SCREENING TROPICAL FORAGE GRASSES FOR RESISTANCE TO THE SPITTLEBUGS (HOMOPTERA: CERCOPIDAE)

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ABSTRACT
Spittlebugs are the most damaging pasture pests in tropical America where extensive monocultures of Signal grasses, especially *Brachiaria decumbens* cv. Basilisk, have favored the buildup of spittlebug populations. Under severe spittlebug attack, the entire above-ground portion of the plant dries and eventually dies, thereby reducing the carrying capacity of infested pastures. Host plant resistance is a low-cost method of controlling spittlebugs. High level of spittlebug resistance is found in the cultivar Marandu (*B. brizantha*), but it requires more fertile soils. *Brachiaria* germoplasm is being screened for spittlebug resistance. In the present study, 30 introductions of *Brachiaria* were evaluated for resistance to the spittlebug *Zulia entreriana*, based on the parameters: nymphal survival and nymphal period. The introduction CIAT 16309, a *B. brizantha*, was the only one selected as resistant in this test. Other 424 introductions and hybrids have already been screened. As a result 23 introductions and seven hybrids were found resistant.

KEYWORDS
Host plant resistance, froghopper, forage grass

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 million 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 30 introductions of genus *Brachiaria* for resistance to the spittlebug *Zulia entreriana* using a selection criterium based on nymphal survival and duration of nymphal period. *Brachiaria* germoplasm was made available at the National Beef Cattle Research Center (CNPGC/EMBRAPA) by the International Center for Tropical Agriculture (CIAT).

MATERIALS AND METHODS
The assay was conducted in the greenhouse (26.2±1.6°C; 75.2±6.3% 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. The cultivar *B. decumbens* cv. Basilisk was included as the susceptible check, while *B. brizantha* cv. Marandu, as the resistant one. The latter cultivar presents antibiosis as resistance mechanism.

RESULTS AND DISCUSSION
The survival rates varied from 2% to 86%, the average being 57.6±20.2% for the group. For nymphal period, the variation was from 28.1 to 46.2 days, with an average of 31.1±3.1 days. The values obtained for the susceptible check were very close to the overall mean for the group. The resistance of cv. Marandu was confirmed by recording low nymphal survival and prolonged nymphal period. In accordance with adopted screening criterium, introduction CIAT 16309 was the only one considered resistant in this trial (Fig. 1). The nymphal survival for this introduction was 18±19.9% and the duration of the nymphal period was 46.2±8.2 days. This introduction, like the resistant check, belongs to the species *B. brizantha*. Presumably the resistance exhibited by these plants is due to secondary chemicals, consequently, additional studies are still necessary to fully understand the basis of this resistance. On three other introductions in this test, CIAT 16767, CIAT 16294 and CIAT 16527, low nymphal percentage survival was also observed, but on the other hand, short nymphal periods were recorded. These should be reevaluated in a follow-up trial. Given the great number of available introductions and even hybrids, tests like this have been conducted routinely at CNPGC. Other 424 introductions and hybrids have already been screened in the last few years. As a result, 23 introductions and seven hybrids were found to be resistant. Aiming to release new spittlebug resistant *Brachiaria* cultivars, complementary evaluations with a first group of selected introductions, are in progress in multilocational trials.

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Figure 1
Screening *Brachiaria* introductions for resistance to the spittlebug *Zulia entreriana* based on nymphal survival and duration of nymphal period. (Selected introduction: CIAT accession nº 16309)