

# CHANGING LEADS

UP-TO-DATE INFORMATION FOR DELAWARE HORSE LOVERS

## INTRODUCTION BY DR. DAVID L. MARSHALL

### INSIDE THIS ISSUE:

<b>FORAGE STAND EVALUATIONS FOLLOWING SEVERE STRESS CONDITIONS</b>	<b>3</b>
<b>PASTURE RENOVATION AND SEEDING</b>	<b>4</b>
<b>FERTILIZING PASTURE AND HAY FIELDS FOR FALL FOLLOWING DROUGHT</b>	<b>5</b>
<b>10 QUESTION INTERVIEW WITH JENNIFER FABRYKA</b>	<b>5</b>
<b>THE TROUBLE WITH TWINS</b>	<b>9</b>
<b>WHEN TO WORRY ABOUT HAY SAFETY</b>	<b>10</b>
<b>DE 4-H'ER COMPETE AT ANNUAL STATE 4-H HORSE SHOW</b>	<b>12</b>
<b>4-H MEMBERS COMPETE IN HORSE JUDGING CONTEST</b>	<b>12</b>
<b>RED MAPLE TOXICITY IN HORSES</b>	<b>13</b>
<b>UPCOMING EVENTS</b>	<b>14</b>
<b>RECEIVE NEWSLETTER</b>	<b>15</b>

Within this issue of Changing Leads, is a group of articles pertaining to equine pasture management and forage crops. The timing of this issue fits well with the timing of several major management decisions we who feed horses will be making in the next several week and months. Dr. Richard Taylor is responsible for contributing the greater bulk to this issue, with three pieces. Dr. Taylor is the University of Delaware's Extension Agronomy Specialist, and has been serving Delaware and our region for more than twenty years. He has conducted applied field research on forage crops and alternative crops, cool- and warm-season annual and perennial grasses and legumes. Our University of Delaware's Dr. Taylor and Delaware State University's Dr. Labreuveux were collaborating on a pasture management research and education grant up to Dr. Labreuveux's move to the University of Kentucky. Dr. Taylor has been personally responsible for tutoring me (and the students I teach) in plant biology and how plants interact with horses for promoting good health; and sometimes bad health. An example of his teaching gets us started.

Just this week I received a call from a former University of Delaware student of mine who has relocated her home to Indiana. Out in Indiana, her newly purchased farm required renovating 40 acres of pastures and seeding additional hay acreage for her paint horses. She called a few days ago seeking veterinary council on a health problem in her horses. The nature and depth of her horse problem was such that she and her veterinarian were struggling to get to the bottom of the problem. The mystery illness started several weeks ago in one of her white faced paints. The affected horse was out on her new 40 acre pasture and it developed a profound swelling of the face. The horse's facial skin with accompanying swelling progressed to the point that spots of skin turned purple, the horse's tongue turned purple, and layers of facial skin fell away. Veterinary recommendations included keeping the horse inside for several weeks and supportive medical management. Within a short period of time, the skin was restored as well as hair and health. The

*(Continued on page 2)*

## FORAGE STAND EVALUATIONS FOLLOWING SEVERE STRESS CONDITIONS

BY DR. RICHARD W. TAYLOR, EXTENSION AGRONOMIST, UNIV OF DE

In many parts of the region, hay and pastures were subjected to prolonged hot and extremely dry conditions. It's often surprising how grasses that were thought to be dead have recovered following good soaking rains. Since in times of drought animals still need feed, pastures often become overgrazed causing more plant injury. Where horses are grazed, the horse's ability to graze right to the soil level means that recovery of the most severely

injured pastures will be slow. It is these severely injured fields where the following guidelines may be useful in deciding whether to do a partial renovation this year or early next year.

There are two ways to evaluate pastures: first by objectively using numerical counts of tiller numbers or percent ground cover; note that tillers are grass shoots with at least 3 visible leaves. Secondly, you can do

your ground cover evaluation subjectively by using your eye and mind to decide if the stand is adequate.

For objective evaluations, you need to either walk across the pasture or hay field and count how many live plants or tillers per square foot are present or use a transect-line to determine percent ground-cover for viable forage grasses.

*(Continued on page 3)*

## INTRODUCTION

(continued from page 1)

horse was returned to the pasture. Shortly thereafter, facial swelling returned; plus two other companion horses were demonstrating swelling of the legs and face. Blood work revealed liver damage in one of the three affected horses. As I was listening to this horse owner detail the weeks long clinical story over our now 30 minute phone conversation, I interrupted with several questions. One question I asked was: "What did the pasture mix you seeded your new pasture with contain?" Her answer confirmed my suspicions; one of the seeds in her new pasture mix was alsike clover (*Trifolium hybridum*). Dr. Taylor had taught me well as I remembered him saying: "Seed mixtures intended for horse pastures and hay should not contain alsike clover." I directed this horse owner to consult with veterinarians at Indiana's Purdue Veterinary School. As I write today, her horses are not out of the woods but definitely on the mend. Purdue Veterinarians concurred, quickly, recognizing the causative problem as they have seen many cases of alsike clover poisoning this summer in horses (some cases in cattle as well). Environmental growing conditions – very hot and dry in Indiana this summer - must have been just right for the production of the alsike clover toxin. We do not know the exact nature of the alsike clover toxin, but we do recognize that alsike clover has the capability to create or concentrate a toxin under certain environmental growing conditions. It is a toxin that will accumulate and change in the horse's liver. Toxicity disseminates from the liver and reacts in the horse's skin in the presence of bright sunlight (photosensitization), to cause swelling of the skin and tongue. This inflamed reddening of the skin under the influence of sunlight can advance to such a degree that it may cause skin death. Light-skinned horses are particularly affected, especially on the head (if white) and on white legs. Swelling of the head provides us with one of alsike clover poisoning names: 'big head'. In my last phone conversation with this horse owner, I dealt with her two new questions: (1) "What must I do with my newly seeded 40 acres of pasture?" and (2) "What am I to do with the 1000 bales of hay containing alsike clover I made this summer; as we expect hay to be a very valuable and hard-to-come-by feed commodity this winter?"

I will stop here with this very real example that still requires attention. I used this unintentional poisoning example to not only grab your attention and to introduce Dr. Taylor, but to additionally emphasize that how we manage our equine pastures and hay sources can have very real consequences.

My educational contribution deals with a very common pasture toxicity (if not the most common) of our area, red maple toxicity. The red maple tree is a commonplace tree in Delaware pastures; or can be found lining the fences of horse pastures. My writing will outline the conditions under which this tree becomes deadly to our horses.

We shift gears somewhat in this issue's student paper in Changing Leads. Jen Fabryka, a senior student here at the University of Delaware provides us with an informative paper on twinning in horses, "The Trouble with Twins". Why twinning in a pasture-hay issue you ask? Let me try to make a long answer short. Surviving twins in horses is a very rare event. We had twin foals born here in Delaware this June that survive to this day. I would like to tell you about this birth and survival miracle and Jen's paper will outline the scientific facts of the twinning dilemma in the horse.

Our Delaware horse twins this year were born to Cindy, an 11 year old pure-bred Percheron mare owned by Leroy Yoder. Cindy lives on a farm a bit north of Dover in Cheswold, Delaware. The twinning phenomenon itself is not that rare in horses, it is surviving twins that beat the odds. Leroy is a member of Delaware's old order Amish community and has been raising Percheron horses since 1967. He was born in Delaware in 1928 and has lived here his whole life; raising 11 children on his Delaware dairy farm. Right along side his family, Leroy has raised many, many foals since his 1969 beginnings; 3-4 foals per year he estimates. Leroy grew up with Percheron horses and a host of his family members to this day raise Percheron horses. Leroy told me he has seen several sets of twin foals born, but Cindy's are the first he has seen survive. I personally saw and examined the foals soon after birth for nutritional consultation purposes and have followed their progress since this time. I introduced Jen to Leroy and his foals in August.

I asked Leroy why he enjoys working with horses, (over mules), which many Amish farmers use for power. He told me: "If I had to farm with mules, I would have quit. I just love to get out in the field behind a team of horses and watch and listen to the sights and sounds of working horses. It is an experience one cannot easily forget. Even today (Leroy continues), I long to get up and go out and work behind a team of horses, but my health will not allow me to." As I was walking out of Leroy's kitchen he said to me: "You know Dr. Marshall, my wife's first two pregnancies were twins – four daughters – I guess with the twin foals, I now have three sets of twins in my family." This recognition brought a spark to Leroy's eyes. It saddened his eyes however to tell me it was going to be necessary to sell these twin colt foals. His declining health will not permit him to raise and train these newest family twins. He will post a sign at the end of his lane: For Sale - Matched Pair of Registered Percheron Colt Foals.

Susan Truehart-Garey's paper, Pasture Renovation and Seeding, will outline the nuts and bolts science [that is practical science] of how we plan and carry out the details of improving our horse pastures.

## FORAGE STAND EVALUATIONS FOLLOWING SEVERE STRESS CONDITIONS

(continued from page 1)

To take stand counts, make a 1-, 2-, or 4-ft<sup>2</sup> rectangle or square from wire or wood, walk across the field dropping or throwing the rectangle or square at random. Then count the number of tillers or live plants of your dominant grass species enclosed by your device. Keep a running total of your plant count and after taking about 10 to 20 counts, divide the total by the number of counts. You will then divide that number by the number of square feet represented by the device. This will give you an estimate of the number of plants/tillers per square foot. Be sure to decide ahead of time how you'll do the counts. From what I've seen in the past, you will be counting the number of tillers for Kentucky bluegrass, smooth brome grass, and reed canarygrass pasture or hay fields and be counting number of plants for orchardgrass, tall fescue (for fescue you can count either plants or tillers whichever is easiest to identify), timothy, and ryegrass fields. The target counts that indicate an adequate stand are given below.

A transect-line consists of a hundred foot wire with marks or spacers set at specific intervals, often at 1-foot intervals. To use the transect-line, you stretch it across different areas of the field and then walk down the line and count the number of times the spacer or mark is directly over a desirable species leaf versus over bare ground or a weed leaf. Generally, there will be 50 or 100 spacers or marks on a line and by multiplying the number of times the spacer intercepts a desirable species by either two or one, respectively, you can obtain the percent ground cover for the desired species. As a rule of thumb after a period of perhaps six weeks recovery time following a drought, you would determine percent ground cover and renovate if the percent ground cover is below about 50 percent.

Various insect foliage feeders often attack the new leaf growth aggressively during the recovery phase following prolonged droughts. For fields that were nearly dead, fields trying to recover by sending up new shoots or tillers, and fields newly renovated or seeded; it will be important to try to protect this new vegetation. The new tillers and leaves are the only photosynthetically active tissue available to the plant, therefore the plant's food reserves will be either very low for recovering plants or will be limited to that stored in the seed for new seedlings. Food reserves must be reestablished or accumulated by seedlings by late fall if the crop is to survive winter. Contact your pesticide dealer for information on products that can be used to control damaging pests and be sure to follow all label warnings and graz-

ing restrictions especially for pastures.

Another suggestion would be to fertilize grass regrowth with nitrogen (N) to stimulate a more rapid recovery (see accompanying article on fall fertilization with N). Finally, weed encroachment often becomes an important problem following severe stress conditions. Check with your herbicide dealer or local county Extension agent for information about weed control in pastures and hay fields. Generally for pasture situations, we prefer to remove animals before fertilization, herbicide, or pesticide application (for some pesticides, removal for a certain number of days is mandatory—consult your dealer or our "Pasture and Hay Weed Management Guide" found at [http://www.rec.udel.edu/weed\\_sci/WeedPublicat.htm](http://www.rec.udel.edu/weed_sci/WeedPublicat.htm)). Following fertilizer and lime applications, we prefer to have had at least one significant (>0.25 inch) rainfall event occur before returning animals to the pasture.

Partial renovation consists of no-till seeding a reduced rate of grass seed into the pasture to aid in stand recovery. For pastures, animals should be removed during planting but can be returned for a week or two until the new seedlings begin to germinate. The animals should be kept off newly renovated pastures until the new plants are well established (probably the middle of the following summer). In addition to adding seed of the dominant grass, you should add a minimal amount of nitrogen (20 to 30 lbs N per acre) and some phosphorus and potash if soil test levels are not at optimum. The phosphorus will encourage strong root growth and the potash will help the plant prepare for the stress of winter weather and regulate water use if dry weather returns. To maintain strong stands, soil test on a regular basis (every two years is best) and maintain your soil pH and nutrients in the optimum range. For pastures and hay fields, we generally recommend a 0 to 4-inch sampling depth since fertilizer and lime can only be applied to the soil surface and the downward movement of these materials is slow.

**What do you do once you have obtained stand counts?** In just walking over the field to obtain the stand count, you probably came away with a feel for whether the field needs help from partial renovation or not. But for those of you who prefer numerical values, here are some guidelines for minimal stands. Please keep in mind that these are guesstimates on my part and are not based on research since little if any has been done on this topic.

With that limitation in mind, obtain an

average count of the number of new tillers per square foot for grasses that are coming back from underground rhizomes such as Kentucky bluegrass, reed canarygrass, smooth brome grass, and perhaps tall fescue. For the other species such as ryegrass, timothy, and orchardgrass, obtain an average count of the number of plants (a single plant will hopefully have a number of new tiller buds developing) per square foot and compare them with the guidelines below.

Kentucky bluegrass: 15 to 20 tillers or new shoots per square foot

Smooth brome grass and reed canarygrass: 8 to 10 new shoots per square foot or, if you can distinguish plants or plant crowns, 3 to 5 crowns showing renewed tiller growth

Tall fescue: For fields established within the past two years, 5 to 8 plants showing new growth per square foot. For old established pastures, 2 to 3 plants per square foot. In each case, I would want to see a minimum of about 15 green tillers or shoots per square foot.

Orchardgrass: 5 to 8 plants showing new or greening tillers per square foot.

Timothy: 8 to 10 plants per square foot showing new tiller growth.

Ryegrasses: 8 to 10 plants per square foot showing new tiller growth.

In summary, I want to again emphasize that these are my best estimations or "guesstimates" of the counts you need for your stand to recover. My estimations are based upon both personal experiences and many years of making pasture renovation recommendations. I do however recognize that many farm specific variables such as drainage, soil variations, presence of rocks, and many more can dramatically alter the accuracy of my estimates; therefore please do not discount your specific farm experiences or that of someone else who has worked with pastures for many years. If you're not comfortable with the stand you see when you walk the field, then it is highly likely the pasture will respond to overseeding or partial renovation. The above guidelines are yet another rule-of-thumb to use in estimating the amount of ground coverage the desirable species provide. With absolute certainty, if you can see bare soil (or annual weeds) on 50 percent of the pasture area, then adding seed of the dominant desirable grass is likely to help improve the stand.

## PASTURE RENOVATION AND SEEDING BY SUSAN TRUEHART GAREY, EXTENSION AGENT ANIMAL SCIENCE

If you evaluate an existing pasture and determine that it needs renovation or reestablishment, where should you begin?

Renovating and establishing pastures are an investment of valuable time and money so it pays to plan well and ahead. As Extension professionals, we address these types of questions regularly.

Any type of pasture renovation project should begin with a thorough evaluation of the area to reseed. This includes evaluating surface topography, soil fertility levels, soil types, potential compaction issues, existing weed pressures, drainage, and planned pasture uses. All of these factors help determine the most appropriate techniques for renovation in an individual situation.

**Renovation vs. Establishment or Re-Establishment:** When speaking of pasture renovation, we are generally talking about seeding without the complete disruption of the existing sod. Renovation usually involves one of two methods; broadcast seeding or the use of a no-till drill. Renovating a pasture without destroying the existing cover is appropriate when a stand has thinned because of severe weather conditions, overgrazing, or age. Re-establishing a pasture involves some type of tillage equipment and destruction of the existing groundcover. This is appropriate when establishing a new pasture, when an existing pasture has little or no improved forage species left, when pastures suffer from extreme soil fertility issues or compaction, when severe perennial weed pressures exist, or when drainage issues need to be resolved by moving soil. Agricultural limestone (used to raise the soil pH, reduce soil acidity, and increase available nutrient levels) moves very slowly through a soil profile at approximately 1 inch per year. If soil pH values are extremely low, it is often better to spread ag lime and then thoroughly incorporate it into the soil with tillage. Small pH corrections can be made by top-dressing lime. When you are performing any type of tillage, you must realize that there will be an increased risk of erosion and a need for more time for newly established plants to establish before animals should be allowed back on the pasture.

To evaluate existing fertility levels, you need to have available either a recent (within the last two years) soil test report for that area or take a soil sample for analysis. Soil testing involves sampling the soil randomly across the pasture and sending a composite, well-mixed sample to a soil test laboratory. Directions for taking a soil sample are available from the University of Delaware Soil Testing Laboratory (UDSTL) or by visiting their web site at: [http://ag.udel.edu/other\\_websites/DSTP/index.htm](http://ag.udel.edu/other_websites/DSTP/index.htm)

The ideal way to take a soil sample is to use a soil test probe rather than trying to dig a sample with a spade. Contact your local county Extension ag agent for assistance in locating soil probes, soil test bags (\$7.50 per bag from the UDSTL), and determining the

type of recommendation needed. Generally, it requires about two weeks from the time a sample is submitted until you receive a recommendation.

Seed germination and vigor can be greatly affected by soil pH and fertility among other factors. When you consider that renovating a 3 to 4 acre field can cost hundreds of dollars for fertilizer, seed, fuel, and your time; seven and a half dollars is a worthwhile investment!

Soil compaction results from running heavy equipment over wet ground or allowing animals out on wet ground. Just consider how much weight a horse bears on those four hooves just walking, let alone the force of a cantering or galloping hoof making contact with wet ground. We once visited a farm in Sussex county where high stocking rates and years of horses being out on wet ground had combined to create enough soil compaction that it was having an adverse effect on the forage plant growth and survival. Keeping animals off of wet pastures can positively affect the longevity and health of your forage stands.

In extreme cases of perennial weed infestation in pastures, the use of a systemic herbicide followed by complete renovation may be in order. A well established, healthy and productive forage stand helps to ward off weed infestations. Weeds are opportunists. They tend to establish in bare spots in a forage stand. Spreading manure containing waste hay (and weed seeds) on pastures often introduces weed problems. Many weed issues can be solved by simply mowing you pasture regularly and maintaining a healthy soil pH and adequate nutrient levels that encourage forage growth.

Evaluating pasture areas for drainage issues is important. Standing water has multiple negative effects. It certainly has a negative effect on forage stands, soil compaction, and even horse health. Wetter areas may have special seeding needs. Some pastures species tolerate "wet feet" better than others. Generally speaking, pasture areas should be firm and level.

There are a number of questions you should ask yourself about the intended use of your pasture. Be realistic with your answers. These questions include: What type of animals am I going to be grazing? How much acreage do I have per animal? What stocking density am I going to carry on that land? Am I going to use the pasture as a nutrition source or simply as an exercise lot? Do I have the ability to rotationally graze [moving animals among paddocks (a fenced area of pasture) based on forage availability] or will I be grazing continuously (one field with animals always on it)? Do I plan on doing any breeding either now or in the future? How much time do I have to spend on managing my pastures? What kind of access do I have to equipment? The answers to these questions must be factored

(Continued on page 6)

## FERTILIZING PASTURE AND HAY FIELDS FOR FALL PRODUCTION FOLLOWING DROUGHT BY DR. RICHARD W. TAYLOR, EXTENSION AGRONOMIST, UNIV OF DE

With much of the region trying to recover from a summer drought, hay growers and pasture managers need to carefully consider factors that can affect their fall fertilization program as well as impact forages' winter survival. Where grazing is short, fall fertilization may be needed to boost pasture plant recovery and growth. Fall fertilization will help to ensure maximum forage production from your pastures, directly reducing your need to supplement your horse's forage requirements with an already expensive hay crop. Future projections are for higher hay prices and possible hay shortages. In addition, fall fertilization of certain forage crops can provide a stockpile of forage available for nutrient rich grazing late into the fall and early winter.

Rainfall/soil moisture level is a major factor in determining when late summer/fall nitrogen (N) fertilizer can be applied without damaging the forage planting or causing an increase risk for nitrate toxicity in the available forage. Following a drought similar to that experienced in many areas of the region, N fertilization should be delayed until adequate rainfall has been received to recharge moisture levels in the topsoil to near field capacity level. This moisture level should be adequate to stimulate or allow renewed growth following the drought although for maximum growth potential continued rainfall as well as pasture/hay fertilization will be needed.

The actual N rate to apply should be geared to the amount of time between when rainfall refills the soil moisture holding capacity and the expected date of the first killing frost. In drought years if rainfall begins in late summer/early fall, an immediate application of 50 to 75 lbs N/acre can help the pasture or hay field recover and produce enough growth for fall grazing/harvest. If adequate rainfall does not come until mid-to late-September, reduce the N rate to between 25 and 50 lbs N/acre. If rainfall begins in mid-October, a further reduction to 25 lbs N/acre or less is appropriate. Do not adjust the above N rates for the legume (clover) content of the pasture or hay field unless the accompanying legume is alfalfa. Red clover, white clover, alsike clover, and most other pasture legumes with the exception of alfalfa will have shut down the N-fixing association with the bacteria, *Bradyrhizobia*. Therefore, little to no N from legumes other than alfalfa will be available for any companion grass.

Producers are often hesitant about applying soil test recommended amounts of potash ( $K_2O$ ) and phosphorus ( $P_2O_5$ ) during droughts. Although it might be wise to delay  $P_2O_5$  and  $K_2O$  applications until cooler weather arrives, soil test recommended levels of  $P_2O_5$  and  $K_2O$  should be applied as early as possible in the fall. Potash in particular will be invaluable to the recovering forage grasses in preparation for winter survival. The phosphorus fertilizer will help plants reestablish a vigorous root system and activate recovery from the rhizomes. Next spring growers should watch the stands carefully and provide N at or just before spring green-up to encourage vigorous spring growth. If the stands appear very weak, addition  $P_2O_5$  and  $K_2O$  and boron (1 lb B/acre for most legumes and up to 2 lb B/acre for alfalfa) early in the season will help strengthen stands and improve yields.

## TEN QUESTION INTERVIEW WITH JENNIFER FABRYKA BY DAVID L. MARSHALL, V.M.D.

In the preface of this issue of *Changing Leads*, I introduced Jennifer Fabryka as author of the "The Trouble with Twins". Jen is a very accomplished student in the Animal Science program at the University of Delaware with a pre-veterinary concentration. This fall (2007), Jen will enter her senior year with a 3.9 cumulative average (almost straight A's). Not only is Jen's undergraduate record superb, her future looks just as exciting. I asked Jen ten questions to get to know her better.

**How many siblings do you have?** I have one younger sister. She is four years younger than I am.

**Did you have any pets growing up? If so, did you have a favorite?** We had lots of pets while I was growing up. By far, my favorite was a yellow lab named Nugget. I love all animals, especially horses. My parents gave me a set of riding lessons ten years ago as a birthday present and from that time on I've been hooked on horses.

**Where did you grow up and what high school did you graduate from?** I was born in Dover [Delaware] and our first home was in Frederica, Delaware. My family and I moved to Felton ten years ago and that has been our home since. I graduated from Dover High School in 2004. I was a member of the National Honor Society and FFA at Dover. I took all of the animal science courses they offered.

**Why and how did you choose the University of Delaware?** Both of my parents are University of Delaware graduates, my father in biology. I suppose that's where I inherited my love of biology. I also did not want to move far from home. It goes without saying because the University of Delaware offered me a wonderful scholarship, that definitely helped me make up my mind.

**How has the University of Delaware affected your career path?** I absolutely loved your repro class. [The 400 level Mare Reproduction Physiology and Neonatology class] The advanced academics your

(continued on page 8)

## PASTURE RENOVATION AND SEEDING

(continued from page 4)

into regional considerations as well as site specific factors when we recommend pasture forage species.

Forage species each have their own individual characteristics and therefore may be better suited to one person's operation than another. I am going to discuss a few of the common pasture forage species used in Delaware and their main characteristics. This is by no means an all encompassing list.

**Kentucky bluegrass-** Kentucky bluegrass is a great choice if it works in your region of the state. Unfortunately, Kentucky bluegrass is only suited for conditions in the northern portion of New Castle County. It prefers heavier, denser soils that are not typically found in Kent and Sussex Counties. Bluegrass forms a dense sod so it tolerates hoof traffic well and is long-lived. It is a cool-season grass that goes semi-dormant during hot, dry periods in the summer. Cooler and wetter fall conditions stimulate regrowth of the grass. This species is slow to establish (it can take 28 or more days for the seed to germinate) but it is highly palatable to horses.

**Perennial ryegrass-** Do not use the turf-type perennial ryegrasses (these varieties are bred to contain an endophytic fungus that produces toxins beneficial to the plant's survival but not to animal performance/health). Consider using a tetraploid type of perennial ryegrass since these varieties are bred to yield better and to have more disease resistance. Perennial ryegrass is a cool-season grass that does best on fertile, well-drained ground. It does tolerate wet soils better than some of the other cool-season grasses. It is very rapid to establish, highly palatable, and highly digestible. However, it will not persist in a pasture for more than a couple of years. It does best when seeded with a legume; otherwise, it needs regular applications of nitrogen (N) fertilizer.

**Timothy-** Timothy is generally not used for grazing. If grazed, it must be rotationally grazed. It does not tolerate set, season-long grazing. It does tolerate slightly wet, heavier soils but does not tolerate drought because of its shallow root system. It is a bit finicky about seeding depth, being very small seeded. It is not a very competitive plant so other grasses can out compete it. It is one of the few grasses that performs better when spring seeded. Timothy is commonly found in pasture mixtures probably because it has a reputation as a feed horses favor and not because it contributes to long-term pasture productivity.

**Orchardgrass-** Orchardgrass performs best under rotationally grazed systems. It does not tolerate overgrazing well or lots of hoof traffic. It needs well-drained fertile soils. It does tolerate drought, heat and shade better than timothy, Kentucky bluegrass and perennial ryegrass. It is a bunch grass and does not form a dense sod. It performs best when mixed with legumes such as ladino clover or red

clover. If not seeded with a legume, it needs regular applications of N fertilizer.

**Tall fescue-** Again as with perennial ryegrass, avoid using anything called turf-type tall fescue since these varieties are bred to contain high levels of an endophytic fungus. Tall fescue is known as the "Queen of Wear and Tear." It has the ability to form a sod and resist trampling in wet weather. It stays green longer into the winter season than other cool-season grasses and survives drought better than many other forage species. It also tolerates "wet feet" better than some other forage species. It is not the best choice for those breeding horses because of the toxic effect of an endophytic fungus that lives within the plant.

**Endophyte-Free Tall Fescue-** Endophyte-free fescue is sold under several trade names. It is essentially the tall fescue with the endophytic fungus removed. However, those characteristics of toughness and persistence that make Kentucky 31 tall fescue so great are largely lost once the endophytic fungus is removed. Longevity in a forage stand, tolerance to grazing and hoof traffic, and drought tolerance are reduced with endophyte-free tall fescue varieties.

**Novel Endophyte Tall Fescue-** Novel endophyte fescue is sold under the trade name Max Q fescue. Novel endophyte fescue has been modified in such a way that the endophyte fungus is left in the plant but does not produce toxic compounds. Because of the technology used to develop this plant, the seed commands a much higher price. It maintains many of the good characteristics and toughness of Kentucky 31 tall fescue without the associated animal reproductive problems. It seems to do best when established through conventional tillage methods and is a bit slower to establish. Graze lightly and carefully at first and allow plenty of time for the grass to establish.

**Ladino clover-** Ladino clover is a large type of white clover. Clovers are also legumes that can fix their own N from atmospheric N and share some of it with nearby grasses reducing the need for fertilizer N. It is commonly used in mixed grass legume pastures. It is cold tolerant but has low tolerance to heat or drought. Ladino clover tolerates grazing to a 2 inch residue height. It can be easily added to an existing pasture by frost crack seeding. Frost crack seeding is the process of broadcasting seed in late winter when the ground is repeatedly freezing and thawing. This action helps work the clover seed into contact with the soil. Although in most cases it does not need a bacterial inoculant added to the seed, it is prudent to apply the appropriate inoculant to the seed before planting. Ladino clover seed is very small so you get more seeds per pound than with many other forage crops. Seed at 1/2 lb. per acre or less, otherwise your pasture can become overwhelmed with clover.

(continued on next page)

## PASTURE RENOVATION AND SEEDING

**Red Clover-** Red Clover is best used under rotational grazing and can also be cut for hay. It does not tolerate continuous close grazing. It does tolerate lower pH better than some other legumes. Red clover is a short-lived perennial but does produce seed even when grazed so it reseeds itself easily. Some people are hesitant to use red clover in horse pastures because occasionally it may cause a horse to get slobbers. This is not a result of the red clover itself but rather a chemical produced by a disease that sometimes affects red clover called black patch. A case of the slobbers is more of a nuisance than a health concern.

As I said before, this is by no means a complete list of available forages but these are the main ones in use in our area. A quick note about clovers; Dr. Marshall explained an instance of alsike clover toxicity in his introduction. Alsike clover does occasionally cause problems for horses and is part of the reason we do not recommend using an off-the-shelf pasture mix from your local farm supply store. These premixes often contain alsike clover since it can tolerate wet soil conditions. Another reason not to use these pasture mixes is that they generally contain species that are not appropriate for your area. If you want to plant a mix, consider making your own mix by combining seed of 1 or 2 grasses plus a legume. Many seed dealers have seed blenders and will gladly mix your purchased seed. Another option is to plant the grass seed in the fall and allow the grass to establish. The next spring or even several springs later a legume can be frost crack seeded.

Unless otherwise noted above, plant cool-season grasses in late summer or early fall. The calendar should not be the only deciding factor. Soil moisture needs to be sufficient at planting. If the seeding does not have enough time to get established before

winter, winter kill is a possibility. Late seeding can delay when you can start grazing animals on the pasture as well. Successful spring seeding of grasses is difficult to accomplish due to delays in seedbed preparation in wet springs, weed competition, and the risk of early-season heat and drought when seedlings are most susceptible to stress.

For pasture renovations without sod destruction, it is necessary to mow or graze the existing forage close to help reduce competition from existing plants. The use of a no-till drill or broadcasting seed are the most common establishment methods in pasture renovations. Many county conservation districts have no-till drills that can be rented. You will need to make sure you have a tractor that has the necessary horsepower to handle the no-till drill and you will need to call ahead to reserve the drill. It is important when using a no-till drill to check your seeding depth since some species are very sensitive to seeding too deep. When broadcasting seed over an existing pasture, it is important to ensure sufficient soil to seed contact. Personally, we have found we have better results when we drag the pasture fairly aggressively prior to broadcasting the seed and then drag less aggressively after seeding rather than broadcasting the seed without any soil preparation. Use higher seeding rates when broadcasting seed versus using a no-till drill since seed can be lost to wind, rain, and pests. When seeding a pasture after conventional tillage, it is important to have a level, firm weed-free seedbed prepared prior to seeding.

In general whether you are planting a new pasture or renovating an existing one, more is better. Logically, more seed results in more plants. However, more time, more planning, more knowledge, more information and more careful management will result in more pasture for more years.

## TEN QUESTION INTERVIEW WITH JENNIFER FABRYKA

(continued from Page 5)

class offered along with the down-to-earth foaling and hands-on foal care experiences we received cemented my career path. It was the “why and how events happen” your class revealed. That is to say, understanding the whys of biology is now my driving educational passion versus just observing that events happen...events such as pregnancy, birth and new life. This surprised me, because at first I was intimidated by the class’s expectations. It was without a doubt my favorite university class so far.

**What have you learned or how has U of D provoked you to become a solution to a global or communal problem?** In my introductory biology classes I started to see the many changes in our world, some of which are not compatible with a biologically healthy life. I also started to see a hope and a solution to these negative changes in some of my classes. For example: in the introductory animal science class, we discussed cruelty to animal issues; topics such as horse slaughter and dog fighting. I could see that there was hope in education towards a positive change.

**What other Animal Science activities are you involved in at the University of Delaware?** I am a member of the equestrian team. This year we finished 7<sup>th</sup> in the nation as a team. First we finished #1 in our region and in the top 2 in our zone [Upper East Coast]; 10 teams competed in the ‘zones’ held in Pittsburgh this year, with two teams advancing to the Nationals. We finished a close second to Penn State in the zones but had enough points to qualify us for the nationals. We turned point totals around and finished well ahead of Penn State in the Nationals. Nationals this year were held in the “Big E” in Massachusetts, a new state of the art riding complex that hosts the largest equestrian venues in the country. This was a big accomplishment for our team because our team was the top placing club team at

the Nationals. Teams finishing higher than ours were varsity teams. Varsity teams are university supported and we [the University of Delaware Club team] are self supported as we pay our own way. It was exciting. Many of the team members are from the College of Agriculture and Natural Resources and we are the biggest club on campus. **(Do you ride English or Western?)** I ride English.

**You were actually the winner of a student contest I held to name the newsletter, *Changing Leads*. What inspired you to come up with that name?** Coming up with that name was fun. I was searching for a play on words using the everyday language we use in the horse world. In riding, training and performance, we are always talking about our horses changing leads. It implies to me something positive, going in a new and sure direction. It seemed to capture what you wanted for the equine newsletter...evolving our thoughts, so-to-speak.

**Where do you see yourself in five years?** By then I hope to be finishing vet school. Then I would like to work with an experienced veterinarian with a large animal or equine expertise. I would eventually like to open my own practice.

**Just one more question...if you had your own horse what would you name him and why?** Now that’s a good question. Would you [Dr. Marshall] please talk to my father and convince him I need my own horse. (She laughs with a daughter’s devious expression). If I were to name any horse, I would need to see the horse beforehand. I really had a fun time this spring with my other group members naming our foal born in your class. Our mare’s name was Mockingbird, so I looked up all the bird names beginning with M. I wanted a cute one beginning with M [our horse breed, Haflingers, require female foals to be named with the first letter of the dams name]. That’s how we came up with Meadowlark as a name? It’s a great name – don’t you think?

## THE TROUBLE WITH TWINS

BY JENNIFER FABRYKA

Most horse owners have accepted the fact that the possibility of twins presents a problem, but do they really understand why? Normally, a foal matures in a mare's uterus where it is surrounded by a placenta that provides nutrients and allows for necessary gas exchange, [oxygen and CO<sub>2</sub> exchange]. When twins are present, the placenta often cannot sustain them nutritionally or spatially. In fact, the mare's body seems to recognize that the presence of two fetuses is not conducive to an ideal gestation. Overall, the probability of a mare having twins that survive to maturity is approximately 1 in 300,000 pregnancies or 0.0003%. Although twin pregnancies normally account for 1-2% of all pregnancies, the mare has a 70% natural reduction rate where one embryo is eliminated. Occasionally, the mare's body will terminate both fetuses partway through a pregnancy. In fact, twinning in the horse is the primary non-infectious cause of abortion and can account for between 6% and 30% of all aborted pregnancies. Between the natural reduction of an embryo and a high incidence of abortions, only 9% of twins will carry to term. Only 14.5% of the twins born alive will actually make it to their second week of life.

Twins are seen so rarely that many people seem to discount the complications that can occur if precautions are not taken to ensure that only one fetus is present. If both embryos happen to survive into late gestation, one or both foals may be stillborn or very weak at the time of parturition. The incidence of dystocia [difficulty in birthing] also increases dramatically with twins and can cause permanent, irreparable damage to the mare's reproductive tract if just one of the foals is positioned incorrectly. The birth of twins can also result in a higher occurrence of retained placentas [afterbirth membranes are not expelled], which in turn can cause laminitis and eventual death.

One important step in ensuring that your mare has a healthy pregnancy is to determine if she is carrying twins and to take the necessary actions to eliminate one of the embryos at the appropriate time of gestation. Because 20% of mares will naturally ovulate two eggs per reproductive cycle and, of those that become pregnant, 1-2% will carry twins, you should always have your mare checked to ensure that she is only carrying one embryo. The ideal time to ultrasound for twins is between day 13 and day 14 of pregnancy. At this point, a second embryo may be manually reduced without resulting in the loss of the other and, consequently, the entire pregnancy. Waiting to take action until after day 16 of pregnancy results in a higher incidence of loss of both twins and what may amount to a lot of money.

Although it is possible for a mare to give birth to healthy twins that survive to maturity, it is generally regarded as a better management practice to have your mare checked for twins and act on the situation appropriately. While we may fantasize about watching twin foals frolic and play together under the watchful eye of their dam, this is definitely a situation where logic and practicality are more important than the desire to produce such a rarity. A mare's wellbeing should rate higher than the novelty of her giving birth to two foals that may or may not survive the process of parturition, if they even make it that far into the pregnancy.



Jennifer Fabryka with Cindy and her twin foals.

## WHEN TO WORRY ABOUT HAY SAFETY BY DR. RICHARD W. TAYLOR

As recently as July of this year, both the popular press and academic journal articles were published or posted on the internet to draw the horse owner's attention to particular problems and toxicities of horse hay being sold. In a July 5, 2007 from the Hay and Forage Grower magazine posted on the internet, hay buyers were warned to check alfalfa hay produced in Michigan and the upper Midwest for a toxic weed called hoary alyssum (*Berteroa incana*). The toxic weed sickened a number of horses in Georgia and most worrisome the weed was not readily visible in the hay.

When should you worry about toxins in hay? I think the greatest danger to horses comes when you change from one supplier to another and especially when you change from a local supplier (one you can visit and actually inspect the hay production fields) to a non-local supplier or hay broker. That's not to say that the non-local supplier or hay broker has lower quality or riskier hay but it does change the onus of checking the hay onto you, the buyer. No one is out to sell toxic hay; but it goes without saying that hay bought from outside the region can have plants in it that no one (not you, your hay dealer, or your veterinarian) will recognize as toxic to your horses.

The recently reported incident involving the poisonous plant hoary alyssum in alfalfa hay is both eye opening and instructive. This particular poisonous plant was practically invisible in the hay. Only after the horses consuming the contaminated hay started to show signs of swollen legs and fever, with some of the affected horses actually advancing to foundering, was the hay examined closely enough to identify the contaminate. This does speak to an often repeated recommendation: that being to carefully monitor any horse fed hay from a new hay lot or new hay dealer. It is always true: the more quickly we identify a problem, the more certain we can be that serious, if not deadly consequences, can be averted. For more information about hoary alyssum, refer to a fact sheet found online at: [www.pestid.msu.edu/factsheets/HoaryAlyssum.pdf](http://www.pestid.msu.edu/factsheets/HoaryAlyssum.pdf)

Besides changing hay suppliers, what other commonly occurring events can bring about uncommonly dramatic changes to our hay safety? One such change to our hay safety occurs following very stressful growing seasons; such as seasons that are too wet, or too dry, or too hot. Such growing conditions produce hay stands that are somewhat thin and open allowing weeds to grow in the open areas. Weeds can contain toxins that can harm horses if eaten in too large a quantity. Hays produced under wet growing seasons and/or hay produced under poor drying conditions will likely encouraged excess mold development in the hay which can cause respiratory problems for horses. Always check a few bales from each new hay lot that you buy to be sure moldy hay is not present; never feed any amount of moldy hay to your horses.

Many horse owners prefer not to buy hay that has been treated with a preservative; but, in actuality, hay treated with preservatives such as buffered propionic acid (prop or buffered prop) is often much higher in quality and has a much lower risk of mold development than sun-cured hay. Buffered propionic acid contains an acid that is a naturally occurring acid found in animals' digestive systems and is quite safe even for horses. Hay treated in this fashion is often greener and more readily acceptable to animals and should not be blindly ignored by the horse community since it offers a way to more safely preserve hay.

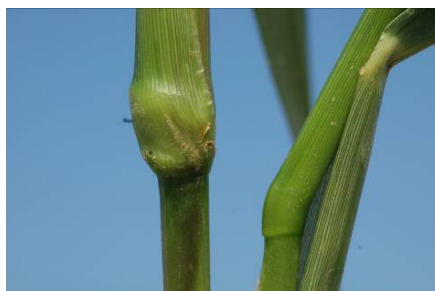
What kinds of problems can occur with hay? The most common and long-standing problem is hay from endophyte infected tall fescue (often the variety Kentucky 31) fields. The endophyte is a fungus that produces toxic alkaloids that harm livestock but help the plant survive stress conditions. Relatively new, there are now novel or friendly endophyte infected tall fescue varieties (sold as MaxQ tall fescue) that do not produce the toxic alkaloids but do help the plants survive. The new novel endophyte tall fescue is mostly used for pastures but you may someday see hay for sale that comes from novel/friendly endophyte tall fescue. Horse owners interested in breeding horses will want to avoid tall fescue hay due to the risk of getting the wrong variety but those not interested in breeding could use novel/friendly endophyte hay. However, be sure to have written certification from the producer; otherwise consider tall fescue hay as off limits for horses. I should point out that tall fescue is one of the most common grasses planted in the eastern United States and is found in many meadows (sometimes called meadow hay if cut for hay), old pastures (called pasture grass or pasture hay), or roadsides (cut and sold as grass hay or grass horse hay). These old stands of tall fescue often have high levels of endophyte in them. When hay production fields are hurt by drought as they have been this year, these sites are often cut and sold as hay. Unless you can identify the grass species in the hay or obtain assurance from the buyer of what the grass species is, it will be safer for your horses if you choose not to buy this type of hay.

Recently in North Carolina and Virginia, concern was raised over panicum in hay samples that caused liver failure in horses and sheep. Several grass species of panicum have been implicated including fall panicum (*Panicum dichotomiflorum*), an annual grass weed common to our area (see first photo); switchgrass (*P. virgatum*), a warm-season grass used on conservation tillage areas; and kleingrass (*P. coloratum*), an introduced grass commonly grown in Texas. Of these panicum species, the one most troublesome for hay buyers in the mid-Atlantic region is fall panicum. Fall panicum produces semi-prostrate large diameter stems with distinct nodes or

(continued on next page)

## WHEN TO WORRY ABOUT HAY SAFETY

(continued from previous page)



joints and wide leaves with a white stripe down the mid-rib (See second and third photos). The weedy grass grows vigorously in late summer so third or fourth cuttings of hay may contain the weed if the stand is thin and fall panicum seeds are present in the soil. Talk with your hay producer and express your concern that this species should not be in hay sold to you.

Another perennial problem, albeit more likely a pasture problem, occurs when alsike clover (*Trifolium hybridum*) is present in a hay production field. This clover is hairless like white clover, upright growing like red clover, and has a pinkish blossom the shape of white clover but closer in color to red clover. In sensitive horses, alsike can cause mild to severe liver damage resulting in photosensitivity (sun burned skin lesions) that require housing the animal inside, a change of diet eliminating the clover, and a lot of hands-on care.

Another example of mechanical injury rather than chemical comes from numerous species of grasses that produced barbed seed heads and some legumes such as matured crimson clover (*T. incarnatum*). The grasses include the foxtails (*Setaria* spp.), wild barley (*Hordeum vulgare* ssp. *spontaneum*), wild oats (*Avena sativa*), and yellow bristlegrass/yellow foxtail (*S. pumila*). These grasses cause problems since the barbs can penetrate and become imbedded in skin and mucous membranes causing ulcerations, infections, and abscesses. Crimson clover dried seedheads can cause similar problems or can become imbedded in the eyes causing great discomfort to the animal.

Other concerns for hay include the dustiness in red clover hay from the fine plant hairs covering the plant; cystitis syndrome caused by sudangrass (*Sorghum sudanese*), sorghum (*Sorghum* spp.), and a range of millets (*Setaria* spp.) [German, foxtail, Japanese, etc. but not pearl millet or hybrid pearl millet (*Pennisetum americanum*)]; nitrate poisoning from heavily fertilized, drought stressed hay fields; and mycotoxins which are most commonly associated with molds, usually on grains or grain products but also detected in forages and bedding.

The bottom line comes down to knowing and building a trust relationship with your hay producer. Talk to your producer about your concerns for your horses and pass along information you may discover about relevant problems such as the widely publicized hoary alyssum problem. If you decide to change hay providers, be sure to observe your horses carefully as they begin feeding on hay from a new source. Anytime you purchase hay from outside the region, limit the amount of the new hay that you feed until you are sure your animals are not having problems. If you have questions about hay, contact your local county Extension agricultural agent for more information.

## DELAWARE 4-H'ERS COMPETE AT ANNUAL STATE 4-H HORSE SHOW BY LAUREN SOUTHARD AND SUSAN GAREY

### *Delaware 4-H'ers Compete at Annual State 4-H Horse Show*

Delaware 4-H members and their horses and ponies recently competed in the 42<sup>nd</sup> Annual Delaware State 4-H Horse Show at the Delaware State Fair in Harrington. The event is planned and conducted by the volunteer Delaware 4-H Horse Advisory Committee. The 4-H'ers competed in English and western events, such as English pleasure, English equitation, western pleasure, and working western pleasure. There were also less traditional events such as the trail classes, which judge the horse's attentiveness to its rider while going over and around obstacles that might be found on a trail ride. Fun classes like the egg and spoon contest, the dollar bareback ride, and a costume class concluded the show.

There was some serious competition amidst all the fun. The most competitive riders at the show are eligible for the Betty Niblett Perpetual Trophy, which goes to the rider with the most points in equitation and showmanship/horsemanship classes. Taylor Scuse and Kaitlyn LeBlanc were tied for this high point award at the end of the show and were asked to compete in a "ride-off" to determine the winner.

The results were:

Betty Niblett Perpetual Trophy – Taylor Scuse, Kent  
 Champion Western Horse – Chips A Sail, shown by Taylor Scuse, Kent  
 Reserve Western Horse –Orkies Feature, shown by Brittany Blackston, Kent  
 Champion Western Pony- Hollering Hill Pocketchange, shown by Brittany Blackston, Kent  
 Reserve Western Pony – Canie, shown by Steven Scuse, Kent  
 Champion English Horse – – I'm a DeVine Story, shown by Kaycee Jo Wells, Sussex  
 Reserve English Horse –IMA Dirty Peyton, shown by Kaitlin LeBlanc, Kent  
 Champion English Pony –Hot Fudge Sundae, shown by Sarah Kosciuszko, Kent

Sponsors of this year's horse show included the Delaware 4-H Horse Advisory Committee, Clendaniel Agri-Sales, the Delaware Equine Council, the Delaware Quarter Horse Association, Dover Saddlery, Red Hawk Farms, Wanda Stayton and Tyloria Acres. 4-H is the world's largest youth group, teaching leadership, creativity and other life skills. 4-H'ers participate in many events, contests and project areas in addition to horse projects. The Delaware 4-H program is a part of the University of Delaware Cooperative Extension. For more information on 4-H programs, please contact your county extension office.

## 4-H MEMBERS COMPETE IN HORSE JUDGING CONTEST BY LAUREN SOUTHARD AND SUSAN GAREY

### *4-H Members Compete in Horse Judging Contest*

Delaware 4-H'ers recently participated in a horse judging competition at the Delaware State Fair in Harrington. In order to qualify for participation in the state level contest, 4-H'ers had to attend county level trainings to expand their knowledge. The state contest gave 4-H'ers the opportunity to demonstrate their knowledge of horses. The contestants judged horses based on conformation, body condition and way of moving as appropriate for the breed and ranked each horse within its class. They judged Arabians, Quarter Horses, Welsh Ponies, and Appaloosas. The 4-H members also judged a performance class in which they ranked horses on their way of going and manners while being ridden in English tack. The 4-H'ers were awarded points based on the closeness of their rankings to an official committee of judges' rankings of the horses. Finally, participants had to present a set of oral reasons to a judge on one of the conformation classes. Oral reasons are an opportunity for young people to communicate their decision making process in arriving at their placing to the judge.

The results were:

- |                             |                               |
|-----------------------------|-------------------------------|
| 1. Jacob Blacksten, Kent    | 6. Amber Caldwell, New Castle |
| 2. Brittany Blacksten, Kent | 7. Alicia Clifton, New Castle |
| 3. Taylor Scuse, Kent       | 8. Sara Kosciuszko, Kent      |
| 4. Jenna Scuse, Kent        | 9. Amanda Jones, Kent         |
| 5. Jamie Board, Sussex      |                               |

## RED MAPLE TOXICITY IN HORSES

BY DAVID L. MARSHALL, V.M.D.

I received a call several days ago that precipitated the writing of this fact sheet. The call was from a veterinarian in our Delaware area. His call was concerning two horses he was about to examine that were laying down -flat out- in the pasture and unable to rise; both horses were depressed to the point of being non-responsive. Along with these two very sick horses, the veterinarian reported the unexpected and sudden death of two ponies pastured together with the two desperately sick horses. The story has a sad ending in that the two horses were beyond the help of therapy and required humane euthanasia. The veterinarian's investigation revealed a tree downed in the pasture from a nor'easter storm that had passed through our area several days preceding the deaths. We identified the downed tree as the common red maple, *Acer rubrum*. The poisoning of horses by leaves of the red maple tree [also called the swamp maple] is a seasonal disorder that occurs during the summer and fall months. Fresh leaves eaten directly from the tree are safe and present no health

risk to a horse other than the danger of colic; not unlike the colic risk of a horse eating any strange food. But dried-wilted or fresh-wilted leaves are a different story; they are deadly to our horses, even deadly in very small amounts. Experimentally dried-wilted leaves are toxic when administered at a dose of 1.5mg/kg body mass. Translated: that is far less than a 1 ounce meal of dried-wilted leaves per 1000 pound adult horse; point of fact, the amount is about equal to the weight of two adult aspirin tablets. The exact toxin present in the Red maple is unknown, but it is recognized and classified as an "oxidant" toxin. The clinical disease produced when horses eat fresh-wilted or dried-wilted maple leaves is that of an acute, hemolytic anemia. Hemolytic anemia is the abnormal break-down of the red blood cells, with ultimate destruction of the red blood cells. The red blood cells are responsible for carrying oxygen in the blood.

Signs of red maple toxicity generally start about 1-2 days following eating of wilted leaves, or dried leaves from a wilted leaf source. That distinction is important to understand. The toxicity is known to occur only when Red maple leaves have wilted. Wilted leaves are different from leaves which become beautifully colored and naturally drop from a tree in the autumn. Dropped autumn leaves are not recognized to be deadly to the horse. The toxin is released only when a limb has fallen or has been fresh cut from a green tree and the leaves wilt; the dried leaves from autumn do not contain the toxin. Affected horses are acutely lethargic, that is they appear to be sleeping on their feet, non-responsive and will not wake up. Affected horses will not eat; they are weak and depressed. The poisoned horse will be breathing with exaggerated effort, heart rates will be greatly elevated, but they will not have a fever. Death occurs 3-7 days following wilted leaf ingestion in more than 60% of horses that eat wilted Red maple leaves. Because we do not know the specific toxin, there is no antidote. Therapy is supportive, including IV fluids, oxygen supplementation and blood transfusions; but please recognize and understand that in many cases even aggressive therapy is unrewarding.



Prevention is key and is accomplished simply by preventing exposure of horses to the wilted leaves of red maple trees. Accidental exposure generally occurs following storm damage and following the routine trimming of trees from pastures and the trimming of trees lining horse pastures. Prior to the removal of the downed limbs, horses nibble on the wilted leaves. I have also had cases where horses have reached through fences to nibble on wilted leaves from branches piled up following trimming or storm downed limbs. Inspect your pastures regularly, especially following high wind storms. Use wisdom when trimming trees, there is no wilted leaf that is healthy for our horses to nibble upon, and some, like the red maple are deadly. Be vigilant of power and phone line crews as they may unwittingly provide our horses nibbling opportunities.

(continued on next page)

## RED MAPLE TOXICITY IN HORSES

(continued from page 13)



Red Maple Leaves



Red Maple Fruit



Red Maple Bark



Red Maple Twig

(Pictures courtesy of the Virginia Tech Forestry Department Website)

Accurate identification of the various species of the maple tree is most important to the prevention of accidental poisoning. But herein lies the last major problem with red maple toxicity: there are 13 native maple tree species growing in our area, of which the Red maple is one. However, there are over 125 introduced maple species in our region, making exact red maple identification a project for the experts. For us, this means we must keep our horses free from having access to wilted maple leaves altogether. To add emphasis to the last statement, recent veterinary scientists have chemically identified the presence of the “oxidant” toxin to exist in all maple tree species, just at a much lower level than the Red maple. Knowing this fact and the difficulty in positively differentiating Red maple from other maple species; it is most important we manage proactively to protect our horses from ingesting wilted maple leaves.

## UPCOMING EVENTS

*Upcoming Equine Educational Opportunities:*

**Saturday, September 15<sup>th</sup> - Rain or Shine 9:30-am- 2:00 pm-**

**“Anatomy of a Grazer: An Equine Pasture Walk,”** covering the how’s and why’s of equine pasture management hosted by Chateau Country Stables at Mt. Cuba Center, Inc. Dress comfortably for a pasture setting! Bring your own lawn chairs. Lunch is provided. If it rains, we will adjust the program and move inside a hay barn. We will apply for both DE Pesticide and Nutrient Management re-certification credit. This meeting is free and everyone interested in attending is welcome. To register, for more information, or special consideration in accessing this meeting, please call the NRCS office in advance, at (302) 832-3100.

**Saturday, November 10, 2007- 10:00 am- 3:00 pm-**

**Annual Equine Conference**, University of Delaware Carvel Center, Georgetown. The National Research Council’s updated nutrient requirements for horses was released last spring. As the “Bible” for feeding horses, learn about the changes since the last edition and its effects on how we should be feeding our horses. Some time will be spent discussing feeding the senior horse. For more information contact Susan Garey at truehart@udel.edu or (302)730-400 or Dr. David Marshall at davidlm@udel.edu or (302) 831-1340.

**Monday, January 7, 2008 – 6:00-9:00 pm-**

**Delaware Ag Week Equine Pasture Program**, Exhibit Hall Boardroom, Delaware State Fairgrounds. Nutrient Management recertification credits will be offered.

(continued on next page)

*Tuesday, January 8, 2008– 9:00 am-3:00 pm and 6:00-9:00 pm (shortened version of morning/afternoon seminar)-*

**Delaware Ag Week Hay and Pasture Program**, Agricultural Commodities and Education Building, Delaware State Fairgrounds. Nutrient Management Recertification Credits will be offered. This program will include all animal species (cow, sheep, goat) and the horse.

*Wednesday, January 9, 2008- 6:00-9:00 pm-*

**Delaware Ag Week Equine Nutrient Management Program**, Large Meeting Room, Delaware State Fairgrounds. Nutrient Management Recertification Credits will be offered.

For more information on any of the Ag Week Programs please contact your county extension office:

New Castle County- (302) 831-2506

Kent County- (302) 730-4000

Sussex County- (302) 856-7303

**RECEIVE NEWSLETTER**

David L. Marshall, V.M.D—Editor

Phone: 302-831-1340

Email: davidlm@udel.edu

Susan Truehart Garey—Assistant Editor

Phone: 302-730-4000

Email: truehart@udel.edu

If you are not currently on our “Changing Leads” mailing list or know someone who would like to receive our free University of Delaware equine up-to-date information newsletter, please fill out the form below and return to:

David L. Marshall, V.M.D  
University of Delaware  
034 Townsend Hall  
531 S. College Avenue  
Newark, DE 19716

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

EMAIL: \_\_\_\_\_

Or email your request to : truehart@udel.edu



<http://ag.udel.edu/extension/>

**UNIV. OF DE**

Cooperative Extension  
University of Delaware  
College of Agriculture and  
Natural Resources  
Townsend Hall  
531 S. College Avenue  
Newark, De 19716  
  
Phone: 302-831-1340  
Fax: 302-831-2822  
E-mail: davidlm@udel.edu

**C H A N G I N G   L E A D S**

University of Delaware  
Townsend Hall  
531 S. College Avenue  
Newark, DE 19711