

# MaxQ Frequently Asked Questions

## MaxQ Technology

---

### **What is fescue toxicity?**

Old traditional varieties of fescue such as Kentucky 31 contain an endophyte (fungus) that dwells within the plant and produces compounds that, when ingested by cattle, horses, sheep and other livestock, cause adverse health and production problems. In cattle, symptoms include long hair coats into summer, runny noses, abnormal body temperatures, poor weight gains, low conception rates, reduced semen quality and lower milk production. These symptoms are collectively known as fescue toxicosis or fescue toxicity. Fortunately, there are new varieties of fescue now available like MaxQ that contain no toxins detrimental to livestock health and performance.

### **What is an endophyte?**

An endophyte is a fungus that lives inside tall fescue plants and is transmitted from generation to generation through the seed. It provides the plants several benefits including drought resistance, insect resistance, and disease resistance. This enables the endophytic tall fescue to be a tougher and more resilient grass than non-endophytic tall fescue. Unfortunately, the endophyte found in the majority of the tall fescue produces toxic alkaloids that are harmful to animals, causing a variety of problems often termed “fescue toxicosis”.

### **What is a non-toxic endophyte?**

A tall fescue variety that contains a non-toxic endophyte does not produce toxic alkaloids that cause health and production problems in grazing animals.

### **What is the MaxQ<sup>®</sup> technology?**

The MaxQ<sup>®</sup> technology is a new, non-toxic type of endophyte that has been incorporated into tall fescue cultivars bred for specific climate zones. The combination of a non-toxic endophyte and high yielding tall fescue varieties bred for specific climate zones results in a desirable forage product. Pennington’s Jesup MaxQ and Texoma MaxQ II are two such varieties. The MaxQ<sup>®</sup> technology was developed by AgResearch Limited of New Zealand.

### **Are the tall fescue varieties Jesup MaxQ and Texoma MaxQ II fungus/endophyte-free?**

No. Like Kentucky 31 fescue, these two varieties contain an endophyte that lives within the plant tissue. This endophyte enhances the plant’s ability to withstand stress brought on by heat, drought and grazing. However, unlike the endophyte in KY 31, the endophytes in Jesup and Texoma have no adverse effects on livestock health and performance. These are known as ‘novel’ or ‘friendly’ endophyte fescue varieties.

### **Why should livestock producers plant a non-toxic endophyte tall fescue variety versus a fungus-free variety?**

Fungus-free tall fescue pastures have a very short stand life (2-5 years) in many areas of the fescue belt. This is an insufficient life span to justify the expense of killing old pastures and planting new ones. The endophyte is essential for tall fescue plants to survive drought, insect attack and other stresses. Research and on-farm use has shown non-toxic endophyte-infected varieties of tall fescue to have similar persistence of toxic varieties with both having significantly greater persistence than fungus-free varieties.

### **Are all novel endophyte fescue varieties the same?**

No. Varieties of tall fescue that are identified as “novel” are not all the same. The cultivar of grass and endophyte may be different in each variety. For example, the Jesup and Texoma cultivars were bred and released by different plant breeders in separate areas of the country. They also contain different strains of non-toxic endophyte. While some varieties like Jesup and Texoma are totally free of animal toxins, others may contain toxins similar to those found in toxic fescue varieties, but at lower concentrations. When selecting a variety of novel endophyte tall fescue, it is important to pick a variety that is well adapted to the region in which it will be grown and has research data supporting its beneficial animal performance attributes.

### **Will the novel endophyte in MaxQ tall fescue revert back to the old toxic endophyte over time?**

No. The endophyte in MaxQ is a pure strain and can never become toxic. Fescue endophytes cannot be taken up from the soil by roots nor can they be transferred or hybridized by cross pollination. However, fields can become contaminated with toxic fescue varieties if seed are introduced via mechanical movement (feeding toxic hay, piles of seed on mower decks, etc.) back into a MaxQ pasture. Because of this, Pennington forage experts discourage the feeding of toxic fescue hay in MaxQ pastures and recommend cleaning any toxic fescue seed from farm machinery prior to its use in MaxQ pastures.

### **Is MaxQ® a genetically modified organism (GMO)?**

No, it is a naturally occurring strain of endophyte found in tall fescue grass. A strain of endophyte can be introduced into a living grass plant without the use of genetic modification.

### **Can I harvest MaxQ seed to sell or use on my own farm?**

No. Jesup MaxQ and Texoma MaxQ II are patented and protected varieties; therefore it is illegal to harvest seed for personal use or to sell to another farmer.

### **What is a patent?**

A patent is a property right that allows an owner of the patent the exclusive right to make, use, or sell the invention for a limited time. This limited period of exclusion permits the inventor to recoup the investment of supplying the new technology for the benefit of livestock industries.

### **Why is patent protection available to a naturally occurring organism like endophyte?**

In the United States, a patent is the only form of intellectual property protection available to fungal endophytes. AgResearch and partners have invested significantly to:

- analyze and characterize hundreds of strains of endophyte;
- identify strains of endophyte that are non-toxic to livestock;
- identify those strains that are compatible with varieties of tall fescue, and provide positive benefits to the plants;
- develop products that are beneficial to livestock producers;
- quantify the benefits of MaxQ® to livestock producers; and
- deliver the benefits provided by MaxQ® to livestock producers

Without the benefit of exclusive use as provided by a patent, and the opportunity to recoup this investment, companies would likely not invest and develop new products that are beneficial to pasture based livestock industries.

## **MaxQ Management**

---

### **When renovating a pasture to MaxQ tall fescue, should existing toxic fescue like KY 31 be killed prior to planting?**

Yes. The endophyte found in old KY 31 pastures produces toxic side effects that reduce animal performance. The only way to completely rid the pasture of these harmful side effects is to eliminate 100% of the toxic fescue.

### **Can MaxQ be overseeded into thinning fescue stands?**

Yes, MaxQ can be overseeded into KY 31 pastures similar to orchardgrass or winter annual grasses. MaxQ can be a better alternative to these grasses because it will persist much longer. However, it should be noted that using MaxQ to thicken toxic fescue only serves to dilute and not eliminate fescue toxicity. As such, cattle performance and MaxQ stand life could be significantly reduced compared to results obtained with pure stands of MaxQ.

### **Can overseeding toxic fescue pastures with small grains and/or clovers eliminate fescue toxicity problems?**

No. Overseeding non-toxic forages into toxic fescue pastures does reduce the effect of fescue toxicity by diluting the amount of toxin ingested. However, this practice does not eliminate fescue toxicity. Research has shown production losses even when small amounts of toxin are consumed by the animal. The only way to completely eliminate fescue toxicosis is to replace toxic fescue with a non-toxic variety like MaxQ.

### **Do I need to get rid of all toxic fescue from my farm before planting MaxQ?**

No. While it is not necessary to remove toxic fescue from the entire farm, it is suggested to remove all toxic fescue from the area where MaxQ will be planted. The reason is two-fold. First, animals will not receive the full performance benefits of grazing the non-toxic MaxQ forage if a significant portion of their diet still consists of toxic fescue. Secondly, cattle will selectively graze the MaxQ over the toxic fescue resulting in overgrazing the MaxQ and potentially shortening its stand life.

### **Will the toxic endophyte found in KY31 tall fescue contaminate a neighboring field of MaxQ due to its close proximity?**

No. The endophyte is safe within the plant and cannot be transmitted from plant to plant. Endophyte is not present in pollen, the soil or juices of the plant. It is only mobile through the seed.

### **If I am only able to plant MaxQ in a few pastures on my farm, will I see improved cattle performance?**

Yes. However, the amount of improvement in cattle performance with the introduction of MaxQ into the grazing system will be dependent on the amount of toxic forage animals continue to consume. To receive the full benefit of MaxQ, the ingestion of toxic forages should be minimized or eliminated completely. There are several strategies that can be employed to do this and reduce the effects of fescue toxicity including planting clover, feeding non-toxic hay, introducing non-toxic forages (like MaxQ) and designing grazing systems that minimized summer grazing of toxic fescue.

### **Can I feed toxic fescue hay in my MaxQ pastures?**

An effort should be made to prevent contaminating MaxQ pastures with toxic tall fescue. Fescue hay is often loaded with seed heads that contain high numbers of viable seed. Many of these seed could potentially be dispersed and germinate into toxic seedlings thus leading to pasture contamination. For this reason, forage experts strongly advise against feeding toxic fescue hay in MaxQ pastures.

### **Is MaxQ safe for horses?**

Yes, both Jesup MaxQ and Texoma MaxQ II have been university proven to be safe for all classes of horses including pregnant mares and mares nursing foals.

### **Can MaxQ be harvested for hay?**

Yes. MaxQ makes high quality, toxin-free hay that is safe for all classes of livestock (including horses). Note: When harvested for hay, mowers should be set to leave a minimum of 3" of stubble height.

### **How do MaxQ forage yields compare to KY 31?**

Based on University trial data, forage yields of Jesup MaxQ and Texoma MaxQ II have been equal to or slightly higher than the forage yield of KY 31.

### **Will MaxQ work as well as small grains for stocker cattle?**

Yes. In a comprehensive study at the University of Arkansas, Dr. Paul Beck found that novel endophyte varieties of fescue like Jesup MaxQ or Texoma MaxQ II can be a viable and a more economical alternative to winter annuals for stocker cattle production. In his trial, Dr. Beck compared performance and economics of grazing stockers on non-toxic novel endophyte fescue and small grain pastures. In this study, grazing days were 35% greater in the fall and double in the spring with novel endophyte fescue versus small grains. Per acre gains were similar in the fall for both systems, but were 110% greater in the spring for novel fescue. Economic analysis showed per acre profits to be \$125 - \$145 per acre more with novel endophyte fescue.

### **Can newly established fescue pastures/hayfields be used the year of establishment?**

Yes. If establishment year weather is favorable, newly planted fescue can be grazed or hayed the first year. Grazing should not begin until plant growth reaches 6-8" in height. Do not graze below a 3" height or allow animals to trample the young seedlings during the year of establishment. If harvested for hay, adjust the mower to leave a minimum of 3" stubble height.

### **Can MaxQ tall fescue be established with companion annual forages such as rye, wheat, clover, etc?**

For best results, Pennington recommends that MaxQ be established alone. Annual grasses and clovers are aggressive competition for young fescue seedlings trying to become established.

### **When can newly seeded fescue fields be safely sprayed with an herbicide to control broadleaf weeds?**

Product labels specify when a certain herbicide can be applied. Some herbicides can be applied once seedling fescue plants become fully tillered while others specify application only to well established plants. Refer to the individual herbicide label for application timing and rate information or contact your local farm supply dealer or university ag extension office for assistance.

### **Can bermudagrass and MaxQ be established together?**

This practice is discouraged. Establishment seasons, fertilization times and management schemes for these two forages are quite different. Trying to establish a suitable pasture mix of these two forages would be difficult and most likely result in the failure of one or the other.

### **When can grazing begin on newly established MaxQ pastures?**

Many factors affect this including planting date, method of planting (overseeded vs. prepared seed bed), fertilization, weather, etc. In general, fescue seedlings do not emerge and grow as quickly as annual grasses. As such, farmers should not plant fescue thinking it will replace small grain grazing in the establishment year. MaxQ can be grazed once growth reaches 6-8 inches in height, the plants are well anchored in the ground and the soil under hoof will adequately hold up the animal grazing it without punching out holes in the pasture from wet conditions. Once grazing is initiated, it should not be grazed below a height of 3 inches during the year following planting.

### **Will applying chemicals to fescue pastures & hay fields to suppress seed heads eliminate fescue toxicity?**

No. While toxic fescue seed heads have high levels of toxins, toxins are also found in the plant leaves. Suppressing seed heads may help reduce the amount of toxins the animals ingest, but does not eliminate all fescue toxicity symptoms. The only way to totally eliminate fescue toxicity is to replace the toxic fescue with forages that do not produce any toxins.