GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Potential of hypocotyl diameter in family selection aiming at plant architecture improvement of common bean

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Genet. Mol. Res. 14 (3): 11515-11523 (2015)
Received January 25, 2015
Accepted June 8, 2015
Published September 28, 2015
DOI http://dx.doi.org/10.4238/2015.September.28.3

ABSTRACT. Cultivars of common bean with more erect plant architecture and greater tolerance to degree of lodging are required by producers. Thus, to evaluate the potential of hypocotyl diameter (HD) in family selection for plant architecture improvement of common bean, the HDs of 32 F_2 plants were measured in 3 distinct populations, and the characteristics related to plant architecture were analyzed in their progenies. Ninety-six $F_{2:3}$ families and 4 controls were evaluated in a randomized block design, with 3 replications, analyzing plant architecture grade, HD, and grain yield during the winter 2010 and drought 2011 seasons. We found that the correlation between the HD of F_2 plants and traits related to plant architecture of $F_{2:3}$ progenies were of low magnitude compared to the estimates for correlations considering the parents, indicating a high environmental influence on HD in bean plants. There was a predominance of additive genetic effects on the

determination of hypocotyl diameter, which showed higher precision and accuracy compared to plant architecture grade. Thus, this characteristic can be used to select progenies in plant architecture improvement of common beans; however, selection must be based on the means of at least 39 plants in the plot, according to the results of repeatability analysis.

Key words: Genetic control; *Phaseolus vulgaris* L.; Plant architecture; Repeatability

