

Investigaciones de la Fundación Servicio para el Agricultor (FUSAGRI), Venezuela

A continuación se incluye una serie de observaciones sobre evaluación de metodologías y comportamiento de varias especies forrajeras, realizadas por la Fundación Servicio para el Agricultor (FUSAGRI) en Venezuela.

Determination of endophyte status of tropical grasses from Venezuela*

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Introduction

Endophyte fungi have been identified in 125 perennial grass species, including the genera *Andropogon*, *Panicum*, and *Sporobolus*. Infection in cool season grasses such as tall fescue (*Festuca arundinacea*) and perennial ryegrass (*Lolium perenne*) have been found to endow the infected plants with some disease and insect resistance and reduce the plant's acceptability to grazing animals (Bacon et al., 1986). An United States Agency for International Development sponsored cooperative project was initiated in 1985 between West Virginia University and Fundación Servicio para el Agricultor (FUSAGRI), Venezuela, on nitrogen fixation in tropical pastures. One of the Venezuelan cooperators (E. R. Velázquez) described the results of an unpublished grazing experiment with *Brachiaria humidicola*. This experiment was conducted at an experiment station near Uracoa, Venezuela. Steers gained weight when first introduced to this pasture. Weight gains were comparable to those of similar steers on *Digitaria decumbens* and *D. swazilandensis*. However, after several months weight gains became less followed by weight losses. The animals were removed from the pasture and put on

D. swazilandensis. Several months were needed for weight gains to reach levels comparable to animals that had been on *D. swazilandensis* all the time. Reduced weight gain is a symptom of pasture toxicity in cattle which has been related to the presence of an endophytic fungus in the grass (Bacon et al., 1986). This pasture and other grasses that are widely used as improved pasture in Venezuela were sampled to determine presence of endophyte colonization.

Procedure

In June 1987 samples of six tropical grasses were collected at two sites in Eastern Venezuela. Material was collected from an introduction garden maintained by FUSAGRI in Pariaguán, Estado Anzoátegui, and from pastures on the Arrollo Hermoso experimental farm near Uracoa, Estado Monagas. One of these pastures was the one referred to in the introduction. Each sample consisted of a stem piece at least 10 cm long and no less than four attached intact leaves. The grasses sample and their origin are listed in Table 1. Samples were placed in water-soaked paper towels, placed in plastic bags, and stored at 4 °C until endophyte determinations were made. Sections of leaf sheath and pith tissue were examined at West Virginia University for presence of endophyte according to the method of Bacon and Lyons (1983).

Results

Endophytes are parasitic fungi in the tribe Balansiae of the Clavicipitaceae family. They are completely systemic with hyphae found between cells of various tissues of the leaf and inflorescence stem. Once a

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Table 1. Site and origin of grasses sampled for determination of endophyte colonization. Pariaguán, Estado Anzoátegui, and pastures on the Arrollo Hermoso experimental farm near Uracoa, Estado Monagas.

Species	Common name in Venezuela	Site	Origin
<i>A. gayanus</i>	Andropogon	Pariaguán, Uracoa	CIAT
<i>B. decumbens</i>	Barrera	Pariaguán, Uracoa	IRI 562 ^a
<i>B. humidicola</i>	Humidicola	Uracoa	IRI 409
<i>B. mutica</i>	Para	Uracoa	Local
<i>D. decumbens</i>	Pangola comun	Uracoa	Local
<i>D. swazilandensis</i>	Swazi	Pariaguán, Uracoa	UF 556 ^b

a. IRI Research Institute (see Larez et al., 1975).

b. University of Florida.

grass is parasitized by an endophyte species it remains infected (Bacon et al., 1986). All the grasses sampled in this study, with the exception of *A. gayanus*, have been propagated vegetatively in Venezuela. No endophyte colonization was observed in these samples. This result would indicate that most improved grasses in Venezuela are endophyte free and that the problem of toxicity to cattle grazing *B. humidicola* referred to in the introduction was not related to endophyte infection.

Resumen

En junio de 1987 se hizo un muestreo de seis forrajeras (*Andropogon gayanus*, *Brachiaria decumbens*, *B. humidicola*, *B. mutica*, *Digitaria decumbens* y *D. swazilandensis*) en dos sitios de Venezuela (Pariaguán, Estado Anzoátegui, y en Arrollo Hermoso, Uracoa, Estado Monagas), con el fin de evaluar la infestación con hongos endofitos. En las observaciones en tejidos de vainas y hojas completas no se encontró evidencia de colonización por estos hongos.

References

- Bacon, C. W. and Lyons, P. C. 1983. Determination, isolation, and culture of the endophyte of tall fescue. Proceedings Tall Fescue Toxicosis Workshop. March 17-18, 1983, Atlanta, GA. Cooperative Extension Service, The University of Georgia, Athens, GA 30602.
- _____; Lyons, P. C.; Porter, J. K.; and Robbins, J. D. 1986. Ergot toxicity from endophyte-infected grasses: A review. Agron. J. 78:106-116.
- Larez, O. R.; Velásquez, E. R.; Parra, O.; and Bryan, W. B. 1975. Pasture and livestock investigations in the humid tropics Orinoco Delta-Venezuela. I. Observations on forage grasses and legumes. International Research Institute. Bulletin 42.