MAY 2024

Pulaski County Extension Office

# Agriculture Newsletter

"Agriculture is the most healthful, most useful and most noble employment of man."
– George Washington

Cooperative Extension Service

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT



Lexington, KY 40506

# UPCOMING EVENTS

**Wheat Field Day**
*May 14, 2024*

**KATS Crop Scouting Workshop**
*May 21, 2024*

**KATS Soil Properties & Their Impact on Delivering Water & Nutrients**
*June 6, 2024*

**Drone Pilot Certification Workshop (Madisonville)**
*June 10 & 11, 2024*

**Pest Management Field Day (IPM Grain Crops)**
*June 27, 2024*

**CORN, SOYBEAN & TOBACCO FIELD DAY**
*July 23, 2024*

**KATS Field Crop Pest Management & Spray Clinic**
*August 29, 2024*

Martin-Gatton College of Agriculture, Food and Environment | Grain and Forage Center of Excellence

Cooperative Extension Service

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT



Lexington, KY 40506

AGR-264

# Improving Kentucky Small Ruminant Pastures

University of Kentucky
College of Agriculture, Food and Environment
*Cooperative Extension Service*

*Chris D. Teutsch, Jimmy C. Henning, and S. Ray Smith, Plant and Soil Sciences; and Krista L. Lea, Forage Extension Program*

Well-managed pastures can provide a nutritious and inexpensive feed source.

Pastures should be soil sampled to a depth of 3 to 4 inches using a soil probe.

Inexpensive sprayers can be attached to ATVs or golf carts to apply herbicides on small pastures.

## Pasture Management

For many small ruminants, quality pasture can provide almost all nutrients needed for maintenance or light work for much of the year. Pasture reduces the cost of keeping livestock while minimizing impacts on the environment. Below are some guidelines for improving pastures.

**Plan to utilize spring and fall pasture growth.** Kentucky pastures are dominated by cool season species such as tall fescue, Kentucky bluegrass, orchardgrass and white clover. These species grow rapidly in the spring and fall. Design grazing plans to utilize this natural flush of growth.

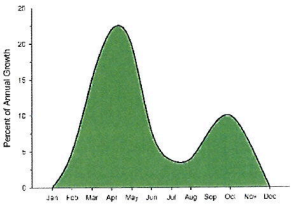
**Soil sample every 2 to 3 years.** Soil nutrients play a key role in pasture productivity and persistence. Soil tests recommend additions of phosphorus (P), potassium (K) and lime (adjusts pH) based on what is needed.

**Apply fertilizer strategically.** Apply fertilizer using a current soil test as a guide. Applying needed nutrients will boost yield and keep forage stands productive and competitive with invasive weeds.

**Control weeds that limit pasture productivity.** Successful weed control includes identifying major weeds, selecting herbicides that are proven to control those weeds and applying at the correct time of year for the targeted species. A thick stand of desirable forages improves long term weed control. Always follow the herbicide label.

**Overseed thin stands to increase available forage.** Fall overseeding of pastures can fill in bare areas left by heavy grazing or aggressive weed control programs. Mow pastures close before drilling seed into the sod. Seed should be placed ¼ to ½ inch deep and should be well established (usually 4 to 6 inches in height) before grazing. Using an improved variety adapted for the area is well worth the investment.

**Re-establish poor pastures.** When desirable forages make up less than half a pasture, complete re-establishment may be needed. Two killing sprays with a non-selective herbicide 4 to 6 weeks apart will be required to remove all undesirable species followed by fall seeding. Pastures can be grazed late the following spring once grasses are well established.



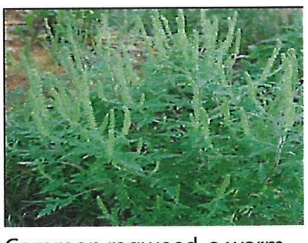

Cool-season grasses grow best in the spring and fall; summer growth is limited by high temperatures.

Apply fertilizer strategically using a current soil test as a guide.

**Use rotation and clipping to manage internal parasites.** Rotationally graze pastures leaving at least 4 inches of residual to prevent re-infestation of small ruminants with internal parasites. Removing a cutting of hay will also reduce the parasite load in fields.

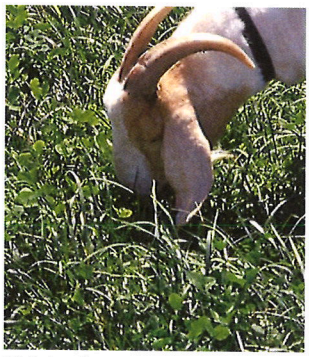
Buttercup, a prolific reseeding annual or perennial. Control in late winter, before flowers are visible.

Horsenettle, a warm-season perennial. Controlled in late summer.

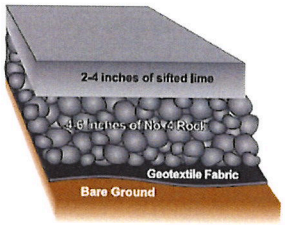


Common ragweed, a warm season annual. Controlled in summer with herbicides or aggressive mowing.

Plantain, a cool season perennial. Edible, but limited yield, best controlled in fall or spring.



Thick, vigorous pasture stands will suppress weeds, intercept rainfall and keep plant crowns and soil cooler.




Heavy use areas are constructed by placing geotextile fabric under crushed stone and dense grade aggregate. These areas provide a dry place for feeding or loafing during wet weather or when pasture is limited.

Fall stockpiled tall fescue can extend the grazing season with high-quality pasture.

## Grazing Management

While improving pastures can significantly improve forage production, changes in grazing management are often needed to maintain improvements long term.

**Consider the stocking rate.** On average, one acre of productive pasture will support two mature ewes or goats for the year. Higher stocking rates may result in overgrazing of desirable grasses, high weed populations and bare areas. If land area is inadequate, consider limiting grazing by confining small ruminants to stalls or sacrifice areas especially during periods of slow or no forage growth.

**Implement rotational grazing.** Rotating stock from one pasture to another gives pastures time to rest. Rotations can be as simple as two pastures rested 2 to 4 weeks or as complicated as weekly rotations as dictated by plant growth. Rotations can help manage internal parasite loads in small ruminants.

**Designate sacrifice areas.** Even well-managed pastures do not grow during the winter months. During such times, keeping small ruminants in designated sacrifice areas will protect pastures from overgrazing. In some cases, these areas can be improved by installing heavy use pads.

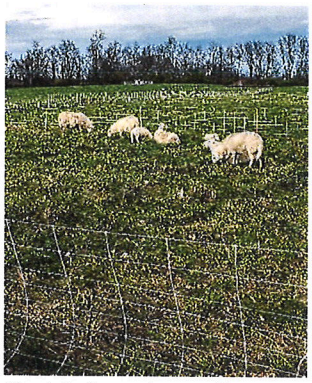
**Install heavy use pads.** Cover is hard to maintain in high-traffic areas such as around water, shade, and feeding areas. Installation of geotextile fabric with crushed stone and dense grade aggregate provides permeable, dry footing for small ruminants and caregivers year around with minimal upkeep.

**Manage toxic tall fescue.** Naturally occurring tall fescue is often infected with a toxic endophyte that can hinder breeding, milk production or gain in sheep and goats. Dilution with legumes, minimizing seedheads, and replacement of some acres with non-toxic tall fescue or other desirable forages will help manage the effects of toxic tall fescue.

**Provide high-quality forage at key times.** Large amounts of high-quality forage are needed at critical production times like flushing breeding animals, lactation or fattening young stock. The use of summer and winter annuals can help in these periods.

**Use legumes strategically.** Legumes add yield and nutritive quality to small ruminant pastures in addition to fixing nitrogen that will cycle through the animals and back to the soil. Legume pasture can be very beneficial for young stock after weaning or during lactation. High-legume pastures can sometime suppress estrus due to phytoestrogens.

Close and frequent grazing weakens sods, lowers yield, increases weed invasion and increases ingestion of internal parasites.



Electric fence is an effective and inexpensive way to begin rotational grazing.

Endophyte infected tall fescue can cause heat stress, reduced milk production and lower gains in small ruminants especially in late spring and summer.

## Additional Resources

**UK Cooperative Extenson Service.** Extension offices can be found in every county of the Commonwealth. Visit http://extension.ca.uky.edu/county to find your county office or call (859) 257-4302.

**UK Forage Extension.** Information and educational events on pastures and forage production can be found at https://forages.ca.uky.edu/.

**UK Weed Science.** Publication and resources on weed control can be found at http://weedscience.ca.uky.edu/forages.


Issued 4-2021

# Hay Fires: Should I Be Concerned?

Posted on **April 3, 2024**

Each year a small number of producers lose hay and barns to hay fires, but for those that do it is devastating. A much more common occurrence though is quality losses that occur due to excessive heating of freshly harvested hay. How do heating and quality losses occur and what can you do to monitor and prevent hay fires?


Producers are challenged each year with small windows of opportunity in their efforts to bale and store hay at the proper moisture level while avoiding the risk of rain damage. Forage cut for hay must go from approximately 80% moisture to 20% moisture or less in order to be stable in storage as baled hay. As the cut forage dries down, both plant and microbial respiration (burning of oxygen) continues in the field.

All hay baled above 15% moisture will undergo some elevation in temperature the first couple of weeks in storage. Many producers refer to this elevation in hay temperature following baling as "sweating" or "going through a heat". This rise in temperature is caused by both plant and microbial respiration. Dr. Mike Collins, retired UK professor, reported that a small amount of heating (130°F or less) does not decrease hay quality and actually serves to dry down the hay by evaporating some of the moisture content.

Baling and storing hay high in moisture content (>20%) without taking steps to reduce or control microbial activity responsible for heat of respiration may reduce nutritional quality. Soluble carbohydrates are the principal group of compounds utilized "burned off" during respiration. The decrease of soluble carbohydrates and other chemical components during microbial respiration results in an increase in acid detergent fiber (ADF) which lowers digestibility.

When hay undergoes significant heating during storage, hay color can change dramatically, for example, green to various shades of brown. The degree of color change (e.g. light brown to dark brown) is indicative of the severity of heat damage to the hay. This type of heat damage represents a chemical reaction that fuses plant sugar and amino acids into an indigestible compound and is called the Maillard reaction. This compound is also referred to as bound protein even though the sugars are rendered indigestible. The degree of heat damage can be quantified by conducting a chemical analysis for acid detergent insoluble nitrogen (ADIN).

Baling and storing hay high in moisture content can result in spontaneous combustion or a hay fire. Hay stored at moisture levels sufficient to maintain high relative humidity of the air in the hay mass allows plant and microbial respiration to generate heat and elevates hay temperatures to 158°F. The 158°F temperature may be reached within a few days or it may take several weeks if the air is drier. Above 158°F heat continues to be generated by oxidative chemical reactions.

When the temperature exceeds 175°F, the thermal death of microbes takes place. The increase in temperatures due to the oxidative chemical reactions is basically responsible for greatly increasing the potential for a rapid increase in heat to combustion temperatures of 448 to 527°F. The amount of time required for heating up to combustion may vary from four to ten weeks; however, it could be earlier or later. The moisture content of the forage, bale density, climatic and storage conditions ( e.g. size of stack) are all factors that influence the time until combustion.

Important Points and Recommendations

• Small square bales should be baled at 20% moisture or less to keep molding and heating to a minimum.

• Since large round or rectangular bales retain internal heat, bale at less than 18% moisture.

• When baling above 20% moisture propionic acid can be applied to reduce microbial activity and subsequent heating. Check for recommended application rates.

• Round bales should usually be left in the field for a 1 to 3 weeks (depending on moisture at baling) to allow heat to dissipate. When moist hay is stacked immediately after baling, the stack concentrates the heat, temperatures rise, quality losses occur, and the stage is set for a hay fire.

• Check hay regularly. Symptoms of heating include: slight caramel odor, strong burning odor, visible vapor, strong musty smell, and hay that feels hot to the hands.

• Make a probe that can be driven or inserted into the hay mass to check the temperature. For example: take a 10' piece of pipe or electrical conduit. Attach a pointed dowel to one end and drill 6 to 10 1/2 inch diameter holes in the tube just above the dowel. Drive the prove into the hay stack and lower a thermometer on a string into the probe. Leave thermometer for 10-15 minutes in several areas of the stack to ensure an accurate reading.

• Watch for the following temperatures:

· 150°F * Beginning of the danger zone. Check temperature daily.

· 160°F * Dangerous. Measure temperature every four hours.

· At 175°F * Call the Fire Department. Wet hay down and remove it from the barn away from buildings and other dry hay.

· At 185°F * Hot spots and pockets may be expected. Flames will likely develop when heating hay comes in contact with the air. Be extremely careful at this stage when moving hay.

· At 212° *Critical. Temperature rises rapidly above this point. Hay will almost certainly ignite.

Take precautions and be extremely careful upon entering the barn when hay temperature are above 160°F. Pockets may have already burned out under the hay surface. Before entering a barn, place long planks on top of the hay. Do not attempt to walk on the hay mass itself. Always tie a rope around your waist and have a second person on the other end in a safe location to pull you out should the surface of the hay collapse into a fire pocket. This last recommendation may seem extreme, but precautions are essential when hay temperatures reach dangerous levels. ~ excerpted from Virginia Tech article by Dr. Ray Smith and Jerry Swisher

# GRASSLANDS PARTNERSHIP PROJECT

The Pulaski County Cooperative Extension Service has been selected among a dozen counties in Kentucky to participate in a USDA funded, multi-state project referred to as the "Grasslands Partnership". The goal of this project is to implement and demonstrate climate smart practices that improve grasslands management and, in turn, improve farm productivity, profits, and access to future markets that may expect enhanced environmental benefits.

This project is focused on documenting the impact of six grassland management practices on soil carbon storage, input costs, profitability, productivity, and, for some practices, responses of grassland birds and pollinators. Participants are required to install at least three of the designated practices and required to maintain them for a 5-year period. Support will be provided to implement practices.

During the 5-year period, participants will allow researchers access to their farms to collect data on the impacts made as a results of the practices. Participants will also be required to maintain detailed grazing management, fertilizer, herbicide, and seeding records. One or more field days will also be held on each participating farm.
The six grassland management practices included in this program are as follows:

Perennial Native Grasses- Participants will establish a minimum of 5 and up to 25 acres of big bluestem/ Indiangrass/little bluestem seed mix or switchgrass. Proper grazing management practices will be applied.

Perennial Grass/Forb Buffers- Participants will establish 60 feet wide buffers (2-10 acres total) around row crop fields to reduce runoff and encourage habitat for birds and pollinators.

Alternative N Sources- Participants will establish and maintain 5-30 acres of legumes. No nitrogen may be applied during the 5-year period. Acres enrolled will include grazing management practices. mproved Grazing Management- Participants will implement improved grazing practices on 10 to 30 acres. Managed grazing heights will be implanted and grazing will begin when enrolled field reaches 10 inches and livestock will be removed when residue reaches 4 inches.

Silvopasture- Participants will establish 2-10 acres of silvopasture. Silvopasture, a sustainable agroforestry practice, involves the intentional integration of forage, trees, and livestock. Silvopastures offer potential for numerous environmental, economic, and social benefits, including improved soil health, increased biodiversity, enhanced livestock responses, and diversified income streams for farmers.

Novel Soil Amendments- Participants will apply biochar or gypsum, to slow soil N transformations and losses from the soil and increase rates of carbon sequestration. Measurements will be collected on forage productivity and nutritive value, as well as carbon sequestration and the mitigation of greenhouse gases in grasslands.

Of the above listed six practices, a minimum of three practices must be implemented by the participant.  In addition, the participant must have a field that undergoes their normal management.

In other words, "business as usual".  Data will be collected from this field to further document improvement made from the practices implemented.

If you would like to know more about the Grasslands Project, contact the Pulaski County Cooperative Extension Service at 606-679-6361.

Martin-Gatton
College of Agriculture,
Food and Environment

Pulaski County Extension Office
P.O. Box 720
Somerset, KY 42502
Phone: (606) 679-6361




# Scrumptious Strawberry Salad

**5 cups** spinach
**½** large cabbage head, chopped
**1 cup** golden raisins
**1 cup** halved red grapes
**1 pint** sliced strawberries
**½** small red onion, sliced
**½ cup** toasted and chopped pecans (optional)

***Dressing***
**¾ cup** plain non-fat Greek yogurt or plain regular yogurt
**3 tablespoons** honey
**6 tablespoons** apple cider vinegar
**3 tablespoons** olive oil
**½ teaspoon** Dijon mustard
**1 teaspoon** poppy seeds
**1 teaspoon** salt
**½ teaspoon** pepper

**Combine** all salad ingredients together in a large bowl. Prepare salad dressing by **mixing** all ingredients together in a jar, **cover**, and **shake** well to combine. **Pour** dressing over salad mixture and **toss** to combine.

**Yield:** 8, 2-cup servings

**Nutritional Analysis:**
240 calories, 10g fat, 1g saturated fat, 0mg cholesterol, 340mg sodium, 33g carbohydrate, 4g fiber, 27g sugar, 6g added sugars, 5g protein