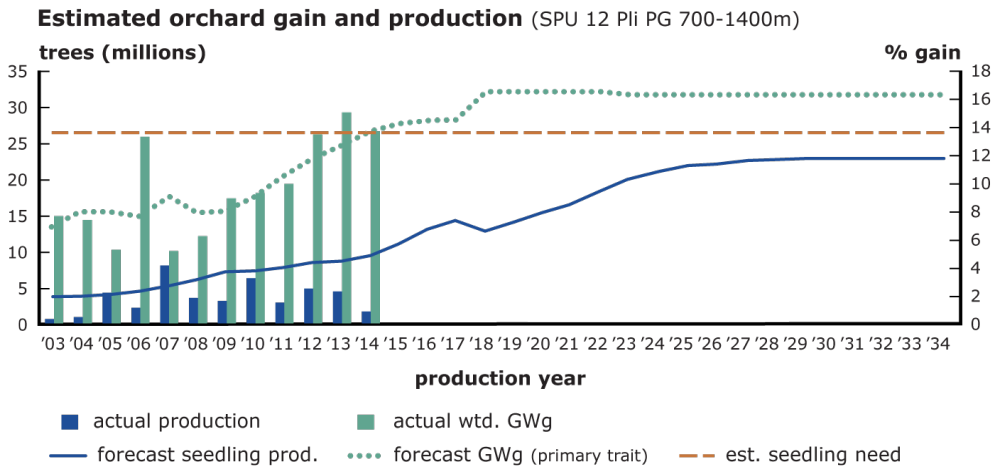
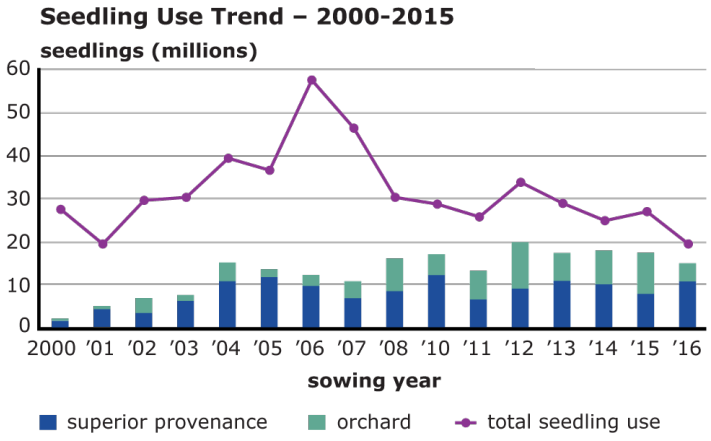
How big should orchards be to meet demand?

For the past 15 years the FGC has published "species plans" to help seed users and orchard managers with their seed planning. These are available for each seed planning unit (species and seed zone - SPU) and are updated annually (species plans are also available online on both the FGC and the FLNRO Tree Improvement Branch websites).

The first difficult question related to determining orchard capacity need is "how many seedlings will be planted in the future for each SPU". Ideally, projections from licensees, BC Timber Sales, and FLNRO would provide these data, but in reality it is very difficult to project planting needs beyond two or three years due to changing markets and other externalities such as large planting programs associated with forest fires. Using past seedling request data compiled through the Seed Planning and Registry system (SPAR - maintained by the FLNRO) provides guidance. The following figure illustrates how sowing requests varied from year to year for lodgepole pine (Pli) in the Prince George seed zone between 700 and 1400m elevation. Changes of plus or minus 50% in seed use are common, adding uncertainty to forecasts of future seed demand. Trends are evident, however, and reasonable estimates can be made using this information in combination with local knowledge. Species plan estimates are based on an average of the previous 5-years seed use.





Another difficult question is "how much seed will an orchard tree (ramet) produce over its lifetime". Orchard ramets generally begin production at about age 4 or 5 and reach full production at about age 12 or 15. While highly variable year to year, there is also a large amount of variation between genetic populations and between orchard sites. For orchard size-planning purposes a reasonable average number of seeds per ramet per year is estimated based on historic production data. Numbers vary for each species and range from 1875 for Pli to over 13,000 for interior spruce.

The next question is how many seeds does it take to produce a seedling? Sowing factors vary by seedlot germination, client demands, nursery regime, etc. Data on sowing factors used is available through SPAR and is also kindly provided by some private nurseries. Average sowing factors are estimated and used to convert orchard-

ramet seed production numbers to seedling production numbers. For example, Pli has an average sowing factor of 1.5 seeds sown per seedling produced. As a result, each orchard ramet is estimated to annually produce, on average, enough seeds for about 1250 seedlings.

Species plans compile all available seed production and use data and provide seed production projections for all orchards producing in a SPU. These data are presented graphically to create a snapshot of actual and forecast seed production and genetic worth over several decades, with the average use for the previous five years shown for reference. While useful for seed supply and orchard size planning, the experience and local knowledge of orchard managers and seed users is relied on to fully understand local needs.

Fortunately overproduction of seed is less of a problem, as seed is easily stored for future use. This argues for shooting a little on the high side when sizing orchards.

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