Using SCC8, SCF27 and VMC7f2 markers in grapevine breeding for seedlessness via marker assisted selection

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ABSTRACT. We used molecular markers associated with seedlessness in grapes, namely SCC8, SCF27 and VMC7f2, to improve the efficiency of seedless grapevine breeding via marker assisted selection (MAS). DNA from 372 F₁ hybrid progeny from the cross between seeded “Alphonse Lavallée” and seedless “Sultani” was amplified by PCR using three markers. After digestion of SCC8 marker amplification products by restriction enzyme BglII, 40 individuals showed homozygous SCC8+/SCC8+ alleles at the seed development inhibitor (SdI) locus. DNA from 80 of the progeny amplified with the SCF27 marker produced bands; 174 individuals had 198-bp alleles of the VMC7f2 marker associated with seedlessness. In the second year, based on MAS, 183 F₁ hybrids were designated as seedless grapevine candidates because they were positive for a minimum of one marker. Twenty individuals were selected as genetic resources for future studies on seedless grapevine breeding because they carried alleles for the three markers associated with seedlessness. The VMC7f2 SSR marker was identified as the marker most associated with seedlessness.

Key words: Grapevine breeding; Marker assisted selection; Seedlessness; Molecular marker