undersander, University of Wisconsin Forage Agronomist

When harvesting hay or haylage we tend to think in terms of how long it takes to get the hay off the field. However, the first concern for quality hay/haylage should be how long it takes to lose the first 15-20% moisture. Forages have 75-80% moisture when cut; they will continue to respire sugars (break down and give off heat and carbon dioxide) at a high rate until the plant is dried to 60% moisture. If we want to save the energy of the starch and sugars for our cattle, we need to dry off the first 15-20% moisture as quickly as possible.

Most of the respiration takes place in the leaves. We should remember that conditioning is for drying the stems but has little impact on drying the leaves. A wide swath has the biggest effect on rate of leaf drying. Leaves dry faster in a wide swath because:

- More sunlight falling on the field is intercepted for drying. (A windrow intercepts only 25-30% of sunlight falling on the field while a wide swath intercepts 70-100% of sunlight.)

- Light keeps the leaf stomates open longer, so moisture can leave through leaf openings. Since most of the forage in a windrow is in the dark, the leaf stomates close to seal the leaf surface.

Table 1 shows the losses that can occur due to making a windrow rather than a wide swath. Data indicate that starch and sugar loss can range from 2-8% of dry matter. If we assume a median starch/sugar loss of 4% of dry matter due to hay in a windrow compared to a wide swath, then the dry matter economic loss is $6.40/ton, according to current hay prices in the Midwest for large square bales.

However, the respiratory losses of starch and sugar also increase the fiber content of the forage. If the forage was near 40% NDF (prime hay/haylage) when cut, then the 4% starch loss will increase fiber 3.4 units and lower the quality to Grade 1 hay (125-150 RFQ). Grade 1 hay is currently selling for $38/ton less than Prime hay. The value to dairy producers is about twice the price differential between hay grades.

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**Table 1. Forage Losses Due to Respiration**

<table>
<thead>
<tr>
<th>Dry matter loss</th>
<th>2%</th>
<th>4%</th>
<th>8%</th>
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<tbody>
<tr>
<td>---Economic Loss---</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Hay Value $150/ton</td>
<td>$3.00</td>
<td>$6.00</td>
<td>$12.00</td>
</tr>
<tr>
<td>Hay Value $186/ton¹</td>
<td>$3.20</td>
<td>$6.40</td>
<td>$14.88</td>
</tr>
</tbody>
</table>

---Forage quality of Prime (>151 RFQ) hay ---

<table>
<thead>
<tr>
<th>ADF, %</th>
<th>NDF, %</th>
<th>RFQ</th>
<th>Value $/ton</th>
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</thead>
<tbody>
<tr>
<td>30.0</td>
<td>40.0</td>
<td>153</td>
<td>$186¹</td>
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</tbody>
</table>

-Forage quality if lose 40% dry matter starch/sugar-

<p>| | | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>33.0</td>
<td>43.4</td>
<td>134</td>
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<tr>
<td></td>
<td></td>
<td>$148¹</td>
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</tbody>
</table>

Value of quality loss/ton | $38

Value of dry matter and quality loss | $44.40

¹Hay price for large square bales from Midwest Hay Price summary, March 26, 2018

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Many farmers have switched to making wide swaths when mowing. A wide swath is the single most important factor affecting forage drying rate; it is more important than conditioning. Farmers who continue to put hay into windrows are increasing drying time and risk of rain damage. They are also currently losing about $44.40/ton due to yield and quality losses from increased respiration. Considering this dollar loss, most farmers could figure out a way to make wider swaths with their existing equipment; they should also look at wide swath mowers when replacing mowing equipment.

(Source: Dan Undersander, NAFA News Release May 15, 2018)

Spray Timing for Roundup Ready Alfalfa

During the last month I have had several calls about the proper timing to spray Roundup Ready alfalfa varieties with Roundup. This is reported in the new “Weed Control in Alfalfa” publication UK Extension publication, AGR-148, [http://www2.ca.uky.edu/agcomm/pubs/agr/agr148/agr148.pdf](http://www2.ca.uky.edu/agcomm/pubs/agr/agr148/agr148.pdf).

It states “the initial glyphosate application is necessary at the 3 to 5 trifoliate leaf stage to remove the small percentage of glyphosate-susceptible alfalfa plants that can be present in a new seeding (and to kill any weeds present in the stand). Spraying at the 3 to 5 leaf stage insures that all alfalfa seedings have emerged. But if weeds are present at earlier stages of alfalfa growth Roundup can be sprayed on Roundup Ready alfalfa from emergence up through any stage of plant growth.

Visit Our Local Farmers’ Markets…

Our local Farmers’ Markets have set their summer schedules. Take a look!

**Berea Farmers’ Market:** Open Saturdays from 9 am to 1 pm. Tuesdays from May 1st till July 31st from 4 to 7 pm. The market is located at 416 Chestnut Street in Berea, across from Peoples Bank. For more information check their Facebook page or website: [www.bereafarmersmarket.org](http://www.bereafarmersmarket.org). They also offer a weekly newsletter via email.

**Harvest 859:** This market is open Saturdays from 9 am to 1 pm. Market sets up in downtown Richmond next to the Madison County Courthouse. For more information, check their Facebook page or website: [www.harvest859.com](http://www.harvest859.com).

**Madison County Farmers’ Market:** Open Saturdays 8 am to 12 noon. In July, the market will also be open from 8 am to 12 noon on Tuesdays. Market sets up at in the parking lot of Lowes in Richmond. This market also sets up at EKU’s Alumni Coliseum parking lot starting Thursday, June 7th 10 am to 1 pm. Check their Facebook page or website at [www.madisonkyfarmersmarket.com](http://www.madisonkyfarmersmarket.com) for more information on the 2018 season.
POWER OF PRODUCE!

Join the Madison County Cooperative Extension Service this summer and learn about the Power of Produce. We will visit each Farmers Market once & we hope you will too!

During each visit, kids ages 4-18 can try a “hello” bite and complete an activity to earn up to $4 in Farmers Market Money to be used at the Market that day! Recipe samples, containing the featured produce will also be available for adults to try. What a great way to try new things and earn FREE produce!

At each Farmers Market, the first 50 participants will also receive a FREE t-shirt. Sizes based on availability. Come to all three Farmers Markets and be entered to win a prize!

Harvest 859 Market
1st Street, Downtown Richmond
www.harvest859.com
Saturday, July 7 from 9am until 1pm

Madison County Farmers Market
Lowes Parking Lot in Richmond
www.madisonkyfarmersmarket.com
Saturday, July 21 from 8am until Noon

Berea Farmers Market
416 Chestnut Street, Berea
www.bereafarmersmarket.org
Saturday, August 11 from 9am until 1pm

MADISON COUNTY BEEKEEPERS ASSOCIATION
The Madison County Beekeepers Association will meet at the Madison County Extension Office on Monday, June 25, 2018, at 6:00 pm. For more information call Kent, 859-623-3576 or Paul, 859-582-6172.

PLATE IT UP! KENTUCKY PROUD!
Whether it’s spring, summer, fall or winter, you can Plate It Up with delicious recipes that put a new twist on your favorite Kentucky Proud foods. Visit http://fcs-hes.ca.uky.edu/piukp-recipes to find all the Plate It Up recipes using Kentucky Proud products.

Please Read! If you received this newsletter in the mail and wish to be removed from our newsletter mailing list, or if you find an error on the mailing label, please contact the Madison County Extension Center at 859-623-4072.