

# Presence of Grass Endophytes and Mycotoxins in Florida Pastures?

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Several livestock ranchers in Florida have reported concerns that their pasture forages are causing animal health issues in cattle, equine and endangered wildlife. A team of researchers and extension faculty are collaborating on a statewide sampling of predominant forage grasses to examine pastures for the presence or absence of endophytes and mycotoxins of concern to animal health.

Beginning in February 2018, we began sampling bahiagrass, bermudagrass, limpograss and smutgrass pastures on approximately 14 ranch sites. These ranches are strategically located across the state, and over a period of 1 year, we plan to evaluate endophyte and mycotoxin presence in those specific grass species.

Over the past two years, on a very limited scale, we have been examining endophyte populations in our Florida pasture grasses and have been testing for the presence of mycotoxin activity in these forages. Working jointly with the Oregon State University School of Veterinarian Medicine Toxicology Department and Endophyte Service Laboratory (OSU), we have identified the presence of fungal endophytes and various mycotoxins occurring in several of our popular forage grass species, including bahiagrass, bermudagrass and limpograss. We have confirmed from this small sample set the identification of several fungal genera living endophytically in these grasses, such as *Fusarium*, *Balansia* and *Myriogenospora*. Additionally, we have found seasonal mycotoxin activity in the forages that are of interest to us concerning animal health. To date, we have identified and quantified the presence of zearalenone, ZEAR-4-sulfate Q1, beauvericin, and 15-AcetylDON, as well as several other mycotoxins that are potentially deleterious to animal health.

What the mycotoxin concentrations are in these forage plants and at what level these harmful to animal health are important questions. However, the first step is to increase our sampling size with additional

locations throughout Florida. All plant samples evaluated were either collected under grazing or fed as hay or silage to cattle, equine, and endangered wildlife. We will test all samples for the presence or absence of endophytes and mycotoxins, and if found, what is their seasonal occurrence and the environmental conditions under which they occur.

To date, we have nearly completed collecting forage and hay samples from the fourteen locations around the state. We have also cultured leaf portions of each grass to determine the presence of endophytes and begun the DNA sequencing to identify those endophytes present in the grasses.

The Florida Cattlemen Association has provided initial funding for the purchase of a freeze-dryer and heavy-duty coolers to expedite sample collection and processing. Those funds have aided us to begin our ranch sampling in early 2018. We have collected over 300 forage samples and are presently analyzing them at Oregon State University.

This research should provide preliminary information on forage sampling procedures for successful endophyte and mycotoxin analyses, DNA profiling of fungal endophytes, and mycotoxin type and quantification. We hope to provide the Florida Cattlemen with unbiased information about endophyte and mycotoxin presence in Florida forages and how it relates, if found, to animal health and performance.

### **Collaborators**

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