

Malting quality improvement and molecular markers to assess genetic diversity in barley

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ABSTRACT

Barley breeding for malting quality aims to pyramid in agronomic superior genotypes genes associated with quality. Molecular markers can be an effective tool in breeding programs by accessing polymorphism at the DNA. In this study we estimated the genetic distance among 12 elite genotypes used by the Embrapa barley breeding program in Brazil. Seed samples of the genotypes were collected in a yield trial seeded in 2012 in three and four locations in the Rio Grande do Sul and Paraná states, respectively. Micromalting and quality analysis were performed by VLB in Germany and ABINBEV in USA. Kolbach Index, β -glucans, α -amylase and diastatic power were the quality parameters measured. The molecular analysis was performed using 16 specific microsatellite markers in agarose gel electrophoresis. All quality parameters of all genotypes were highly influenced by the environment in the different locations. BRS Brau, BRS Korbel had the highest overall value for malt quality whereas Victor Graeff/RS was the site with the best environmental conditions for the expression of the quality variables. Some of the cultivars/lines tested had a superior malt quality profile than Scarlett, an international high quality standard. In the microsatellite analysis and linking genotypic data with phenotypic markers, the genotypes that excelled in malt quality appeared in the same groups of the ones established by genetic diversity. However, the microsatellite genetic distances produced more groups than the quality analysis. Therefore, the use of molecular markers showed greater specificity of the data and could be used in malting barley breeding programs.

SECTION:

Barley end use: malting and brewing