Cone Collection Workshop

June 2018
# Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>Introductions and Agenda</td>
<td>Don Pigott</td>
</tr>
<tr>
<td>8:45</td>
<td>Forest Genetics, Tree Seed Regulations and Seed Planning</td>
<td>Margot Spence or Brian Barber</td>
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<tr>
<td>9:15</td>
<td>Climate Based Seed Transfer</td>
<td>Margot or Susan Zedel</td>
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<td>10:00</td>
<td><strong>Coffee</strong></td>
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<tr>
<td>10:15</td>
<td>Seed Planning and Registry System (SPAR)</td>
<td>Susan or Margot</td>
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<td>11:00</td>
<td>Seed Biology and Tree Seed Centre Services</td>
<td>Dave Kolotelo</td>
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<td>12:00</td>
<td><strong>Lunch</strong></td>
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<tr>
<td>1:00</td>
<td>Cone and Seed Pests</td>
<td>Dave</td>
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<tr>
<td>1:45</td>
<td>Cone Collections</td>
<td>Don</td>
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<tr>
<td>3:00</td>
<td><strong>Coffee</strong></td>
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<tr>
<td>3:15</td>
<td>Cone Collections (Con’t)</td>
<td>Don</td>
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<td>4:00</td>
<td><strong>End</strong></td>
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Overview

1. Forest Genetic Resource Management
2. Tree Seed Use Regulations and Standards
3. Seed Planning and Availability
Why do these matter?

• Genetic diversity foundation of biodiversity and ecosystem resilience
• High genetic diversity within a tree species and between populations
• Forest health and productivity (i.e. future timber supply) depends on genetic source of seed.
• 1000s of Kg of seed used to grow the 260M seedlings planted annually
Seedling Requests by Source

million seedlings

Class A  Class B+  Class B

sowing year


119  103  84  98  136  143  142  165  158  148  179

137  101  89  71  88  90  81  79  90  95  72
1. Forest Genetics Resource Mgmt

**Value**
- Select for fast growth, wood quality, and pest resistance
- Produce seed of high genetic quality

**Resilience**
- Understand geographic patterns of genetic diversity
- Develop seed transfer standards
- Respond to climate change

**Conservation**
- Conserve indigenous-tree genetic diversity
- Catalogue conservation status
- Appointed by Provincial Chief Forester
- Develop Strategies, Goals, and Plans
- Provide Advice and Coordinates Activities
- Supported by Technical Advisory Committees
FGC Partners
## Roles and Responsibilities

<table>
<thead>
<tr>
<th>Ministry of Forests... Forest Improvement and Research Management Branch</th>
<th>Licensees/BCTS</th>
<th>Academia</th>
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</thead>
<tbody>
<tr>
<td>Research</td>
<td>Harvesting</td>
<td>Research</td>
</tr>
<tr>
<td>Tree Breeding</td>
<td>Silviculture</td>
<td>Education</td>
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<tr>
<td>Seed Orchards</td>
<td>Seed Planning</td>
<td>(Climate modelling)</td>
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<tr>
<td>Policy and Planning</td>
<td>Seed Orchards</td>
<td>(In situ catalogue)</td>
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<td>Tree Seed Centre</td>
<td>Reporting</td>
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<td>Information Systems</td>
<td></td>
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<td>Region/Districts</td>
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<tr>
<td>Authorizations</td>
<td>Seed Orchards</td>
<td>Cone collections</td>
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<tr>
<td>Silviculture</td>
<td>Seedling Nurseries</td>
<td>Stock Coordination</td>
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<tr>
<td>Compliance and Enforcement</td>
<td>Field test measurement and maintenance</td>
<td>Planting</td>
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</table>
2. Tree Seed Regulations and Standards

- Forest and Range Practices Act (FRPA)
  - Forest Planning and Practices Regulation
  - Woodlot Licence Planning and Practices Regulation
  - Chief Forester’s Standards for Seed Use
Seed

31 A person required to establish a free growing stand must ensure that seed used for that purpose conforms to prescribed requirements.

Rule of Law not Professional Reliance

Unauthorized timber harvesting

52 A person must not cut, damage or destroy Crown timber unless authorized under the Acts or by the minister for silviculture ... or other purpose.
Forest and Range Practices Act

52.1 Minister may require, comments by interested parties, impose conditions, and request security.

- Section 52.1 authorizations delegated to District Manager

- Interpretation of requirements:
  - Required for any cutting (or ‘raking’) of branches or tops of standing timber by means of climbing or helicopter
  - Not required for picking cones from live branches, felled timber or squirrel caches.
**Forest Planning and Practices Regulation**

**Use of seed**

43 Chief Forester authorized to establish seed use standards

Persons planting trees must follow seed standards unless alternative approved.

Persons must keep records of seed used.

**Silviculture treatment records**

86(3)c Persons must report pertinent information about seeds used to reforest a cutblock (e.g. seedlot #)

* Woodlot Licensee Planning and Practices Regulation s. 32 Use of Seed; s.76 Annual Report
Chief Forester’s Standards for Seed Use

Purpose:
To maintain the identity, adaptability, diversity and productivity of the Province’s tree gene resources

Contents:
• Registration
• Storage and Testing
• Selection and Use
• Seed Transfer
Registration Standards – Natural Stands

Application form submitted to Ministry (on-line via SPAR)

- Lat/long/elevation/BEC unit (Map now required)
- Collection dates & methods
- Collectors name & contact information

Seed must be:

- collected from ≥ 10 trees
- collected from same BEC variant, within 8km radius
- not collected from a plantation
- shipped to Tree Seed Centre
- labelled with # inside and outside of sacs
- ≥ 97% pure seed, between 4% and 9.9% moisture content

Ministry assigns seedlot #s

- Class A    Seed Orchard
- Class B+   Superior Provenance
- Class B    Natural Stand
Storage and Testing Standards

• Maintain identity and integrity of lot during collection and interim storage (keep accurate records)
• Store seed at the Tree Seed Centre
• TSC tests seed for purity, moisture content and germination
• Withdrawal requests in writing to TSC or through SPAR
• No fees* for registration, storage, testing or withdrawal
  *with some exceptions.
Selection and Use Standards

- Persons must use seed with $GW \geq 5\%$ (for the species and trait that best achieves the forest management objectives for the stand) if available.

- Genetic worth (GW) = % improvement for trait compared to natural stand seed
  - $GVO+20 = 20\%$ more volume at rotation
  - $DSB+50 = 50\%$ resistant to white pine blister rust

- ‘Available’ if...
  - you own it or it is identified as surplus on SPAR
  - of sufficient quantity for request
  - complies with the seed transfer limits
  - fair price
Seed Transfer Standards

Geographically-based seed transfer (GBST)

• Natural Stand seedlots
  • Seed Planning Zones (SPZs)
  • Lat/Long and Elev limits
  • BEC zone

• Seed orchard seedlots
  • Seed Planning Units (SPZs and elevation limits)
  • Latitude limits for coastal species
Seed Transfer Standards

**Climate-based seed transfer (CBST)**

CBST Seedlot Selection Tool Version 2.0

BEC variant mapping in SPAR
3. Seed Planning & Availability

1. Determine seed/seedling needs (by BEC variant of planting sites)
2. Identify BEC variants from which seed can be procured and suitable seedlots in SPAR (or by SPU)
3. Review FGC Species Plans for seed orchard coverage and availability
4. Contact seed owners and seed producers to purchase seed
5. Collect if insufficient seed available
Seed Orchards

- 100 seed orchards in BC
- Managed by Ministry, private companies and SelectSeed
- 12 conifer species, plus alder & birch
- Yellow cypress cuttings hedges
- Contain 20-50 parents
FGC Species Plans

2017/18 FGC Business Plan, Appendix 3
http://www.fgcouncil.bc.ca/doc-04-speciesplans.html
Orchard Seed Availability

See Handouts of Seed Demand (RESULTS) and Class A Inventory (SPAR) for:

• Geographic Based Seed Transfer Standards
• Climate Based Seed Transfer Standards

CBST seed availability covered in next section
# Orchard Seed Contacts

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Agency Name</th>
<th>Contact</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLNRO</td>
<td>BC Ministry of Forests…</td>
<td>Stephen Joyce</td>
<td><a href="mailto:Stephen.Joyce@gov.bc.ca">Stephen.Joyce@gov.bc.ca</a></td>
</tr>
<tr>
<td>PRT</td>
<td>PRT Growing Services</td>
<td>Dan Livingston</td>
<td><a href="mailto:Dan.Livingston@prt.com">Dan.Livingston@prt.com</a></td>
</tr>
<tr>
<td>SelectSeed</td>
<td>Select Seed Co. Ltd</td>
<td>Brian Barber</td>
<td><a href="mailto:bbarber.fgc@shaw.ca">bbarber.fgc@shaw.ca</a></td>
</tr>
<tr>
<td>Tolko</td>
<td>Tolko Industries Ltd</td>
<td>Rod Massey</td>
<td><a href="mailto:Rod.Massey@Tolko.com">Rod.Massey@Tolko.com</a></td>
</tr>
<tr>
<td>TW</td>
<td>TimberWest Forest Corp.</td>
<td>Bevin Wigmore</td>
<td><a href="mailto:wigmoreb@timberwest.com">wigmoreb@timberwest.com</a></td>
</tr>
<tr>
<td>VSOC</td>
<td>Vernon Seed Orchard Co.</td>
<td>Dan Gaudet</td>
<td><a href="mailto:Dan@vsoc.ca">Dan@vsoc.ca</a></td>
</tr>
<tr>
<td>Vernon private</td>
<td>Coldstream Seed Orchards</td>
<td>Barry Kasdorf</td>
<td><a href="mailto:kasdorffamily@gmail.com">kasdorffamily@gmail.com</a></td>
</tr>
<tr>
<td>WFP</td>
<td>Western Forest Products Inc.</td>
<td>Annette van Niejenhuis</td>
<td><a href="mailto:AVanniejenhuis@westernforest.com">AVanniejenhuis@westernforest.com</a></td>
</tr>
<tr>
<td>YPP</td>
<td>Yellow Point Propagation</td>
<td>Don Pigott</td>
<td><a href="mailto:ypprop@shaw.ca">ypprop@shaw.ca</a></td>
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</table>

Also included in 2017/18 FGC Business Plan, Appendix 3

[http://www.fgcouncil.bc.ca/doc-03-businessplans.html](http://www.fgcouncil.bc.ca/doc-03-businessplans.html)
Summary

• Seed matters
• Determine if suitable seed is available before investing in a collection
• If collecting, abide by the regulations and standards
• When in doubt, give a shout
References

• **Forest Genetics Council of BC**
• **Forest & Range Practices Act (FRPA)**
• **Tree Seed** (FLNRORD website)
• **Chief Forester's Standards for Seed Use**
• **Species Plans** (e.g. seed orchards)

**Margot Spence, RPF**
Seed Policy Officer
Forest Improvement and Research Management Branch
FLNRORD, Victoria, BC
Margot.Spence@gov.bc.ca

**Brian Barber, RPF**
Program Manager, FGC
CEO, SelectSeed Co. Ltd.
Victoria, BC
bbarber.fgc@shaw.ca
Extra slides with seed use
## Superior Provenances (B+ stands)

**Table 5.1 Lodgepole Pine Superior Provenances**

<table>
<thead>
<tr>
<th>Species Code</th>
<th>Common Name</th>
<th>Provenance</th>
<th>Located within the following elevation range (metres)</th>
<th>Latitude of centre point of area (degrees / minutes)</th>
<th>Longitude of centre point of area (degrees / minutes)</th>
<th>Additional criteria</th>
<th>Genetic Worth Section 7.2 (a) (iii)</th>
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<tbody>
<tr>
<td>Pli</td>
<td>Interior Lodgepole Pine</td>
<td>Bowron River</td>
<td>620 – 720</td>
<td>53° 54'</td>
<td>122° 00'</td>
<td>Within natural stands located within an 8 km radius of the latitude and longitude of centre point of area</td>
<td>G+03</td>
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<td></td>
<td></td>
<td>Canoe Creek</td>
<td>840 – 940</td>
<td>50° 42’</td>
<td>119° 11’</td>
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<tr>
<td></td>
<td></td>
<td>Cartwright Lake</td>
<td>1120 – 1220</td>
<td>50° 49’</td>
<td>116° 26’</td>
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<tr>
<td></td>
<td></td>
<td>Champion Lakes</td>
<td>950 – 1050</td>
<td>49° 11’</td>
<td>117° 35’</td>
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<tr>
<td></td>
<td></td>
<td>China Valley</td>
<td>1080 – 1180</td>
<td>50° 44’</td>
<td>119° 30’</td>
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<td></td>
<td></td>
<td>Inonoaklin Creek</td>
<td>530 – 630</td>
<td>49° 54’</td>
<td>118° 12’</td>
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FGC SelectSeed Use Target: GW

Forest Genetics Council 2020 objective: GWg 20%

- actual
- forecast

sowing year

- 2006
- 2010
- 2015
- 2020
- 2023
Forest Genetics Council 2020 objective: 75%
Class A sowing requests by Species