

Concurrent Session B2 - Seed Orchards/Climate Change

Is Randomization Necessary in Seed Orchards?

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Randomization of clonal ramets in seed orchards is commonly practiced to promote cross-fertilization and minimize selfing. While it is practiced for the “right” biological reason, randomization comes with added managerial burden during crop management and harvest. Evidence for extremely low selfing rates in most conifers’ seed orchards and natural populations has led to a re-evaluation of seed orchard designs. The clonal-row seed orchard design represents a viable option for reducing management burden, but it comes with increased estimates of correlated matings between adjacent clones (i.e., “neighbourhood effect”). Staggering of clonal rows was proposed to double the number of adjacent clones to reduce correlated matings; however, it limits every clone to only four neighbours. We propose a modification to the staggering rows with a “randomized, replicated, staggered clonal-row” design to allow the simultaneous realization of randomization and clonal-rows orchard designs benefits. An interactive computer program was designed for this purpose that allows controlling the orchard’ size and layout, the number of clones, rows and their length, selection of the physical distance between repeated rows of the same clone, the level of “anti-randomization” tolerance imposed by the design parameters, and the clonal deployment mode (equal clonal size vs. linear deployment).