

Tall Fescue Novel Endophyte Varieties and Establishment for Livestock and Horse Farms

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What is the endophyte of tall fescue?

“Endophyte” refers to a fungus that lives *within* the fescue plant, meaning it cannot be seen with the naked eye. The endophyte found in tall fescue is beneficial to the plant: It gives tall fescue insect resistance, enhanced grazing tolerance, and greater persistence in stressful environments. The major disadvantage of some of the endophytes of tall fescue is that they produce toxic alkaloids that have detrimental effects on many types of livestock. Most tall fescue fields in Kentucky contain the toxic, “wild type” endophyte such as the one found in KY 31 tall fescue. Fortunately, there are now fescue varieties that have a novel or beneficial endophyte that gives the plant increased stress tolerance without negatively affecting the animals. There are also fescues without any endophyte, called “endophyte-free” varieties. The endophyte status of tall fescue in existing fields can only be determined using laboratory testing.

Steps for Converting Pastures from Toxic to Novel Endophyte Tall Fescue

Spring

Soil sample and remove/prevent tall fescue seedheads

1. Take soil sample in May or earlier. Follow lime and fertilizer recommendations from the soil test report.
2. Mow the pasture closely in early May as soon as seedheads begin to elongate. Mow again in late May to remove any seedheads that escaped earlier mowing. Timely clipping is important since tall fescue seed can be viable 15-20 days after pollination and then will germinate in the fall, contaminating the new seedlings.

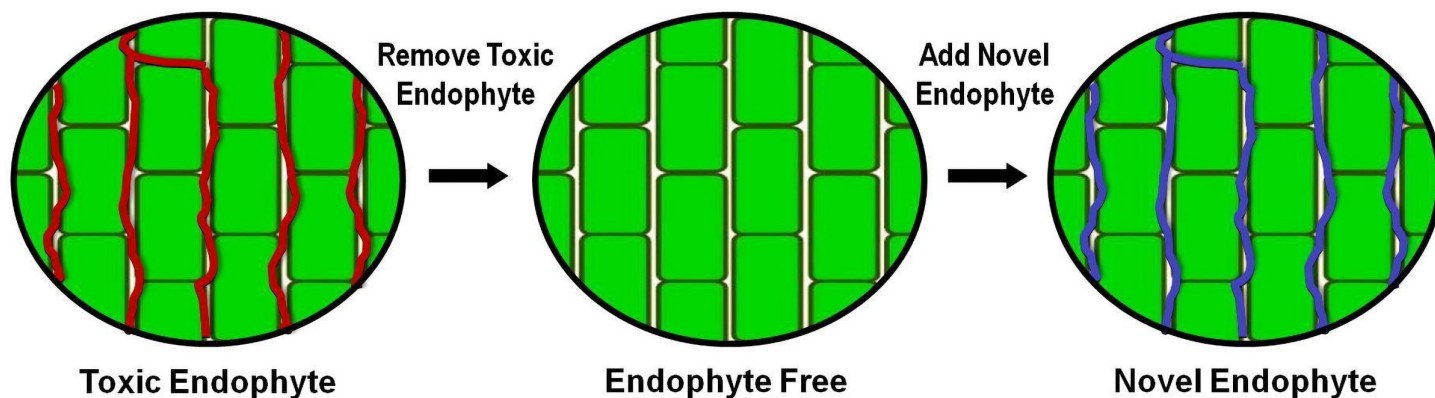


Figure 1. Removing toxic endophyte and adding beneficial novel endophyte.

Endophyte-Infected Tall Fescue

- Contains the wild-type endophyte that produces toxic alkaloids.
- Toxic alkaloids harm horses and ruminant livestock.
- More than 80% of tall fescue fields/pastures in Kentucky have the toxic endophyte.

Endophyte-Free Tall Fescue

- Contains no endophytes.
- Lacks the compounds needed for insect resistance, grazing tolerance, and stress tolerance that are present in fescue with an endophyte (toxic or novel endophyte).
- Considered non-toxic tall fescue.

Novel Endophyte Tall Fescue

- Contains an endophyte that does not produce toxic alkaloids.
- Endophyte produces compounds that increase pest resistance, grazing tolerance, and stress tolerance.
- Considered non-toxic tall fescue.

Figure 2. Different states of tall fescue.

Mid-Late Summer

Apply broad spectrum herbicide to kill existing tall fescue stand before planting novel endophyte tall fescue or other forage grasses

1. Graze tall fescue heavily during late spring and summer, during periods of growth, stopping to allow regrowth to 4-5 inches in height.
2. Apply glyphosate in mid to late July.
3. Allow weeds and toxic tall fescue to germinate or re-grow.
4. Re-apply glyphosate immediately before planting in early to mid-September.

Early Fall

Plant novel endophyte tall fescue seed

1. Using a no-till drill, plant a novel tall fescue variety by early to mid-September, after the last glyphosate application.
2. Plant 20lb/a at a depth of ¼ to ½ in.
3. To achieve better ground cover, set the drill to deliver 10 lb/a and go over field twice, with the second set of rows perpendicular to the first.

Late Fall and Early the Following Spring

New stand management

1. Apply 40 lb N/a in late fall and early spring to enhance stand establishment.
2. Herbicides such as 2,4-D can be used to control broadleaf weeds after tall fescue seedlings have reached the 4-leaf stage (4-5 inches tall).
3. Allow the tall fescue to become well established before grazing the following spring. Wait until plants are 8 inches tall and lightly graze or mow to a residual height of 4-5 in or simply cut for hay in the spring (4 in stubble height).
4. Cool season grasses require 18 months to become fully established. Light grazing during the first season will allow for the development of a strong sod and dense stand that should last 10 to 15 years or more.



Look for the Alliance for Grassland Renewal logo on seed tags or bags to ensure high-quality, guaranteed novel endophytes. Additional tall fescue management publications are available at www.GrasslandRenewal.org

Table 1. Characteristics of Novel Endophyte Tall Fescue Varieties.¹

| Variety | Maturity | Region | Unique Characteristics |
|---------------------------------------|------------|----------------------|---|
| BarOptima PLUS E34² | Late | Fescue Belt | Soft leaves, more palatable Not safe third trimester mares |
| Estancia with ArkShield | Medium | Fescue Belt | High magnesium content High seedling vigor, persistent |
| Jesup MaxQ II | Early | Eastern Fescue Belt | Jesup variety, improved endophyte Good grazing persistence |
| Lacefield MaxQ II | Medium | Northern Fescue Belt | High seedling vigor Developed in Kentucky |
| Martin 2 Protek | Early/Med. | Fescue Belt | High quality forage |
| Texoma MaxQ II | Early | Western Fescue Belt | Drought resistant |
| Tower Protek | Late | Northern Fescue Belt | Soft leaves, more palatable |

1 From <https://content.ces.ncsu.edu/comparison-of-commercially-available-novel-endophyte-tall-fescue-forage-varieties>.

2 E34, ArkShield, MaxQ II, and Protek are different strains of novel endophyte.

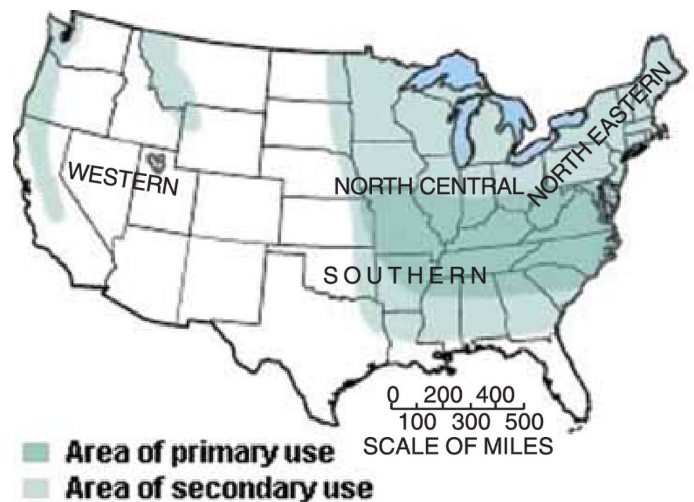


Figure 3. The Tall Fescue Belt. Hannaway, David & Daly, Chris & Coop, Leonard & Chapman, D & Wei, Y. (2023). GIS-based Forage Species Adaptation Mapping.

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