

North Carolina Department of Agriculture & Consumer Services Fescue Endophyte Testing Service

A number of grasses, including tall fescue and perennial ryegrass, contain a fungal endophyte which has a beneficial relationship with the grass host. The tall fescue endophyte, *Neotyphodium coenophialum* (previously *Acremonium coenophialum*), lives exclusively inside plants, and can only be detected through laboratory analysis. This endophyte has been proven to give the grass insect, disease and mammal resistance. Though very beneficial to tall fescue plants, this endophyte produces chemicals which are toxic to a variety of animals. In North Carolina, fescue toxicosis is especially a problem in horses and cattle.

Most of the perennial ryegrass and tall fescue seed sold in North Carolina is used for lawn and turf purposes, where the presence of the *Neotyphodium* endophyte is beneficial. The perennial ryegrass endophyte, *Neotyphodium lolii*, has a similar lifestyle to the tall fescue endophyte and is detected in the same way. The only way either endophyte is known to spread is through infected seed produced by infected plants.

When Should You Use The Testing Service?

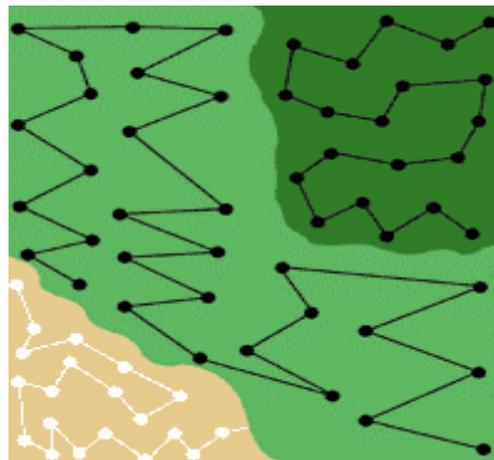
Livestock, lawn and turf, and seed producers who grow tall fescue should consider using the service when the following conditions occur.

1. You want to ensure the endophyte is present and viable for use as a biological control agent.
2. Symptoms of fescue toxicosis are observed in cattle grazing tall fescue during the summer and include:
 - Poor gains
 - Unthrifty appearance
 - Rough hair coat
 - Low milk production
 - Mud smeared over body
 - Elevated temperature or respiration rates
 - Standing in water or shade for long periods

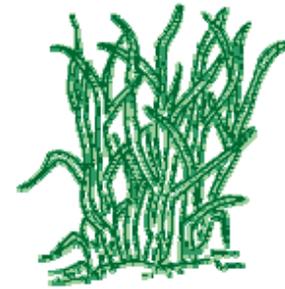
3. Horses or other animals grazing tall fescue are having reproductive problems.
4. You are establishing or renovating a pasture with your own or unlabeled seed.
5. You are producing tall fescue for seed.
6. You have renovated a pasture and you want to ensure that a thorough kill of the old pasture occurred.

Sampling Procedure for Pastures and Lawns

1. Take at least 50 tillers per sample. (NOTE: Tall fescue is a clump grass and each "stem" in the clump is called a tiller.) Take one and only one tiller from each plant selected. Remove the tiller with ½ in. of roots attached. Then remove the soil (see figure at right) and place in a plastic bag. If sample will not be mailed that day, refrigerate sample until mailed. **DO NOT FREEZE TISSUE!** Do not select tillers that have flowers or seed heads. Make sure that you correctly identify the plants as fescue or ryegrass.
2. Limit the field, lawn or turf area to a maximum of 10 acres. Take a sample from an area in which the seed lot, seedling date and production practices are similar.
3. Take more samples in:
 - Fields greater than 10 acres
 - Fields originating from different seed lots or seeding dates
 - Fields with different management practices



4. Sample a given field or area using the scheme in the preceding column.
5. For pastures, avoid sampling ditch banks, fence rows, and other non-typical areas in the field.
6. Avoid sampling during periods of rapid growth and after severe freezes.



Fescue Clump



Single Tiller
(Free of Soil)

Sampling Procedure - for Seed

New crop seed, seed less than a year old, are examined with a seed stain test. If the fungus is detected, it is assumed to be viable. Turnaround time is about two weeks. The endophyte viability test is used for old crop seed or seed more than a year old. The seed must be grown out, and the resulting plants are examined for viable fungus. Turnaround time is about 10 weeks.

Sampling seed fields

Take a random sample of seed, preferably after harvest. Include seed from many different fescue plants in the sample area. Seed taken from any given plant will produce the same results.

Sampling bags of seed

A single sample of seed should represent no more than about 2,000 pounds of seed. For best results, take small subsamples from several bags or from several areas within a given seed lot. A seed probe is the best way to obtain such samples. Mix these subsamples and then take one (1) pint from the mixture to be mailed to the Endophyte Testing Service for analysis.

Packaging and Mailing Procedures

Plant Tissue Samples

1. Collect plant tissue samples so they can be mailed on Monday or Tuesday.
2. Place cleaned plant tissue samples in a plastic bag and immediately mail to the laboratory in a padded envelope.
3. Ship via first class or priority mail to minimize transit time.

Seed samples

1. Place seed samples in a plastic bag and mail in a padded envelope or box.
2. Seed samples can be mailed any time of the week.

All tissue or seed samples

1. Completely fill out the submission form (available online at: <http://www.agr.state.nc.us/plantind/Seed/endo.htm>)
2. Be sure to clearly indicate name, address, sample information and type of test required.
3. Complete a separate form for each sample and make sure the form is attached to the proper container if you submit more than one sample.

Fees

TYPE OF SAMPLE	IN STATE	OUT OF STATE
Plant tissue sample	\$15/sample	\$25/sample
New crop Seed	\$15/sample	\$35/sample
Old crop Seed	\$25/sample	\$45/sample

3. Make check payable to the North Carolina Department of Agriculture and Consumer Services.
4. Mail the sample, information form and a check or money order for the proper amount to:

Fescue Endophyte Testing Service

North Carolina Department of Agriculture & Consumer Services
Plant Industry Division, Seed Section
1060 Mail Service Center
Raleigh, NC 27699-1060

Results

As soon as the results from the analysis of plant tissue or seed samples are available, they will be reported to the person who submitted the sample. Livestock producers should consult their local N. C. Cooperative Extension Service Agent for assistance in interpreting these results.

The North Carolina Department of Agriculture & Consumer Services Fescue Endophyte Testing Service is operated for livestock producers and seedsmen who wish to determine the approximate levels of *Neotyphodium coenophialum* (*Acremonium coenophialum*) in tall fescue seed or pastures. The North Carolina Department of Agriculture & Consumer Services assumes no liability regarding animal performance, eventual fungus status of seed or pastures, or any private or commercial uses of reported results.

More information

For more information on the testing service contact:

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You may also visit our website at:
<http://www.agr.state.nc.us/plantind/Seed/endo.htm>
or call the local N. C. Cooperative Extension Service office.

This information was prepared in cooperation with N. C. Cooperative Extension Service and N. C. State University personnel.

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North Carolina Department of
Agriculture and Consumer Services

