

Grazing Summer Grasses: What to Expect

Despite the fact that horses graze year-round, pasture forage does not. Pasture grasses vary from season to season and even from month to month. Each new season brings limitations and availabilities to pastures, and understanding these rhythms will help horse owners take advantage of forages year-round.

The most important difference to understand is cool-season vs. warm-season grasses. Cool-season grasses, such as orchardgrass, bluegrass, and tall fescue, grow during the cool spring and fall months, while warm-season grasses, such as Bermudagrass and crabgrass, grow during the summer months.

Cool-season grasses are most productive when the air temperature is 65-75°F. They respond well to high soil moisture, cooler temperatures, and short photoperiods, making them most productive in the fall and spring. As summer arrives and temperatures increase, growth will slow and cool-season grasses will enter dormancy, sometimes referred to as the “summer slump.”

Warm-season grasses, on the other hand, become productive during the summer months before going dormant in the fall. Their growth rate is most efficient when the air temperature is 85-95°F. Warm-season grasses can tolerate low precipitation because they are more efficient at using water than cool-season grasses; warm-season plants require on average 50% less water than cool-season plants to produce a single unit of forage dry matter. Warm-season grasses are generally lower in protein than cool-season grasses, but tend to have a higher forage yield due to greater efficiency with nitrogen use and photosynthesis.

Depending on the region, warm-season grasses can provide high-quality grazing, or they can be a nuisance. Forage seasonality can provide challenges and opportunities that, with good planning and management, property owners can optimize for grazing. Each season it is important to understand what forage species you have, your operation’s goals, and how to manage those forage species in your favor.

Common Warm-Season Grasses

Bermudagrass (*Cynodon dactylon*)

Bermudagrass is a sod-forming, warm-season perennial grass that is widely grown throughout the southern United States for both pasture and hay. It is well-adapted to a variety of soil types and conditions but is most productive on fertile, well-drained soils. Bermudagrass is well-liked for its potential to produce high yields and, when managed properly, has a nutritional value comparable to that of orchardgrass or tall fescue. However, production depends on proper nitrogen and potassium fertilization. Due to its low-growing nature, Bermudagrass tolerates traffic well and can withstand intense grazing



Foxtail is safe for horses, but has a low nutritional value.

Articles of Interest

UK Researchers Awarded Grant to Study an Avermectin Dewormer

UKVDL Releases New Test Rates

UK to Host Eastern Kentucky Grazing Day

Graduate Student Spotlight: Jennifer Janes

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Upcoming Events

pressure. In a 120-day study at the University of Kentucky in 2007, 14 adult open mares were rotationally grazed on 4.9 acres of well-fertilized Bermudagrass and were able to maintain body condition throughout the summer. For more information on this study, see the UK publication AGR-48 Bermudagrass: A Summer Forage in Kentucky located at uky.edu/Ag/Forage/ForagePublications.htm.

Crabgrass (*Digitaria* spp.)

There are several crabgrass species, the most common being large crabgrass, smooth crabgrass, and southern crabgrass. While these species can vary in appearance, generally crabgrass has an oblong leaf shape and can have pubescence (hair) on the stem and leaf surface. Crabgrass is a bunch grass that has a tendency to quickly fill bare spots in pastures in late spring. Depending on the region, property managers consider crabgrass either a quality forage or

Grazing Summer Grasses

a weed. In the Deep South crabgrass is managed and utilized as a highly nutritional forage. Further north, crabgrass has such a short growing season that overall productivity is low, making it an undesirable forage.

Bahiagrass is widely planted in Florida and other regions of the southeastern United States. It is well-liked for its low fertility and management requirements. However, it does not have high nutritional quality, so would not be suitable to maintain growing or lactating horses.

Less-Desirable Warm-Season Grasses

There are several other types of warm-season grasses found in pastures that are not considered good forages for horse pastures:

Millets are leafy, rapidly growing annual forages that have no risk of cyanide production. There are several types of millets, the most common ones being pearl millet and German (foxtail) millet. Pearl millet is very productive over a short growing season, and is identified by its seedhead shaped like a large cylindrical spike, similar to a cattail. German millet is fine-stemmed but less productive than pearl millet. German millet is not recommended for horses due to a toxin that has been shown to cause kidney and joint issues.

Weedy foxtails are rapidly growing, clump-type annual grasses known for their seedheads that resemble a fox's tail. There are a few types of weedy foxtails: giant foxtail, yellow foxtail, and green foxtail. Foxtails are safe for horses to eat; however, they have low nutritional value and palatability and are, therefore, not ideal horse pasture forage. Another concern with grazing weedy foxtail is that mature seedheads produce long, pointed awns that have the potential to irritate horses' mouths and cause infection. If grazing fields with foxtail, try to graze before seedheads emerge, or mow

Here's the Science:

C3 plants (referred to as cool-season or temperate) and C4 plants (warm-season or tropical) both use photosynthesis to convert light energy and carbon dioxide to carbohydrates and oxygen. They differ in how their chemical pathways carry out photosynthesis, affecting their efficiency. Cool-season grasses fix energy into 3-carbon units, hence the name C3 plants. Warm-season grasses fix energy into 4-carbon units, making them C4 plants. This dictates that C3 and C4 plants will differ in optimal growing conditions, forage quality, and nitrogen and water-use efficiency.

the seedheads before grazing. The best weedy foxtail control is to maintain good ground cover. Because they are annuals, shaded soil in the late spring and early summer can greatly reduce foxtail seed germination.

Nimblewill is very invasive, difficult to control, and hard to get rid of.

A Grass That's Considered a Weed

Nimblewill (*Muhlenbergia schreberi*) is a wiry, upright growing warm-season perennial grass similar to creeping bentgrass and Bermudagrass in structure. The leaves are short, thin, and flat, with veins visible on the upper surface. It can be troublesome in horse pastures for two reasons.

First, horses typically will not eat nimblewill, making it undesirable for pastures and classifying it as a weed. Second, nimblewill is very invasive, difficult to control, and hard to get rid of. It is extremely adaptable, thriving in the eastern and central United States, though it is most common north of the Bermudagrass belt. It has become an increasingly common weed in western Virginia, West Virginia, Kentucky, and surrounding states. Nimblewill spreads

by stolons, which are aboveground stems that grow horizontally across the soil surface and produce new plants at beadlike nodes. (Bermudagrass differs in that it spreads through both stolons and rhizomes, or underground stems.) Chain dragging in the summer months is good practice for parasite control, but it can spread nimblewill and other weed seeds through a field. Mowing can also spread nimblewill through seeds if the mower operator does not clean it out between fields.

Because it is a grass, broadleaf weed herbicides do not have an effect on nimblewill, so complete removal and re-establishment will be necessary to eliminate it. Administer two glyphosate (Roundup) applications at the highest rate to completely spray out nimblewill. Consider spot spraying when you find nimblewill in small patches of an otherwise productive pasture, and always follow label recommendations and precautions. After spraying, reseed the field. Maintaining good ground cover will prevent nimblewill seeds from germinating and reinfesting the pasture. Refer to the article "When and How to Re-establish Horse Pastures," in the June 2014 *Bluegrass Equine Digest*, for more information on complete re-establishment: TheHorse.com/34094. **UK**

>Kelly Prince, an MS candidate; Krista Lea, MS; and Ray Smith, PhD, professor and forage extension specialist, all within the University of Kentucky Department of Plant and Soil Sciences, provided this information.

UK Researchers Awarded Grant to Study an Avermectin Dewormer

A team of researchers at the University of Kentucky Department of Veterinary Science received a \$19,285 Koller Fund grant to study the pharmacokinetics (study of a substance

administered externally) of moxidectin, a type of avermectin dewormer. Moxidectin is used to treat and prevent external and internal parasites in the horse and other species.

Cindy Gaskill, DVM, PhD, clinical veterinary toxicologist at the UK Veterinary Diagnostic Laboratory; Martin Nielsen, DVM, PhD, Dipl. EVPC, assistant professor at the UK Gluck Equine Research Center; and Lori Smith, PhD, senior chemist,

Avermectin Dewormer

toxicology at the UKVDL, are the investigators of the grant.

Macrocyclic lactone (ML) anthelmintic intoxication can occur in horses from overdoses, from interactions with other drugs or plant compounds, or from inappropriate dosing of very young or old animals. Signs of ML intoxication occur due to excessive accumulation of the drugs in the brain. Confirming ML poisoning as a cause of death can be difficult, especially if the owner provides no history of known exposure. The best post-mortem confirmatory test is by measuring drug concentrations in the brain tissue.

The UKVDL has recently received a number of horses for post-mortem evaluation with histories of neurologic abnormalities and suspected exposure to the ML anthelmintic moxidectin at unknown doses. Several of the horses came from Central Kentucky farms.

As stated in the grant proposal, "Results of this study will help confirm or reject a diagnosis of moxidectin intoxication in these horses."

The grant will further help the researchers determine expected brain concentrations of moxidectin post-therapeutic dosing in horses and develop a quantitative HPLC (high performance liquid chromatography) method

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for macrocyclic lactone anthelmintic (e.g., moxidectin, ivermectin) analyses in equine brain tissue. **UK**

>Jenny Evans, MFA, is the marketing and promotion specialist senior at the University of Kentucky Gluck Equine Research Center.

UKVDL Releases New Test Rates

The University of Kentucky Veterinary Diagnostic Laboratory (UKVDL), in consultation with the UKVDL Advisory Committee, has increased fees for 17 tests/panels it offers.

The UKVDL offers 233 tests/panels. On average, the fees for the 17 tests/panels increased 5%. These were selected based on historical volume of testing, availability of the testing at other laboratories, and an assessment of the fee level in comparison with other laboratories.

"We very much appreciate your business and look forward to working with you in the coming fiscal year," said Craig Carter, DVM, PhD, Dipl. ACVPM, director of the University of Kentucky Veterinary Diagnostic Laboratory. "Let us know how we can serve you better."

The new prices went into effect July 1. The fees listed do not include the \$10 accession fee. More information including a full list of all tests/panels offered by UKVDL is available at vdl.uky.edu. **UK**

>Jenny Evans, MFA, is the marketing and promotion specialist senior at the University of Kentucky Gluck Equine Research Center.

Test Name	Current Fee In	Current Fee Out	FY2015 Fee In-St	FY2015 Fee Out-St
Equine adult	\$110.00	\$165.00	\$120.00	\$180.00
Equine fetus/foal	\$50.00	\$75.00	\$60.00	\$90.00
Equine placenta	\$30.00	\$45.00	\$35.00	\$52.50
Food animal adult	\$40.00	\$60.00	\$50.00	\$75.00
Food animal <1 year old	\$30.00	\$45.00	\$40.00	\$60.00
Poultry and other food birds	\$30.00	\$45.00	\$30.00	\$45.00
Small animal/exotic/petbird/wildlife	\$75.00	\$112.50	\$80.00	\$120.00
Spinal cord removal	\$130.00	\$195.00	\$150.00	\$225.00
Field necropsy - equine adult	\$50.00	\$75.00	\$60.00	\$90.00
Field necropsy - equine fetus/foal	\$20.00	\$30.00	\$40.00	\$60.00
Field necropsy - food animal adult	\$15.00	\$22.50	\$40.00	\$60.00
Field necropsy - food animal <1 year old	\$15.00	\$22.50	\$30.00	\$45.00
Field necropsy - poultry/food birds	\$20.00	\$30.00	\$20.00	\$30.00
Field necropsy - small animal/exotic/petbird/wildlife	\$35.00	\$52.50	\$50.00	\$75.00
Biopsy - Histopathology	\$30.00	\$45.00	\$40.00	\$60.00
Fluid exam	\$20.00	\$30.00	\$30.00	\$45.00
Cytology, pathologist review	\$25.00	\$37.50	\$35.00	\$52.50

UK to Host Eastern Kentucky Grazing Day

Due to the overwhelming success of a spring grazing program, the University of Kentucky Master Grazer Program is hosting a one-day grazing school in Morgan County.

The event will take place from 8 a.m. to 12:30 p.m. on Saturday, Aug. 23, at the Morgan County extension research farm in West Liberty, Kentucky. Specialists with the UK College of Agriculture, Food and Environment will cover topics related to fall pasture management.

"The participants will learn about issues producers face during the fall," said

Cody Smith, coordinator for the UK Master Grazer Program. "This includes topics like stockpiling fescue, selecting winter annuals for grazing, summer annuals' performance, and calibrating a no-till drill and an herbicide sprayer."

Anyone is welcome to attend, regardless of whether they participated in the spring grazing school. Refreshments will be provided. Contact Smith at 859/257-7512, Sarah Fannin at 606/743-3292, or Daniel Wilson at 606/668-3712 for more information or to register. Fannin and Wilson are agriculture and natural



resources agents with the UK Cooperative Extension Service in Morgan and Wolfe counties, respectively.

The research farm is located on state Route 172, just past the intersection of U.S. Route 460 in West Liberty. **UK**

>Katie Pratt is an agriculture communication specialist at the University of Kentucky.

GRAD STUDENT SPOTLIGHT

JENNIFER JANES

From: Peoria, Ill.

Degrees: Bachelors of Music, Vanderbilt University, 2002

DVM, University of Tennessee, 2006

PhD, University of Kentucky, 2014

Jennifer Janes came to the University of Kentucky Gluck Equine Research Center for a doctoral degree because it allowed her the unique educational opportunity to pursue her interests in anatomic pathology and equine musculoskeletal disease. She accomplished this through a dual-degree program comprised of an anatomical pathology residency at the UK Veterinary Diagnostic Laboratory and a doctoral degree under the mentorship of James Macleod, VMD, PhD, John S. and Elizabeth A. Knight chair and professor of veterinary science at the Gluck Center.

"The opportunity to learn and train with respected equine scientists was very exciting and has been a wonderful experience," Janes said.

Janes' main research focus has been investigating the roles of orthopedic pathology and genetic determinants in equine cervical stenotic myelopathy, commonly known as wobbler syndrome. Wobbler syndrome is an important neurologic and musculoskeletal disease that can have a significant impact on a horse's health and athletic future. Gaining a better understanding of how this disease develops will enhance veterinarians' identification of susceptible horses, treatment, and management decisions.

"Wobbler syndrome is a multifactorial disease, but a major knowledge gap in our understanding is the interactions of these variables—for instance nutrition, growth rates, possibly genetics, that lead to disease development. So the focus of our project was twofold," Janes said. "First, we used current imaging techniques, specifically MRI and micro-CT in conjunction with classic anatomic pathology, to re-evaluate and identify lesions associated with the neck vertebrae in this disease."

Understanding the types of lesions present in the bone can provide clues about possible disease mechanisms, Janes said.

"Secondly, given recent advances in equine genomics, we were also able to re-examine the long-standing question of the role of genetic determinants in wobbler syndrome," she said.

She says she hopes that, together, these two aims can address current knowledge gaps in wobbler syndrome's cause and development.

"My future plans include pursuing my interests in diagnostic anatomic pathology and collaborative research in an academic setting," Janes said. "I hope to continue to make contributions to the further understanding of musculoskeletal diseases in the horse." **UK**



>Shaila Sigsgaard is an editorial assistant for the Bluegrass Equine Digest.

Hay: Does Fertilization Matter?

Q Should I look for hay that comes from a fertilized or unfertilized field? In what ways would the nutrition be affected? Does fertilizing the field increase the protein content of the hay? What are appropriate questions to ask regarding the hay?

*Roberta
Camano Island, Washington*

A Whether a hay field is fertilized might be more important to the hay producer than to the hay purchaser.

Fertilization might affect the nutrient content of the hay to some extent, but it might also be needed to keep the plants productive. It can increase yield by tons of hay per year, and it can also keep the plants productive for a longer period of time. Fertilization practices should be individualized for the type of plant and the composition of the soil.

Fertilization with nitrogen can affect the amount of crude protein in the hay, but other factors, such as stage of maturity at harvest, are more important. A very immature plant would be one that is very soft and leafy, whereas a mature plant is more stemmy and might have flowers or seed heads on it. As a plant matures, its

Does Fertilization Matter?



nutrient value usually decreases, so hay harvested at a mature stage is less nutritious than hay harvested at an immature stage.

In selecting hay the first thing you should figure out is what your horse's needs are. A young, growing horse requires hay with more nutrients than a mature, inactive gelding, for example. The best hay to purchase is hay that fits the needs of your horse. Another very important item is to make sure that the hay is not moldy or excessively dusty.

Finally, if you are purchasing hay by the bale, be sure to find out how much a bale weighs. A bale that costs \$4, but only weighs 45 pounds, is not a better value than a 60-pound bale that costs \$5!

Laurie Lawrence, PhD

*Professor of equine nutrition
University of Kentucky's Department of
Animal Sciences.*

WEED OF THE MONTH

Common name: Nimblewill

Scientific name: *Muhlenbergia schreberi*

Life Cycle: Perennial

Origin: United States

Poisonous: No

Nimblewill is a warm-season perennial grass that is widespread across the eastern United States. It is a commonly occurring plant in many types of pastures and turf, but especially in Kentucky bluegrass. This stolon- (stem tissue that grows along the ground) producing grass can generate dense stands because the stolons root at the nodes and produce dense, fibrous root systems.

The grayish-green leaf blades are smooth with few hairs and with a loosely spreading growth habit. Nimblewill emerges in the spring and grows throughout the summer. It thrives under a wide range of climatic conditions, especially during the dry summer months usually encountered in Kentucky. The plant turns brown in winter, and many horse pasture managers consider it unsightly.

One reason nimblewill persists in pastures is because horses, and other animals, rarely eat this plant. Mowing is ineffective as a control tactic. Currently, there is no herbicide available that will control nimblewill without severely damaging desirable pasture grasses.

Consult your local Cooperative Extension Service personnel for information on nimblewill in your area. [UK](#)

William W. Witt, PhD, professor emeritus in the department of plant and soil sciences at the University of Kentucky, provided this information.



Reproductive Leptospirosis

Pathogenic leptospire are zoonotic, spirochete bacteria. They have a worldwide distribution, and can infect a wide variety of species. Leptospire are most commonly maintained in the urinary tract of small mammals and are transmitted through contact with the urine. Though exposure to leptospire is generally through small mammals, affected horses can also shed bacteria in their urine and be a source of infection. In horses, abortion is the most economically significant manifestation.

Infection of pregnant mares with pathogenic leptospire can result in abortion, stillbirth, birth of live,

nonviable foals and, rarely, viable foals. Live but nonviable foals are often born significantly premature. Foals that survive intrauterine infection are generally weak at birth, but can recover through intensive supportive care. From July 1, 2011, through May 28, 2014, 57 cases were recorded at the University of Kentucky Veterinary Diagnostic Laboratory; 50 abortions (88%), four live but nonviable foals (7%), and three viable foals (5%). The 54 abortions and live but nonviable foal data are represented in Figure 1, in addition to previously reported data.* A foaling season spans July 1 to June 30,

Figure 1. Leptospirosis Abortions by Foaling Season (2007 - present).

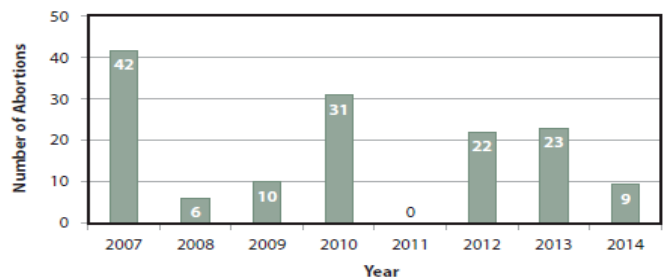
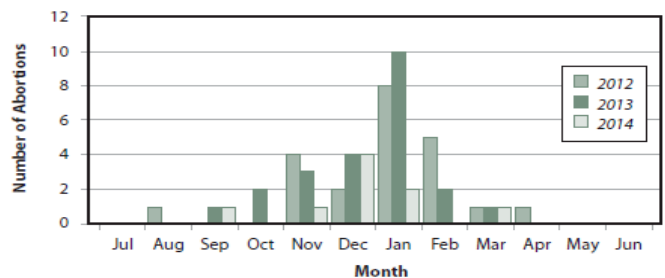


Figure 2. Leptospirosis Abortions by Month (2012 - 2014 foaling season).



Reproductive Leptospirosis

i.e., the 2013 foaling season ended June 30, 2013.

Diagnosis of leptospirosis from the fetus and placenta is rarely complicated; however, identification of infected pregnant mares can be difficult. Unlike many other bacterial causes of abortion, mares that abort due to leptospirosis rarely show premonitory signs. Surveillance of mares using serologic testing is often performed in the fall. However, the significance of positive findings can be complicated because many uninfected mares are seropositive for *Leptospira* spp. A polymerase chain reaction assay on urine can identify animals that are shedding leptospire, and these animals can be managed to reduce the risk of exposure of other horses, humans and animals.

Mares that abort due to leptospirosis rarely show preliminary signs.

The incidence of reproductive leptospirosis can vary widely by year (see Figure 2 on page 5). There is anecdotal evidence that this variation is associated with wet weather in the fall. However, it is important that surveillance should not be eased due to weather patterns. Leptospirosis generally occurs sporadically, though farms can occasionally experience multiple cases of reproductive leptospirosis within one foaling season.

CONTACT: Dr. Laura Kennedy, (859) 257-8283, dr1aurakennedy@uky.edu, Veterinary Diagnostic Laboratory, University of Kentucky Lexington, Kentucky.

From *Lloyd's Equine Disease Quarterly*, July 2014, Volume 23, No. 3.

UPCOMING EVENTS

July 31, 4-6 p.m.

Department of Veterinary Science Equine Diagnostic and Research Seminar Series, Veterinary Diagnostic Laboratory, Lexington. Topic and Speakers: Is the Hoof a Smart Structure? Dr. Debra Taylor, Auburn University; Equine Welfare, Dr. Tom Lenz, Zoetis.

August 28, 4-6 p.m.

Department of Veterinary Science Equine Diagnostic and Research Seminar Series, Veterinary Diagnostic Laboratory, Lexington. Topic and Speakers: Foal Diseases, Dr. Pam Wilkins, University of Illinois.

WATCH: Airway Remodeling in Heaves

Airway remodeling occurs in horses with long-term, unresolved inflammation caused by recurrent airway obstruction (RAO), the disease commonly known as heaves. Is it possible to reverse this negative effect in horses? Listen to Jean-Pierre Lavoie, DMV, Dipl. ACVIM, present new research on the topic as part of the UK Department of Veterinary Science Equine Diagnostic and Research Seminar Series, at TheHorse.com/34128.

Heaves (RAO, COPD, emphysema, ...)



Domestication (Aristotle)
Mature horses (10-15%)
Temperate climate
Dyspnea with stabling



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