CHARACTERISTICS OF SELECTED GENOTYPES OF *BRACHIARIA* FOR BRAZILIAN PASTURES

C.B.Valle[1], J.R. Valério[1], S.Calixto[1] and A.O.Barcellos[2]
[1]EMBRAPA/CNPGC, C.P. 154, CEP 79002-970, Campo Grande, MS, Brazil
[2]EMBRAPA/CPAC, C.P.8223, CEP 73301-970, Planaltina, DF, Brazil

ABSTRACT
Brachiaria is a grass genus of African origin. Some genotypes have shown good adaptation to poor, acid soils and now cover millions of hectares of pastures in tropical America. In an effort to increase diversity for selection, CIAT led collection expeditions to East Africa and later distributed this germplasm to collaborating institutions. Agronomical evaluation of a *Brachiaria* collection of broad genetic base was conducted at EMBRAPA/CNPGC with the objective of selecting potential new cultivars. Multivariate analysis was used to classify 193 accessions of nine different species into 8 groups using annual and seasonal production, leaf:stem ratio and regrowth characteristics. Resistance to spittlebug was evaluated under controlled conditions and monitored in the field. The evaluation resulted in the selection of 19 genotypes with superior agronomic characteristics. *B. brizantha* accessions BRA 003361, 003204 and 003395 combine good overall production with spittlebug resistance, important prerequisites for potential new cultivars.

KEYWORDS
Agronomic evaluation, *B. brizantha*, *B. decumbens*, *B. humidicola*, spittlebug.

INTRODUCTION
Brachiaria pastures are estimated to cover 40 million hectares of the Brazilian Cerrados (Macedo, 1995). These are largely monocultures of *Brachiaria decumbens* cv. Basilisk, an apomictic cultivar well adapted to low fertility, acid soils but susceptible to spittlebugs (Homoptera:Cercopidae). *Brachiaria* is essentially of African origin and the demand for new cultivars for the tropics prompted collection expeditions to six East African countries, led by the International Center of Tropical Agriculture, Colombia, between 1984 and 1985 (CIAT, 1986). In an effort to increase diversity for selection of new cultivars of *Brachiaria* in Brazil, a large collection, comprised of nine different species and close to 350 accessions was introduced from CIAT in 1987 and evaluated in small plots under a cutting regime for three years (Valle et al., 1993).

The objective of this paper is to present the agronomic characteristics of the 19 accessions selected from the evaluation of the *Brachiaria* collection in Brazil (Valle et al., 1993) and included in regional trials to test their adaptation and performance.

MATERIAL AND METHODS
A field experiment was established in 1988 at CNPGC, with 220 accessions of nine different species, on an acid, low fertility latosol (Campo Grande, MS, Brazil - lat. 20°27´S; long. 54°37´W, alt. 530m; mean annual temp. 23°C; annual rainfall 1550 mm). Experimental plots comprised of five plants, spaced 1m apart in the row and 2m between plots, with three replicates. Plots were cut every six weeks during the rainy season (Oct. to May) and once during the dry season, for three consecutive years. Parameters evaluated included seasonal and annual production (total and leaf dry matter), leaf:stem ratio, flowering pattern, vigor, insect attack, and speed of regrowth and density. Agronomical data for 193 accessions was analyzed by multivariate analysis. PRINCOMP SAS allowed selection of 12 most discriminant parameters which were then used in CLUSTER SAS for the formation of groups, by Ward's minimum variance criterion.

Spittlebug evaluation was carried out under greenhouse conditions by a procedure developed by Lapointe et al. (1989). Pots were artificially infested with 5 spittlebug eggs ready to eclode and monitored to determine length of the nymphal period and survival rates of the insect. Accessions were rated from poor to good hosts, as presented on Table 1: ** = very resistant; * = resistant; + = tolerant and S = susceptible. Superior *Brachiaria* accessions (**) were those with nymph survival rates lower than the average minus 1 standard deviation (SD) and length of nymphal period longer than the average plus 1 SD. Natural field infestations were also monitored by counting nymphal masses and sampling adult populations with entomological nets. Results were compiled, averaged and summarized graphically.

RESULTS AND DISCUSSION
Multivariate analysis of the 193 accessions evaluated resulted in the formation of eight clusters. The classification was arbitrarily truncated with a semi-partial R-squared value of 0.02348. Clusters 7 and 8 were comprised only of *B. brizantha* of best performance: TDM, LDM, %DSP and R averaged, respectively 13.6 and 16.5 t/ha; 8 and 9 t/ha; 20% in both; and 3.6 and 3.5 (grades 0 = none to 6 = fast, dense regrowth) . Of 11 accessions in these clusters, nine were selected (Table 1). Cluster 1 grouped the 21 lowest producing accessions (3.7 t/ha TDM) and poorest regrowth (1.9). Cluster 6, with six selected accessions, averaged 9 and 4t/ha of TDM and LDM respectively, showed good seasonal distribution (20% of TDM in the dry season) and good regrowth (3.1). Two very promising accessions are BRA-003361 and 003204, with high overall agronomic performance and resistance to spittlebug (Table 1). Data on Table 1 show that the selected accessions represent an improvement over the commercial varieties, especially for overall production and leaf DM production. The average values for all traits of the selected accessions was substantially higher than those for the entire collection (Table1).

Figure 1 shows the performance of the accessions under natural field infestation. *B. brizantha*, BRA-003395, a tall, productive genotype, presented the lowest population whereas *B. humidicola* behaved as the best host for spittlebugs.

The *Brachiaria* collection introduced from CIAT is an example of morphological/genetical diversity that may be assembled when collecting germplasm at centers of origin and dispersion of the genus. All selected accessions are apomictic genotypes and, as such, are potential new cultivars.

All these accessions were included in regional trials in different ecosystems in Brazil, and seven of these are being evaluated under grazing in Campo Grande (MS).

CONCLUSIONS
The evaluation of a *Brachiaria* collection of broad genetic base, has resulted in the selection of 19 new genotypes with superior agronomic characteristics. *B. brizantha* accessions BRA-003361, 003204 and 003395 combine good overall production with spittlebug resistance, important prerequisites for potential new cultivars for Brazilian pastures.

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Table 1
Agronomic characteristics of the 19 selected accessions of *Brachiaria* as compared to the checks and the entire collection.

Accessions	Species[1]	Cluster	TDM[2]	LDM	%DSP	R	L/S	SB
BRA002739	B	7	13.5	6.5	18.4	3.2	1.2	*
BRA002801	B	6	8.7	4.2	25.7	3.1	1.6	S
BRA002844	B	2	9.5	5.4	21.1	3.2	2.0	*
BRA003204	B	8	17.7	9.8	21.0	3.6	1.6	**
BRA003247	B	4	11.8	6.9	17.0	4.0	2.3	**
BRA003361	B	7	13.6	8.9	22.1	4.1	2.6	**
BRA003387	B	6	8.7	4.9	21.6	3.2	1.9	+
BRA003395	B	7	13.5	8.4	13.7	3.2	2.3	**
BRA003441	B	7	14.5	9.4	15.7	4.4	2.8	**
BRA003450	B	8	16.2	8.6	16.1	3.4	1.6	*
BRA003484	B	6	7.4	4.0	21.0	3.5	1.8	+
BRA003719	B	4	12.3	4.9	23.4	3.3	1.1	*
BRA003824	B	7	13.8	7.3	21.0	3.6	1.6	*
BRA003891	B	8	15.7	8.5	23.3	3.5	1.6	+
BRA003948	B	7	13.5	7.2	23.6	3.7	1.5	+
BRA004391	B	4	8.4	4.2	36.3	2.8	1.3	*
BRA004499	D	6	9.1	4.4	21.5	3.0	1.4	S
BRA005011	H	6	6.4	3.6	16.3	3.0	3.3	S
BRA005118	H	6	7.9	3.9	15.4	3.1	1.4	S
Checks (commercial cultivars):								
BRA001068	D	4	10.3	4.4	25.7	3.2	1.1	S
BRA000591	B	4	10.8	5.8	17.6	3.9	2.1	**
BRA002208	H	5	6.1	2.9	17.8	3.4	2.4	+
Average of collection: 193 accessions/9 species		7.8	3.8	18.6	2.8	1.6		
Average of selected: 22 accessions/3 species		11.7	6.4	20.8	3.4	1.8		

[1]B = *B. brizantha*; D = *B. decumbens*; H = *B. humidicola*
[2]TDM = total DM production (t/ha); LDM = Leaf DM production (t/ha); %DSP = leaf DM production (dry season/annual); R = regrowth (0 = none to 6 = best); L/S = leaf:stem ratio;
Spittlebug index: **=very resistant; *=resistant; +=tolerant; S=susceptible

Figure 1
Population levels of spittlebug nymphs on field plots of *Brachiaria* accessions.
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