USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

Plant Guide

TALL FESCUE
Lolium arundinaceum
(Schreb.) S.J. Darbyshire

Plant Symbol = LOAR10

Contributed by: USDA NRCS National Plant Data Center

Robert H. Mohlenbrock
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Midewestern Wetland Flora
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Alternate Names

Schedonorus phoenix (Scop.) Holub, *Festuca arundinacea* Schreb., *Festuca elatior* L. ssp. *arundinacea* (Schreb.) Hack., *Festuca elatior* L. var. *arundinacea* (Schreb.) C.F.H. Wimmer, Kentucky fescue, reed fescue

Uses

Tall fescue has been used extensively in the past, prior to the understanding of its endophytic fungus interactions and their implications. For decades, the tall fescue cultivar Kentuckey-31 was planted widely as a forage and erosion control plant, because it is widely adapted, easy to establish, and long lived under harsh conditions and mistreatment. It is now recognized that the presence of the endophyte (in this grass and others) contributed to both the tough nature of the grass and the poor performance of grazing animals in the warmer months. It is suspected that this endophyte infected

cultivar has been deleterious to wildlife as well. For these reasons, there are efforts by some groups to ban the use of tall fescue in some states, and it still may be overused.

Studies indicate that the presence of tall fescue and the fescue endophyte diminish biological diversity on the level of soil organisms, insects, plants, birds, and mammals. Soil organisms, both beneficial and detrimental to individual plants, exert a major influence on the structure of plant communities. Beneficial associations between mycorrhizal fungi and plants occur in about 80% of all land plants; these associations are critical in supplying specific nutrients for many plants. Endophyte infected tall fescue inhibits many soil organisms, including pathogenic fungi, parasitic nematodes and beneficial mycorrhizal fungi. The fescue endophyte produces loline alkaloids that are toxic to at least twenty insect species from ten families and five orders. The endophyte also produces ergot alkaloids that are toxic to mammals including domestic livestock.

Tall fescue exerts many problems for a number of game birds. Tall fescue, which has replaced many acres of native grass, does not supply the type of food and cover that many smaller game species need in order to thrive. For example, tall fescue only supports a limited number of insects, which are an important food for both quail and turkey. Another problem is that when tall fescue either mowed or grazed it forms a thick, impenetrable mat of culms near the soil surface. Many birds, including dove and quail are "weak scratchers" and tall fescue does not allow enough bare ground for these birds to obtain adequate food. Several bird species lost weight when fed an endophyte-infected tall fescue seed compared to endophyte-free seed. Meadow voles exhibit higher mortality rates when restricted to endophyte-infected tall fescue seed compared to an endophyte-free diet. Grasslands dominated by endophyte-infected tall fescue are expected to support less total herbivore biomass, which in turn should support less predator biomass. A 25 to 30 foot wide border around tall fescue pastures, which is composed of either native grasses or native grasses and legumes, can moderate the harmful effect of tall fescue on wildlife. A border supplies some food and cover for small game, and is particular effective when the pasture is adjacent to a well-managed forest.

Studies have show that tall fescue is allelopathic to rape (*Brassica napus* L.), bird's-foot trefoil (*Lotus corniculatus* L.), red clover (*Trifolium pratense* L.), white clover (*Trifolium repens* L.), sweetgum (*Liquidambar styraciflua* L.), and loblolly pine

(*Pinus taeda* L.). These studies did not reveal whether the endophyte or the fescue caused the allelopathy. In a recent study, both endophyte-infected and endophyte-free tall fescue seed extracts exhibited allelopathy to red clover, white cover, small white clover (*Trifolium nigrescens* Viviani), crimson clover (*Trifolium incarnatum* L.), and subterranean clover (*Trifolium subterraneum* L.). In general, a loss of plant diversity is expected where tall fescue is common and where a high percentage of plants are infected with the endophyte.

Approximately 75% of the tall fescue stands in the United States are endophyte-infected. In mixed stands, containing both endophyte-infected and endophyte-free plants, the percentage of plants that are endophyte-infected is expected to increase across time.
Currently, most tall fescue cultivars planted for forage contain a low level of the endophyte (less than 5 percent). Low endophyte cultivars are less drought tolerant and more susceptible to overgrazing than high endophyte cultivars. Therefore, greater management skill is needed for both the establishment and grazing management of low endophyte cultivars. In the southern portion of the tall fescue region (Oklahoma-Texas and eastward), cultivars with a high levels of the endophyte are recommended because they exhibit better drought tolerance, which results in better summer survival. Tall fescue cultivars planted for turf and soil erosion control, in all regions, often contain high levels of the endophyte.

The soil concentration of phosphorus near shade and water was greater in endophyte-infected tall fescue pasture compared with endophyte-free pasture. The risk of phosphorus loss to the environment, when grazing endophyte infected tall fescue, can be reduced by changing the location of shade and water every 4 or 5 years and ensuring that shade and water are not located in areas subject to water runoff.

There are many cultivars of tall fescue. Many cultivars introduced since 1980 contain a low level of the endophyte (less that 5 percent). Fine leafed cultivars are intended as turf grasses and often are intentionally endophyte infected to capitalize on the competitive advantage that the endophyte confers to the plant. Testing services are available to have existing stands of this grass evaluated for endophyte presence. Strategies for managing endophyte infected tall fescue for forage include: 1) graze and clip so plants remain vegetative; 2) graze only during spring and autumn when the plants are vegetative; 3) cut for hay during boot stage rather than later growth stages; 4) dilute the effect of the endophyte by intercropping tall fescue with forage legumes. Additional information about the fescue endophyte and the antiquality factors caused by the endophyte is available from web sites, which can be accessed from the tall fescue Plants Profile as described in the Key Web Sites section.

The old standby cultivar Kentucky-31 (with a high level of the endophyte) is a very good critical area treatment grass due to its tolerance of poor soils and abuse or neglect. However, the user should be sure this grass will meet all the planting objectives and that there are not good alternative species before specifying its use.

Status
Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g. threatened or endangered species, state noxious status, and wetland indicator values).

Weediness
This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Cooperative Extension Service office, or state natural resource or agriculture department regarding its status and use. Weed information is also available from the PLANTS Web site.

Description
Tall fescue is a robust long-lived, comparatively deep-rooted, bunchgrass. The leaves of forage types are broad, while turf types have been selected for narrow leaves. The flat leaves are smooth and shiny on the underside, with pronounced ribs on the upper surface. The stems are 3-4 feet tall, supporting a nodding panicle that is 4-12 inches long. There are 227,000 seeds per pound.

Adaptation
Tall fescue is adapted to cool and humid climates and most soils with a pH of 5.5 to 7.0. Tall fescue will grow fairly well on soils low in fertility, but it is better adapted to fertile conditions. Tall fescue will produce top growth when soils are as cold as 40 F, and it continues growth into late fall in the south. The areas of tall fescue adaptation include all areas east of the Great Plains, except southern and central Florida. Other areas of adaptation include the Pacific and Intermountain Northwest and extreme southern Alaska. A map that displays the area of adaptation for tall fescue is available from the Forage Information System web site.

Establishment
Tall fescue is easy to establish due to its rapid germination and good seedling vigor. It may be planted by any common method such as grass seeders, hydroseeding, and broadcasting. Recommended seeding rates for pasture and hayland establishment vary from 12 to 20 pounds per acre for pure fescue. Some researchers recommend using the lower seeding rate of 12 pounds per acre when seeding tall fescue with a forage legume. Seeding rates for turf establishment are very high in order to obtain a dense, even turf, usually 50-100 pounds per acre. In mixtures with other seed for critical area treatment work, the tall fescue component is typically 10-15 pounds per acre.

Management
While tall fescue is tolerant of abuse and low fertility, it does respond to fertilizer inputs. Follow the soil test recommendations for turf and forage uses. The management considerations for forage use of endophyte infected stands are discussed under **Uses**.

Cultivars, Improved, and Selected Materials (and area of origin)
Plant breeders have developed tall fescue cultivars for every region of the tall fescue adaptation area. These cultivars include both forage and turf types, and low and high endophyte types. University extension publications contain information about cultivars for local areas. Also, information about cultivars is available from the Grass Varieties in the U.S. and Forage Information System web sites. These sites can be accessed from the tall fescue Plants Profile as described in the Key Web Sites section.

Contact your local Natural Resources Conservation Service (formerly Soil Conservation Service) office for more information. Look in the phone book under "United States Government." The Natural Resources Conservation Service will be listed under the subheading "Department of Agriculture."

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