

# Tall Fescue: Bounty or Bane?

by Troy Smith

**N**orthern regions, with their cold, snow and brief growing season, and the arid West's sparse, rugged ranges are not the only places where environmental adversity challenges beef production. To outsiders, the upper South and lower Midwest may look like an emerald environment, blessed with relatively mild winters and more than enough precipitation (on average) to produce ample forage for grazing and hay production.

On the other hand, many natives claim their region's predominate forage species, tall fescue, is cursed. While tall fescue is hardy and highly productive, cattle health problems related to its consumption cost U.S. beef producers more than \$600 million annually.

Still, tall fescue may be the most important cultivated pasture grass in the country. No other cool-season grass is so well-adapted to the region, which includes the states of Oklahoma, Arkansas, Missouri, Tennessee, Kentucky and Virginia, as well as northern North Carolina, Georgia and Texas. Tall fescue dominates more than 35 million acres grazed by more than one-third of the nation's beef cattle, including approximately 13 million mother cows.

Introduced into the United States from Europe, the grass was little-known until agronomist E.N. Fergus developed a cultivar from tall fescue growing in the steep mountain pastures of eastern Kentucky. Released in 1943, Kentucky 31 (KY 31) cultivar was tolerant of acid soils, drought and insects. It provided grazing throughout much of the year and stood up to hard use. Promoted as a "wonder grass," tall fescue was

widely planted during the 1940s and 1950s for pasture, hay production and turf.



PHOTOS BY SHAUNA ROSE HERMEL

## Gaining a reputation

"The only thing wrong with fescue is cattle don't do very well on it," says Carl Hoveland, University of Georgia forage specialist.

According to Hoveland, tall fescue soon gained a reputation for causing health problems in livestock, resulting in poor performance. Three separate "fescue poisoning" syndromes were identified:

(1) Fescue foot occurs primarily during cold weather and results in lameness, often with progressive gangrene in the affected limbs. The tail and ears may also be affected. An affected animal may exhibit an elevated respiration rate, loss of body mass and a rough hair coat.

(2) Bovine fat necrosis results in the accumulation of hard fat along the intestinal tract, which may hinder digestion and increase calving difficulty.

(3) Fescue toxicity is the most widespread

syndrome, with symptoms becoming most severe during the summer. Affected animals commonly fail to shed winter hair and display intolerance to heat, seeking shade or wet areas where they can lie down. Signs also may include fever, increased water consumption, frequent urination and excessive salivation. Decreased gains and poor reproductive performance are typical.

"For 30 years, researchers looked for reasons to explain fescue toxicosis," Hoveland says. "A lot of time and money were poured into research with nothing to show for it, until toxicologist Joe Robbins, at the USDA Russell Research Laboratory (Athens, Ga.), suspected it was related to a fungus."

Subsequent research confirmed that an endophytic fungus was the culprit. Known as an endophyte — because its entire life cycle occurs within the host plant — the fungus produces alkaloid substances

responsible for the toxic response among cattle, sheep and horses feeding on tall fescue. Ironically, the endophyte's presence is good for the grass.

"It's a symbiotic relationship," Hoveland explains. "The plant feeds the endophyte and the endophyte helps the plant utilize nitrogen, stimulating deeper root development and more tiller production. The plant becomes more tolerant of drought, disease and pests, so infection with the endophyte is beneficial to tall fescue."

Far from beneficial to cattle is the constriction of blood vessels and decreased blood flow to peripheral tissues caused by toxins in endophyte-infected fescue. Particularly costly to cow-calf producers is the resulting effect on reproductive performance. Hoveland says pregnancy rates may be reduced by 40%-60%, especially in first-calf heifers. Milk production may be

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► Above: Winter grazing of stockpiled fescue pastures can be particularly attractive to producers who manage fall-calving herds.

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► Managing fescue to maintain its vegetative state can help offset endophyte's negative effects on cattle. Among those negative effects, pregnancy rates may be reduced by 40%-60%, especially in first-calf heifers. Milk production may be lowered by 30% or more. And calf weaning weights may be decreased by 60-70 lb.

lowered by 30% or more. Calf weaning weights may be decreased by 60-70 pounds (lb.) — a combined result of lower milk production by cows and the calves' own consumption of toxic fescue. The reduction in forage intake commonly seen among stockers grazing infected fescue pastures can reduce gains by as much as 50%.

"Many producers just put up with it. They accept a 70% calf crop, 350-pound weaning weights and gains that are half of what they could be," Hoveland says. "But they don't have to accept it."

### Manage for the best

Tall fescue pastures can be managed to minimize, and even eliminate, the endophyte's toxic effects. One alternative is to remove cattle from infected fescue pasture during late spring and summer, when toxicity is greatest. Clipping pastures to remove seedheads will also help, since toxins become concentrated in tall fescue seeds.

The risk of fescue poisoning can be reduced through dilution of the tall fescue pasture to provide grazing animals with a more diverse forage diet. Interseeding with legumes or other grasses and using appropriate grazing management to sustain a mixed plant community won't remove the toxicity risk entirely, but animal performance can be significantly improved.

Dilution is also the solution when feeding toxic tall fescue hay. Blending it with other grass or legume hay will lessen toxicity. Ammoniation of fescue hay also reduces its toxicity.

Hoveland says the most effective, but most

costly, solution is to destroy infected fescue pastures and replant with nontoxic tall fescue. Endophyte-free seed is readily available. In fact, storage of infected seed for periods of a year or more results in death of the endophyte. However, while endophyte-free fescue affords excellent animal performance, stands are less vigorous and are difficult to maintain. Without the beneficial influence of the endophyte, the grass is less resistant to drought, competition from other plants and grazing pressure.

In 2000, the first novel (nontoxic) endophyte tall fescue cultivar was developed. This cultivar contains an endophyte that provides the host plant with beneficial stress tolerance, but creates no toxicity problems for animals.

"It costs about \$150 per acre to tear up an old stand and replace it with novel endophyte fescue," Hoveland adds. "That seems pretty expensive, and it takes six to nine months to re-establish a pasture. But a serious producer using good management can recover the cost fairly rapidly."

Many producers are intimidated by the cost of complete pasture conversion to nontoxic tall fescue or an entirely different forage species. Pasture renovation seems pricey. But grazing consultant Jim Gerrish,

Brookfield, Mo., says lost production and performance in cattle due to fescue toxicity are far more costly. However, Gerrish does not advocate wholesale elimination of infected fescue. Rather, he encourages producers to use the prolific forage grass to their best advantage.

Gerrish says fescue varies in toxicity, depending on the plant's stage of development. Access to some alternative pastures, offering warm-season grasses, summer annuals or grass-legume mixtures, will help producers avoid fescue pastures when toxicity is greatest.

"The amount of toxin in tall fescue leaves is much lower than in the seed, where toxin is concentrated," Gerrish explains. "As seedhead production occurs almost entirely in late spring (May and June), this is when fescue is most toxic."

Mechanically clipping pastures to prevent seedhead formation reduces ingestion of toxin by cattle, but the same thing may be achieved through planned rotational grazing. Keeping fescue in a vegetative state helps reduce toxicity.

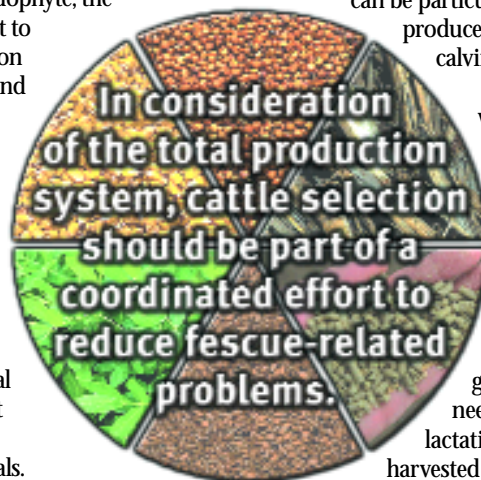
Gerrish urges producers to remember that the growing season and the grazing season are not necessarily the same thing. The "five best reasons" to have fescue pastures, he adds, are November, December, January, February and March. Even endophyte-infected fescue offers options for grazing in winter, when toxicity is low. Winter grazing of stockpiled fescue pastures can be particularly attractive to producers who manage fall-calving herds.

"One of the quickest ways to overcome toxicity problems in a breeding herd is to switch to fall calving," Gerrish states.

Many producers consider fall-calving systems too expensive because the cow's greatest nutritional needs (during peak lactation) must be met with harvested forage or concentrate.

However, Gerrish considers tall fescue the perennial grass that is best-suited to stockpiling for winter grazing, with minimal supplementation. It grows rapidly in late summer and early fall, increasing energy content in response to shorter day length and cooler nights. It also withstands freeze damage better than other cool-season species. Fescue's protein content rarely drops below the required level for lactating cows.

"So, even though we may first consider



getting cows bred on endophyte-infected tall fescue to be a challenge, it also provides the best opportunity for a low-cost winter-grazing system that allows us to effectively breed cows at a time of year when fescue toxicity is a minimal problem," Gerrish explains.

In consideration of the total production system, cattle selection should be part of a coordinated effort to reduce fescue-related problems. According to Gerrish, while some animals become debilitated on infected fescue, some of their herdmates may be affected very little. Over time, culling of the

most susceptible animals, while selecting replacements from those least affected, will increase the fescue tolerance of the herd.

"Many cow-calf producers end up with a six-month breeding season on infected fescue because they are afraid of having open cows," Gerrish adds. "To create a cow herd with fescue tolerance it is essential to maintain a tightly controlled breeding season of 45-60 days. Yes, you will have some open cows for the first several years, but you will also rapidly eliminate the genetics most susceptible to fescue toxicity."

While tall fescue is thought of as an

aggressive species that crowds out most other plants, Gerrish says it is pasture management that encourages fescue dominance.

Manipulation of stocking rates and the timing and duration of grazing can just as effectively discourage fescue, while favoring clover or other species in the pasture plant community. Through appropriate pasture management and genetic selection for endophyte tolerance, Gerrish believes producers can significantly reduce toxicity-related problems and take advantage of the positive attributes of tall fescue.

