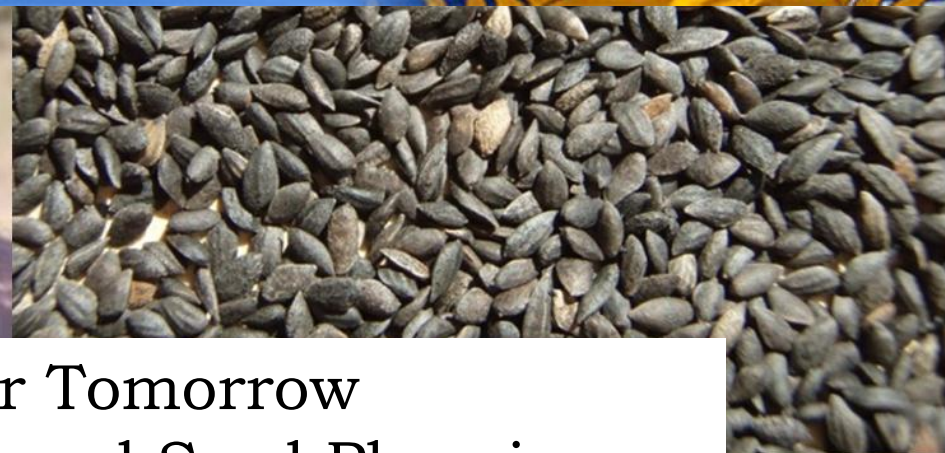


Ministry of Forests, Lands and Natural Resource Operations



Forests For Tomorrow Seedling Requests and Seed Planning

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Seedling Requests and Seed Planning

- Tree Improvement Branch / Seed Policy and Planning, including Seed Planning and Registry system (SPAR)
- BCTS - Seedling Services and Nursery Contracts
- Stock Type Selection
- FFT Seedling Requests from 2006 to 2014 – quantities and species selection
- FFT Guidance – Mixed Species and Density Targets
- Chief Forester's Standards for Seed Use & Amendment for Assisted Migration and use of Western Larch
- Seedlot Availability and Ownership
- Future Seed Planning for FFT



Tree Improvement Branch, Resource Stewardship Division

- HQ, including Seed Policy and Planning section
 - Chief Forester's Standards for Seed Use
 - SPAR – Seed Planning and Registry system
- Tree Seed Centre in Surrey
 - Cone and seed processing, seedlot registration, seed preparation
 - Invoicing and Journal Vouchers for seed and services
- Seed Orchards at 6 sites – Saanich, Vernon, Skimikin, Prince George
 - Produce 40-50% of the Class A seed used in BC
- Forest Genetics Section, including Kalamalka & Cowichan Lake Research Stations
 - Tree Breeding, Genecology, Provenance and Progeny Testing, Conservation



BC Timber Sales – Seedling Services Section

- Administers all of the seedling production on behalf of BCTS, FFT and FSMF
- Sets the deadlines for seedling request entry of Aug. 18, Sept. 15 and Oct. 15 for request entry
- Tenders and contracts the seedlings to forest seedling nurseries based on combination of price and nursery performance/quality.
- Information goes into NSA (Nursery Shipping and Admin system)
- Seedling Services staff monitor seedlings during growing season, perform quality assurance testing and audits on seedlings, communicate with FFT contacts about stock quality and acceptance of overruns or underruns arrange lifting and cold storage (spring stock) or hot-lift (summer stock).
- Surplus seedlings may be re-allocated within FFT program or other ministry programs, with seedling sale contracts used.

BCTS Recommended Seedling Stock Type Selection

Sx		Ht (cm)	Min RCD (mm)	Cost Relativity	# Box	Stock Type
Small	410	12 - 27	2.6	47%	315	PSB 410 1+0
Medium	412A	13 - 35	3	67%	210	PSB 412A 1+0
Large	512A	14 - 40	3.3	100%	120	PSB 512A 1+0
Pli / Py		Ht (cm)	Min RCD (mm)	Cost Relativity	# Box	Stock Type
Small	310B	6 - 16	2.1	51%	360	PCT 310B 1+0
Medium	410	7 - 20	2.6	71%	315	PCT 410 1+0
Large	412A	8 - 22	2.8	100%	210	PCT 412A 1+0
• Copper root pruning (PCT) recommended for spring plant stock						
Fdi		Ht (cm)	Min RCD (mm)	Cost Relativity	# Box	Stock Type
Small	412B	13 - 28	2.6	57%	315	PSB 412B 1+0
Medium	412A	15 - 34	3	81%	210	PSB 412A 1+0
Large	512A	15 - 40	3.3	100%	120	PSB 512A 1+0
Lw		Ht (cm)	Min RCD (mm)	Cost Relativity	# Box	Stock Type
Small	410	12 - 28	2.5	45%	315	PSI 410 1+0
Medium	412A	14 - 32	2.8	65%	210	PSI 412A 1+0
Large	512A	15 - 40	3.2	100%	120	PSI 512A 1+0

Cw		Ht (cm)	Min RCD (mm)	Cost Relativity	# Box	Stock Type
Small	410	16 - 35	2.2	45%	315	PSB 410 1+0
Medium	412A	18 - 42	2.5	71%	210	PSB 412A 1+0
Large	512A	20 - 50	2.8	100%	120	PSB 512A 1+0
Pw		Ht (cm)	Min RCD (mm)	Cost Relativity	# Box	Stock Type
Small	410	12 - 27	2.6	51%	315	PSB 410 1+0
Medium	412A	8 - 22	2.8	75%	210	PSB 412A 1+0
Large	512A	9 - 24	3.1	100%	120	PSB 512A 1+0
BI		Ht (cm)	Min RCD (mm)	Cost Relativity	# Box	Stock Type
Small	310B	7 - 12	2	58%	360	PSB 310B 1+0
Medium	411B	7 - 17	2.3	65%	315	PSB 411B 2+0
Large	412A	10 - 20	3.3	100%	210	PSB 412A 2+0

* Summer plant stock - RCD min reduced 0.2 mm, large stock not recommended. For all Pli PSB is recommended

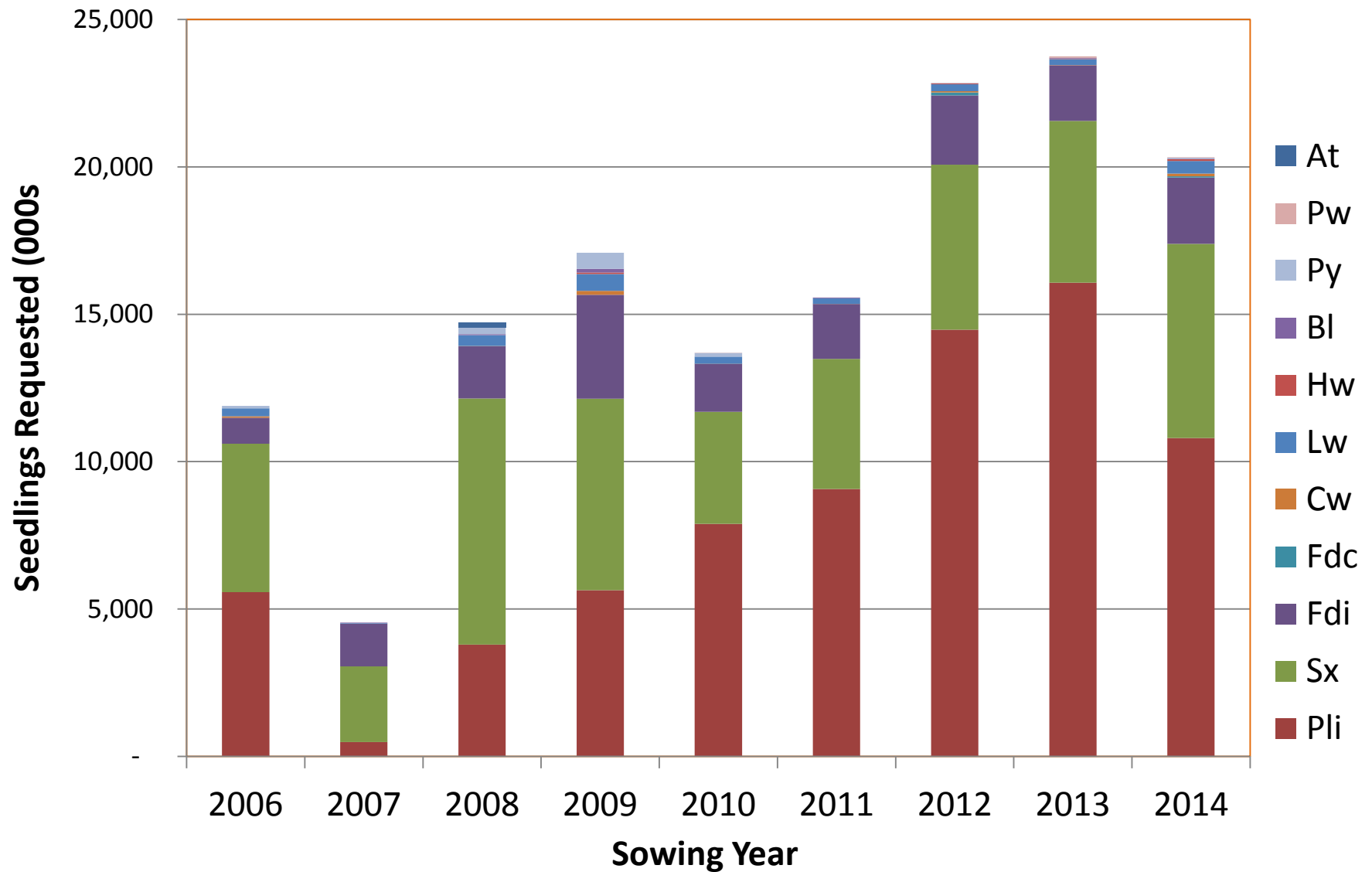
Source: Seedling Services Section, BCTS

<http://www.for.gov.bc.ca/nursery/headqtrs/Stock1Pager2014version.pdf>

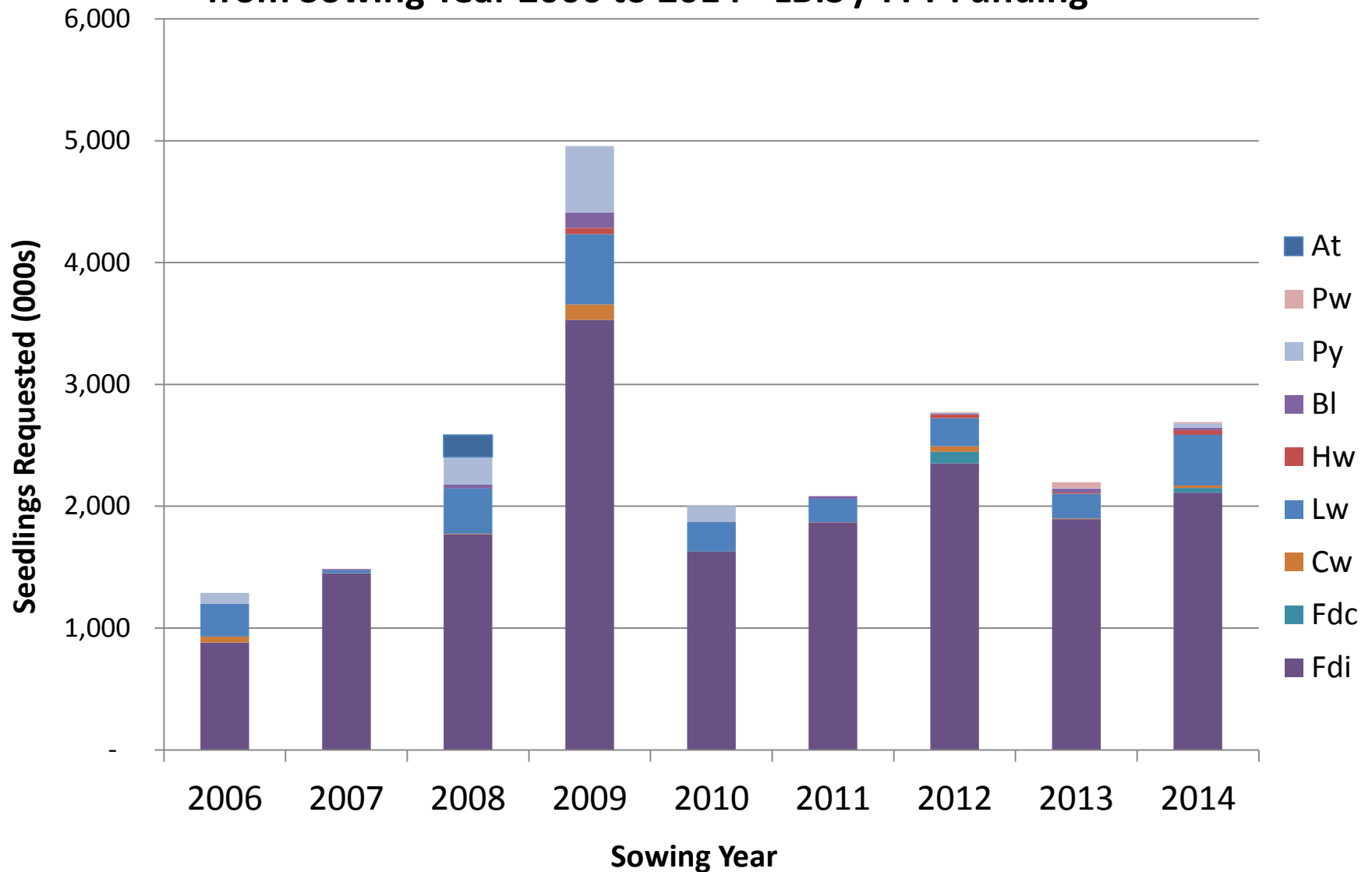
Seedling Requests by Sowing Yr & Species for FFT Program

	Sowing Year - Seedling Requested quantities in thousands								
Species	2006	2007	2008	2009	2010	2011	2012	2013	2014
Pli	5,575	488	3,795	5,645	7,892	9,075	14,480	16,068	10,805
Sx	5,032	2,565	8,350	6,488	3,796	4,407	5,594	5,487	6,579
Fdi	882	1,451	1,770	3,530	1,628	1,868	2,353	1,895	2,251
Fdc						-	95	-	40
Cw	48		5	126	1	1	44	6	99
Lw	270	24	372	578	241	194	232	203	422
Bl		10	30	127		20	6	31	19
Hw				50		-	29	10	60
Pw					2	-	6	50	17
Py	88		230	545	132	-	9	3	35
At			178			-	-	-	-
Totals	11,896	4,538	14,729	17,089	13,692	15,564	22,846	23,752	20,327

Figure 1 - Seedling Requests by Species from Sowing Year 2006 to 2014 - LBIS / FFT Funding



**Figure 2 -Seedling Requests by Species (Pli and Sx removed)
from Sowing Year 2006 to 2014 - LBIS / FFT Funding**



FFT Guidance web page

<http://lbis.forestpracticesbranch.com/LBIS/node/103>

Stand Management Guidance

- Silviculture treatment funding criteria

- Management of tree species composition

 - FFT species and density indicators and targets

 - Mixed species options for FFT - Encouraging conifer mixtures

 - An Evaluation of the Main Factors Affecting Yield Differences between Single- and Mixed-species Stands

 - Assisted Species Migration

 - FFT use of western white pine guidance

- Seed and seedling management policy

Planting

- Seed Planning and Registry System (SPAR)

 - Recommended seedling stock type selections

 - Seedling ordering deadlines

 - Sowing deadline Memo

- Treeplanting information

FFT Species management and density targets

Objectives :

- Species mixtures will be planted,
 - Where appropriate, and to the degree reasonable:
 - areas will be planted with a mixture of desirable species; and
 - on sites with more than one "preferred" species, more than one preferred species (and, where practicable, all of the preferred species) will be planted.
- Species management decisions will be informed by forest-level analysis.
 - FFT species management will be informed by analyses of the long-term, forest-level impact of species choices, where these analyses are available.
- Cumulative impacts, and impacts at the landscape scale, will be considered.
 - Where appropriate, and to the degree practical, FFT will work to improve watershed and landscape composition.
 - Where young stand composition is known to deviate from natural composition (as a result of past management), FFT treatments will help to re-establish natural composition.
- Density management will optimize productivity, future product value, and resiliency of the forest at a stand and landscape level.

FFT Species management and density targets

Targets

- 80 % of the area planted within a management unit, where funded by FFT, should have 2 or more species in the silviculture label at the time of establishment
- In ecosystems with more than one preferred species, where practicable, no one species should comprise more than 70% of the composition of the inventory label of an opening area at establishment, regeneration delay, and at free growing
- Establishment and regeneration delay density management target well spaced stocking (planted & naturals) of, at least, 1200 sph (interior) and 900 sph (coast) for non-lodgepole pine dominated stands and, at least, 2000 sph for lodgepole pine dominated stands (i.e. > 50 % of the species mix is lodgepole pine) at free growing declaration.

Caveats

- Professional decisions to deviate from the objective will be recognized in those situations where it is ecologically appropriate (i.e. forest health- rusts, frost, weevil, root rot, the site being a complex of more than 1 site series, etc).

FFT Seed Use – Genetic Gain

In 2014 – FFT seedling requests used

- **44% Class A**
- **21% Class B+ (Pli)**
- **35% Class B seed**

Over past 4 sowing years, FFT seed use by species / genetic class

- **Sx – Class A 80% to 99%**
- **Pli – Class A 32% to 40%, Class B+ 15% to 37%**
- **Fdi – Class A 2% to 10%**
- **Lw – Class A 32% to 92%**

Chief Forester's Standards for Seed Use

Includes:

- Seedlot Registration
- Seed Use – selection of Class A seed if Genetic Worth of Growth is G+05 or greater is available
- Seed Transfer Limits
 - For Class A, each species has it's own set of Seed Planning Zones and elevation ranges
 - For Class B, all species use the same SPZs, Biogeoclimatic zones, elevation range and latitude / longitude range

Climate Based Seed Transfer

- Climate based seed transfer will start implementation by 2017. The scientific foundation is still underway and the policy development will start next.
- In the meantime, there have been some interim changes to seed transfer
 - Elevation limits increased in 2008 for most species
 - Interim measures for western larch in 2010

Assisted Range and Population Expansion of Western Larch for Use as a Climate Change Adaptation Strategy in British Columbia

- ▶ Combining seed planning zones Lw1 and Lw3 as they are represented by one seed orchard population,
- ▶ Expanding the seed planning zone boundaries of Lw1 and Lw2, and
- ▶ Smoothing the raster data of seed planning zone boundaries of Lw 1 and Lw2 (to remove the 'blocky' pixel-based shapes).

This amendment will continue to serve as "interim measures" for western larch until replacement with the new Climate-Based Seed Transfer system.

Range and Population Expansion of Western Larch (2030) Climate Change - Seed Planning Zone LW1 and LW2 (2014)

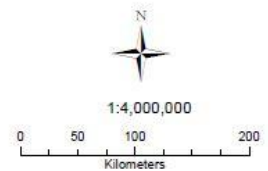
Area Statistics (Seed Planning Zone LW1 and LW2)

	Total Area (ha)	THLB Area (ha)
LW1	9,063,297	3,962,834
LW2	1,278,070	452,005

Legend

- Climate Change LW1
- Climate Change LW2
- Contemporary Lw SPUs
- Contemporary Lw SPZs - A
- NTS 250K Grid
- Communities

For more information consult the Chief Forester's Standards for Seed Use website at: www.for.gov.bc.ca/code/cfstandards/



Data from Barry Jaquish

Map produced for Tree Improvement Branch by Forsite Consultants Ltd.



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Seed Ownership and Seed Planning

Seedling Requests for FTM funding can use:

- MOF 27 – FFT – South – both Class A and B
- MOF 28 – FFT – North – both Class A and B
- MOF 20 – Tree Improvement Branch – Class A
(ministry orchards and portions from private)
- MOF 01 – Field Services – Class B
- BCTS 00 – Surplus only
- Private Seed Owners – Surplus only

FFT Seed Use in 2014

48.6 % of FFT seedling requests used seed owned by MOF 27 and 28 (FFT program)

Seedlot Owner	# of Requests	Quantity Seedlings	Grams
BCTS0	3	126.4	1,996
MOF0	1	13.0	69
MOF1	46	3,506.2	61,408
MOF20	33	6,693.5	46,309
MOF27	50	6,104.7	40,343
MOF28	24	2,196.2	19,412
MOF42	1	394.5	2,350

Ministry Seed Ownership as of Sept 2014

- ▶ BCTS 00 – BC Timber Sales – Class A & B – for use by all TSOs
- ▶ MOF 01 – Field Services – Class B
- ▶ MOF 20 – Tree Improvement Branch – Class A (ministry orchards and portions from private)
- ▶ MOF 27 – FFT – South – both Class A and B
- ▶ MOF 28 – FFT – North – both Class A and B
- ▶ DCH – for FSMF - old Chilcotin District Manager
- ▶ DCS – for FSMF – Cascades District Manager
- ▶ DKA – for FSMF – Kamloops District Manager
- ▶ DOS – for FSMF – Okanagan Shuswap District Manager
- ▶ DQU – for FSMF – Quesnel District Manager

Seed Planning

- ▶ A Seed Planning Working Group could be formed with members from Regions/Districts, RPB and TIB.
- ▶ Identify SPZs where Class A seed should be purchased from Tree Improvement Branch and private seed orchards – Vernon Seed Orchard Co., Select Seed, Tolko, etc.
- ▶ Identify SPZs and BEC zones where Class B should be collected or purchased
- ▶ There will be changes with Climate Based Seed Transfer
- ▶ Possibly makes sense to coordinate seed planning for FFT and FSMF programs together

Ministry of **Forests, Lands and Natural Resource Operations**



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