



Genetic diversity studies of Brazilian garlic cultivars and quality control of garlic-clover production

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ABSTRACT. The garlic cultivars grown in Brazil evolved from somatic mutations and clone selection by breeding programs and by the introduction of germplasm from other countries. Morphological characters have been used to differentiate these cultivars. Two hundred and six random amplified polymorphic DNA markers were utilized for a diversity analysis of the 17 most planted garlic cultivars in Brazil. Bootstrap analysis showed that the number of markers was efficient and sufficient to obtain a coefficient of variation of 10%. Similarity varied between 16 and 98% and cluster analysis showed that, in general, genetic similarities correlate with morphological characters of the cultivars and production cycle variation. High bootstrap values at most of the nodes supported the dendrogram stability. The grouping of most varieties agreed well with previous reports

based on morphological characters. As a vegetative-propagated species, viral diseases are a key problem regarding production and quality of the bulbs, causing gradual loss of yield and decrease in storage capacity. To improve the health quality of garlic seed, a virus-free stock of garlic cloves of the Amarante cultivar was obtained. The ability to distinguish garlic cultivars to detect varietal mixing after *in vitro* multiplication is extremely important, since correct identification is not possible until bulbs are produced. Random amplified polymorphic DNA markers were also used to differentiate cultivars while they are *in vitro* and not amenable to morphological discrimination. No difference was identified between the fingerprints of the virus-free or of the infected bulks of Amarante, showing that there was no clove mixing in the handling of material in the clonal multiplication phase.

Key words: Genetic divergence; Random amplified polymorphic DNA; *Allium sativum*