

Performance Effects of Outside Pollen on Seed Orchards In and Out of the Genetic Source Area

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Abstract

Contamination by outside pollen sources is recognized as a serious problem that reduces the genetic gain obtained from open-pollinated seed orchards. A mitigating tactic is to locate an orchard outside the source area into a region with higher performance, e.g. Virginia source clones established in the more southerly, and high performing, Atlantic Coastal source region. Previous studies have emphasized estimation of the degree of contamination. This study sought to quantify the impact on realized gain from two Virginia source orchards, one located in the Virginia source area, and another located in Georgia. Field performance of progeny from controlled crosses using an orchard pollen mix were compared to open-pollinated progeny. Contamination by outside pollen resulted in a significant increase in volume growth for the Georgia progeny, but no significant effect on the Virginia orchard progeny. Outside pollen resulted in decreased performance in straightness ratings for both orchards, with the negative effect more pronounced with the Georgia orchard progeny.

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