# Mountain Pine Beetle Seed Planning

TREE IMPROVEMENT BRANCH
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## Interior Seed Supply Analysis and Planning

This bulletin reviews the seed supply situation for interior lodgepole pine (Pli), interior spruce (Sx), interior Douglas-fir (Fdi), and western larch (Lw). Seed supply is presented separately for orchard and natural stand Seed Planning Zones (SPZs). Assumptions associated with the analysis are presented and discussed. Emphasis is on the provincial seed supply, but analysis and suggestions are provided for smaller scale units. This document is based on a workshop presentation at the April 2007 SISCO meeting, but methodology has been adjusted slightly, the entire 2007 sowing season is accounted for and the inventory date was July 13, 2007.

### Key Messages

The seed supply for Sx and Lw is large and much of the orchard and natural stand seed is available for sale. Fdi has substantial available quantities of natural stand seed for most SPZs, orchards are starting to produce significant amounts of seed, but at this time, supply is not meeting total demand. For lodgepole pine, seed orchard production has not yet met expectations and seed from both orchards and natural stands are generally not available on the open market. If you do not have an adequate supply of Pli seed, attempt to purchase from a seed owner who may have surplus seed, or conduct cone collections. The operational reaction has been a substantial investment in Pli cone collections.

### Analysis Assumptions

The analysis looked at the potential seedling estimates for Pli, Sx, Fdi, and Lw from the provincial seed inventory for all interior SPZs. The primary variable investigated was **potential seedlings**[1] (referred hereafter as 'seedlings') as it is of direct relevance to reforestation and adjusts for differences between species and seedlots in germination capacity and seed size. Potential seedlings in inventory [Supply] and the annual number of seedlings requested, averaged over the past five years [Demand] (Figure 1) were used to estimate the years supply of seed. For Pli, 2003 to 2006 showed a fairly consistent increase in seedling demand, but an appreciable downturn occurred in 2007. This illustrates the uncertainty of future Pli demand. Years supply of seed, even with its uncertainty, is considered a key variable as it is easily understood and can directly invoke action if inventories fall below a certain level.

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1 Potential seedling background information and calculations can be found at http://www.for.gov.bc.ca/hti/spar/2007_sowing_guidelines.htm.

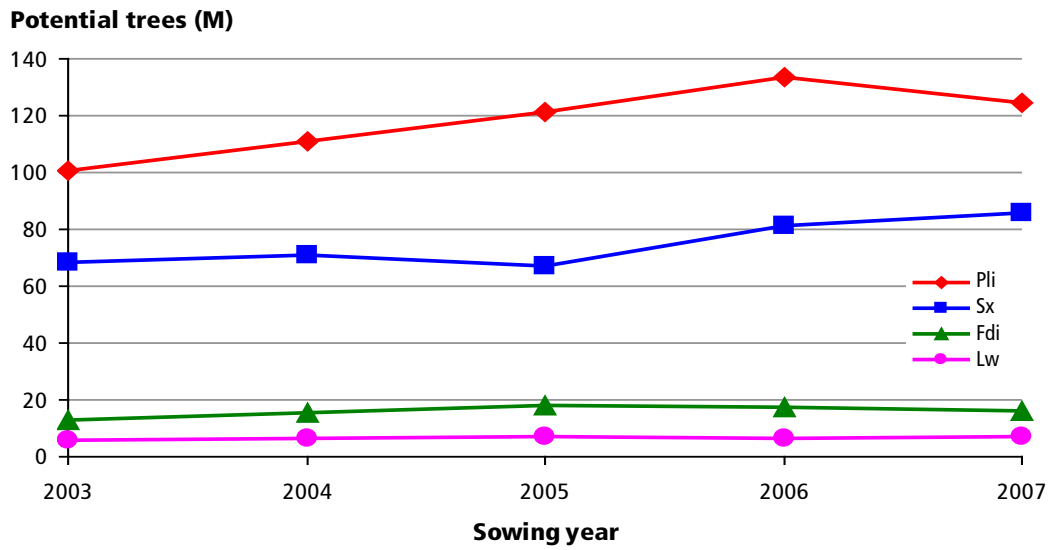


**Figure 1.** The demand for seedlings from 2003 to 2007 for lodgepole pine (Pli), interior spruce (Sx), interior Douglas-fir (Fdi) and western larch (Lw).

The five-year average annual seedling demand is reasonable for a provincial overview, but there are a variety of uncertainties in extrapolating this demand to the future including:

- species selection
- stocking levels
- reliance on natural regeneration
- further AAC increases due to Mountain Pine Beetle (MPB)
- wildfires
- changes in seed transfer guidelines in response to climate change.

In response to MPB, the number of seedlings required will increase, stabilize and then drop over operating areas in a cascading effect in response to already announced AAC increases. Using seedlings requested on SPAR is advantageous, as analysis can be performed immediately. However, actual planting figures on RESULTS are probably more accurate, although a lag of two years can be expected for these data to be available. Using the five-year average seedlings requested is not a great solution, but it is the basis of much of our planning and probably reasonable over the longer term. Local operators are in the best position to determine whether their seedling demands are increasing, stabilizing, or on the downturn within their local MPB scenario.

A complication of this analysis is that different SPZ exist for seed from natural stands and seed from seed orchards. To address the issue, the average number of seedlings requested by species (Demand) was allocated separately to both natural stand SPZ and orchard SPZ. This is possible as all sowing requests are assigned to both natural and orchard SPZ on SPAR. Therefore, the **demand and years supply**

**for seed can be viewed through the orchard SPZ[2] or the natural stand SPZ lens, but both reflect the same total demand**. The natural stand SPZ (common to all species) covers all planting locations, but the orchard SPZ (specific to species) does not, as breeding and seed orchard programs are not developed for all species and SPZ in the province. As a result, planting areas outside orchard SPZ are shown as ZND (Zone Not Defined).

For orchard-derived seedlots (Supply), the tested SPZ was further divided by elevation band to place them on a Seed Planning Unit (SPU) basis, as this is the primary unit used to guide orchard seed production and deployment. For example, Fdi in the Nelson zone between 400 and 1100 m is defined as a SPU, and seed from a suitable orchard can be used on any appropriate site within this geographic unit. A summary of the genetic characteristics and breakdown by biogeoclimatic zone of the interior orchard seed supply are also presented and discussed below.

To divide the average demand by orchard SPZ into SPU, the proportional historical usage has been used as the probability factor. This allocates seed to the elevation bands based on historical usage. For the overlap zones, the seedlings were divided equally among applicable SPU, but generally this was a relatively small proportion of the seedling demand. The superior provenances have been allocated equally to applicable SPZ and orchard seedlots apportioned to SPU based on elevational coverage. These are all methods of trying to allocate the inventory based on reasonable assumptions.

The intent of this Bulletin is to review the *existing* seed inventory, but seed from *future* seed orchard crops will add to this inventory and should not be ignored. For reference, the proportion of seed for a SPU that is expected to be used for reforestation between 2007 and 2030[3] is included. The assumptions for seed supply and demand in the analysis are presented below, with some examples for clarity.

Summary of procedures for allocating demand among overlapping and multiple zones:

1. Seedling **demand** is based on the average number of seedlings requested for the last five sowing seasons[4] (2003 to 2007).
2. This analysis does not include Pli seedlots pending as of July 13, 2007 (currently being collected, processed and registered) and therefore, is a conservative estimate of our Pli seed supply.
3. For calculating **demand** at the SPU level when more than one SPU is present for an orchard SPZ, due to different elevation ranges, the five-year average for the

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2 Orchard SPZ is also referred to as a "parent tree" or "tested parent tree" SPZ. Orchards consist of a set of tested parent trees that produce seed.

3 Data supplied from the report "Summary of seed and seed orchard need analysis for Seed Planning Units impacted by Mountain Pine Beetle" prepared by Jack Woods for the Forest Genetics Council (Dec. 4, 2006)

4 When using the SPAR Seedling Request Extract report, the first critical step is to remove the lines associated with cancelled (CAN) requests.

SPZ was apportioned based on the relative demand of each SPU[5] (e.g., average five-year demand for Fdi Ne is 5.4 M seedlings and relative proportions are 2.4 for SPU 21 and 3.4 for SPU 22; therefore 41.4% (2.4/5.8) of the potential seedlings are allocated to SPU 21 and 58.6% (3.4/5.8) are allocated to SPU 22).

4. For sowing requests [Demand] destined for orchard overlap zones, the potential seedlings were divided equally among the main SPZ in which it is eligible for use (e.g., for CPP overlap zone for Pli, the seed was divided equally between the Central Plateau and Prince George SPZ).
5. For natural stand seedlots with multiple seed planning zones (e.g., superior provenances), the inventory was allocated equally to all eligible SPZ (i.e., Oie Lake superior provenance collections are eligible for use in six natural stand SPZ; potential seedlings were divided equally among them).
6. Orchard derived seedlots can be used in more than one SPU if their transfer limits span the elevational border between SPU. The allocation of seed was based on the elevational coverage of each seedlot relative to the eligible SPUs (e.g., Sx XXXXX can be used between 1181 and 1650 m in the Thompson Okanagan SPZ. The seed is therefore eligible for use in SPU 28 (TO High 1300 to 1900 m) and SPU 30 (TO Low 700 to 1300 m). The entire elevational range for this seedlot is 469 m so 25.4% (1181 to 1300 m) was allocated to SPU 30 and 74.6% (1300 to 1650 m) was assigned to SPU 28.
7. The analysis did not attempt to incorporate deterioration (change in germination capacity) of seedlots in inventory over time, but this is considered negligible compared to other factors.

## Inventory and Demand

The supply figures, and years supply derived from the five-year demand, are presented in Table 1 to provide an overview of the total seed inventory for the species examined. There exists a 27-year supply of seed that varies from a low of 16 years for Fdi to over 44 years for Sx. These figures provide a general guide to the vitality of the seed inventory, but to identify gaps, one must drill down to the SPZ level for orchard or natural stand seed.

**Table 1.** Seed inventory (in M of potential seedlings) for natural stands and tested parent trees (supply), average annual demand and estimates of years of supply for interior lodgepole pine (Pli), interior spruce (Sx), interior Douglas-fir (Fdi), and western larch (Lw)

| | Supply (M seedlings) | | | Mean annual demand | |
|---|---|---|---|---|---|
| Species | Natural stand | Orchard | Total | (M seedlings) | Years supply |
| Pli | 2053.1 | 41.5 | 2094.6 | 118.6 | 17.7 |
| Sx | 2994.1 | 308.5 | 3302.5 | 74.8 | 44.2 |
| Fdi | 270.5 | 0.6 | 271.2 | 15.9 | 16.0 |
| Lw | 75.5 | 33.5 | 109.0 | 6.7 | 16.3 |
| **Total** | **5393.2** | **384.1** | **5777.3** | **215.4** | **26.8** |

5 The relative contributions were based on the SPU demand figures presented in the 2006/2007 Forest Genetics Council Business Plan.

In Table 2, the analysis assumptions have been used to divide the seed inventory for natural and orchard seed based on the same demand. The table is intended to 1) provide an estimate of orchard seed by SPU, 2) provide an estimate of SPU seed needs met by orchards in 2007 to 2030, and 3) look at the same demand applied to the inventory of natural stand seedlots. The third level is especially relevant to those that currently do not have access to seed orchard seed. For example, in SPU 13, there is only a 1.1-year supply of orchard seed for Lw, but the orchard is still predicted to supply 97% of the seed for this SPU between 2007 and 2030, so current production is equivalent to use. Allocating that same demand to natural stand seedlots indicates a 6.0-year inventory for the West Kootenay SPZ.

**Table 2.** The seed inventory (Supply), annual seedlings requested (Demand), years of seed supply, and proportion of seedling needs met by seed orchards (A) (2007–2030) and natural stand seed of interior lodgepole pine (Pli), interior spruce (Sx), interior Douglas-fir (Fdi) and western larch (Lw)

| Species | SPU/SPZ | Current seed inventory (M seedlings) | Demand (M seedlings) | Years seed supply | 2007–2030 demand met by orchard seed (%)[6] |
|---|---|---|---|---|---|
| Lw-A | 13 (Ne) | 4.29 | 3.93 | 1.1 | 97 |
| Lw-A | 34 (EK) | 29.24 | 2.46 | 11.7 | 100 |
| Lw | EK | 16.12 | 2.26 | 7.1 | |
| Lw | SA | 13.57 | 0.68 | 20.1 | |
| Lw | TOA | 3.36 | 0.15 | 22.7 | |
| Lw | TOD | 24.98 | 0.61 | 40.8 | |
| Lw | WK | 17.42 | 2.92 | 6.0 | |
| Fdi-A | 21 (Ne Low) | 0.11 | 2.44 | <0.1 | 81 |
| Fdi-A | 22 (Ne High) | 0.02 | 3.41 | <0.1 | 77 |
| Fdi-A | 37 (QL) | 0.37 | 0.65 | 0.6 | 98 |
| Fdi-A | 39 (EK) | 0.00 | 1.34 | 0.0 | 52 |
| Fdi-A | 41 (PG) | 0.00 | 3.07 | 0.0 | 49 |
| Fdi-A | 43 (CT) | 0.12 | 1.15 | 0.1 | 99 |
| Fdi | BB | 17.37 | 0.32 | 54.7 | |
| Fdi | BLK | 1.84 | 0.08 | 23.5 | |
| Fdi | BSH | 16.87 | 0.30 | 55.8 | |
| Fdi | CHL | 0.48 | 0.04 | 11.3 | |
| Fdi | CP | 1.86 | 0.44 | 4.3 | |
| Fdi | CT | 21.26 | 1.16 | 18.3 | |
| Fdi | EK | 25.99 | 0.92 | 28.2 | |

6 Expected orchard production based on forecasts developed by the Forest Genetics Council of BC.

| Species | SPU/SPZ | Current seed inventory (M seedlings) | Demand (M seedlings) | Years seed supply | 2007–2030 demand met by orchard seed (%)[6] |
|---|---|---|---|---|---|
| Fdi | MGR | 12.88 | 0.46 | 28.0 | |
| Fdi | MIC | 8.76 | 0.36 | 24.1 | |
| Fdi | MRB | 15.63 | 0.31 | 50.6 | |
| Fdi | NCH | 7.32 | 1.66 | 4.4 | |
| Fdi | QL | 10.32 | 0.21 | 50.2 | |
| Fdi | SA | 43.12 | 3.39 | 12.7 | |
| Fdi | TOA | 25.03 | 1.95 | 12.9 | |
| Fdi | TOD | 17.68 | 2.25 | 7.8 | |
| Fdi | WK | 41.90 | 2.07 | 20.3 | |
| Pli-A | 7 (Ne Low) | 9.79 | 5.67 | 1.7 | 100 |
| Pli-A | 10 (TO Low) | 2.05 | 17.49 | 0.1 | 57 |
| Pli-A | 12 (PG Low) | 7.68 | 42.94 | 0.2 | 54 |
| Pli-A | 16 (TO High) | 0.05 | 7.37 | <0.1 | 74 |
| Pli-A | 17 (BV Low) | 5.94 | 17.85 | 0.3 | 92 |
| Pli-A | 18 (CP Low) | 11.36 | 9.84 | 1.2 | 100 |
| Pli-A | 20 (Ne High) | 0.00 | | 0.0 | 55 |
| Pli-A | 32 (EK Low) | 0.00 | 4.93 | 0.0 | 73 |
| Pli-A | NST | 4.61 | 0.02 | 230.2 | |
| Pli | BB | 60.62 | 4.79 | 12.6 | |
| Pli | BLK | 157.83 | 10.66 | 14.8 | |
| Pli | BSH | 20.33 | 0.37 | 54.7 | |
| Pli | CHL | 198.75 | 9.23 | 21.5 | |
| Pli | CP | 171.54 | 10.54 | 16.3 | |
| Pli | CT | 126.63 | 8.1 | 15.6 | |
| Pli | DK | 20.49 | 0.01 | 1736.2 | |
| Pli | EK | 78.49 | 4.4 | 17.8 | |
| Pli | FIN | 77.27 | 6.44 | 12.0 | |
| Pli | HH | 72.09 | 4.91 | 14.7 | |
| Pli | MIC | 5.61 | <0.01 | 904.2 | |
| Pli | MGR | 66.95 | 4.73 | 14.2 | |
| Pli | MRB | 16.59 | 0.15 | 109.6 | |
| Pli | NCH | 561.42 | 22.00 | 25.5 | |
| Pli | NST | 62.56 | 0.07 | 904.8 | |
| Pli | QL | 37.51 | 1.00 | 37.6 | |
| Pli | SA | 60.19 | 4.38 | 13.7 | |
| Pli | TOA | 71.87 | 15.34 | 4.7 | |
| Pli | TOD | 91.36 | 7.22 | 12.7 | |
| Pli | WK | 72.14 | 4.06 | 17.8 | |

| Species | SPU/SPZ | Current seed inventory (M seedlings) | Demand (M seedlings) | Years seed supply | 2007–2030 demand met by orchard seed (%)[6] |
|---|---|---|---|---|---|
| Sx-A | 4 (Ne Mid ) | 44.13 | 4.23 | 10.4 | 100 |
| Sx-A | 5 (Ne High) | 18.39 | 4.83 | 3.8 | 100 |
| Sx-A | 14 (PG) | 160.82 | 28.19 | 5.7 | 100 |
| Sx-A | 25 (EK) | 0 | 2.78 | 0 | 100 |
| Sx-A | 28 (TO High) | 11.84 | 3.60 | 3.3 | 100 |
| Sx-A | 30 (TO Low) | 10.46 | 1.56 | 6.7 | 100 |
| Sx-A | 35 (BV) | 22.72 | 8.71 | 2.6 | 100 |
| Sx-A | 40 (PR) | 0 | 6.89 | 0 | 90 |
| Sx-A | 42 (PG High) | 6.39 | 6.43 | 1.0 | 100 |
| Sx-A | 44 (Ne Low) | 20.34 | 2.05 | 9.9 | 90 |
| Sx | BB | 24.55 | 0.60 | 40.6 | |
| Sx | BLK | 158.53 | 9.41 | 16.8 | |
| Sx | BSH | 56.91 | 0.49 | 116.6 | |
| Sx | CHL | 36.10 | 1.87 | 19.3 | |
| Sx | CP | 216.26 | 6.82 | 31.7 | |
| Sx | CT | 51.6 | 5.15 | 10.0 | |
| Sx | EK | 129.35 | 2.06 | 62.8 | |
| Sx | FIN | 392.99 | 4.34 | 90.6 | |
| Sx | FN | 139.14 | 5.02 | 27.7 | |
| Sx | HH | 186.07 | 7.19 | 25.9 | |
| Sx | MGR | 56.28 | 5.59 | 100.8 | |
| Sx | MIC | 83.45 | 1.73 | 48.2 | |
| Sx | MRB | 103.66 | 0.70 | 148.4 | |
| Sx | NCH | 79.07 | 9.29 | 8.5 | |
| Sx | NST | 10.50 | 0.19 | 54.4 | |
| Sx | QL | 194.31 | 1.45 | 134.0 | |
| Sx | SA | 118.51 | 3.54 | 33.5 | |
| Sx | TOA | 63.72 | 2.54 | 25.1 | |
| Sx | TOD | 114.24 | 2.25 | 50.7 | |
| Sx | WK | 228.95 | 4.92 | 46.5 | |

## Genetic Characteristics of the Orchard Seed Supply

This section provides a summary of the characteristics of seed derived from seed orchards. It is intended to provide additional details on seedlots from tested parents and suggest variables that may be useful to consider in seed planning decisions (Table 3).

**Table 3.** Characteristics of the interior seed supply derived from seed orchards

| | Lodgepole pine | Interior spruce | Interior Douglas-fir | Western larch |
|---|---|---|---|---|
| Proportion of seedlings from orchards (%) | 2.0 | 9.3 | 0.2 | 30.8 |
| Orchard seedlots (count) | 94 | 174 | 19 | 27 |
| Proportion of orchard inventory designated as surplus on SPAR (%) | 0.1 | 78.0 | 0.0 | 88.9 |
| Average seedlot genetic worth (GW) | 8.5 | 12.6 | 20.6 | 16.6 |
| GW weighted by seedlings | 4.8 | 14.9 | 23.5 | 12.8 |
| Highest GW seedlot | 17 | 30 | 34 | 35 |
| Seedlings (M) – GW ≥ 5 | 18.8 | 259.8 | 0.6 | 30.5 |
| Seedlings (M) – GW < 5 | 22.7 | 47.4 | <0.1 | 2.5 |
| Seedlings (M) – B+ sources | 208.2 | 23.2 | 0.0 | 0.0 |
| % Zone Not Defined (ZND) | 7.6 | 7.8 | 25.4 | 4.5 |

The majority of the inventory is Sx (Table 1), with a large proportion of surplus seed (78%) that is available for sale. The average level of genetic gain is moderate, the potential for much higher gains (GW 30 seedlot registered) exists and only 15% of the orchard inventory falls below GW 5. Western larch also has a large inventory of surplus seed (89%), moderate average genetic gain and the highest GW seedlot (35) to date. Larch also exhibits the best coverage (lowest % ZND) with only 4.5% of the sowing requests falling outside the orchard SPZs. These species exhibit different trends comparing average GW and GW weighted by potential seedlings. For Sx, the higher weighted GW indicates a majority of the inventory is above the average GW, while in Lw, the majority of the inventory lies below the species average. These species are generally not an issue with regards to an orchard seed supply, as ≥90% of the seed will be supplied from orchards between 2007 and 2030 (Table 2) and large volumes of seed are already available for sale (Surplus).

The other two species, Pli and Fdi, have very little orchard seed and virtually none available for sale. The Pli orchard program has had problems with reproductive biology of the species (see Owens 2006[7]) and insects. However, new young seed

7 Owens, J.N. 2006. The Reproductive Biology of Lodgepole Pine. FGC Extension Note 07. http://www.fgcouncil.bc.ca/ExtNote7-Final-web.pdf.

orchards are coming on line and are expected to add significant amounts of seed with GW of >15 over the coming decade. The superior provenance seedlots of Pli are also a substantial source of seedlings with a moderate level of gain (<GW 5).

Interior Douglas-fir orchards have started producing seed recently, with most of the seed being utilized as quickly as it is produced. The genetic potential is quite high, with seedlots of GW 34 already being produced, but long-term estimates forecast that in some SPZ (PG and EK), only about half the demand will be met from orchard seed. The species also has a much greater proportion of ZND than the other species, indicating that over 25% of the planting sites for Fdi are outside the orchard SPZ boundaries. This is primarily because these areas have low productivity or will be managed on an uneven-aged basis and do not have breeding and seed orchard investments directed at them (Barry Jaquish, pers. comm.).

## Species Natural Stand Inventory by Biogeoclimatic Zone

Natural stand seedlots can be transferred outsider their SPZ of origin if used in the same biogeoclimatic (BEC) zone and within the lat/long and elevation transfer limits. Preliminary discussions suggest that BEC zones could be used to facilitate the migration of species and seed source in response to climate change. It is worthwhile presenting and reviewing the natural stand inventory through this BEC lens (Table 4).

**Table 4.** Percent distribution of seedlings by biogeoclimatic (BEC) zone

| BEC Zone | Lodgepole pine (%) | Interior spruce (%) | Interior Douglas-fir (%) | Western larch (%) |
|---|---|---|---|---|
| BWBS | 4.4 | 12.4 | | |
| ESSF | 5.7 | 28.1 | 0.6 | 2.8 |
| ICH | 8.7 | 12.7 | 30.4 | 40.9 |
| IDF | 4.6 | 1.3 | 25.6 | 22.3 |
| MS | 7.0 | 3.4 | 2.5 | 31.8 |
| SBPS | 5.4 | 0.4 | 0.1 | |
| SBS | 60.9 | 34.1 | 21.6 | |
| No BGC identified | 3.3 | 6.9 | 19.0 | 2.2 |

There is potentially a considerable amount of natural stand seed available for use in more than one SPZ. The most striking feature is the proportion of seedlings for Fdi in which no BEC data are available. Under existing rules, the transfer of this seed is therefore restricted to the SPZ of origin and cannot be moved to another SPZ site (with common BEC), reducing the flexibility of the Fdi inventory. The other species have much lower proportions of the inventory without BEC information, but they also represent seed transfer limitations on the inventory. However, this

BEC information may be derived, with varying degrees of confidence, based on the collection history and location. It is important to capture the correct BEC information when collecting and registering seedlots in order to optimize its use – under present and future seed transfer rules.

## Discussion

There is no single recipe for conducting a seed supply analysis. The intent of this bulletin is to provide a broad picture of the current seed supply situation and to assist persons with seed planning, collections and acquisition. It sounds quite simple, but several current factors in BC complicate such analyses including:

- different seed planning zones for orchard and natural stand seed
- the existence of overlap zones for orchard seed
- the allowance for some orchard seedlots to be used in different SPUs based on elevational ranges
- the allowance for some superior provenances to be used in several natural stand SPZs.

The exercise becomes more complicated with MPB because of the uncertainty regarding harvest levels, planting requirements, and the possibility of gaps in available natural stand lodgepole pine cone crops due to mortality. Climate change and our eventual seed transfer guideline adjustments will are also become a further complication as a seed owner may potentially no longer have seed for the land in which they have reforestation obligations. This latter issue, however, is unlikely to have any impact in the ensuing four or five years.

The methods and assumptions used in this analysis are intended to deal with the complications and provide a reasonable picture of the seed supply for interior SPZ. Emphasis is on the provincial picture to quantify the existing seed supply as part of our stewardship mandate. Reasonable assumptions from a provincial stewardship perspective may be quite different than the assumptions applied to an individual Timber Supply Area. Assignment of seedlings to an SPZ or SPU involves assumptions that quantify the probability of seedlings in terms of supply and demand. Other methods may also be appropriate for smaller scale planning as many of the provincial scale issues disappear (e.g., no need to subdivide your B+ seed inventories to various SPZs if you only operate in one). In general, the more specific one can be with your seed use assumptions, the more realistic and useful the seed planning analysis.

This analysis provides a precise estimate of seed available in July, 2007 for Sx, Fdi and Lw. As most of the seedling demand (≥90%) for Sx and Lw is capable of being met by seed orchards between 2007 and 2030, and large natural stand inventories exist for most SPZ, there are no provincial-level issues with seed supply. For Fdi, SPU 39 (EK) and 41 (PG), only about half of the 2007–2030 seed needs are met

by orchards, but a 28-year supply exists for the equivalent natural stand SPZ. Although provincially there is adequate seed in storage, these orchard deficits are certainly areas to investigate in determining seed availability for your specific operating areas.

The analysis recognizes that the estimate of Pli inventory is an underestimation of what will be available for sowing in 2008. The Pli inventory is highly dynamic, with natural stand collections occurring throughout the year. The largest inventory gaps still reside within the Thompson–Okanagan SPUs, as orchards will not meet demand and only a 4.7-year supply exists for the natural stand TOA SPZ (Table 2). Orchard production for SPU 12 and 20 is also expected to meet slightly more than half the 2007–2030 demand, but the relevant natural stand SPZs have between 14.2 (MGR) and 17.8 (WK) years supply of seed. The situation is more optimistic if one considers that transfers of natural stand seed across SPZ and within the same BEC are possible.

There are many Pli seedlots currently being collected, processed, tested, and some that require additional information before they can be registered. This large collection effort is primarily a response to the MPB outbreak and absence of surplus seed on SPAR. For orchard seed, only 0.1% is surplus (Table 3) and for natural stand seed, only 4.6% of the inventory is available for sale.

The bottom line is, if you do not have an adequate supply of Pli seed, try to arrange purchase from owners who may have an excess, or conduct cone collections for areas you will be regenerating. This is becoming more problematic in the north, as MPB-killed stands are harvested or the seed crops disseminated due to the release of the serotinous bonds breaking on the multi-year cone crop. The situation is more optimistic in the south, but it is best to initiate collections sooner than later as the potential will not last forever.

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