University of Kentucky

Bluegrass Equine DIGEST

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Tips for Overseeding Fall Horse Pastures

Fall is the ideal time to overseed cool-season pastures to thicken a stand and fill in bare areas. The following recommendations will improve the chances of a successful overseeding.

Apply any needed lime and fertilizer amendments. An up-to-date soil test will indicate which nutrients are needed for both established and growing plants. For more information, contact your local county Extension agent or consult the University of Kentucky (UK) publication *Soil Sampling and Nutrient Management in Horse Pastures* at uky.edu/Ag/Forage/agr200.pdf.

Additionally, applying nitrogen in the fall can benefit new seedings as well as most horse pastures. Spread two applications of 30 to 40 pounds per acre of actual nitrogen 45 days apart to thicken stands and increase winter survival rates.

Use high-quality seed of an improved variety. Use a seed variety that has proven to be a top performer under conditions in your area. The UK Forage Variety Testing Program looks at the seedling vigor, stand persistence, yield, and survival under horse grazing. Find this data in the Forage Variety Trials reports at uky.edu/Ag/Forage/foragevarietytrials2.htm.

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Using high-quality seed is essential for a successful overseeding.

High-quality seed has good germination rates and is free of contamination from weed seed. Remember, quality seed will produce a pasture that lasts for years; "cheap seed" will only lead to headaches. Purchase seed well in advance, as quality seed will be in high demand close to planting dates. Store seed in rodent-proof containers in a cool, dry area. If you plan to store seed for more than six months, keep it in a refrigerator to maintain viability.

Plant enough seed at the right time. Seeding rates are determined by the grass mixture you choose to plant. See Table 1 (above right) for the recommended seeding rates for common forage plants. Also, be sure to seed as early as possible—anywhere from mid-August to mid-September is ideal for Kentucky and most northern states, while later in the year is better in the Deep South).

Use the best seeding method available. No-till drill seeding is recommended for overseeding existing pastures.

TABLE 1
COMMON SEEDING RATES AND OPTIMUM SEEDING DATES FOR HORSE PASTURES

Species	Rate lb/A (seeded alone)	Rate lb/A (in mixtures)	Optimum Seeding Dates*
Novel or endophyte-free tall fescue	20 - 40	10 - 20	8/15 - 9/15
Orchardgrass	15 - 30	10 - 15	8/15 - 9/15
Kentucky bluegrass	15 - 30	10 - 15	8/15 - 9/15
Endophyte-free perennial ryegrass	20 - 40	5 - 10	8/15 - 9/15

**Seeding dates are for Kentucky and the transition zone.*

But with any method, place the seed ¼ to ½ of an inch into the soil and cover it to achieve good seed-to-soil contact. Drill seed in two directions across the field to ensure better coverage.

Control competition. Close mowing or grazing prior to overseeding in the late summer and fall will reduce weed and grass competition. Be sure to follow recommended waiting periods when applying herbicides. In addition to limiting grazing of an overseeded pasture, limit herbicide applications at critical times. It's typically recommended to seed at least six weeks after spraying and wait until the grass seedlings are at least 4 to 5 inches tall before spraying again. Always follow herbicide labels—some of the newer herbicides have even longer waiting periods. For more information, see *Weed Management in Grass Pastures, Hayfields, and Other Farmstead Sites* at ca.uky.edu/agc/pubs/agr/agr172/agr172.pdf.

Allow time for seedlings to establish. Returning horses to an overseeded pasture too soon can wipe out any seedlings via grazing or trampling. Ideally, a pasture should have six months of rest after overseeding before heavy grazing resumes; however, seedlings can generally tolerate a few light grazing sessions. Harvesting the pasture once for hay after the grass has reached maturity and before returning

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Overseeding Tips

the pasture to full grazing can also be beneficial. If it's not possible to limit grazing for six months, consider using temporary fencing and overseeding half of a pasture one year, then the other half the next.

Other Overseeding Considerations

Do not plant Kentucky 31 tall fescue in pastures grazed by pregnant mares because it can be infected with a toxic fungal endophyte. Check to ensure you are planting endophyte-free or novel-endophyte-infected tall fescue in broodmare pastures.

Perennial ryegrass is a short-lived, cool-season grass that has exceptionally high seedling vigor and can be used to thicken up troublesome areas. If perennial ryegrass is seeded at high rates (<25%) it will outcompete other grasses, which will result in bare spots in the future as perennial ryegrass usually dies out in two to three years. Additionally, perennial ryegrass can be infected with an endophyte similar to that of tall fescue. Therefore, only seed endophyte-free perennial ryegrass in broodmare pastures.

COURTESY KRISTA LEA, MS

Seedlings fill in bare areas faster when seeded in two directions.

COURTESY KRISTA LEA, MS

Ryegrass seedlings emerge in an overseeded horse pasture.

For more information on establishing horse pasture, see the UK extension publication *Establishing Horse Pastures* at uky.edu/Ag/Forage/id1471.pdf or visit the UK Forage webpage at uky.edu/Ag/Forages. UK

>Krista Lea, MS, research analyst and coordinator of UK's Horse Pasture Evaluation Program within the Department of Plant and Soil Sciences; and Ray Smith, PhD, professor and forage extension specialist within UK's Department of Plant and Soil Sciences, provided this information.

Estate Planning Tips for Horse Owners

Most people don't like to dwell on their own mortality. But do your horses a favor by planning ahead for what should happen to them once you're gone.

For instance, well-meaning, but ultimately not equine-savvy, family members might think they're doing the right thing when they turn your easy-keeping pony out in a big grass pasture to live out her days or send your rescued and rehabilitated pasture pets to find new homes at the same auction you pulled them from years before. Fortunately, there are ways to ensure your horses don't end up in this predicament.

At the 31st National Conference on Equine Law, hosted by the University of Kentucky and held May 4-5 in Lexington, Kentucky, two attorneys—Shannon Bishop Arvin, JD, and Sarah Sloan Reeves, JD, both of Stoll Keenon Ogden PLLC, also in Lexington—shared tips on how to make sure your equine interests are handled to your specifications after your passing.

Arvin and Reeves stressed there's no one-size-fits-all approach to estate planning. As such, it's up to you to decide who will inherit what and when. These are personal decisions you should make after carefully considering the available options, they said. They also suggested working with an estate planner, who can take your wishes

Masthead

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The Horse: Your Guide To Equine Health Care

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Estate Planning

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There's no one-size-fits-all approach to estate planning. As such, it's up to you to decide who will inherit your horses—and the responsibilities that accompany them—and when.

and ensure they're carried out in the most tax-effective way possible.

Arvin and Reeves offered tips on several important topics to consider when planning your estate.

The Future of Your Horses This can be a challenging plan to formulate, the attorneys said. But regardless of the decision you end up making, the key to a successful transition is knowing (and specifying) exactly what you want and leaving a responsible person who'll make good decisions in charge.

Some owners, including many who own competition or racehorses, might elect to have some or all of their horses sold. This can either take place with private sales or at a dispersal sale at auction, which, the attorneys said, might end up increasing the total amount of money your estate will receive.

Retired or special needs horses might be more difficult to sell or place in good homes. As such, many people leave a specified amount of money for their care and designate a beneficiary to receive the horse and those funds.

An attorney can draw up the legal documents stating your intentions for your horses.

The Future of Your Belongings Again, be specific when deciding and stating who will inherit your belongings.

It's also crucial to know how much potentially valuable items—such as saddles, harnesses, or farm maintenance equipment—are worth. For example, you know your custom silver-covered Western show saddle is worth more than $3,000, even gently used. Your nonhorsey executor, however, might not think it's any different than the $500-dollar model at the local tack shop. Or, you might not know that the thrift-store sofa you bought for your arena observation room is actually a valuable antique worth five times the price you paid. If possible, have potentially valuable items appraised so your beneficiaries and executors know what they're working with.

Your money is also considered a belonging that you're free to distribute as you choose. The key, again, is to be specific about your wishes in your will or trust documents.

The Future of Your Land In a time when developers are scooping up farmland left and right, some land owners might want to ensure their property doesn't end up becoming a shopping center or an apartment complex. One way to do this, Arvin and Reeves said, is with a conservation easement.

A conservation easement is a legally binding agreement that limits certain types of uses or prevents development on the land. Essentially, you can specify what you want your land to be used for in the future.

The attorneys said conservation easements have both pros and cons. Perks include income and estate tax and other financial benefits, along with agricultural land preservation. Drawbacks can include decreased property value, difficulty selling the land, and the limited future land use potential.

They also cautioned that negotiating conservation easements can be complicated. As such, it's advisable to work with an attorney familiar with conservation easements to determine if one might be a good option for you.

The Future of Your Business If you own an equine business, you're faced with an added challenge of determining who you want to leave in charge or what you want to happen to that entity upon your death. An attorney is the best person to help you determine and document the business' future, but things to consider include:

- Who owns the business? Are you the sole owner, or do you have partners? This will make a difference in how it will be handled.
- Who will run the business once you're gone and until your trust or will has been carried out?
- Do you want to leave any long-time or valuable employees gifts upon your passing?
- Will you have a buy/sell agreement for your beneficiaries? For example, if you leave your equine business to your two children—an equestrian daughter and a nonhorsey son—can your son sell his portion of it if he doesn't want to maintain his interest?

Again, work with an attorney to ensure your desires are documented to be carried out after you're gone.

How Do I Accomplish This? Once you've decided what you want to happen after your passing, it's time to get it in writing. But you've got one more decision to make: Do you want a trust or a will? Arvin and Reeves described some of the differences between the two, including:

- A revocable trust (meaning one you can revoke and adjust during your lifetime) is more flexible than a will;
- A trust is also easier to manage when it comes to dealing with out-of-state real estate (if, for example, your main residence is up north, but you head south to a property you own during the winter);
- There's no wait for probate with a revocable trust like there is with a will, so your wishes can be carried out sooner rather than later. Either way, though, it's advisable to have a letter of last instructions—this is a document that, among other permissions, describes who will care for your horse and how, from the date of your death until the will is probated or the trust is approved. Remember: A letter of last instructions doesn't legally bind someone to care for your horse, but it will provide direction and guidance.
- Revocable trusts can also allow for continuity of manage-

Estate Planning

ment of operations.

Of course, you'll definitely want to have an attorney look at your individual scenario and help you decide which option will work best for you.

Use Caution: Undue Influence and Duress A common complaint from beneficiaries (especially those who think they should have received more from you) regarding wills and trusts is that the writer might have been under undue influence or duress when he or she put the documents together. Basically, the writer might have been influenced by outside forces or of unsound mind when deciding how to distribute their belongings.

You can help protect your intent by having your doctor supply a note indicating that, at the time the will or trust was written or established, you were of sound mind and knew what you were doing.

Take-Home Message No, it's not fun to think about your own death. However, working with an attorney to draw up end-of-life documents can help ensure your horses are either well-cared-for or sold according to your wishes and that your land and belongings are handled appropriately. UK

>Erica Larson is the news editor for *The Horse: Your Guide To Equine Health Care*.

GRAD STUDENT *SPOTLIGHT*

GLORIA GELLIN

From: Cleveland, Ohio
Degrees and institutions where received: AAS in veterinary technology from Morehead State University, BS in animal science from UK, MS in animal science with a concentration in microbiology from UK, and MPH with a concentration in epidemiology at UK.

Gloria Gellin came to the UK College of Agriculture, Food and Environment for her bachelor of science and her master's degree. For her master's, she worked on a project looking at antibiotic resistance in swine, and for her MPH, Gellin worked with both the College of Agriculture, Food and Environment and the College of Public Health. Gellin is currently working on her PhD in veterinary science under the direction of Craig Carter, DVM, PhD, Dipl. ACVPM, director of the UKVDL.

Gellin said Carter is the reason she is working on a doctorate.

"He believed in me and my ability to continue to work while working on my doctorate," she said.

Gellin's current research project focuses on the horses' immune response to leptospirosis, particularly in pregnant mares, and the epidemiology of leptospirosis in the Central Kentucky area, looking at kidneys, eyes, urine, and heart blood in horses brought to the UKVDL.

"My most valuable takeaway from my time spent at the University of Kentucky is the willingness of the department and my committee to allow me to continue to work and still work on this degree; it isn't easy and definitely not for everyone," Gellin said. "I think having several degrees behind me and experience in research helps to be able to focus in on not just areas I'm interested in, but ways to form a program that allows me to still work and work on my degree."

Gellin plans to finish her PhD in either December 2017 or May 2018. After graduation, she plans to focus her work in areas of animal diseases, their epidemiology, and their cause and effect on the environment, animals, and humans. UK

>Alexandra Harper, MBA, is the operations and communications coordinator with the UK Ag Equine Programs.

Vector-Borne Diseases' Emergent Threat for Horses

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Vector-borne diseases represent a serious threat to both human and livestock health.

Vector-borne diseases represent a singularly serious threat to the health of humans and domestic livestock species in countries or regions of the world in which they occur. Historically, many such diseases were frequently regarded as geographically restricted in their global distribution and not considered a risk to human and animal populations in far-distant countries in other continents or possibly other hemispheres. Major disease migrations in the last 20 years, however, have undermined that sense of security. No longer can the future distribution of specific infectious agents be predicted with confidence.

This was most recently exemplified by the explosive and unexpected spread of Chikungunya and Zika viruses, both human pathogens, from where they were originally identified in Africa years ago.

Concerns are further highlighted by the risk of spreading yellow fever from Angola, Republic of Congo, and Uganda to European Union member states and even further afield to intertropical zones in the Americas and Asia. The most significant group of emerging human and animal diseases is caused

Vector-borne Diseases

by arboviruses such as West Nile, Chikungunya, and Zika; they are single stranded RNA viruses which have spontaneous mutation rates as high as one base per 1,000 bases for each replication cycle. Arboviruses are transmitted in nature by arthropods vectors.

With the exception of African swine fever virus, all arboviruses of medical or veterinary medical importance belong to one of the following four families: *Bunyaviridae*, *Flaviviridae*, *Reoviridae*, and *Togaviridae*. They are maintained in nature by cycling between a host (mammal, bird, reptile, amphibian) that is infected with a particular virus and a vector (mosquito, tick, sandfly, midge) that is a carrier and transmits the virus to other hosts.

Some of the most important viral diseases of humans are caused by arboviruses, many belonging to the *Flaviviridae* and *Togaviridae* families. These include the following notable examples: yellow fever, dengue fever, Japanese encephalitis (JE), West Nile encephalitis (WNE), Zika virus infection, Eastern and Western equine encephalomyelitis (EEE and WEE), Venezuelan equine encephalomyelitis (VEE), and Chikungunya virus infection. Arboviruses are also the cause of a number of highly significant equine diseases, the most important of which are African horse sickness (*Reoviridae*); VEE, EEE, and WEE (*Togaviridae*); and JE, WNE, and Murray Valley encephalitis (*Flaviviridae*). It is evident from the foregoing that many of the listed equine diseases are caused by zoonotic pathogens.

Of major concern in assessing the health impact of arboviral diseases is the potential of the causal agents to evolve, giving rise to strains of enhanced pathogenicity for humans or animals. This is well exemplified by the emergence of variants of West Nile virus (lineage 2) in Europe that are highly pathogenic for horses. The same phenomenon has also been observed with respect to human infection with Chikungunya virus and most recently, also, with Zika virus. There is mounting evidence that strains of Zika virus have acquired marked neurotropic tendencies, being implicated as a cause of neurologic defects in unborn infants and an increased incidence of Guillain-Barre syndrome in people.

It is highly likely we will face future threats from the emergence of other arboviruses with epidemic potential. If we are to be successful in preventing such a threat becoming a reality, we need to identify those viruses with the potential for emergence and gain a greater understanding of their biology and epidemiology, complemented by development of more effective vector control strategies, active surveillance, and enhanced ability to diagnose such infections.

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>This is an excerpt from *Equine Disease Quarterly*, funded by underwriters at Lloyd's, London.

THE *GRASS* GUIDE

LARGE CRABGRASS *(Digitaria sanguinalis)*

Life cycle: Summer annual
Native to: Southern Africa
Uses: Pasture and hay
Identification: Flat leaf covered in short hairs on both sides with a broad, flat stem

Large crabgrass grows well on sandy and clay-loam soils and can also tolerate both wet and drought conditions. Large crabgrass is very palatable and has a high nutrient content compared with other summer annuals, making it useful for grazing in the south. It is considered a weed farther north due to its short growing season.

Although crabgrass can be useful in pastures as a summer annual, it only grows during warmer weather and leaves bare areas in late fall, winter, and early spring. When planted in pure stands, livestock producers commonly plant annual ryegrass for grazing during the cooler months of the year. UK

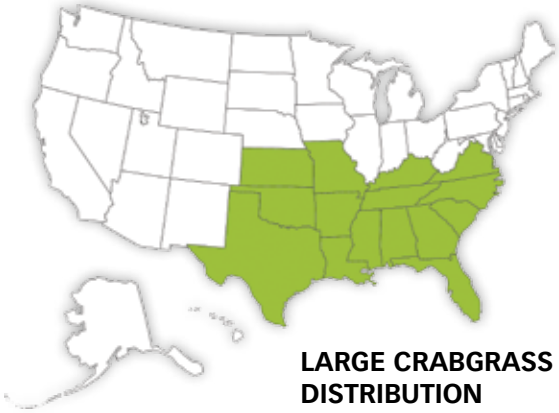
>Information provided by AnnMarie Kadnar, graduate student; Krista Lea, MS, coordinator of the UK Horse Pasture Evaluation Program; and Ray Smith, PhD, professor and forage extension specialist. All three are part of UK's Department of Plant and Soil Sciences.

PHOTOS COURTESY OF THE UNIVERSITY OF ARKANSAS FORAGE ID WEBSITE

A crabgrass seedhead.

The leaves of crabgrass can be a bright green color.

An example of crabgrass foliage in a pasture.



LARGE CRABGRASS DISTRIBUTION

I'm Selling My Horse. What Should I Disclose?

You've listed your horse for sale, and you've already gotten an inquiry! You read the questions the potential buyer has asked, but slowly your excitement turns to trepidation.

Does the horse have any vices?

His cribbing and stall walking don't count, do they?

Would he be suitable for a novice child rider?

Sure … if the child is on a lead line.

Does he have any existing health issues?

Not aside from the presumptive Cushing's diagnosis he got last year …

I'm never going to sell this horse!

You don't really have to answer all those "self-incriminating" questions, do you? Actually, you should. Misrepresenting a horse could land you in some serious legal trouble.

At the 2016 National Conference on Equine Law, hosted by the University of Kentucky, Dottie Burch, JD, reviewed equine seller disclosure laws and how to protect yourself as both a seller and a buyer. Burch is an equine attorney with Ragsdale Liggett PLLC, in Raleigh, North Carolina.

If you're not sure whether to inform a potential buyer about a quirk or health issue, always err on the side of disclosure, said Burch. Don't tell white lies (even something as simple as "stands quietly for tacking" or "loads and trailers well" if neither is true) and absolutely avoid blatant misrepresentations of a horse just to sell him faster—this could potentially result in a life-threatening scenario for both rider and horse, she said. Neglecting to inform a possible buyer about a cardiac arrhythmia or saying a horse is kid-safe when the opposite is true, for instance, could result in the injury or death of the horse, rider, or both.

Opting to disclose information before selling the horse will help you protect yourself in the event of a lawsuit, Burch said.

Moving forward, she described specific seller disclosure requirements and gave examples of how disclosure works in different sale scenarios.

ANNE M. EBERHARDT/THE HORSE

Ensure a potential buyer is well-informed and understands any vices, limitations, or physical issues the horse might have.

Disclosure Laws

The laws you're expected to abide by when it comes to disclosing information about horses for sale vary according to your state of residence.

California, Florida, and Kentucky, for example, have specific statutes regarding disclosure requirements in equine transactions, Burch said. In states that don't have equine-specific statutes, horses generally fall under one or more of the following: Article 2 of the Uniform Commercial Code, consumer protection acts, livestock regulations common law contract, or equitable legal principles, she said.

It's important to know what laws govern horse sales in your state, in addition to what those laws require you, as a seller, to disclose to a potential buyer. As such, it's advisable to consult an attorney familiar with equine pursuits if questions arise when you're selling a horse.

Protecting Yourself

As a seller, be transparent. Answer buyers' questions honestly and fully to help ensure your horse goes to an appropriate home.

Also, include a seller's disclaimer in your sale contract. Even if you've been 100% honest in your disclosures, this block of text essentially stating that you're selling the horse "as-is" can help protect your interests should a lawsuit arise.

Attorneys recommend including language such as the following in sale contracts:

Seller makes no warranties or representations whatsoever, expressed or implied, with respect to the horse, including warranties concerning the physical condition, health, or soundness of the horse, or warranties or representations with respect to the merchantability or fitness of the horse for any particular purpose, all of which are hereby excluded. The parties to the agreement acknowledge that the horse is sold "as is" and "with all faults." Buyer acknowledges that he has conducted such investigations and inspections, including the use of a qualified veterinarian, and is satisfied with the horse's condition.

Additionally, put everything in writing. Burch recommended using a disclosure form, which is designed to allow the seller to disclose information—in writing—including:

- The horse's owner(s), lessee(s), or agent(s);
- A physical description of the horse;
- The horse's current stabling information (i.e., is he stalled, how much turnout, any special turnout equipment such as boots or blankets, etc.);
- Feeding information;

I'm Selling My Horse.

- A health history; and
- Behavioral habits, along with anything else the seller wants to disclose or buyer needs to know.

Also, be sure you have a sale contract in writing outlining the terms of the sale and signed by all parties involved or at least a bill of sale signed by you as seller.

In some cases, Burch said, a buyer or seller prefers to speak on the phone instead of via email or text message. In fact, she said, sometimes it gets to the point that the other party can't seem to get anything in writing. In these cases, Burch recommended following up via email with the individual, outlining conversations that have taken place. It's not as good as a real contract signed by the parties, but it's better than nothing at all, she said. For example:

I'm writing to confirm that my takeaways from our conversation yesterday are accurate. You stated that the horse you're interested in needs to be suitable for a beginner rider, and I confirmed that the animal has been a solid beginner lesson mount for the past four years. You also asked whether the horse had any physical limitations, to which I replied that the mare has some arthritis developing in her hocks that has not been treated or affected her performance in any way thus far. I also offered to share her health records with you to show where her veterinarian indicated that there are pain-relieving options available when the arthritis worsens. Does this sound correct to you?

By sending such a message to the opposite party, you've given them the opportunity to confirm (or deny) that everyone is on the same page moving forward, Burch said.

Take-Home Message

Ultimately, Burch encouraged attendees to "disclose, disclose, disclose" and "disclaim, disclaim, disclaim." Ensure the potential buyer is well-informed about the animal he or she is interested in and understands any vices, limitations, or physical issues the horse might have. Also, she stressed the importance of putting everything in writing when selling (or buying) a horse to cover your bases should a lawsuit occur. UK

>Erica Larson is the news editor for *The Horse: Your Guide To Equine Health Care*.

Buyers Can Protect Themselves, Too

You don't have to be a seller to protect yourself during a horse deal. Equine lawyer Dottie Burch, JD, of Ragsdale Liggett PLLC, in Raleigh, North Carolina, said one of the best ways to protect yourself as a buyer is to exercise due diligence in evaluating the horse's condition before you buy.

If you're buying a horse at auction, make use of the repository—essentially, a library that contains information and analysis of various exams (often endoscopic and radiographic, provided by the seller) for each horse in the sale—if there's one available. But, Burch said, remember a few things about repositories:

- The auction house generally does not review information in the repository, nor does it warrant the accuracy of the reports submitted to the repository by the seller or third parties;
- That said, the seller is typically required to warrant the accuracy of the information they submit; and
- It's wise to use repository information in addition to a veterinary prepurchase examination to ensure the information provided is accurate and so you know exactly what you'll be getting should you buy the horse.

Likewise, if you are purchasing a horse from a private seller, be sure to have a trusted veterinarian conduct a prepurchase exam prior to making a final decision about buying the horse. Burch recommended drawing blood at the prepurchase exam, even if you just store it for a couple of months before spending the money to test it. Many labs will store the blood sample at a nominal cost, and if you notice any changes in the horse after your purchase, you can send the sample for testing. And if everything goes fine after the purchase, you're not out any money on unnecessary testing.

Without exercising due diligence before a purchase to ensure the horse is healthy and appropriate for your purpose, it's unlikely you'll have any success with legal action against a seller involving things that reasonable due diligence would have revealed. UK

UK Researcher Develops New Tall Fescue Variety

University of Kentucky plant breeder Tim Phillips, PhD, has developed a new tall fescue variety that is nontoxic to grazing animals.

The variety, Lacefield MaxQ II, is the result of selections Phillips, a member of the UK College of Agriculture, Food and Environment, made from endophyte-free Kentucky 31 and related lines. Phillips named the variety for UK Professor Emeritus Garry Lacefield, PhD, upon his retirement to honor his numerous contributions to the forage industry and to the college.

Lacefield MaxQ II contains a novel endophyte developed by AgResearch in New Zealand. While active, the endophyte does not produce the ergot alkaloids that can cause fescue toxicosis, a disease that primarily affects cattle but can also negatively impact pregnant mares and milk-producing goats. The active alkaloids in the new variety help make it drought-tolerant, insect-resistant, and more vigorous.

"It has the persistence and performance of the endophyte found in Kentucky 31, but it doesn't have the bad qualities of that endophyte," Phillips said. "It's the best of both worlds."

This variety has been tested for 12 years in trials at UK's research farms, private Kentucky farms, and farms located from Michigan to Mississippi. Phillips said it has tested well in all locations for seeding vigor, high yield potential, grazing tolerance, live weight gains by stocker cattle, and resistance to winter injury.

"It's Kentucky born, Kentucky bred, and Kentucky proven to excel," he said.

When compared with Jesup, the first commercially

New Tall Fescue

available tall fescue variety containing a novel endophyte, Lacefield MaxQ II was later flowering in Kentucky, which would allow it to be available to animals for a longer period of time. Scientists in the USDA Forage-Animal Production Research Unit conducted the comparison study on UK's C. Oran Little Research Farm in Versailles.

Lacefield MaxQ II is expected to be commercially available in 2017. UK

>Katie Pratt is an agricultural communications specialist within UK's College of Agriculture, Food and Environment.

UK, USDA Researchers Live by the Word 'Collaboration'

Collaboration seems to be a buzz word in higher education these days. While many people claim to collaborate, researchers at UK and USDA have proven to be excellent examples of collaboration. Their successes translate to improving the body of knowledge surrounding tall fescue toxicosis, equine gut health, and other aspects of horse health and management.

This partnership began in 2003 when a USDA research unit was located within UK's College of Agriculture, Food and Environment (CAFE). This unit, known as ARS-Forage-Animal Production Research Unit (FAPRU) is housed within the physical buildings of the college and allows the unit to focus its efforts and capital on research while the college provides basic services such as buildings and land, physical

UNIVERSITY OF KENTUCKY

Morgan Pyles, MS student

COMMENTARY

Challenging Nature on Equine Infectious Diseases

ERICA LARSON

"Nature doesn't break, it only bends." This quote was recently uttered on a television drama, which depicted an infectious disease clinician fighting a catastrophic epidemic that developed following a genetic mutation of a forgotten infectious disease agent.

As a pathologist and former microbiologist, this reference to the constant evolution of microbes made me ponder, once again, how such relatively simple organisms rapidly and continually adapt to their environments to survive and replicate. It is unfortunate, at least for the host, when the intricate balance between host, environment, and microbe becomes offset and results in infectious disease.

This theme was exemplified in April 2016 when equine infectious disease experts from around the world gathered for the 10th International Equine Infectious Diseases Conference in Buenos Aires, Argentina. The conference, which is held every four years, provides excellent continuing education for equine clinicians and brings together equine infectious disease researchers who share recent developments and breakthroughs. The five-day event addressed infectious diseases of continued and historical concern, newly recognized and emerging diseases, and important reemerging infectious diseases of the horse. These motifs were addressed in 11 separate sessions on biosecurity, diagnostics, diseases of working equids, emerging and reemerging diseases, gastroenterology, international equine movement, neurology, parasitology, theriogenology (reproduction), respiratory diseases, and infectious diseases of other systems.

Although I enjoyed all of the presentations, I was particularly taken with the talks on emerging and reemerging diseases. Emerging viral agents that were discussed included equine enteric coronavirus (a potential cause of necrotizing enteritis), Theiler's disease-associated virus (the newly identified cause of equine serum sickness) and other viral causes of hepatitis (equine hepacivirus and equine pegivirus), Bunyamwera virus in Argentina (a cause of nervous disease and/or abortion), and Hendra virus (an acute fatal and zoonotic disease that frequently affects the respiratory and neurologic systems). Other interesting and noteworthy disease conditions comprised anthelmintic resistance (resistance of parasitic worms to treatment), the potential role of microbes in equine polyneuropathy, and strangles-like disease caused by *Streptococcus zooepidemicus*. The reemergence of West Nile virus (a cause of neurologic disease) in France and Salmonella *Abortusequi* (a cause of abortion and septicemia) in Argentina were also addressed. Although many of these diseases are emerging or reemerging in specific locations, one must be globally aware of them due to the increasing frequency with which equine athletes and breeding stock are transported around the world.

We might never break nature, but rest assured that clinicians and infectious disease researchers will continually attempt to challenge nature and develop new modalities to quickly detect, track, diagnose, treat, and hopefully learn to prevent and control infectious diseases as they occur.

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UK, USDA Collaboration

plant needs, and custodial services. In exchange, USDA-ARS provides funding through a Specific Cooperative Agreement (SCA) to CAFE faculty to conduct collaborative research with FAPRU scientists. The SCA accounts for more than half of the total budget for the ARS unit housed in Lexington, equating to approximately $800,000 a year for research at UK.

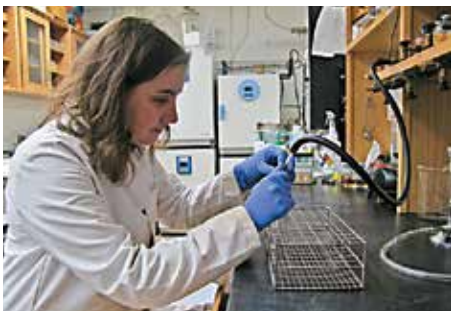
"The USDA lab and the SCA funds have opened up research opportunities that were not available previously," said Laurie Lawrence, PhD, a professor in UK's Department of Animal and Food Sciences. "In the equine area, much of the funding available from private foundations or the health care industries focus on clinical diseases; the SCA funds allow us to study normal horses, particularly in regard to digestive function."

The benefits to both parties are more than just monetary. Students and faculty at UK have the unique opportunity to work alongside and learn from some of the world's leading researchers in their areas, as FAPRU scientists also serve as adjunct faculty in the college's Animal and Food Sciences or Plant and Soil Sciences departments. In this role, they serve on graduate committees and allow students to use lab space and research equipment that would otherwise be unavailable. Since establishing the FAPRU unit in Lexington, more than 25 graduate students have completed their research in USDA labs while completing advanced degrees in animal science, plant and soil sciences, agricultural engineering, and chemistry. Many of these students are also retained on campus. Ben Goff completed his PhD in 2012 and is now the legume forage specialist for UK, while Brittany Harlow completed her PhD in 2016 and is in a post-doctorate with the FAPRU unit.

The FAPRU unit operates on five-year research cycles with three main objectives:

- Improve production, production efficiencies, and enhance animal well-being in production systems;
- Make genetic improvements by identifying genes that contribute to current issues; and
- Improve upon measuring and enhancing product quality.

Within these objectives, major research areas for the FAPRU unit



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Brittany Harlow, PhD

are varied and include UK faculty and students. Tim Philips, PhD (UK Plant and Soil Sciences), and Karen McDowell, PhD (UK Veterinary Sciences), are working with Glen Aiken, PhD (FAPRU), to test a new variety of tall fescue containing a nontoxic novel endophyte. This variety is expected to be as productive and versatile as KY31+ tall fescue, but safe for pregnant mares to graze. It should be commercially available in the next two years. To determine mare safety, potential vasoconstriction (blood vessel constriction) is being measured via a unique Doppler ultrasound technique that Aiken and McDowell developed.

For several years Michael Flythe, PhD (FAPRU), and Lawrence have been studying many different aspects of the microbial community in the horse's gastrointestinal (GI) tract.

"There is very little information about the normal bacteria in the GI tract and how they are affected by various factors such as diet and use of antibiotics," Lawrence said. "We have been able to examine several of these factors and are now beginning to get enough puzzle pieces that the bigger picture is starting to emerge."

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Further, Isabelle Kagan, PhD (FAPRU), is working with Lawrence and Ray Smith, PhD (UK Plant and Soil Sciences), to study the effects of soluble carbohydrates from different grass species on horse health.

Smith said the research collaborations with FAPRU scientists have been some of the most rewarding of his career. Those scientists provide technical experience to UK staff and translate their research findings to practical applications on the farm in extension programming.

Stakeholder Meetings Determine Priorities for USDA-ARS Unit

A public stakeholder meeting was held at the UKVDL on May 26 to help develop the research and funding priorities for the next five-year funding cycle at USDA-ARS. Stakeholders in attendance included faculty and students from UK, industry leaders, and private producers from all livestock groups, including equine. Morning sessions included a recap of the last five years and the successful work that has come from the unit.

Jimmy Klotz, PhD, presented research findings regarding tall fescue toxicosis, mainly looking at how it affects cattle and other small ruminants. The most common side effects of tall fescue toxicity in cattle are a rough hair coat, decreased average daily weight gains, and vasoconstriction. Researchers examined what happens in the body to make these clinical signs appear and have found that the systemic vasoconstriction leads to most of the problems cattle experience. Decreased blood flow in the rumen epithelium is caused by the presence of ergot alkaloids, such as ergovaline, which leads to decreased volatile fatty acid absorption and reduces average daily gain. Decreased prolactin (a hormone that stimulates milk production) levels cause the increase in hair coat, but when animals were removed from ergovaline exposure, their prolactin levels returned to normal within two days while vasoconstriction took about five to seven weeks to normalize.

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Jack Goodman, PhD

Harlow presented the equine research results to the stakeholders in attendance. Equine research has been focused mainly on gut health and somewhat on ergovaline, as well. Researchers developed an *ex vivo* (outside the body) hindgut starch fermentation method, which will allow scientists to study how horses digest different starch sources without using a live animal. Scientists have also focused research on how antimicrobials affect horses' gut microbes. They found that antibiotics can cause microbial disruption, which could lead to pathogen proliferation within the horse.

Flythe gave an overview of the microbiology research FAPRU has been working on. Biochanin A, an isoflavone (a type of polyphenolic compound) produced by red clover, has been found to inhibit hyper-ammonia-producing bacteria. This leads to decreased ammonia production in cattles' rumens and also decreases hypertension caused by vasoconstriction—a clinical sign of tall fescue toxicity. Biochanin A relieves vasoconstriction caused by ergovaline within six days of use in cattle; this same response is expected in horses. This research breakthrough could change the way producers manage tall fescue toxicity within their herds.

Randy Dinkins, PhD, presented pasture and forage research to the stakeholders and producers that attended the meeting. In an effort to control or minimize tall fescue toxicity, the herbicide Chaparrel has been used to keep tall fescue from producing seeds, which contain high concentrations of ergovaline. Keeping tall fescue in the vegetative state has been shown to increase protein and digestibility and reduce ergovaline, making it a more attractive forage for livestock. Researchers have also been working on developing the tall fescue genome, which is twice as large as the human genome.

The afternoon session included roundtable discussions on issues concerning producers and the industry. This information will be presented to the national committee where they will decide the plan and funding for the next research cycle.

More information about USDA-ARS can be found at ars.usda.gov. UK

>Information provided by AnnMarie Kadnar, graduate student; and Krista Lea, MS, coordinator of UK's Horse Pasture Evaluation Program. Both are part of UK's Department of Plant and Soil Sciences.

So Many Acronyms!

Complex acronyms are a reality of working in state or federal government but can be confusing for those outside (or even inside) these organizations. Here are some common ones listed here, along with what they stand for and some of who they include (yes, we had to look some up, too!).

UK – University of Kentucky (all things UK, including horses and basketball)

CAFE – College of Agriculture, Food and Environment (everything from horses and cattle to tobacco, grain crops, food safety, and environmental protection). This is the new name for the College of Agriculture, which was renamed in 2015.

PSS – Department of Plant and Soil Sciences (grass production, wheat, corn, soybeans, and even hemp!)

AFS – Animal and Food Sciences (livestock and food safety)

Gluck – Not an acronym, but the UK Gluck Equine Research Center focuses on horse health and well-being research.

USDA – United States Department of Agriculture (nationally, all things related to agriculture)

ARS – Agricultural Research Service (the research arm of the USDA)

FAPRU – Forage Animal Production Research Unit (focus primarily on beef and dairy, goats and sheep, and horses.)

SCA – Specific Cooperative Agreement (the agreement that houses FAPRU at UK in exchange for research dollars) UK

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[1] Cortese V, Hankins K, Holland R, Syvrud K. Serologic responses of West Nile virus seronegative mature horses to West Nile virus vaccines. *J Equine Vet Sci.* 2013;33:1101-1105.

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UKVDL Releases New Testing Fees

Effective July 1, the University of Kentucky Veterinary Diagnostic Laboratory (UKVDL) implemented new fees for several tests for fiscal year 2016-2017. The fees were approved by the UKVDL Advisory Committee.

A $10 accession fee is also required and not included in the fees listed.

A complete list of all UKVDL test and information is available at vdl.uky.edu. For questions about any test or fees, call the UKVDL at 859/257-8283. UK

>Jenny Evans, MFA, is the interim executive director of the Gluck Equine Research Foundation and marketing and promotion specialist senior at the Gluck Equine Research Center.

UKVDL Test Fee Changes	New In-State Fee	New Out-Of-State Fee
Contagious equine metritis	$19	$28.50
MIC panel, equine isolates only	$13	$19.50
Avian influenza, PCR	$40	$60
Lawsonia intracellularis, PCR	$40	$60
Tritrichomonas foetus, PCR	$22	$33
Field necropsy, equine fetus/foal	$70	$105
Gross necropsy, equine adult	$160	$240
Gross necropsy, equine fetus/foal	$90	$135
Gross necropsy, equine placenta	$50	$75
Gross necropsy, food animal adult	$75	$112
Gross necropsy, food animal fetus/neonate	$60	$90
Gross necropsy, small animal/exotic animal	$100	$150
Biopsies, beyond two tissues, $20 for each additional	$45	$67

Stay Socially Connected to UK Ag Equine Programs

The UK College of Agriculture, Food and Environment has several equine-related social media pages featuring the latest news and event information.

Follow us on Twitter:

UK Ag Equine Programs @UKAgEquine
UK Maxwell H. Gluck Equine Research Center @UKGluckCenter

Prefer Facebook? Like these pages we administer:

University of Kentucky Ag Equine Programs An overarching framework for all things equine at the University of Kentucky, including the undergraduate degree program, equine-related student organizations, equine research and outreach activities.

University of Kentucky Equine Alumni A community established for the alumni of the University of Kentucky's equine programs, including ESMA, graduate students and clubs and teams' members.

University of Kentucky Maxwell H. Gluck Equine Research Center The Gluck Center's mission is scientific discovery, education, and dissemination of knowledge for the benefit of the health and well-being of horses.

University of Kentucky Horse Pasture Evaluation Program A service program offered to horse farms in Kentucky with the goal of overall improved pasture management.

Saddle Up SAFELY A rider safety awareness program sponsored by UK HealthCare, UK College of Agriculture, Food and Environment and many community organizations. It aims to make a great sport safer though education about safe riding and horse handling practices. UK

Upcoming Events

August 16
Kentucky Equine Networking Association (KENA) Meeting: Networking at 6 p.m. and dinner at 6:30 p.m., Fasig-Tipton

August 25
UK Department of Veterinary Science Equine Diagnostic and Research Seminar Series: Kathryn Graves, PhD, director of genetic testing at the Gluck Center, and Martin Nielsen, DVM, PhD, Dipl. EVPC, ACVM, associate professor at the Gluck Center, will speak about genetic testing at Gluck and parasitology, respectively, at 3:30 p.m., at the UKVDL

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