

# Views From The Foothills

A Publication of the Culpeper Soil & Water Conservation District  
Serving Culpeper, Greene, Madison, Orange & Rappahannock Counties  
[www.culpeperswcd.org](http://www.culpeperswcd.org)

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M. Johnson

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## **Fescue Toxicosis and Management** **Brad Jarvis, Extension Agent Agriculture, Madison County**

Tall fescue is among the most common cool season pasture grasses in Virginia and is widely grown in other countries with temperate climates. In the U.S., nearly all tall fescue pastures planted before 1980 are infected with *Neotyphodium coenophialum*, a microscopic fungus. The fungus is commonly referred to simply as “the endophyte,” because it grows inside (“endo”) the plant (“phyte”). The common strain of this fungus produces toxins called ergot alkaloids, such as ergovaline. These ergot alkaloids cause fescue toxicosis, a severe livestock disorder that costs U.S. livestock producers up to \$1 billion each year.

At present there is no cure for fescue toxicosis. However, there are proven management strategies that avoid or lessen the extent of toxicosis. One strategy is replacement of toxic tall fescue with cultivars that are endophyte-free or contain non-toxic endophytes (novel endophytes). Other strategies involve management of toxic tall fescue pastures by a series of practices that limit the amount of toxin that is ingested by the animal.

Fescue toxicosis is most easily recognized by obvious physical symptoms such as fescue foot, maintaining winter hair coat in the summer, elevated body temperature, standing in water and no milk let down at parturition. But some of the most serious symptoms of tall fescue toxicosis are not readily apparent. These symptoms include vasoconstriction, increased respiratory rate, low heart rate and serum prolactin, suppression of the immune system, reduced forage intake and low rate of weight gain. In addition, fescue toxicosis causes serious reproductive problems such as low pregnancy rates, thickened placenta, retained placenta and agalactia (failure to produce milk). The reproductive issues are particularly more severe in pregnant mares. Recent research also indicates that fescue toxicosis reduces sperm quality in bulls grazing tall fescue, resulting in decrease fertilization potential in beef cows.

Toxins responsible for tall fescue toxicosis are ergot alkaloids, a class of compounds produced by the endophyte. Ergovaline is the most prevalent and most frequently researched of these alkaloids, although the other alkaloids may also prove to be partially responsible for tall fescue toxicosis.

Ergot alkaloids are highly concentrated in the seed but can be detected in the leaf and stem tissue as well. Ergot alkaloids concentrations

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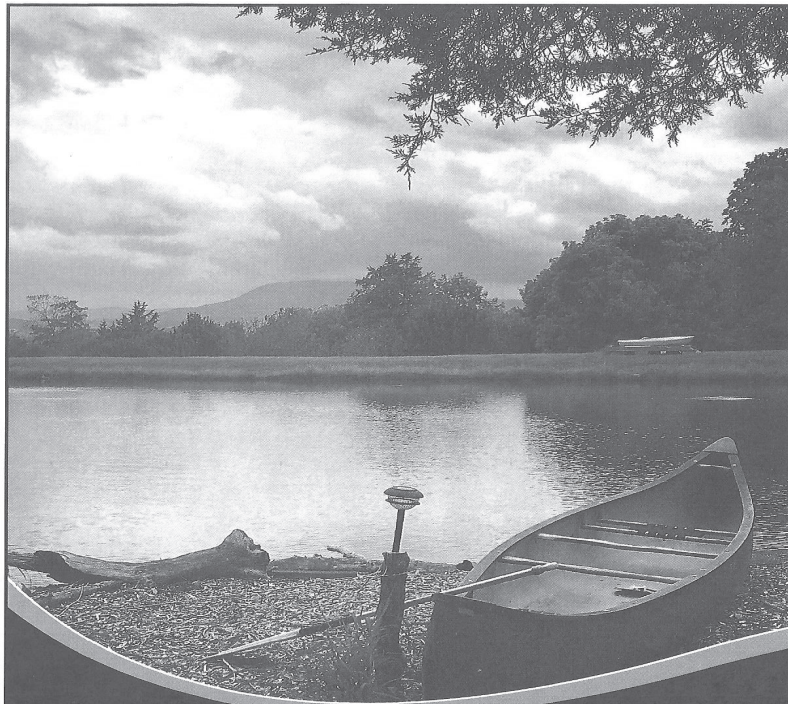
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## **Jordan Farm in Orange County Receives York River Basin Award for Exemplary Conservation Efforts**

Orange County farmer and CSWCD Director Robert Brame was recognized with the York River Basin Award at the VASWCD Annual meeting in December 2017. Mr. Brame had installed the following best management practices on his farm:

- Nine water troughs were installed either in cross fence lines or the center of the larger fields to facilitate better, more uniform grazing.
- After the stream exclusion fence was completed, which totaled over 7,800', the fencer began on the interior cross fences to more efficiently subdivide the fields.
- Fortunately, the layout of the stream exclusion fence helped with the design of the cross fence. Short stretches of cross fence would connect to stream exclusion fence and eventually 14 smaller grazing units were created.
- Converting the existing fescue into endophyte free tall fescue. The poorest field was planted in corn that a neighbor would chop for corn silage. This would help with weed control, reduce thatch and prepare the seedbed. Once the silage was removed in the late summer, the endophyte free fescue was no-till drilled into the stubble. The addition of frost seeded clover in the early spring created a lush, palatable field for the cattle the next spring. This practice worked so well that other fields are being scheduled for this same conversion process. Converting the fields was all done at the expense of the landowner.
- The final, major step in the evolution of the farm was to control the invasive species on the farm. Multi-floral rose inhabited the old fence lines, autumn olive and ailanthus dotted the field borders against the woods, and perilla mint existed in a few pastures. Mr. Brame worked with the local Natural Resource Conservation Service staff to develop an invasive species control plan. Herbicide treatment of stumps and foliar applications, cutting, and grubbing commenced on these unwanted species.

Looking back on the condition of the farm at purchase time as compared to now is amazing. The streams and creeks have been stabilized and no longer erode, the pastures are healthy and it's difficult to find an invasive species. Mr. Brame is glad that he put the time and effort into reviving a farm that wasn't being productive or environmentally friendly. Mr. Brame's work on the Jordan Farm, where environmental stewardship and agricultural production find a balance, exemplifies why he received the York River Basin Award.



Left to right: Secretary of Natural Resources Molly Ward, Award Recipient J. Robert Brame and Deputy Secretary of Natural Resources Russ Baxter

## Conservation District Announces Scholarship Recipients

Each year the Culpeper Soil & Water Conservation District awards educational scholarships to students who plan to pursue a career in a conservation related field. Financial assistance is available for eligible students from Culpeper, Greene, Madison, Orange and Rappahannock Counties. Applicants must be full time students enrolled in or who have been accepted to a college undergraduate or graduate program related to soil and water conservation, natural resource management, animal science, environmental science or other related programs. For 2018, the District chose to recognize Rappahannock County resident **Caragh Heverly** as our top candidate with the John H. Boldridge Academic Scholarship.

- **Caragh Heverly** graduated from **Rappahannock County High School** with a 4.1968 GPA. She will attend **Duke University** in the fall, where she will major in **environmental science and policy**. (\$1,500 award)
- **Liam Godbold** graduated from **Holy Trinity Home School** with a 4.0 GPA. He will major in **biotechnology** at **James Madison University**. (\$1,500 award)
- **Robert Keast** is an Eastern View High School alum. He was a member of the school's Environment team. He graduated from Eastern Michigan University with a degree in environmental science. He will attend graduate school at **The Ohio State University**, where he will major in Landscape Architecture and Horticulture. (\$1,500 award)

The Culpeper Soil and Water Conservation District is honored to recognize these students and wish them well in their future endeavors.

## 2019 Tree Seedling Sale!

Send species requests to [stephanied@culpeperswcd.org](mailto:stephanied@culpeperswcd.org).

## Student Scholarships for Summer Camps

Culpeper Soil and Water Conservation District supported two students Holiday Lake Forestry Camp was held June 18-23 at the Holiday Lake 4-H Center in Appomattox. The students that represented the District were:


- Carlie Ryals (Culpeper County Middle School)
- Makenna Diaz (Culpeper County Middle School)

## District Receives Grant for Lawn Testing Program

The Culpeper Soil and Water Conservation District has received a grant through the Chesapeake Bay Restoration Fund (also known as the License Plate Fund) to expand our lawn soil testing program, which was piloted in Madison County last summer. A soil test will evaluate what nutrients exist and are available in your lawn and what is lacking. Understanding your soil test and balancing your soils helps restore healthy lawn and solve problem areas. The test costs just \$10 plus shipping but CSWCD and Virginia Cooperative Extension are offering it to landowners for free! Proposed dates are as follows:

- **Culpeper:** July 30 & August 20 at VFW
- **Greene & Madison:** August 3 & August 24 at Hoover Ridge
- **Orange:** August 2 & August 23 at the Ag Research station
- **Rappahannock:** August 1 & August 22 at Extension office (church next door if necessary)

Registration is limited to 100 people per county. For more information, contact Stephanie DeNicola at [stephanied@culpeperswcd.org](mailto:stephanied@culpeperswcd.org) or 540-825-8591.



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## **Drinking Water Testing Clinics: Culpeper & Rappahannock**

### **Wednesday October 3, 2018 at 6:30 p.m.**

**Are you interested in testing your well water?**

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**Register:** Call Becky Sheffield at the Culpeper Extension office at 540-727-3435 ext. 344. You must pre-register, space is limited! Please bring a check made payable to Treasurer, Virginia Tech or cash for \$50 to the kickoff meeting to receive your sampling kit.

Samples must be dropped off at the Culpeper, Fauquier or Rappahannock Extension offices on Wednesday October 10 between 7am and 9am.

The follow-up meeting will be Wednesday November 7.

## **Exotic Tick Found on Cattle Farm in Virginia**

### **Only the second U.S. state where the tick has shown up**

On May 14, the National Veterinary Services Laboratory in Ames, Iowa confirmed the finding of the *Haemaphysalis longicornis* tick (otherwise known as the East Asian or Longhorned tick) in Virginia. The tick appeared on an orphaned calf on a beef farm in Albemarle County.

This is only the second state with this species of ticks in the United States. In late 2017, *H. longicornis* was initially found in New Jersey. No known direct link exists from the Virginia farm to the area in New Jersey where the first ticks appeared on a sheep farm.

Virginia state veterinary officials will continue to work with the U.S. Department of Agriculture and other federal and industry partners to determine the extent and significance of this finding.

**Livestock producers and owners should notify VDACS if they notice any unusual ticks that have not been seen before or that occur in large numbers on an individual animal. The site below contains images and descriptions of the common Virginia ticks. Typically, ticks are seen in the greatest numbers in spring and fall, but can persist through all four seasons, especially in warmer weather. Livestock producers should work with their herd veterinarians to develop a tick prevention and control program. Livestock owners also may contact VDACS' Office of Veterinary Services at 804.786.2483.**

Common Ticks of Virginia:

[https://pubs.ext.vt.edu/content/dam/pubs\\_ext\\_vt\\_edu/2906/2906-1396/ENTO-250.pdf](https://pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/2906/2906-1396/ENTO-250.pdf).

## **New Direct Phone Numbers for USDA-NRCS Staff**

- Rex Rexrode 540-317-7724
- Nancy Utz 540-317-7727
- Ashleigh Cason 540-317-7731
- John Jeffries 540-317-7728



## Septic Systems and Water Quality

A septic system is an individual wastewater treatment system that uses the soil to treat wastewater. A septic system has two main parts, a holding tank and an absorption field. Sewage from the home enters into the septic tank where heavier solids settle out and scum rises to the surface. The water between the scum and the solid layer enters the absorption field where it trickles down into the soil.

Through the use of septic systems we tend to flush sewage and wastewater underground and put them out of our thoughts. However, “out of sight, out of mind” does not necessarily mean everything is working well and there is no impact on water quality. If not used and maintained properly, septic systems’ performance will suffer and *will* eventually fail, and in the meantime create unpleasant problems in our homes and contaminate groundwater that feeds drinking wells and also contaminate streams and lakes.

Malfunctioning or overflowing septic systems release harmful bacteria and excessive nutrients into the ground water and surface water and may also release other substances that were disposed of improperly by “flushing it away.” There are many compounds that are detrimental to the proper functioning of your septic system and these may pass thru the system into ground and surface water and thereby contaminate these. Typical examples include paints, solvents, engine oil, pesticides, etc.

Nitrogen and phosphorus are two nutrients in wastewater that, either in excess or through cumulative effect, can adversely impact receiving waterbodies. When septic systems fail to operate as designed, excess nutrients in untreated wastewater can enter the environment.

E. coli bacteria are microscopic organisms that live in the intestines of warm-blooded animals. They also live in the waste material, or feces, excreted from the intestinal tract. When E. coli bacteria are present in high numbers in a water sample, it means that the water has received fecal matter from one source or another. Malfunctioning septic systems are one of these sources.

Now the good news: the District continues to operate a cost share program available to residents of all 5 member counties which reimburses participants up to \$150 for a tank pump-out, up to \$1,000 for pump outs with full inspections and 50% of repair expenses, including full system replacement. Some participants, depending on annual income, may receive up to 80% cost share reimbursement. The District strongly recommends the pump out and inspection as a good place to start unless you already know your system is failing.

For more information, go to [www.culpeperswcd.org](http://www.culpeperswcd.org) or call 540-825-8591. To be eligible for reimbursement you must have an approved application before work can be done.



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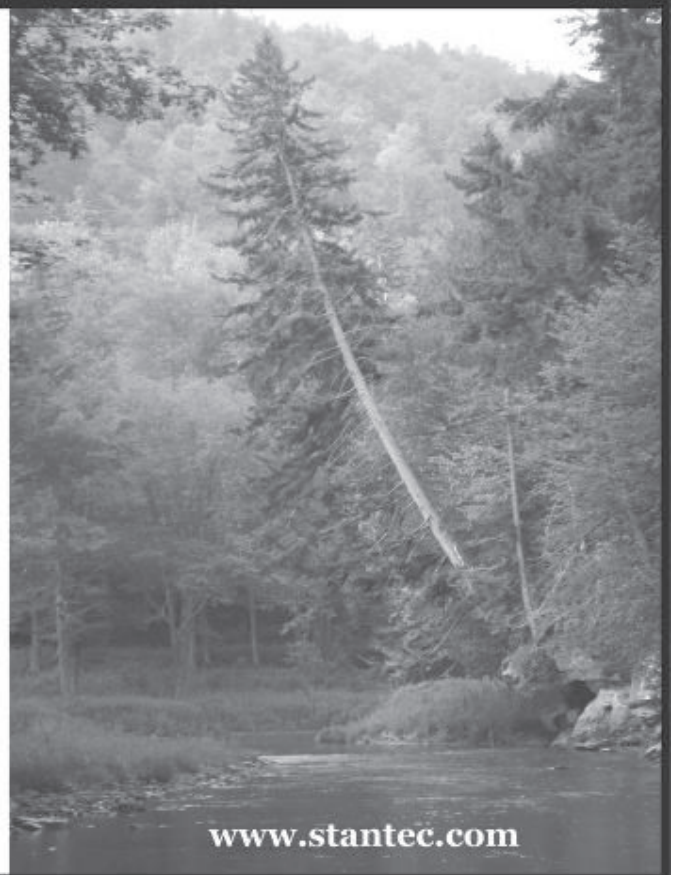


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concentrations peak in the spring of the year, decrease during the summer, peak again in the fall of the year and then decrease again during the winter months. Research shows that the spring ergovaline concentrations can be kept to moderate levels with frequent clipping and possibly intensive rotational grazing of pastures.

The period of the highest ergot alkaloid concentrations in the pasture does not coincide with the most extreme visible symptoms of toxicosis in the animal. One explanation for this is there is a residual effect of ingesting toxic tall fescue. Animals consume high concentrations of ergot alkaloids in the spring, then continue ingesting lesser amounts through the summer while suffering from severe heat stress that is exacerbated by hot summer temperatures.

It is known that ergot alkaloids can be retained in fat tissue. This suggests that fat deposits may serve as a reservoir for toxic alkaloids. Such reservoirs may allow toxins to be released gradually in the months after grazing animals have been removed from infected tall fescue. Retention and slow release of the ergot alkaloid from the fat tissue may explain not only why toxicosis symptoms are observed in hot summer months, long after seed heads containing high toxin concentration have been consumed, but also why symptoms such as rough hair coat continue to be observed in feedlots long after cattle are removed from pastures.

Tall fescue should be managed to reduce or eliminate toxicosis as this will have a greatest impact on animal performance. Research throughout the southeastern U.S. suggests that gains in yearling cattle are reduced by an average of 0.1 pounds per day with each 10% increase in the level of endophyte infection (EI) in a pasture. However, data collected in Virginia suggest that while the effect of EI on steer performance is significant, the relationship between animal gain and EI level may be closer to a 0.04-0.06 pounds per day loss with each 10% increase in EI level. This may be a result of Virginia's cooler climate compared to other southeastern states. Even though fescue toxicosis is often referred to as summer syndrome, poor steer gains can occur throughout the seasons.

The first step in tall fescue management is testing for the endophyte. Sampling in the 1980's revealed that 75% of Virginia fields surveyed had fungus present in 50% or more of the plants. Levels of 40% or more can generally be expected to produce moderate to severe adverse effects in animals, although no level of infection can be considered completely safe.

Tall fescue management options to reduce animal exposure to toxicosis include replacement of infected fescue with other grass species or non-toxic fescue and/or management of toxic tall fescue.

Replacing toxic tall fescue with a nontoxic forage is the only way to ensure the toxic alkaloids are no longer present. It is also the best way to avoid annual input costs and time commitments that are necessary when a toxic cultivar is retained for pasture. Before replacing toxic tall fescue with a nontoxic cultivar, the following criteria should be considered:

- Level of Toxic Endophyte – If endophyte infection level is less than 25% infected tillers, replacement is not usually necessary or economically feasible.
- Land Ownership – The replacement process may not be economically feasible for short-term rental arrangements.
- Landscape – Replanting into terrain with steep slope may not be practical.
- Livestock Class – Novel endophytes improve performance in beef stocker, replacement heifers and cow-calf operations but have the biggest economic impact on high value breeding horses and grass based dairies.
- Grazing Management – If the pasture is to be grazed close to the ground, continuously, and with the same low level of management, it may be better to keep the old fescue stand.

Replacement of toxic tall fescue commonly employs a process called spray-smother-spray crop rotation. This procedure assumes the new forage to be seeded is going to be a cool season forage. According to the spray-smother-spray process, the old tall fescue is sprayed with a systemic, nonselective herbicide. The field is then quickly no till drilled with an annual smother crop that is grazed or cut for hay, then the field is sprayed again before planting the non-toxic cool season grass. The reason for such an involved process is that the old stands

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with well-established tall fescue are not easily eradicated. While a single spray coupled with cultivation may kill most of the existing plants, it does not kill them all. Some of the infected tillers are covered by dung piles and some of the seed in the seed bank are unaffected by the first spray. These escape tillers and viable seed from the seed bank can reestablish the toxic field.

Until recently producers who preferred to use tall fescue faced a dilemma. They could plant either a traditional endophyte infected cultivar or an endophyte-free cultivar. The infected fescue resulted in excellent plant persistence but poor animal performance. The endophyte-free cultivar would result in the opposite, poor plant persistence, but excellent animal performance.

Now producers have a third choice. They can plant tall fescue infected with an endophyte that is beneficial, sometimes called a “novel” endophyte. Novel endophyte has been inserted to increase plant persistence in an attempt to overcome the major disadvantage of endophyte-free cultivars with no animal performance concerns.

If replanting is not feasible the other option is to adjust management of the current pastures. The following management practices can be used to help reduce the negative impact of infected fescue.

- Livestock Rotation to Other Pastures – Livestock should be moved to pasture other than toxic tall fescue in mid-spring and should graze these non-toxic pastures through the summer months.
- Dilution with Other Forages – Toxic tall fescue pastures can also be diluted by interseeding nontoxic forages. Forages commonly used to dilute infected tall fescue are perennial legumes, such as red and white clover.
- Supplemental Feeding – The feeding of supplements has also been proven to alleviate tall fescue toxicosis. Supplements commonly fed to cattle on toxic fescue include grain, grain milling by-products, silage and nontoxic hay.
- Nitrogen Fertilizer – If producers are trying to reduce toxin loads in the field, they should not fertilize toxic tall fescue pastures with high rates of nitrogen fertilizer (less than 60 pound of N).
- Hay Ammoniation – The process of treating low-quality toxic fescue hay with anhydrous ammonia can reduce the toxicity of the hay, as the ammonia breaks down the cell walls where the endophyte resides and increases forage digestibility.
- Winter Grazing Management – Research has shown that ergovaline concentrations are high in fall grown fescue, although no seed heads are present. Feeding hay early in the winter and grazing stockpiled fescue later could reduce the amount of ergovaline ingested during the winter feeding season.
- Seed Head Control – Seed heads contain five times more ergovaline than leaves or stems. Seed head can be controlled by clipping pasture or herbicide application labeled for plant growth regulator purposes.

Fescue toxicosis is not completely alleviated by one management practice change, but several practices should be adopted to greatly reduce toxicosis to improve animal performance.

Tall fescue toxicosis is a serious problem for all classes of the livestock, but producers can effectively manage it. They should first test fields to determine endophyte levels and then develop the best management strategies for their farms. Producers can eliminate ergot alkaloid problems by converting all old tall fescue pastures to non-toxic grass species, endophyte-free cultivars or new novel endophytes cultivars. Alternatively, they can employ a combination of new and old management practices to limit the ingestion of toxic alkaloids to improve the health and performance of their livestock for great profitability.

#### References:

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