

## From breeding to timber supply: quantifying gain supports investment

Tree improvement is a silviculture investment focused on increasing timber supply and adding value to provincial forest lands. A larger timber supply means more opportunities in the forest sector with the increased benefits of jobs, community stability, and Crown revenues in the form of taxes and stumpage.

Increases in timber supply due to tree improvement are the result of faster-growing and healthier stands of planted trees. Quantifying growth gains from tree improvement involves a complex series of steps that begins with calculating a growth breeding value (BVg) for parent trees tested in tree breeding and selection programs. Using consistent methods developed for BC, tree-breeder estimates of BVg quantify the expected incremental growth of tested parent trees. For example, a stand of trees grown from seed collected from selected trees with an average BVg of 15 would be expected to produce 15% more timber volume at a specific rotation age (usually 60 years) than a stand grown from non-selected wild seed.

Parent tree BVg estimates are then used by seed orchard managers to estimate a genetic worth for growth (GWg) for all seedlots they produce. The GWg is an average BVg of all parent trees in an orchard, weighted by the seed and pollen contribution each parent tree made to a seedlot. Seedlots are registered for use on Crown land and the GWg value associated with each seedlot is recorded. As harvested areas are replanted, the registered numbers of the seedlots used to replant each opening are recorded, along with other information, in a provincial data base.

Estimating incremental stand growth due to the use of high GWg seedlots across the broad range of ecosystems, species, and stand characteristics found in BC requires a link to the highly regarded TASS<sup>1</sup> stand development model and its associated user-friendly growth and yield program, TIPSYS<sup>2</sup>. These tools allow foresters to estimate gains in timber growth and yield due to the use of select seed, based on the GWg of seedlots used.

Estimating incremental timber supply across the many stands growing in a geographical area (management unit) is a process of inputting information on stands, including seedlot GWg, in timber supply models. Output from these models provides information on the expected timber supply over long periods of time, and helps managers make decisions on harvest levels and allowable annual cut (AAC) determinations. Such decisions are extremely important to communities and to the forest industry as they establish parameters for the amount of wood that will be available for harvest now and in the future. Connecting the links in the value chain from breeding programs to AAC determinations is a key part of realizing the value from tree improvement programs.

<sup>1</sup> TASS – Tree and Stand Simulator;

<sup>2</sup> TIPSYS – Table Interpolation Program for Stand Yields. Both were developed and are maintained by staff from the Ministry of Forest Lands and Natural Resource Operations.  
<http://www.for.gov.bc.ca/hre/software/>



### Photos

**Top:** Second-growth Douglas-fir logs on southern Vancouver Island  
(J. Woods)

**Bottom:** Second and third growth Douglas-fir on Vancouver Island.  
(J. Woods)

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