

ABSTRACT

IDENTIFICATION OF QUANTITATIVE TRAIT LOCI AND CANDIDATE GENES FOR BRUISING, BLEEDING, AND FLESH COLOR IN PEACH FRUIT

Impact bruising of peach is a serious concern, as it can initiate the onset of browning of the flesh beneath the surface, rendering fruit undesirable to the consumer. Flesh color and a severe red pigmentation, known as “bleeding” are also important characteristics that may be associated with browning/bruising development. The goal of this research was to identify important genes and detect quantitative trait loci (QTL) for fruit bruising, bleeding, and flesh color of peach. During the 2004 season, these traits were evaluated in fruit at commercial maturity in a test population of 108 peach progeny. PCR and polyacrylamide gel electrophoresis analysis of candidate genes identified an expressed sequence tag (EST) encoding the enzyme β -carotene hydroxylase to be polymorphic, segregating 1:1 within the test population. β -carotene hydroxylase allelic diversity was observed in several cultivars of peach, nectarine, exotic peach hybrids, and other *Prunus* species. Quantitative trait locus (QTL) analysis detected several QTLs for bruising, bleeding, flesh color, and total phenolic content, which may assist in future development of marker-assisted selection for these traits.

Joshua Darryl Williamson
August 2006