



Forest Genetics Council  
of British Columbia

Interior Technical Advisory Committee

# Realizing Genetic Worth – or not

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# Tree Improvement

- Millions invested
- Many man-years of effort
- Proven gains and constant improvements.
- Field experience

# Many Ways to not realize tree Improvement

- Seed supply gaps
- Nursery errors
- Species selection and site prescription errors
- Planting and stock handling errors
- Damage and pests
- Brush encroachment
- Less than optimal seedlots
- A narrow path to 100% realized gain

# TFL 52 Planting Stock Experiment

- Clare Kooistra designed
- Planted 2015
- 3 sites and randomized
- Big Stock is better – known information
- Localize using current A-seed and practices
- Quantify effect to enable cost/benefit

# PSB 309A Spring Plant

**Ht. 27cm, GLD 4.3, Code 3, Fault – Chlorosis.**

**End of 1<sup>st</sup> growing season - Sep 29, 2015**



**Ht. 82cm, GLD 7.8, Code 3, Fault – veg press.**

**End of 5<sup>th</sup> growing season – Aug 28, 2019**



# PSB 411B Spring Plant

Ht. 23cm, GLD 5.2, Code 3, Fault – 2 leaders.    Ht. 41cm, GLD 12.0, Code 3, Fault – 2 leaders.  
End of 1<sup>st</sup> growing season - Sep 29, 2015    End of 5<sup>th</sup> growing season – Aug 28, 2019



# PSB 410A Spring Plant

**Ht. 25cm, GLD 4.5, Code 4, Fault – none.  
End of 1<sup>st</sup> growing season - Sep 29, 2015**



**Ht. 82cm, GLD 16.8, Code 4, Fault – none.  
End of 5<sup>th</sup> growing season – Aug 28, 2019**



# PSB 412A Spring Plant

Ht. 39cm, GLD 9.0, Code 4, Fault – none.

End of 1<sup>st</sup> growing season - Sep 29, 2015



Ht. 104cm, GLD 24.8mm, Code 4, Fault – none.

End of 5<sup>th</sup> growing season - Aug 28, 2019





# PSB 512A Spring Plant

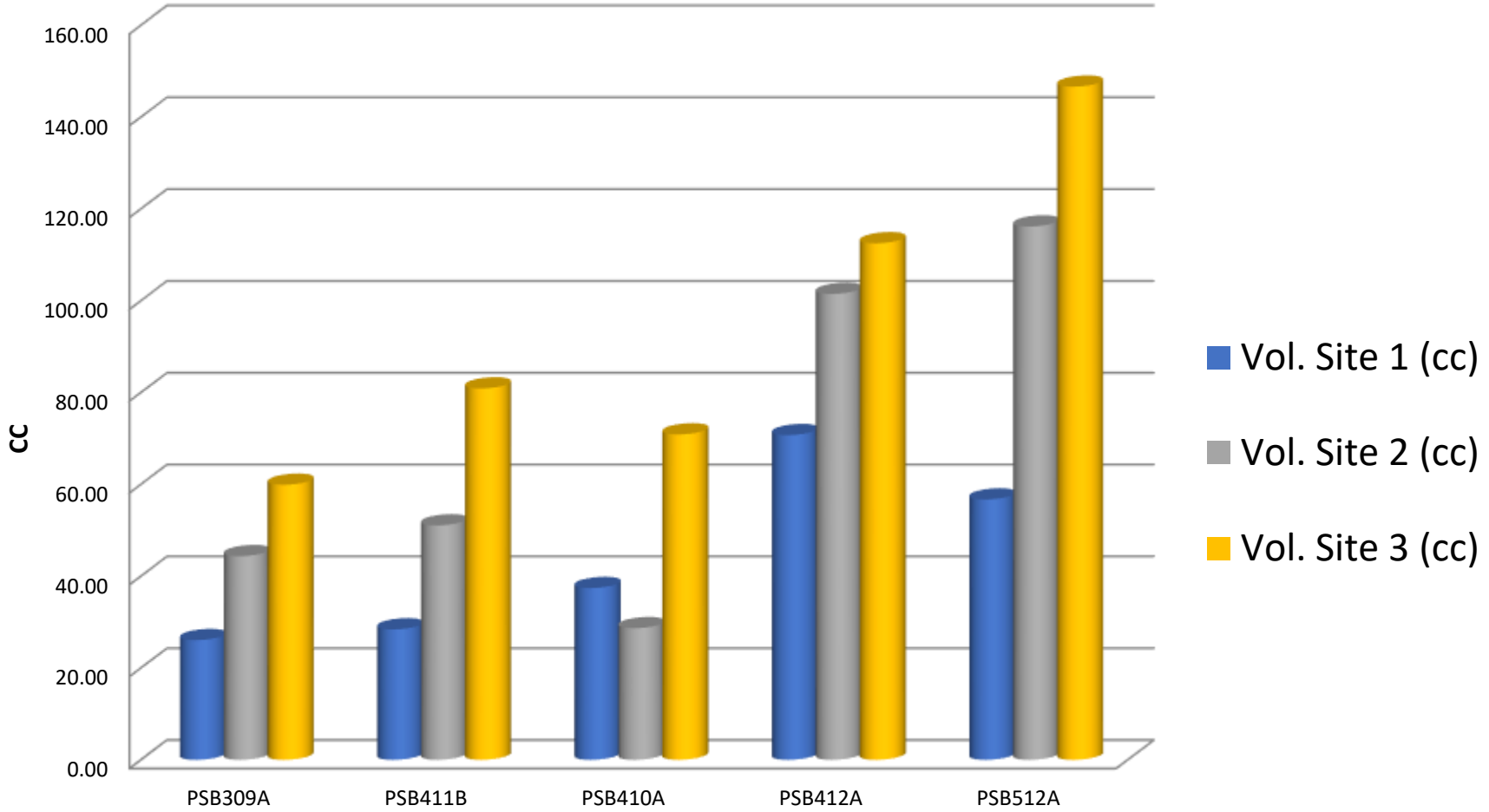
**Ht. 29cm, GLD 7.5, Code 4, Fault – none.  
End of 1<sup>st</sup> growing season - Sep 29, 2015**



**Ht. 111cm, GLD 17.6, Code 4, Fault – none.  
End of 5<sup>th</sup> growing season – Aug 28, 2019**



# Spring Plant 2015 -Volume

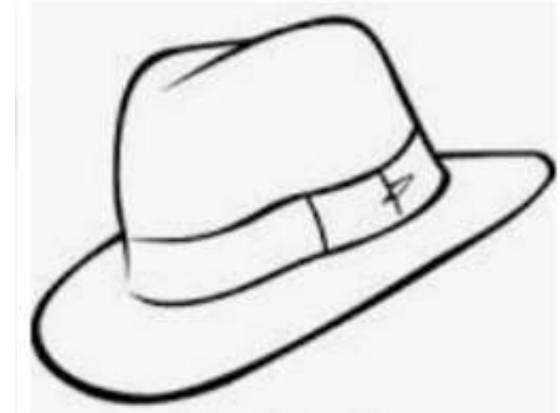


# Discussion by Clare Kooistra:

- There is an economic advantage to planting larger stock types as :
  - Higher survival is achieved and thus increasing the volume growing per hectare on the sites.
  - Larger volume is achieved per tree also leading to greater volume being grown per hectare on the sites.
- These economic implications should be explored also in light of maximizing the yield of our investments into superior seed.

# A Noble Cause

- We can use this to maximize yield
- We can analyze the cost/unit of yield



# A Noble Cause?

- What have we done with our improved seed?
- Field experience – minimizing interventions and cost
- What is the smallest stock that will get FG?
  
- Why the bad attitude?



# The cosmic background

- Pre-1987 Government direct funding reforestation
- Post-1987 Indirect funding as stumpage allowance
- Based on average cost by subzone
- Property in trees
- Silviculture on Licencee books

# Our current appraisal system:

Assume no failures and Licencee B plants higher density of large stock

	<b>Licencee A</b>	<b>Licencee B</b>
Cost to FG	800	1200
Allowance for subzone	1000	1000
Profit/loss	200	-200

## **Licencee A**

Less expense and effort

Realizes a \$200 profit on positive appraisal blocks

The Crown receives a \$800 plantation

## **Licencee B**

More expense and effort

"Invests" \$200 in a Crown Asset

The Crown receives a \$1200 plantation

index	Mound	Trench	Pli	Fdi	Sx	309A	411B	410A	412A	512A
\$/tree	\$ 0.79	\$ 0.27	\$ 0.006	\$ 0.095	\$ 0.035	\$ 0.13	\$ 0.20	\$ 0.24	\$ 0.35	\$ 0.50
\$/million	\$ 785,714	\$ 271,429	\$ 6,100	\$ 95,000	\$ 35,000	\$ 130,000	\$ 200,000	\$ 240,000	\$ 350,000	\$ 500,000
\$/ha @1800	\$ 1,100	\$ 380	\$ 11	\$ 171	\$ 63	\$ 234	\$ 360	\$ 432	\$ 630	\$ 900
\$/ha @1400	\$ 1,100	\$ 380	\$ 9	\$ 133	\$ 49	\$ 182	\$ 280	\$ 336	\$ 490	\$ 700
\$/ha @1200	\$ 1,100	\$ 380	\$ 7	\$ 114	\$ 42	\$ 156	\$ 240	\$ 288	\$ 420	\$ 600
	Assume MSP helps a max of 1400 SPH									



# Lower investment means lower realized GW

- On the site
- On the landscape
- What is the current mechanism to attain a minimum level of investment?

# Stewardship enforced by:

- Stocking standards
- Survey methodology
- Stratum size
- Brush competition, pest and damage assessment
- All stick – no carrot
- Why not manage to minimum?
- The system functions well – but can we improve?

# Realizing GW – by investing public funds

- Enhanced appraisal was a good start – but re-think funding to encourage investment and cool adversarial climate
- Non-competitive with cap based on value (\$/mai)
- Tie standards and surveys more directly to yield at the landscape level, like Alberta. Make a survey system that feeds growth model. Manage by multiblock standards and don't micro-manage sites with low carrying capacity
- Monitor and audit post FG to quantify standards vs. results
- Standards must be consistent with TSR assumptions - circular
- Reward performance with AAC (secure)

# Let's Manage all of these:

- Seed supply
- Nursery culture
- Species selection and site prescription
- Seedlot Selection
- Planting and stock handling
- Damage and pests
- Brush encroachment

# And add elements to fully capture GW:

- Large stock
- Early brushing
- 100% planting with minimum RG delay
- Planting density to match crop plans
- Density management
- Fertilization

# And focus investment:

- High site index
- Operable and close to market
- High carrying capacity sites
- Value for timber in second pass - unconstrained

# A first step



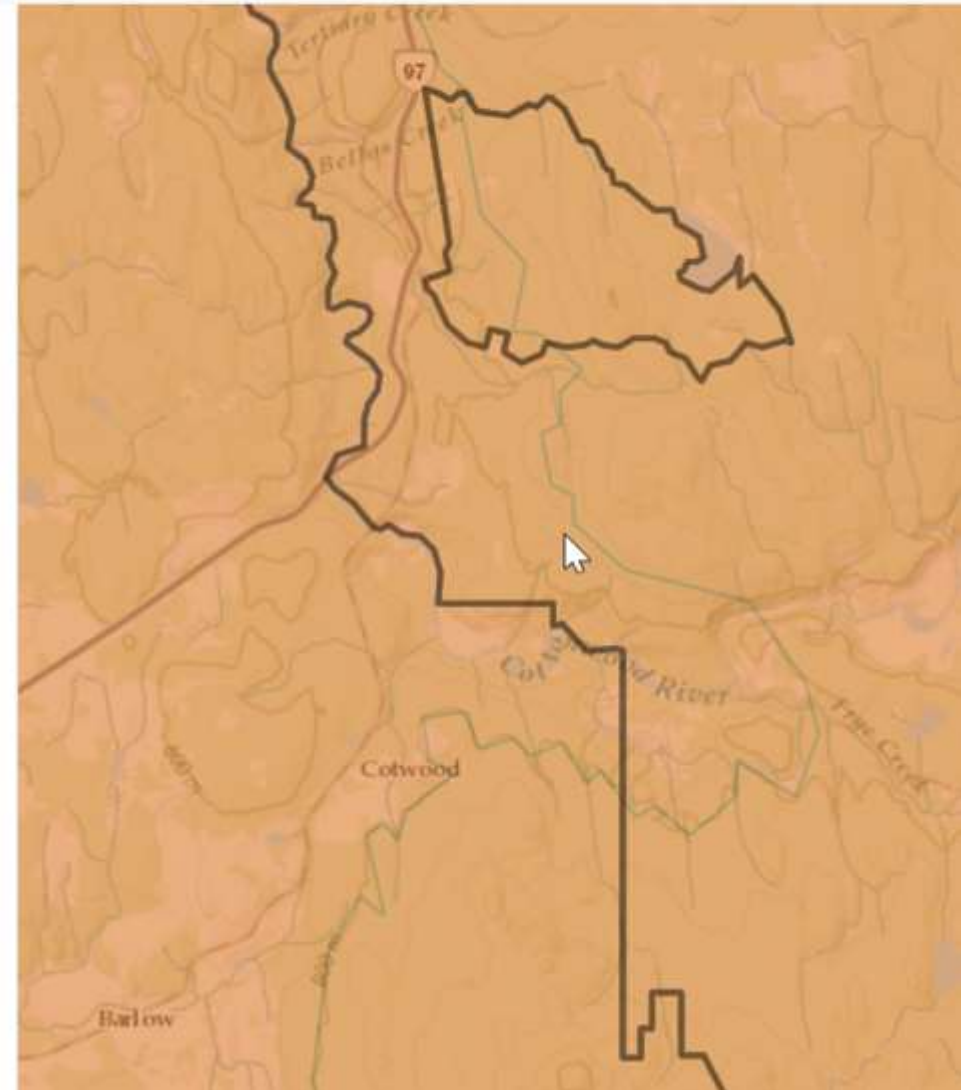
## CBST Seedlot Selection Tool Version 6.0 CBST Area

Seedlot Data Current as of November 26, 2021

GO Clear

Plantation BEC	Seed BEC	Suitabili
SBSmw	ICHdk	Suitable
SBSmw	ICHdw1	Suitable
SBSmw	ICHdw3	Suitable
SBSmw	ICHdw4	Suitable
SBSmw	ICHmc2	Suitable
SBSmw	ICHmk1	Suitable
SBSmw	ICHmk2	Suitable

Seedlot	Orchard	GW	Clas
63564	247	38.0	A
63759	247	36.0	A



# A first step

- Optimal seedlots for the site tool
- Consider as many site factors as practical – a lower GW may be a better fit
- Based on long term trials
- Based on investment analysis
- Use the best available information to start now



