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# SCREENING *Brachiaria* INTRODUCTIONS FOR RESISTANCE TO SPITTLEBUGS (HOMOPTERA: CERCOPIDAE)

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## Abstract

Spittlebugs are the most evident and damaging pests of Signal grasses (*Brachiaria*) in tropical America. Damage caused by these insects can result in the complete loss of available forage, thereby reducing the carrying capacity of infested pastures. Host plant resistance is a low-cost method of controlling insects. High level of spittlebug resistance is found in the cultivar Marandu (*B. brizantha*), but it requires more fertile soils. *Brachiaria* germplasm provided by the International Center for Tropical Agriculture (CIAT) is available at National Beef Cattle Research Center of the Brazilian Agricultural Research Corporation (Embrapa Beef Cattle) and it is being screened for spittlebug resistance. In the present study, 23 introductions of *Brachiaria* were evaluated for resistance to the spittlebug *Deois flavopicta*, based on the parameters: nymphal survival and nymphal period. The introductions CIAT 16125 and CIAT 16309, both *B. brizantha*, were selected as resistant in this test. Given the great number of available introductions and hybrids, tests like this have been conducted routinely at Embrapa Beef Cattle. A total of 551 introductions and hybrids have already been screened in the past few years. As a result 40 introductions and 11 hybrids were found resistant. The aim of continuing evaluations is to release new spittlebug resistant *Brachiaria* cultivars.

**Keywords**: Host plant resistance, froghopper, forage grass, pasture, pests, *Deois flavopicta*

## Introduction

The beef cattle industry in tropical America, with its extensive production systems, depends on forage grasses for meat production. Several species of the genus *Brachiaria* comprise the most important of these. Because of their excellent adaptation, particularly of *B. decumbens* to low-fertility acid soils, they have been widely adopted throughout Central and South America. In Brazil, approximately 50 millions ha are covered by Signal grass cultivars. Their introduction, mainly in the savannas, has increased the carrying capacity of pasture lands previously occupied by low-yielding native grasses. However, the extensive monoculture of susceptible grasses has favored the buildup of several spittlebug species, the most damaging pests of *Brachiaria* in tropical America. These insects can drastically reduce plant growth, dry matter production as well as forage quality (Valério and Nakano, 1988). Host-plant resistance offers the advantage of being a low-cost method of controlling pasture pests, and one that farmers can easily adopt. A great effort has been devoted to finding grasses resistant to spittlebugs. Cosenza et al. (1989) and Nilakhe (1987) reported a high level of spittlebug resistance in *B. brizantha* cv. Marandu but it requires more fertile soils. The objective of this work was to evaluate 23 introductions of the genus *Brachiaria,* from the germplasm availabe at the National Beef Cattle Research Center, for resistance to the spittlebug *Deois flavopicta* using the selection criteria of nymphal survival and nymphal period.

## Material and Methods

The assay was conducted in the greenhouse (26.4±2.3°C; 68.9±9.8% RH) using methodology described by Lapointe et al. (1989). The introductions were initially established in jiffy pots and, posteriorly were transferred to plastic pots. Each of these pots were covered with aluminum tops, which have a central opening for the grass stems. This is done in order to stimulate abundant superficial rooting at the soil surface and hence provide enough feeding sites for the newly hatched nymphs. The plants were infested two and half months after planting with five eggs (obtained according to Valério (1993)) per pot. There were ten replications for each introduction in a complete randomized assay. Close to adult emergence, the pots were individually caged. The emerging adults were collected daily. As screening criterium, only the introductions presenting, simultaneously, percentage of nymphal survival below the average for the group, minus the correspondent standard deviation and, nymphal period above the average for the group plus the respective standard deviation, are selected as resistant. *B. decumbens* cv. Basilisk was included as the susceptible check whereas *B. humidicola* and *B. brizantha* cv. Marandu, as the resistant ones. The latter cultivar has antibiosis, while *B. humidicola* is known for its tolerance and suitableness as host plant to the spittlebugs.

## Results and Discussion

The survival rates varied from 20% to 68%, the average being 43±14.8% for the group. For nymphal period, the variation was from 36 to 48 days, with an average of 41.1±2.7 days. The values obtained for the susceptible and tolerant checks confirmed their suitability as host plants (higher survival and shorther nymphal period), whereas for the cultivar Marandu lower nymphal survival and prolonged nymphal period were recorded. In accordance with adopted screening criterium, however, the introductions CIAT 16125 and CIAT 16309 were

the ones selected as more resistant in this trial (Fig. 1). The latter, was also found resistant in a previous trial (Valério and Souza, 1997). Both introductions, like the resistant cultivar Marandu, belong to the species *B. brizantha*. The nymphal survival for these introductions were, respectively, 22 and 20%; whereas the duration of the nymphal period were, respectively, 46.5 and 48 days. Presumably the resistance exhibited by these plants is due to secondary chemicals, being still necessary, additional studies to fully understand the basis of this resistance. Considering that five other introductions in this test (CIAT 16113, CIAT 16316, CIAT 16315, CIAT 16306 and CIAT 26110) were close to fulfilling the selection criterium, they should be reevaluated in follow-up trials. Given the great number of available introductions and hybrids, tests like this have been conducted routinely at Embrapa Beef Cattle. A total of 551 introductions and hybrids have already been screened in the last few years. As a result, 40 introductions and 11 hybrids were found to present appreciable level of resistance. Aiming to release new spittlebug resistant *Brachiaria* cultivars, complementary evaluations with this group of introductions, are in progress in multilocational trials.

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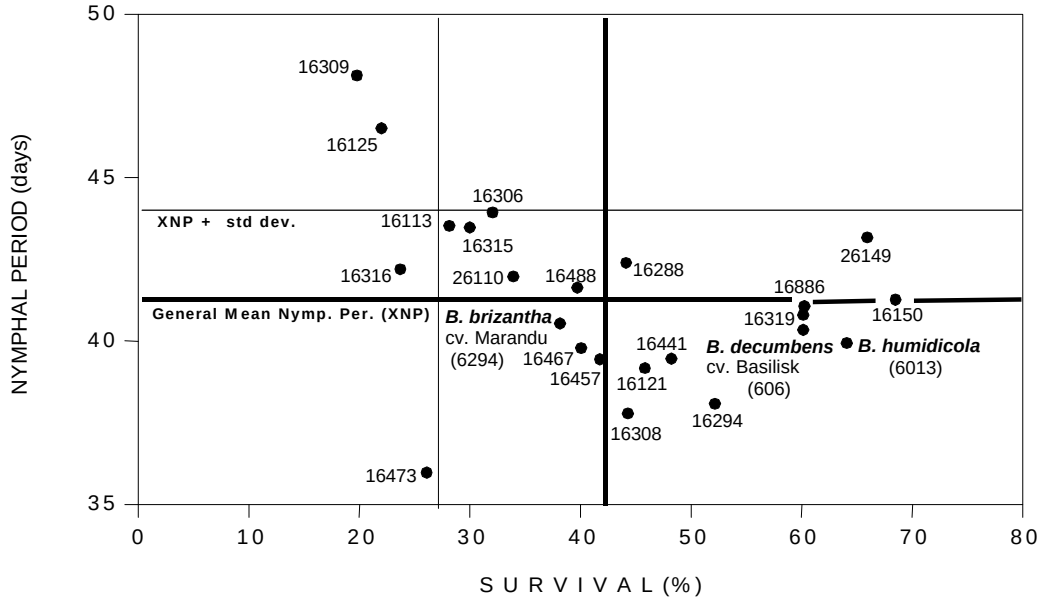


**Figure 1 -** Screening *Brachiaria* introductions for resistance to the spittlebug *Deois flavopicta* based on nymphal survival and duration of nymphal period (Selected introductions: CIAT accession nº 16125 and 16309)