The demand for pasture seed production in Brazil has been increasing since the 1980s, due to the increase of pasture areas cultivated by seeds, instead of vegetative propagation fodder, as occurred until the 1970s, in especial a great demand for *Brachiaria ruziziensis* seeds, which is a good choice of fodder for use in integrated systems between crop, livestock and forest. From the forage species cultivated in Brazil, *B. ruziziensis* is the only sexual and diploid species, which allows the generation of variability to select the best genotypes. The objective of this research was to select populations of *B. ruziziensis* originated from a recurrent selection cycle that obtained better nutritional value in order to recombine them to obtain new populations. Ten improved populations of *B. ruziziensis* and two controls (*B. ruziziensis* cv. Kennedy and *B. brizantha* cv. Marandu) were evaluated in experiments conducted in a randomized complete block design with three replicates and five cuts, performed on January 14, February 19, May 05, July 09 and October 08, in the year 2014, the first cut being made 41 days after the standardization cut. In each cut, samples were collected for determination of percent crude protein (CP), in vitro dry matter digestibility, acid detergent fiber (FAD), neutral detergent fiber (NDF), lignin and ash. The data were submitted to analysis of variance in the scheme of subdivided plots, whose primary factor were the populations and the secondary were the cuts. For the comparison of means, the Tukey test was used at 5% of significance and, from the joint analyzes, the Pearson correlations between the variables were estimated. In general, the improved populations presented better performance than the Marandu cultivar and similar performance to Kennedy cultivar. The improved populations III, IV, V, VI and IX were selected for new recombination and evaluation by the best CP, FDA and NDF levels, both in the water period and in the dry season.

**Keywords:** animal nutrition, *Brachiaria* spp., forage, plant breeding