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Breeding apomictic bahiagrass (*Paspalum notatum* Flüggé) in southeastern USA

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Introduction Livestock production systems in the southern Coastal Plain of the USA are mainly based on warm-season grasses. Bahiagrass, *Paspalum notatum* Flüggé, is one of the most important species in the region. The tetraploid ecotypes reproduce by apomixis which has restricted breeding efforts to ecotype selection. The production cycle of currently available ecotypes is restricted to the warmer part of the year. The general objective of our breeding program is to generate apomictic hybrids with an extended growing season and improved nutrient uptake.

Materials and methods Approached crosses were made between induced sexual and apomictic bahiagrass tetraploids during summer 2004. Two clones of each progeny were transplanted into the field located in Gainesville, Florida in May 2005, and evaluated for growth habit, cool-season regrowth and cold tolerance. Progeny were classified as sexual or apomictic based on embryo sac observations. Ten superior apomictic progeny and the cultivar Argentine were planted in small plots in May 2006. These plots were harvested once on October 2006, and eight times at 4-wk intervals during 2007 starting in May. The N and P concentrations of the harvested material were determined by a modified Kjeldahl procedure described by Hambleton (1977).

Results and discussion Six hundred hybrids were generated by crossing 13 different combinations of sexual and apomictic bahiagrass tetraploids. A ratio of 2.6 sexual to 1 apomictic (facultative and obligate) progeny and a ratio of 1 obligate apomictic (potential new cultivar) progeny to 8 others (facultative and sexual) were observed. As expected, the obligate apomictic progeny set similar amounts of seed when self- or cross-pollinated. In contrast to previous reports for other apomictic grasses (Noirot, 1997), the bahiagrass sexual hybrids were more self-fertile than the sexual parents. The non transmission or non expression of the self-incompatibility genes present in the autotetraploid parents (Acuña et al., 2007) should be further investigated.

The heterozygous condition of the apomictic parents was reflected by the marked variability observed among the progeny. The growth habit of the progeny varied notably from being mainly upright for some hybrids to markedly prostrate for others. Genetic variation for cool-season growth and cold tolerance was also observed.

Most of the 10 apomictic clones grown in plots outperformed the cultivar Argentine for forage production during the fall of the first growing season and during the spring of the second season. They also showed higher ability for N and P extraction during most of the evaluated period compared to Argentine. Further studies analyzing the responses of these clones to grazing pressure are needed.

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