

| | | | |
|--|------------------------|----------------------|-------------------------------------|
| SPU # 25 | Interior Spruce | East Kootenay | 750 - 1900m |
| Breeding and orchard production | | | |
| Adjusted for new Parent Tree Area of use. Previously 750-1700m | | | Seedling need (million): 3.6 |
| Program Category: Advanced generation | | | |
| filename: 25 Sx EK low Sept 2017.xlsx | | | |

STRATEGY

| | | | | |
|---------------|-----------------|--------------------|-------------------|-----------------------------|
| TRAITS | Primary: | Stem volume | Secondary: | Wood density, weevil |
|---------------|-----------------|--------------------|-------------------|-----------------------------|

| | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| TESTING AND PRODUCTION | Production Year (July 1 to June 30) -- (Cone harvest year shown) | | | | | | | | | | | | | | | | | | | |
| | '17 | '18 | '19 | '20 | '21 | '22 | '23 | '24 | '25 | '26 | '27 | '28 | '29 | '30 | '31 | '32 | '33 | '34 | '35 | '36 |

| | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Parents in progeny test: | | | | | | | | | | | | | | | | | | | | |
| Open pollin. | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| Polycross | | | | | | | | | | | | | | | | | | | | |
| Clonal | | | | | | | | | | | | | | | | | | | | |
| F1 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| F2 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| F3 | | | | | | | | | | | | | | | | | | | | |

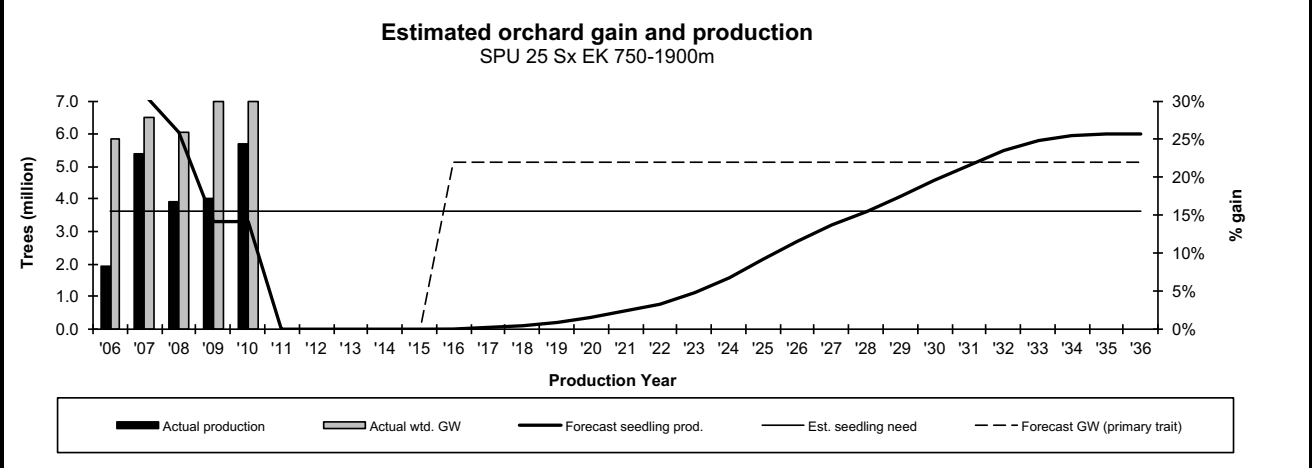
| | | | | | | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Production forecast (million plantables) | | | | | | | | | | | | | | | | | | | | |
| Orchards (#, owner) | | | | | | | | | | | | | | | | | | | | |
| 304 FLNRO (Kalamalka) | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 356 FLNRO (Kalamalka) | 0.0 | 0.1 | 0.2 | 0.4 | 0.5 | 0.8 | 1.1 | 1.6 | 2.1 | 2.7 | 3.2 | 3.6 | 4.1 | 4.6 | 5.0 | 5.5 | 5.8 | 5.9 | 6.0 | 6.0 |

| | | | | | | | | | | | | | | | | | | | | |
|--------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Vegetative prod.: | | | | | | | | | | | | | | | | | | | | |
| Phase 1 | | | | | | | | | | | | | | | | | | | | |
| Phase 2 | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Estimated gain in primary trait | | | | | | | | | | | | | | | | | | | | |
| Orchards (#, owner) | | | | | | | | | | | | | | | | | | | | |
| 304 FLNRO (Kalamalka) | | | | | | | | | | | | | | | | | | | | |
| 356 FLNRO (Kalamalka) | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% |

| | | | | | | | | | | | | | | | | | | | | |
|--------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Vegetative prod.: | | | | | | | | | | | | | | | | | | | | |
| Phase 1 | | | | | | | | | | | | | | | | | | | | |
| Phase 2 | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Total Production | 0.0 | 0.1 | 0.2 | 0.4 | 0.5 | 0.8 | 1.1 | 1.6 | 2.1 | 2.7 | 3.2 | 3.6 | 4.1 | 4.6 | 5.0 | 5.5 | 5.8 | 5.9 | 6.0 | 6.0 |
| Total gain | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% | 22% |



The above forecasts are based on orchard status, seed inventories and seed use as of June, the year of publication, and are subject to change. Refer to the seed Planning and Registry System (SPAR) or contact the orchard manager for current seed inventories. Contact the Forest Improvement and Research Mgt. Branch, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, to confirm data if used for silviculture or timber-supply planning.

Interior Spruce East Kootenay 750 - 1900m
 Conservation -- Seed Orchards -- Seedling Use

SPU #25

GENETIC CONSERVATION STATUS

Conservation statistics

| | | |
|---|------------------|-----------|
| Seed planning unit (SPU) area | 1,612,927 | ha |
| Area protected within SPU | 130,104 | ha |
| Percentage of SPU area protected | 8% | |
| Estimated genetic reserves with >5000 mature trees based on botanical sample data | >2 | |
| Confirmed genetic reserves with >5000 mature trees based on forest inventory data | 14 | |

Conservation status

Current in-situ protection status: **Well protected**
 Probability of maintaining > 3 protected areas with adequate population size given natural disturbance regimes: **Very high**

For further information visit <http://www.genetics.forestry.ubc.ca/cfg/>

ORCHARD STATUS

| Orchard location | Orchard number | Number of parents | Mean BV | # of ramets currently established | # of ramets planned for final orchard size | Target Seed production kg/y at maturity | Total Seedling Prod. million seedlings | |
|------------------------|----------------|-------------------|---------|-----------------------------------|--|---|--|-------------------|
| FLNRO (Kalamalka) | 356 | 36 | 22% | 202 | 504 | 35.3 | 6.05 | Under development |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Total ramets | | | | 202 | 504 | Total production | 6.05 | |
| Vegetative propagation | | | | | | Stecklings/Emblings | 0.0 | |
| | | | | | | Total production | 6.0 | |

Seed and Nursery Factors

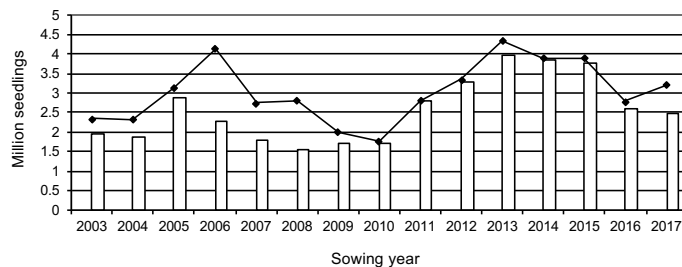
Estimate of Required Orchard Capacity

| | | |
|---|--|------------|
| Expected annual average seedling production per ramet = 12,000 | Annual planting (million seedlings) | 3.6 |
| Seed weight (seeds/gram) = 377 | Planned over-production factor | 1.2 |
| Seedling recovery factor (seedlings/seed) = 0.45 | Ramets required | 302 |
| Seedling recovery factor (seeds/seedling) = 2.20 | Ramets required with over-capacity | 363 |
| | Projected necessary expansion | 0 |

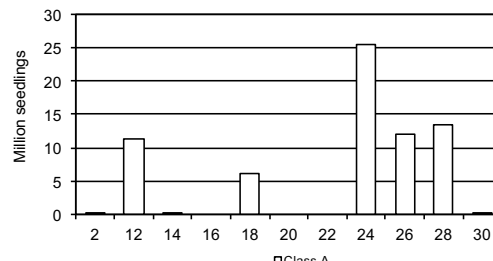
SEEDLING USE AND SEED IN STORAGE

5-year average seedling requests to SPAR (2013 - 2017) 3.6 million
Estimated years of select seed in storage 18.9 years

Seedling Use Trend - 2003 to 2017



Seed in Storage by GW class



Seedling use data include 1/2 of adjacent overlap zones, where applicable
 Sowing year: Aug 1 to July 31 (i.e. 2017 sowing year starts Aug 1, 2017)

Notes:

- "Reserve" and "Available" seed in the Seed Planning and Registry System (SPAR) are included.
- Class A = seed orchard; Class B+ = superior provenance; Class B = wild stand seed.
- Genetic Wroth (GW) for growth means the projected additional wood volume available at rotation compared to using Class B seed.

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