Genetics and Molecular Research

Estimate of genetic gain in popcorn after cycles of phenotypic recurrent selection

H.J. Ematné[1], J.A.R. Nunes[1], K.O.G. Dias[1], P.E.R. Prado[2] and J.C. Souza[1]

[1]Departmento de Biologia, Universidade Federal de Lavras, Lavras, MG, Brasil
[2]Syngenta Seeds, Uberlândia, MG, Brasil

Corresponding author: H.J. Ematné
E-mail: so_hugo85@yahoo.com.br

Genet. Mol. Res. 15 (2): gmr.15026860
Received May 27, 2015
Accepted January 14, 2016
Published May 20, 2016
DOI http://dx.doi.org/10.4238/gmr.15026860

ABSTRACT. Popcorn is widely consumed in Brazil, yet there are few breeding programs for this crop. Recurrent selection (RS) is a viable breeding alternative for popcorn; however, the gains achieved must be frequently checked. The aim of this study was to assess the effect of selection for grain type (round and pointed) after four cycles of phenotypic RS on the main agronomic traits of popcorn, to estimate the genetic gain achieved for the trait of expansion volume (EV), and to obtain estimates of phenotypic correlations for the main traits of the crop in the UFLA E and UFLA R populations. The zero, one, two, and three cycles of the UFLA E and UFLA R populations, the fourth cycle, and the controls IAC-112 and IAC-125 were used. The experiments were conducted at the experimental farm of Universidade Federal de Lavras (UFLA; Environment 1) and at the experimental area of the Genetics and Plant Breeding Sector of the Department of Biology at UFLA (Environment 2) in the 2010/11 crop season. Nine agronomic traits were evaluated, including EV and grain yield (GY). The UFLA R and UFLA E populations showed similar behavior for all evaluated traits. The type of grain did not affect the genetic gain for EV, which was 5 and 3.7% in each cycle carried out in the UFLA E and UFLA R population, respectively. Phenotypic selection carried out during

recombination for EV is an effective method for increasing expression of the trait. EV and GY did not show a linear association.

Key words: Recurrent selection; Gain from selection; Expansion volume

