Initial Development of Dwarf Elephant Grass (*Pennisetum purpureum* Schum.) Clones in the Coastal Region of Pernambuco State, Brazil

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Key words: average leaf angle, leaf index area, light interception, hybrid

Introduction Elephant grass germplasm is highly heterozygous and presents great variability, which may be exemplified by its large variability in plant height ('T Mannetje, 1992). Growth analysis of elephant grass clones with different plant heights it is an important tool to understand plant morphological adaptations to the environment and management strategies. This experiment aimed to evaluate physiological responses of elephant grasses clones with different plant heights.

Material and methods The experiment was carried out at the Agricultural Research Station of IPA, located in Itambe, dry forest zone of Pernambuco State, Brazil. It was evaluated eight elephant grass clones. Five of these clones are considered dwarf elephant grass (Taiwan A-146 2.37, Taiwan A-146 2.27, Taiwan-146 2.114, Merker México MX 6.31 and Mott), and one of them (HV-241) is a hybrid with pearl millet. These clones, except Mott, were developed from the IPA/UFRPE elephant grass breeding program. The last two clones are elephant B (or Mercker) and IRI-381. Elephant B is one of the first elephant grass introductions in Brazil. These two clones are not dwarf and represent the average clones used in the region. Growth was evaluated by measuring the leaf area index (LAI), light interception (LI), and average leaf angle (LA), every 14 d, until 56 d of regrowth after cutting at ground level. For these measurements, it was used a LICOR LAI 2000. It was used a complete randomized blocks design with four replications.

Results and discussion The relationship between LI and LAI was high ($R^2=0.99$). Differences among elephant grass clones ($P<0.05$) related to LI and LAI occurred only at 42 d of regrowth (Tables 1 and 2). It was verified LAI reduction for the elephant grass clones after reaching 95% of LI (critical LAI), however, time needed to reach critical LAI varied among elephant grass clones. According to Bréda (2003), any change in the LAI is followed by modifications in the stand of forage plants. No differences among clones ($P>0.05$) were observed for LA, with averages of 46°, 39°, 30°, and 38° at 14, 28, 42, and 56 d of regrowth, respectively.

Table 1 *Leaf area index along the growth period of elephant grass clones with different plant heights.*

Clones	Growth, days			
	14 days	28 days	42 days	56 days
Taiwan A-146 2.37	0.9a	2.1a	3.0c	2.8a
Taiwan A-146 2.27	1.2a	2.4a	3.7bc	3.4a
Taiwan A-146 2.114	1.1a	2.5a	4.0ab	3.5a
Mercker México 6.31	1.3a	2.3a	4.1ab	3.0a
HV-241	0.9a	2.4a	3.7abc	3.1a
Mott	1.2a	2.4a	4.5a	3.3a
Elefante B	1.2a	2.5a	3.4bc	3.5a
IRI-381	0.9a	2.6a	3.7abc	3.1a
Mean	1.1	2.4	3.8	3.2
CV, %	27.5	19.5	10.7	12.9

Means followed by different letters in the same column are different by Tukey test ($P<0.05$).

Table 2 *Light interception along the growth period of elephant grass clones with different plant heights.*

Clones	Growth, days			
	14 days	28 days	42 days	56 days
Taiwan A-146 2.37	51a	81a	93b	91a
Taiwan A-146 2.27	61a	89a	95abc	95a
Taiwan A-146 2.114	57a	88a	96ab	94a
Mercker México 6.31	60a	84a	97ab	91a
HV-241	52a	86a	96ab	92a
Mott	63a	84a	98a	93a
Elefante B	59a	88a	94bc	94a
IRI-381	53a	89a	95abc	93a
Mean	57	86	95	93
CV, %	18	7	2	3

Means followed by different letters in the same column are different by Tukey test ($P<0.05$).

Conclusions The length of time needed to reach the critical LAI varies with the elephant grass genotype, indicating that management strategy should differ according to the genotype.

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