

Abstract Format

Clonal replication to assist breeding

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Abstract

The current Swedish breeding strategies for the major species Norway spruce, Scots pine, Silver birch and Lodgepole pine were created about 20 years ago. They were designed according to the Multiple Population Breeding System (MPBS) principle.

The strategy for Norway spruce (*Picea abies*) has used clonal replication as a tool for breeding since early 1990's. By field testing clonally replicated members of full sib families followed by forward selection for the next breeding generation, genetic gain increases considerably compared to progeny testing and backward selection. Also selection of parent clones for seed orchard establishment is much more efficient. Simulation examples using the "POPSIMTM" simulation tool show 30% higher genetic gain after approximately 100 years (five generations with clonal test strategy or three generations with progeny tests) when seed orchards were established after clonal testing compared to selection of parents following progeny testing.

The effect of number of clones and number of ramets per clone, if the total number of rooted cuttings per breeding generation is fixed, was analysed.

Other aspects of using clonal tests in breeding will be pointed out. One is the safety in keeping genotypes alive since each genotype is represented in four different test sites, which are also serving as clonal archives. The other is the great advantage of having enough scions of each clone for grafting a new seed orchard without wasting time.

The importance of testing genotypes in different environments, in times when global warming is an important issue, is discussed.

Use of clonal tests in breeding for the other species in Sweden will be presented.

Advantages in integrating mass production of vegetatively propagated plants and breeding activities will be shown.