

# Sampling for the Tall Fescue Endophyte in Pasture or Hay Stands

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Most of the tall fescue growing in Kentucky is colonized by the tall fescue endophyte, a fungus which causes disorders in livestock that feed on the infected grass. The animal disease syndrome is called fescue toxicosis, which some researchers estimate may cost Kentucky producers over \$200 million yearly. This problem can be greatly reduced by identifying the infected fields and replacing them with endophyte-free or novel endophyte tall fescue varieties or by managing them in a way to minimize the impact of the endophyte on herd productivity. One of the simplest ways to reduce toxicity symptoms in cattle is add red and white clover to existing tall fescue stands.

## Endophyte Testing in Kentucky

The best ways to determine the level of infection within a stand is to examine individual tall fescue tillers sampled from the field microscopically for evidence of the fungus or to use a recently developed immunoblot laboratory procedure. In Kentucky, the Division of Regulatory Services, located at the University of Kentucky, offers a service to test tall fescue infection level. To obtain useful information samples must be collected in accordance with the guidelines given here.



**Figure 1.** Tillers must be cut at the soil surface.

## Selecting Stands to be Sampled

Only fields of the same seeding date and management unit should be included under the same field designation. The fungus is spread through seed, and since fescue seed can be moved in many different ways, the variation in endophyte level between fields can be great. However, before spending money on sampling, farmers should consider that most fields will be highly infested. Several extensive surveys conducted by UK researchers found that in more than 50 percent of the stands in Kentucky 80 percent of the plants are infected. Only about 7 percent of the stands in Kentucky have fewer than 25 percent of the plants infected. **Note:** New tall fescue varieties such as MaxQ contain a novel or non-toxic endophyte that cannot be distinguished from other infected stands using currently available commercial laboratory procedures. Therefore, fields planted to novel endophyte fescue should not be sampled.

## When to Sample

Specimens must be collected during periods when the fungus is most likely to be present in the tillers. Specimens should be collected when plants have been growing well for at least a month, for best assurance of finding the endophyte. The optimum collection times in Kentucky appear to be late April to early June and October through November, based on University of Kentucky tests. Specimens collected at other times can give erratic results. Check with the local county extension office before sampling the site.

## Collecting the Specimens

A sample consists of tillers (stems) of plants that have been cut with a razor blade or sharp knife at the soil surface. (**Note:** It is very important to cut the tiller at the soil surface! See Figure 1.) Avoid taking stems that have seed heads on them, but do not take small or immature tillers either; tillers with stems 1/8-inch thick or thicker work best. Take about 10 to 20 more tillers than necessary to ensure a good working sample for the laboratory. Measure up about 4 inches from the base of the stem and cut the remaining plant tissue distant from the stem base. Save the stem bases but discard the tissue containing the leaves. Place the stem pieces into a plastic zip lock bag. Put a damp (not wet) paper towel in the bag to prevent drying of the tissues.

## Representative Samples

Make sure you take your tiller samples while walking back and forth across your field so you get roughly the same number of tillers from all sections of the field. (See Figure 2.) It is critical that the specimens collected be representative of the field at large. The specimens should be taken at random, by walking a zigzag pattern about the field. Avoid collecting from ditches, pond areas, feeding sites and borders, unless these areas make up more than 20 percent of the stand. These areas have often been destroyed and reseeded through natural processes and can produce misleading data.

## Field Size Affects Specimen Number

The number of specimens to collect is determined by field size (see Table 1).

**Table 1.** Sampling recommendations

Number of acres	Number of specimens
Less than 5	20
5 to 10	40
More than 10	At least 50, with higher numbers for larger fields

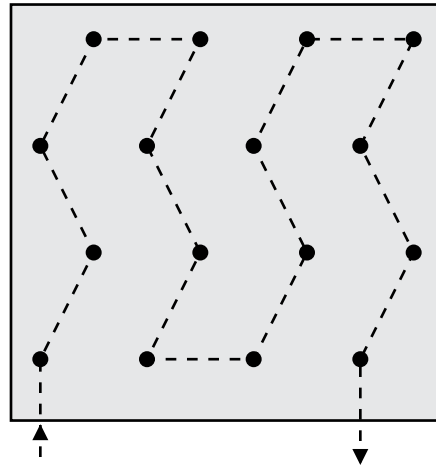
**Note:** These sampling recommendations are estimates; more or fewer plugs may be necessary to accurately represent the areas of concern. Large fields of variable terrain should be divided into smaller sampling blocks.

## Protecting the Samples

After collecting, place the specimens with a cold pack in a sturdy, plastic-lined box and take them to the county extension office or send overnight express directly to the testing laboratory. Refrigerated storage

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**Figure 2.** Collect specimens randomly from the site using a zig-zag pattern.



after sampling is best to ensure sample quality, but when not available, do not let the container sit in the sun or get too hot. Deliver or send the specimens early in the week so they will arrive in the lab without delay. Weekend mail may sit along the route in hot trucks!

## Results

The laboratory's findings will be reported to the person who submitted the sample with a copy to the county extension agent when requested. The report will indicate the percentage of tillers submitted that were infected with the endophyte. No recommendation as to how this level of infection will affect animals will be included. This is because the acceptable level of infection is highly dependent upon the particular farming system involved. After receiving the results you are encouraged to meet with your county agent to discuss management options. The publications listed at the end of this publication provide more information.

## Cost

A fee is necessary to partially cover the cost of lab testing. Charges for processing samples are as follows: Up to 50 tillers is \$35.00. Up to 100 tillers is \$60.00. Each field should be submitted as a separate sample. A billing statement of charges will be mailed after the laboratory analysis is completed. Checks should be made payable to: University of Kentucky.

## Mailing Samples

If tillers were collected from more than one stand, mark each group of specimens with a unique name for identification. Place all specimens from each sample inside a single plastic bag, loosely seal and put into a box or padded envelope with a cold pack. Multiple samples can be included in the same box as long as individual samples are clearly marked. A sample submittal form or a letter from the county extension agent for agriculture clearly identifying the sample and number of specimens should accompany each sample submitted to the lab. Enclose the letter or form inside the package or box but outside the plastic bag that contains the samples. Samples should be shipped overnight to: Seed Laboratory, Division of Regulatory Services, 103 Regulatory Services Bldg., University of Kentucky, Lexington, KY 40546-0275.

## Additional Information

Publications available at your county extension office or at [www.uky.edu/Ag/Forage](http://www.uky.edu/Ag/Forage).

- *Tall Fescue* (AGR-59)
- *Alternatives for Fungus Infected Tall Fescue* (AGR-119)
- *Renovating Hay and Pasture Fields* (AGR-26)
- *Tall Fescue Endophyte Concepts* at <http://www.uky.edu/Ag/Forage/Tall%20Fescue%20Endophyte%20Concepts%20for%20Web.pdf>.