Marker-assisted selection of *Fusarium* wilt-resistant and gynoecious melon (*Cucumis melo* L.)

P. Gao, S. Liu, Q.L. Zhu and F.S. Luan

College of Horticulture, Northeast Agricultural University, Harbin, China

Corresponding author: F.S. Luan
E-mail: gaopeng_neau@163.com

Genet. Mol. Res. 14 (4): 16255-16264 (2015)
Received August 12, 2015
Accepted October 2, 2015
Published December 8, 2015
DOI http://dx.doi.org/10.4238/2015.December.8.16

ABSTRACT. In this study, molecular markers were designed based on the sex determination genes *ACS7* (*A*) and *WIP1* (*G*) and the domain in the *Fusarium oxysporum*-resistant gene *Fom-2* (*F*) in order to achieve selection of *F. oxysporum*-resistant gynoecious melon plants. Markers of *A* and *F* are cleaved amplified polymorphic sequences that distinguish alleles according to restriction analysis. Twenty F_1 and 1863 F_2 plants derived from the crosses between the gynoecious line WI998 and the *Fusarium* wilt-resistant line MR-1 were genotyped based on the markers. The results showed that the polymerase chain reaction and enzyme digestion results could be effectively used to identify plants with the *AAggFF* genotype in F_2 populations. In the F_2 population, 35 gynoecious wilt-resistant plants were selected by marker-assisted selection and were confirmed by disease infection assays, demonstrating that these markers can be used in breeding to select *F. oxysporum*-resistant gynoecious melon plants.

Key words: Melon; Sex determination; Disease resistance; Molecular marker; Cleaved amplified polymorphic sequence markers

 ©FUNPEC-RP www.funpecrp.com.br