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Fescue

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While not as ubiquitous in Nebraska as it is for our neighbors to the south and east, tall fescue is still a prevalent perennial grass in many eastern Nebraska pastures. Fescue has been a go to grass for grazing for some time, but has historically had one bit problem, endophytes.

In the 1970's researchers discovered that a majority of fescue plants were infected with a fungus (*Neotyphodium coenophialum*) that lives inside the plant. Endophyte means exactly that, internal fungus. While providing benefits to the grass itself like better tolerance to stressors like drought and overgrazing, alkaloid toxins produced by the endophyte were causing problems for grazing animals. While it's tricky to pin down exactly, estimates put the reduced performance caused by endophyte toxicity at \$600 million to over \$1 billion annually.

Fescue toxicity can take many forms including lameness and loss of extremities in cold weather due to constriction of blood vessels (fescue foot), reduced feed intake, reduced gains and milk production, elevated body temperature, more time spent in water or shade and reduced time grazing, rough hair coat, and lowered reproductive performance. Obviously, these are problems we want to avoid, so management of endophyte infected pastures is critical. Endophyte has the highest concentration in seedheads, so grazing or harvest prior to emergence will help. Improving the health of other forage grasses in the pasture and/or planting legumes can provide a more varied diet and dilute the amount of toxin ingested as well as increase pasture quality and offset some of the reduction in gains.

Another solution to this problem is to plant an endophyte free fescue. Endophytes are found in the plant themselves and pass on through seed, not pollen, so by using endophyte free seed, pastures can be established without the risk of toxicity. There is one catch, remember when we said that the endophyte helped the plant become more stress tolerant? As a result, endophyte free fescue tends to be less vigorous, have reduced stand life, and can be out competed and replaced by endophyte infected fescue plants if they become established in the area.

Once again scientists went back to the lab and in the 1990's found several strains of tall fescue endophyte that did not produce toxic alkaloids. Even without these compounds, these new strains helped with pest resistance, grazing tolerance, and overall vigor under stressful conditions. These strains were called novel endophyte and were inserted into several fescue varieties and made available for purchase and use.

Fescue can be a great forage resource in pastures, but the risk of endophyte infection makes proper management key. Knowing if your fescue stand is endophyte infected or not is the first step, which can be tested for. Once we know the level of endophytes, we can manage accordingly or consider replacing the stand with an endophyte free or novel endophyte variety.

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