

A versus B class seed in CTZ: Who
will be the winner?
(I got a hunch...)

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FIRM

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Breeding and Testing:

- 1) Progeny Test Establishment
- 2) Measure trait of Improvement
- 3) Analyze data
- 4) Select Winners and graft them
- 5) Deploy to Seed Orchards
- 6) Hope that the SO seed is doing well

Two types of genetic tests in CTZ with Douglas-fir

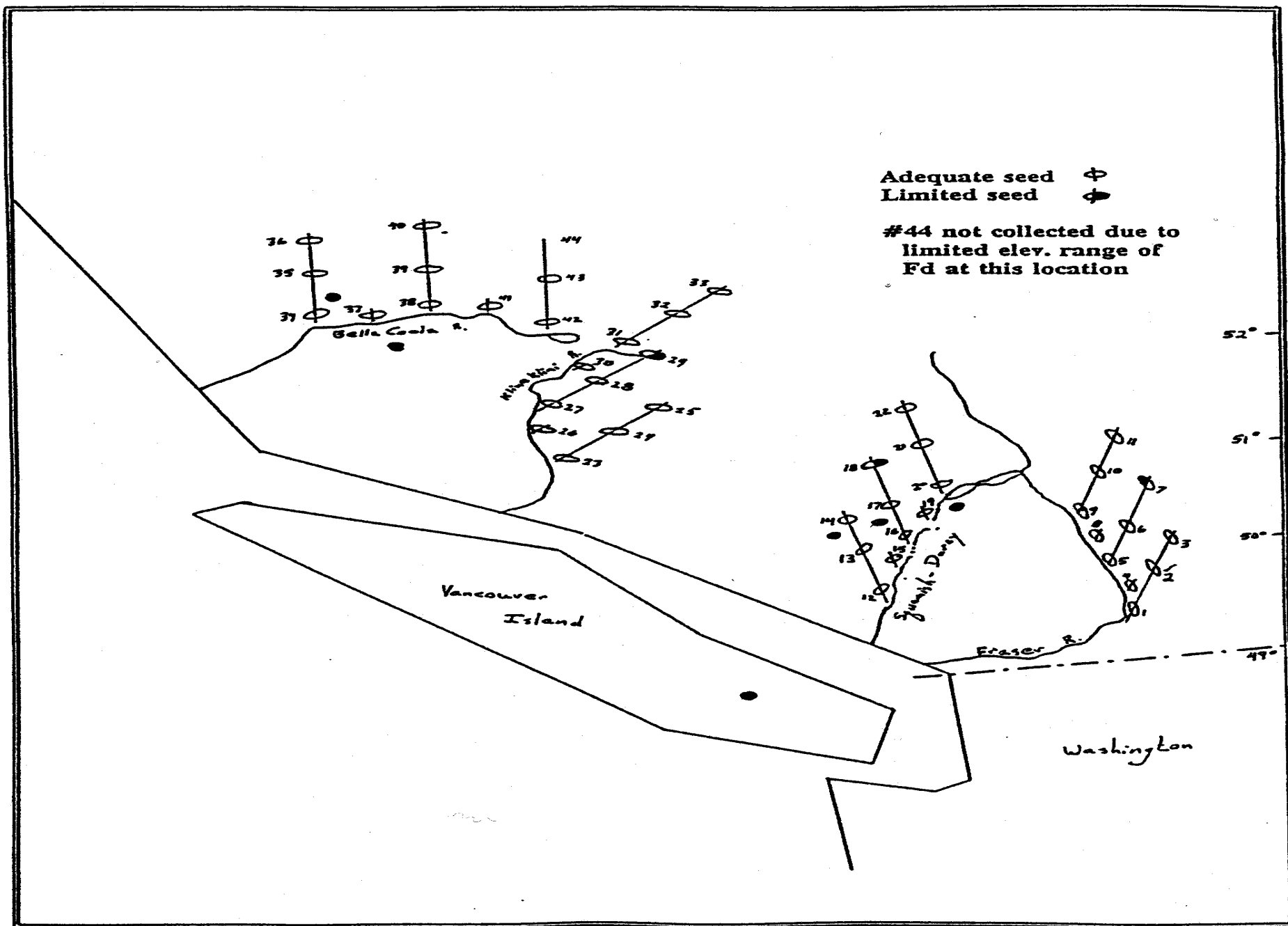
Provenance Test (with family structure, 4 sites): EP1200

testing seed sources from different locations,
possible to make selections

Progeny Test

testing families to select parents

Sub-Maritime Zone Seed Source Locations



Provenance Test Results:

Survival % and Volume/ha (m³) at Age 12

Sites:	<u>Lillooet R. (ds1)</u>	<u>Railroad (ms1)</u>	<u>Saloompt (ms2)</u>	<u>Talchacko (ds2)</u>
<u>Class:</u>	<u>S% V/ha</u>	<u>S% V/ha</u>	<u>S% V/ha</u>	<u>S% V/ha</u>
A class:	82 51.5	77 6.6	55 33.2	78 6.1
B Class:	85 39.1	89 6.5	70 31.3	85 5.2

Progeny Test Results: 3 sites:

D'Arcy, Birkenhead, Hurley Rd.

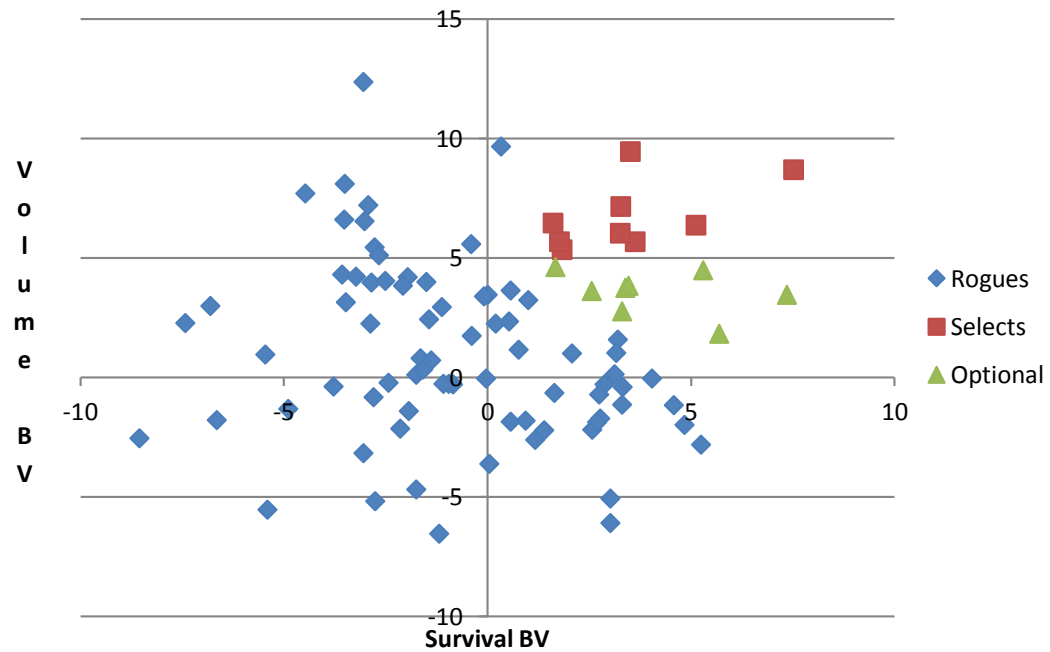
Two traits were evaluated and selected for:

Height Growth

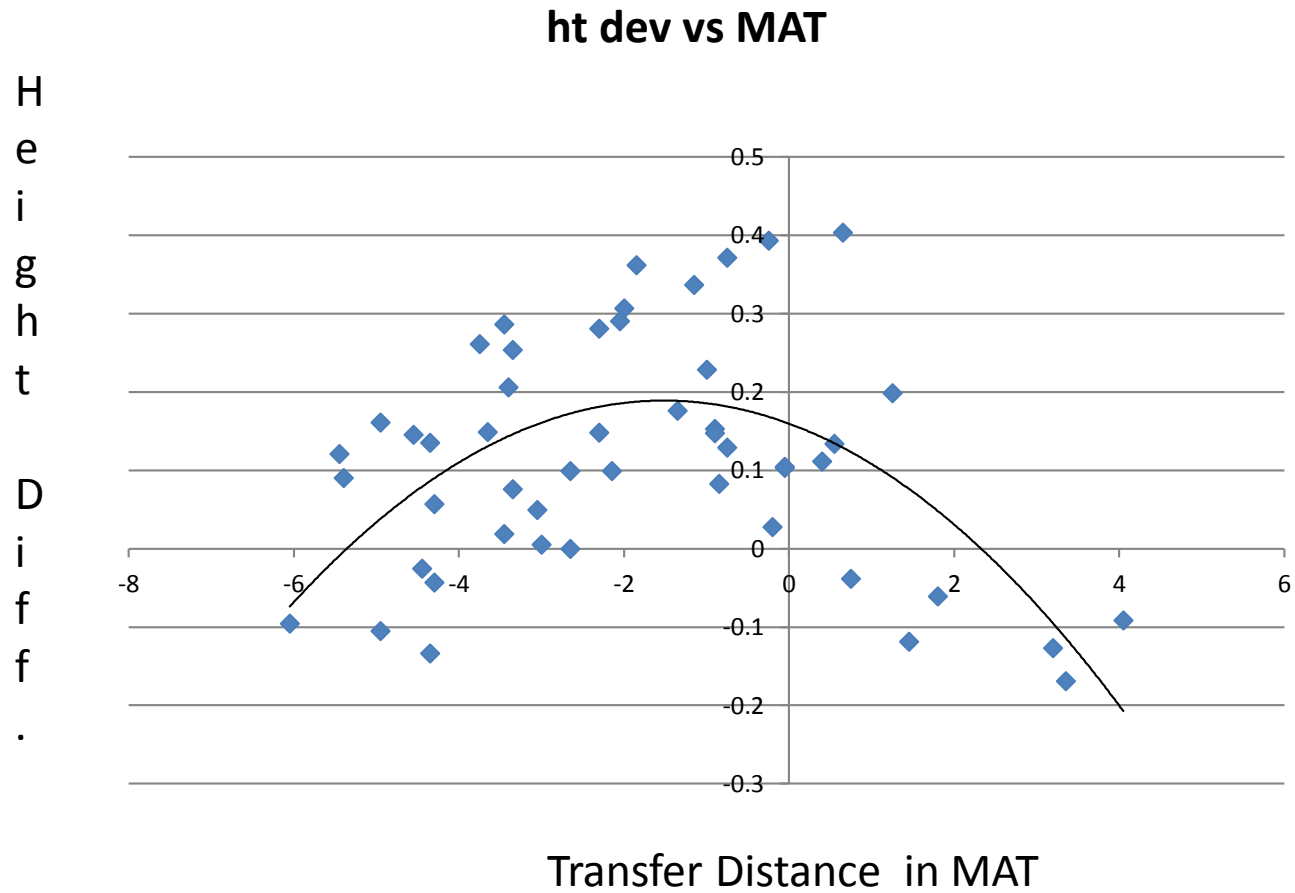
Survival

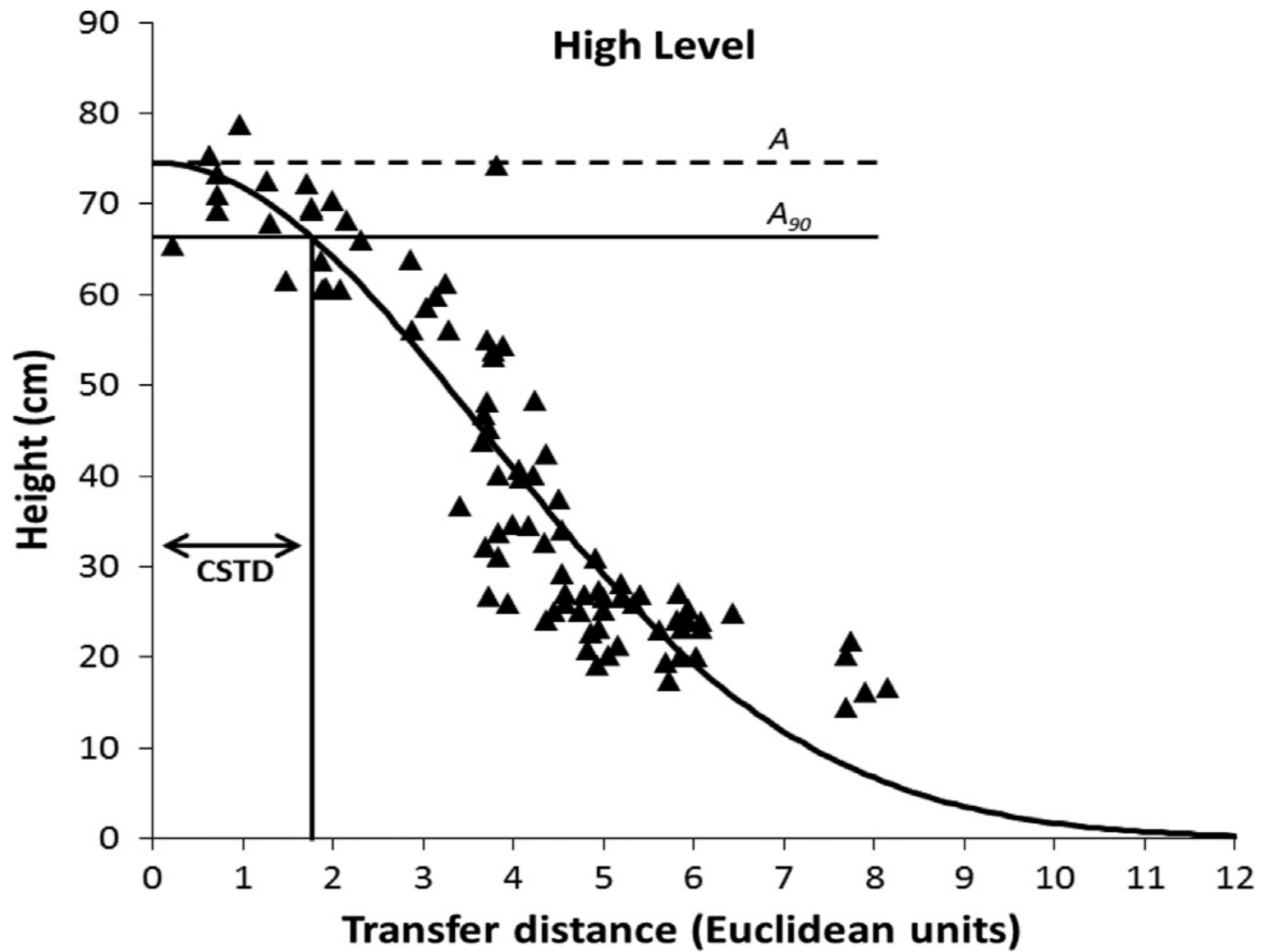
Used: Independent Culling as a selection method

Independent Culling: Select on two traits at the same time



Transfer Distance: Seed Lot Origin – Test Site



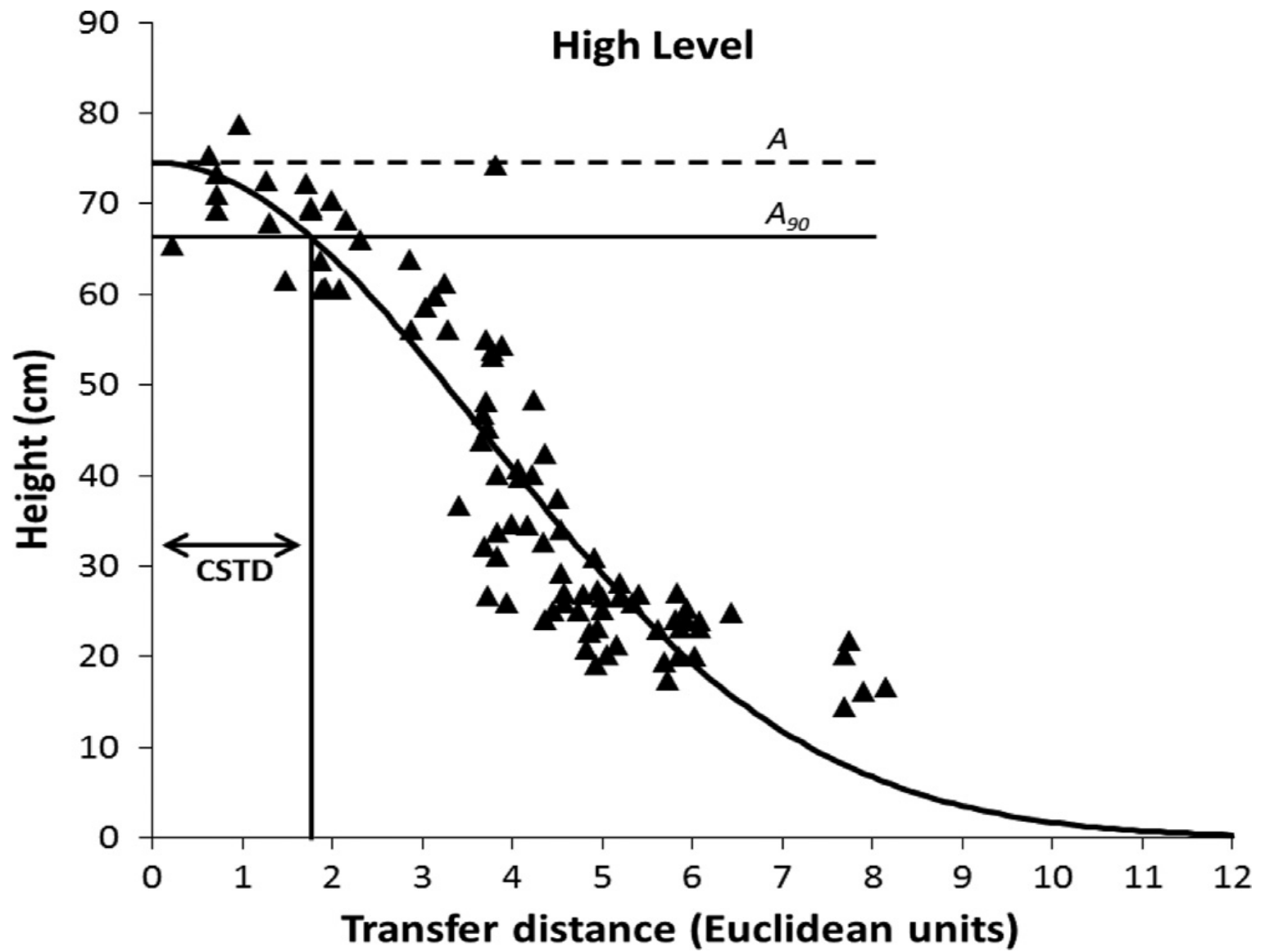


CBST Implications and what are we doing about it?

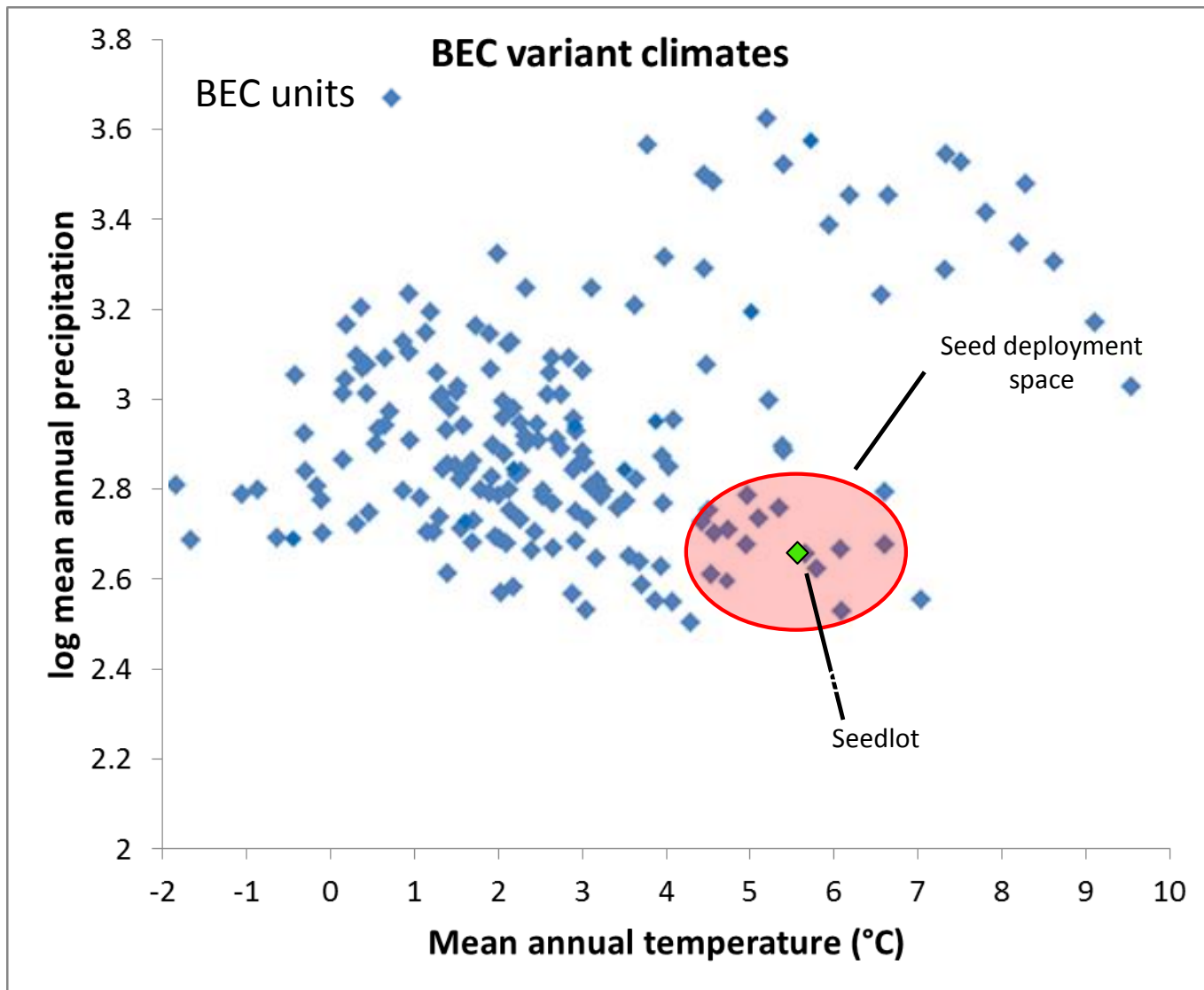
Based on BEC variants

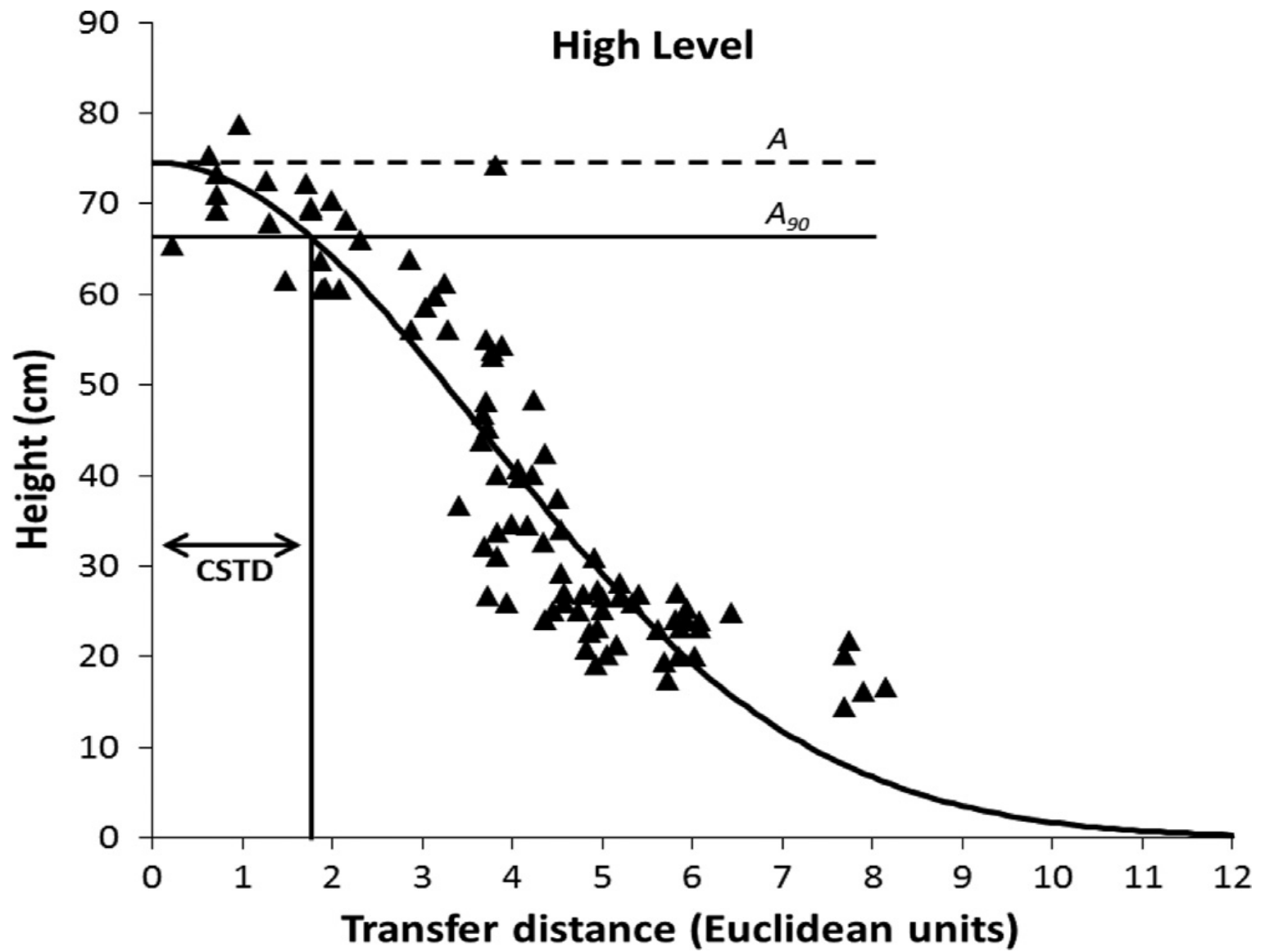
Uses Transfer functions

Uses Seed Orchard “average” climate to determine **Transfer Distance** and resulting growth potential of orchard seedlots in “near or similar” BEC variants



CBST design – climate perspective





CBST Seedlot Selection Tool: CWHms1

Species:

FDC

BEC Variant:

CWHms1

Minimum Genetic Suitability: 97.5

GO

Plantation BEC	Seed BEC	Genetic Suitability	Species Suitability
CWHms1	CWHds1	99.4	Suitable
CWHms1	CWHmm1	99.0	Suitable
CWHms1	CWHms2	99.0	Suitable
CWHms1	CWHms1	98.8	Suitable
CWHms1	CWHmm2	98.6	Suitable
CWHms1	CWHxm2	98.2	Suitable
CWHms1	CWHvm1	97.5	Suitable
CWHms1	CWHws1	97.5	Suitable
CWHms1	CWHds2	97.5	Suitable

Seedlot	Orchard	▼ GW	Class	Seed BEC
63610	181	16	A	CWHms2
63610	181	16	A	CWHms2
63709	406	13	A	CWHms2



CBST Seedlot Selection Tool: CWHms2

Instructions I Have A Cutblock I Have A Seedlot

Species:

FDC

BEC Variant:

CWHms2

Minimum Genetic Suitability: 97.5

GO

Plantation BEC	Seed BEC	Genetic Suitability	Species Suitability
CWHms2	CWHxm2	97.8	Suitable
CWHms2	CWHdm	97.8	Suitable
CWHms2	CWHms2	97.6	Suitable

Seedlot	Orchard	▼ GW	Class	Seed BEC
63721	199	20	A	CWHdm
63650	199	19	A	CWHdm
63649	199	18	A	CWHdm
63611	197	17	A	CWHdm
63648	199	17	A	CWHdm



CBST Seedlot Selection Tool: CHWds1

Instructions | I Have A Cutblock | I Have A Seedlot

Species:
FDC

BEC Variant:
CWHds1

Minimum Genetic Suitability: 97.5

GO

Plantation BEC	Seed BEC	Genetic Suitability	Species Suitability
CWHds1	CWHdm	98.8	Suitable
CWHds1	CWHds1	98.4	Suitable
CWHds1	CWHxm2	98.3	Suitable
CWHds1	CWHxm1	97.6	Suitable

Seedlot	Orchard	GW	Class	Seed BEC
63721	199	20	A	CWHdm
63650	199	19	A	CWHdm
63649	199	18	A	CWHdm
63611	197	17	A	CWHdm
63648	199	17	A	CWHdm
63672	405	17	A	CWHdm



CBST Seedlot Selection Tool: CWHds2

Species:
FDC

BEC Variant:
CWHds2

Minimum Genetic Suitability: 97.5

GO

Plantation BEC	Seed BEC	Genetic Suitability	Species Suitability
CWHds2	CWHds1	97.7	Suitable
CWHds2	CWHds2	97.7	Suitable
CWHds2	IDFww	97.3	Suitable
CWHds2	CWHws1	94.7	Suitable

Seedlot	Orchard	GW	Class	Seed BEC
39765		0	B	CWHds1
31952		0	B	CWHds1
31951		0	B	CWHds1
53985		0	B	CWHds1



Most Recent Seedling Requests: SPAR 2019 Seedling Requests

	<u>CWH ds1</u>	<u>CWH ds2</u>	<u>CWH ms1</u>	<u>CWH ms2</u>	<u>Total</u>
Seedling Requests (x1000) (2018)	547.4	12.5	1084.4	20.1	1664.3
Seed Source After CBST	Coastal A	B Class	SM A	Coastal A	

Source: Zedel and Donnelly

So, what seed source will be the winner?

Based on our experience on the coast, it will be A class seed:

Approaches to Breeding and Selections

and Assumptions in the Data Analysis are the same for Coast and CTZ

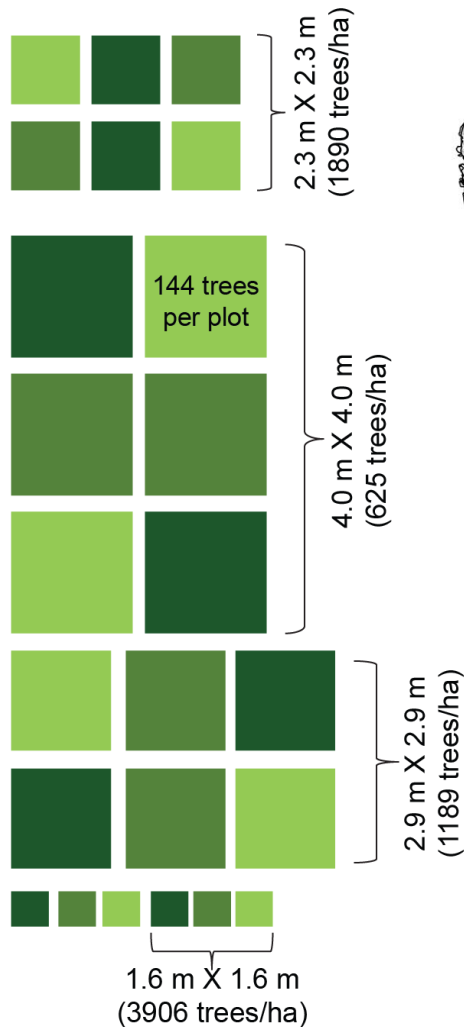
So, we can make inferences from our coastal results:

Realized Gain Results

Realized Gain Trials: Design

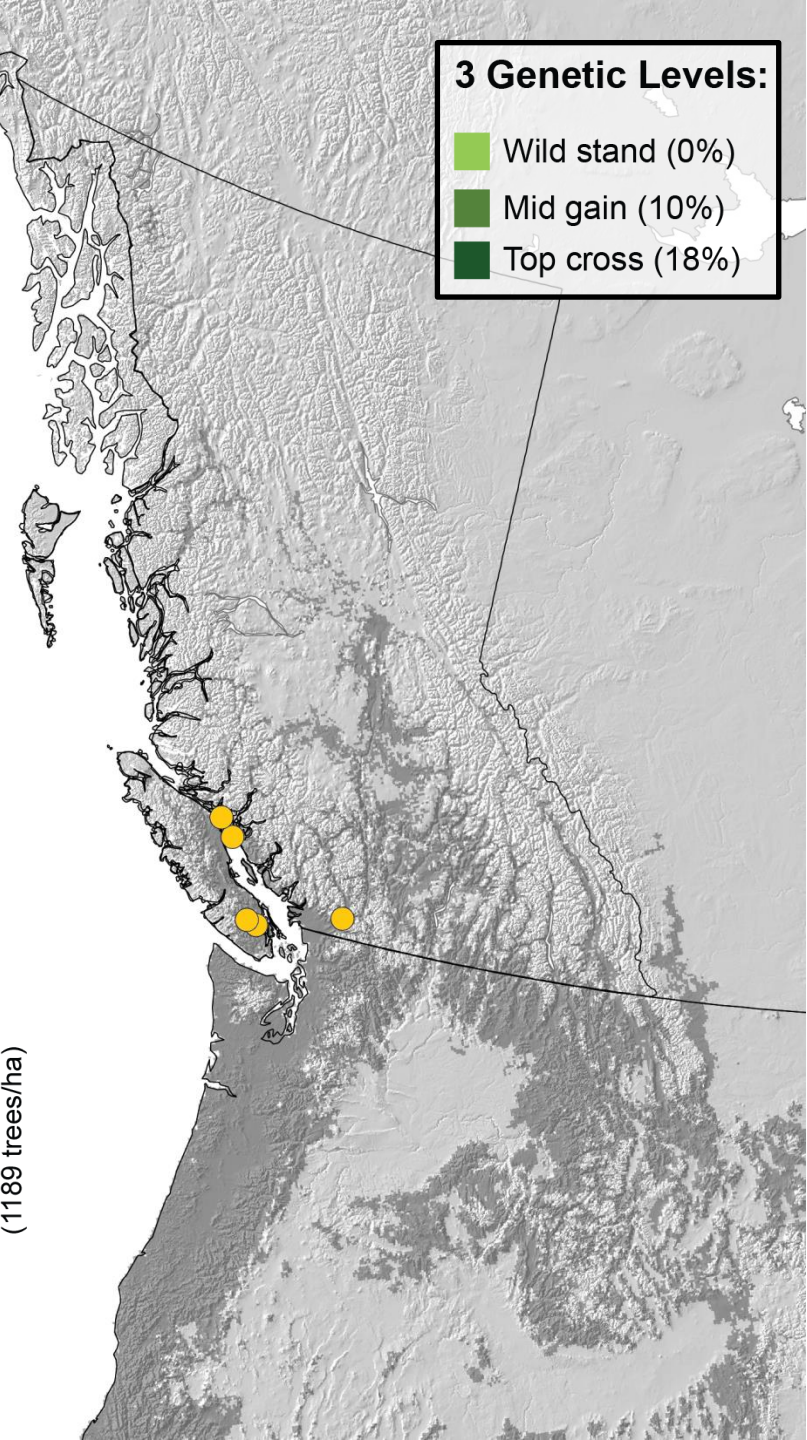
- 20-year realized gain trial (5 sites)
- Verify growth predictions
- Excellent design to test wood quality traits
- 3 genetic entry levels
- 4 densities
- 2 reps

Example Site Layout

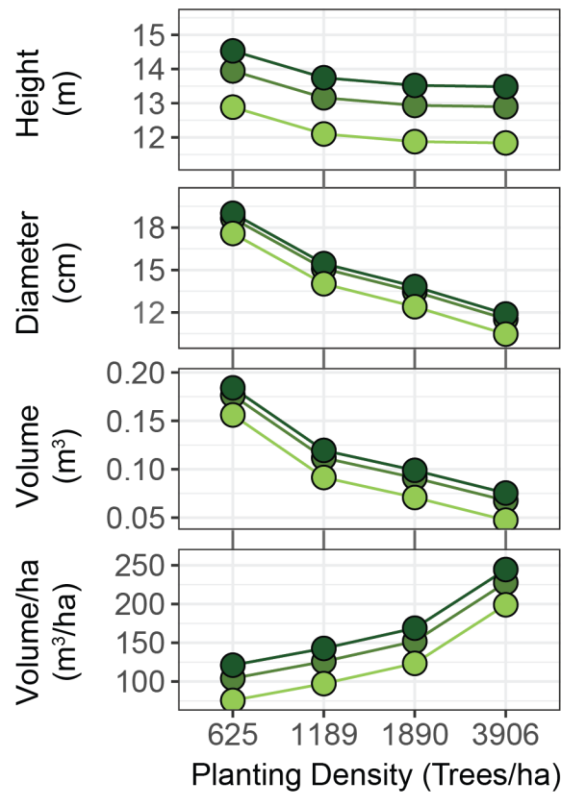


3 Genetic Levels:

- Wild stand (0%)
- Mid gain (10%)
- Top cross (18%)



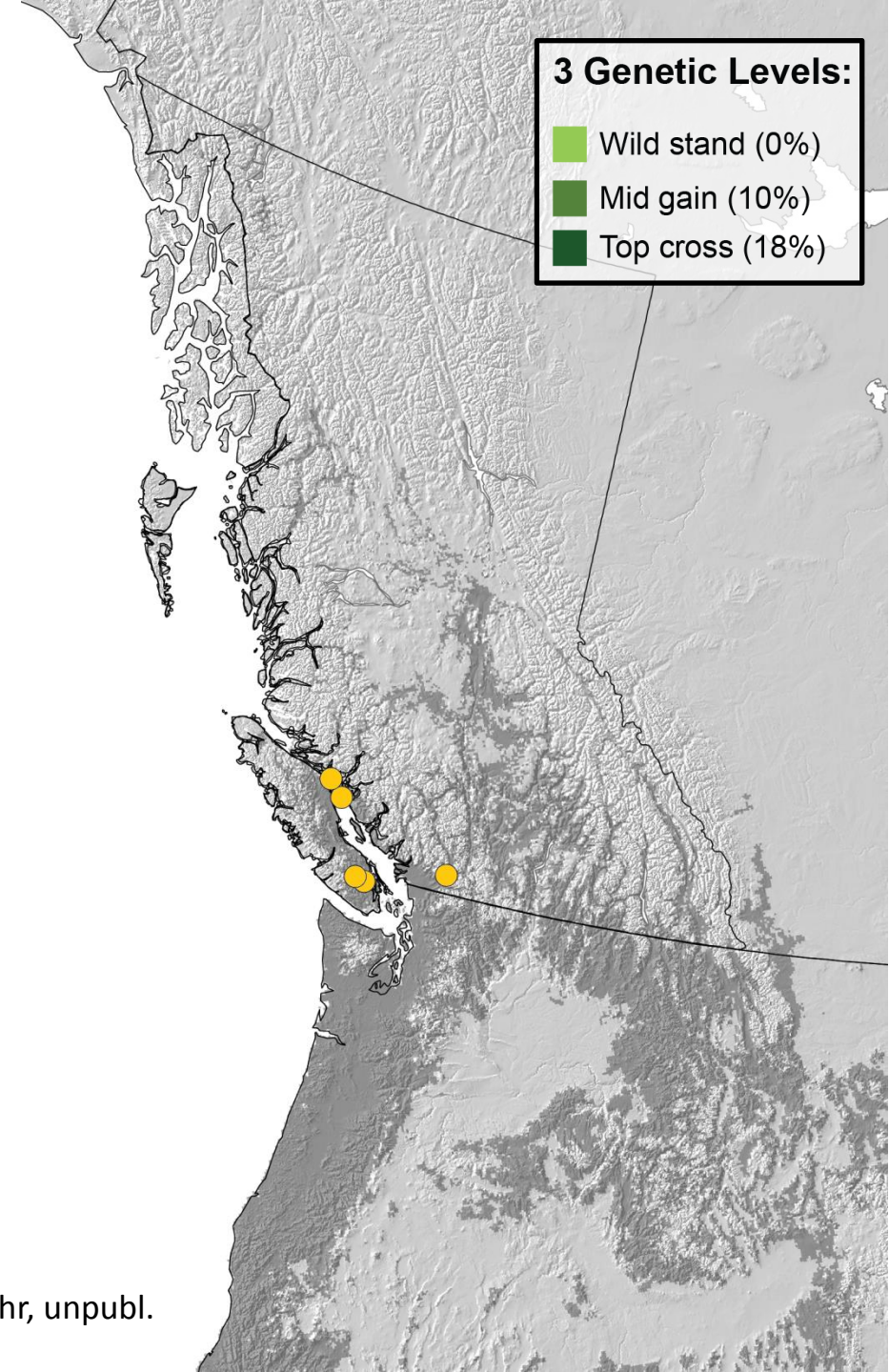
Results



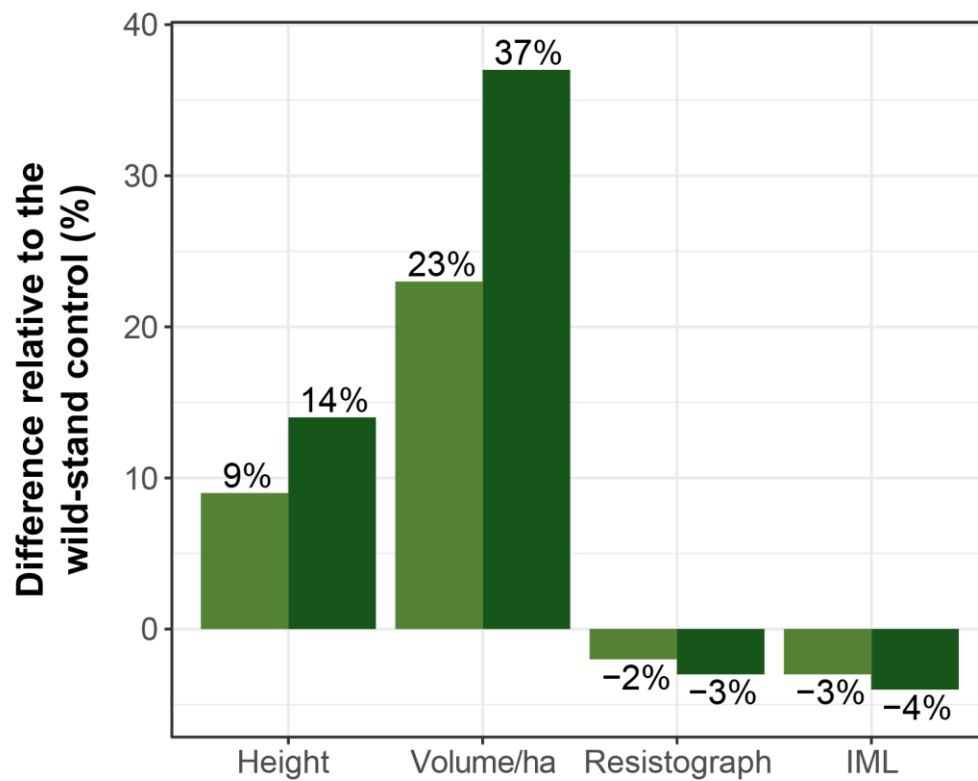
Source: Isaac-Renton and Stoeher, unpubl.

3 Genetic Levels:

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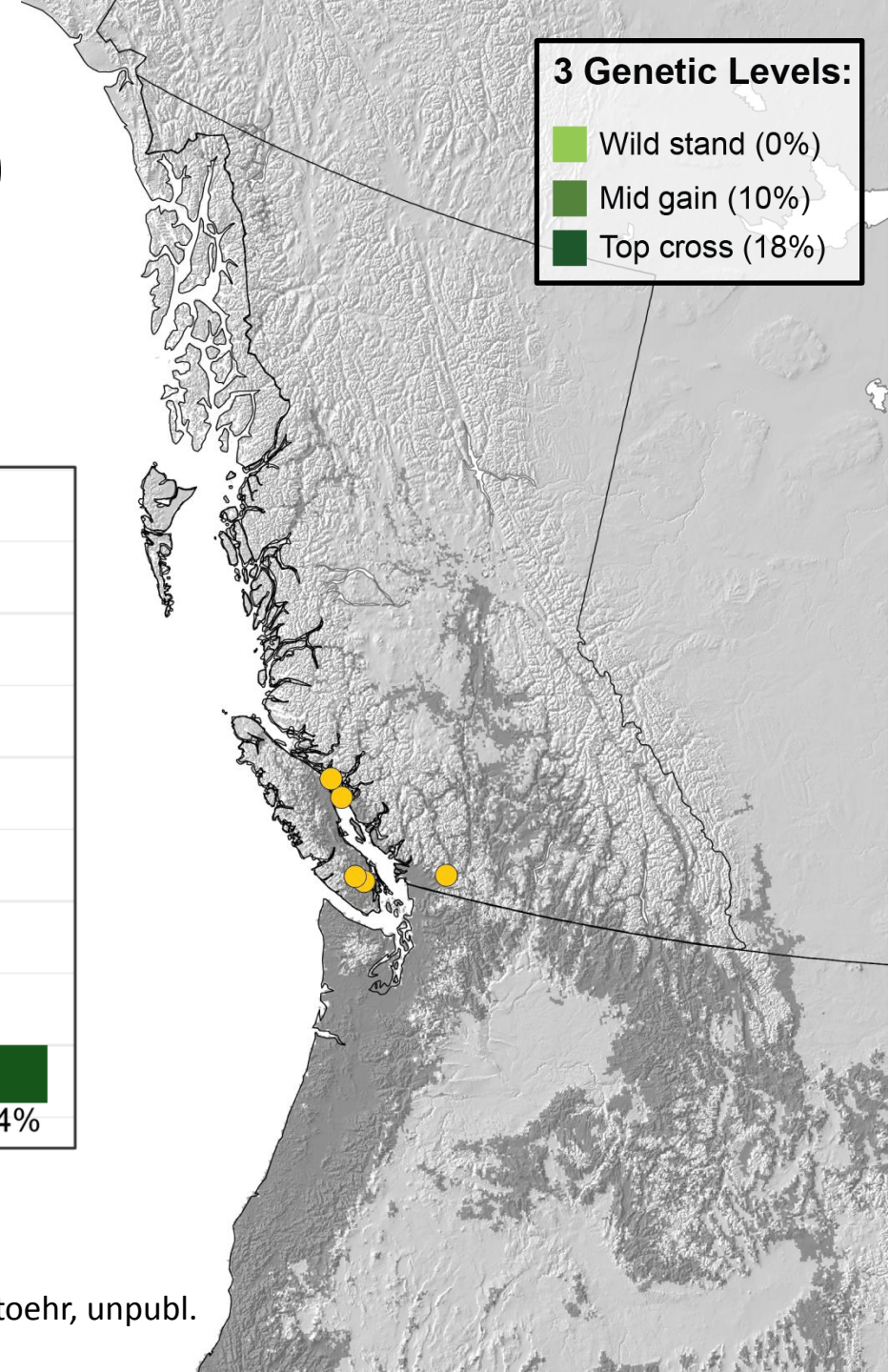
Volume Gain at age 20



Source: Isaac-Renton and Stoeher, unpubl.

3 Genetic Levels:

- Wild stand (0%)
- Mid gain (10%)
- Top cross (18%)



What we will do for you:

Move TI program from 1st gen to advanced gen:

Establish progeny tests in CTZ with both coastal and SM families, also include some interior families and parents

Evaluate other traits not just growth
such as: snow load resistance, early survival, drought resistance

Any disease or insect problems?? You will have to let us know....

Increment Cores to study drought resistance

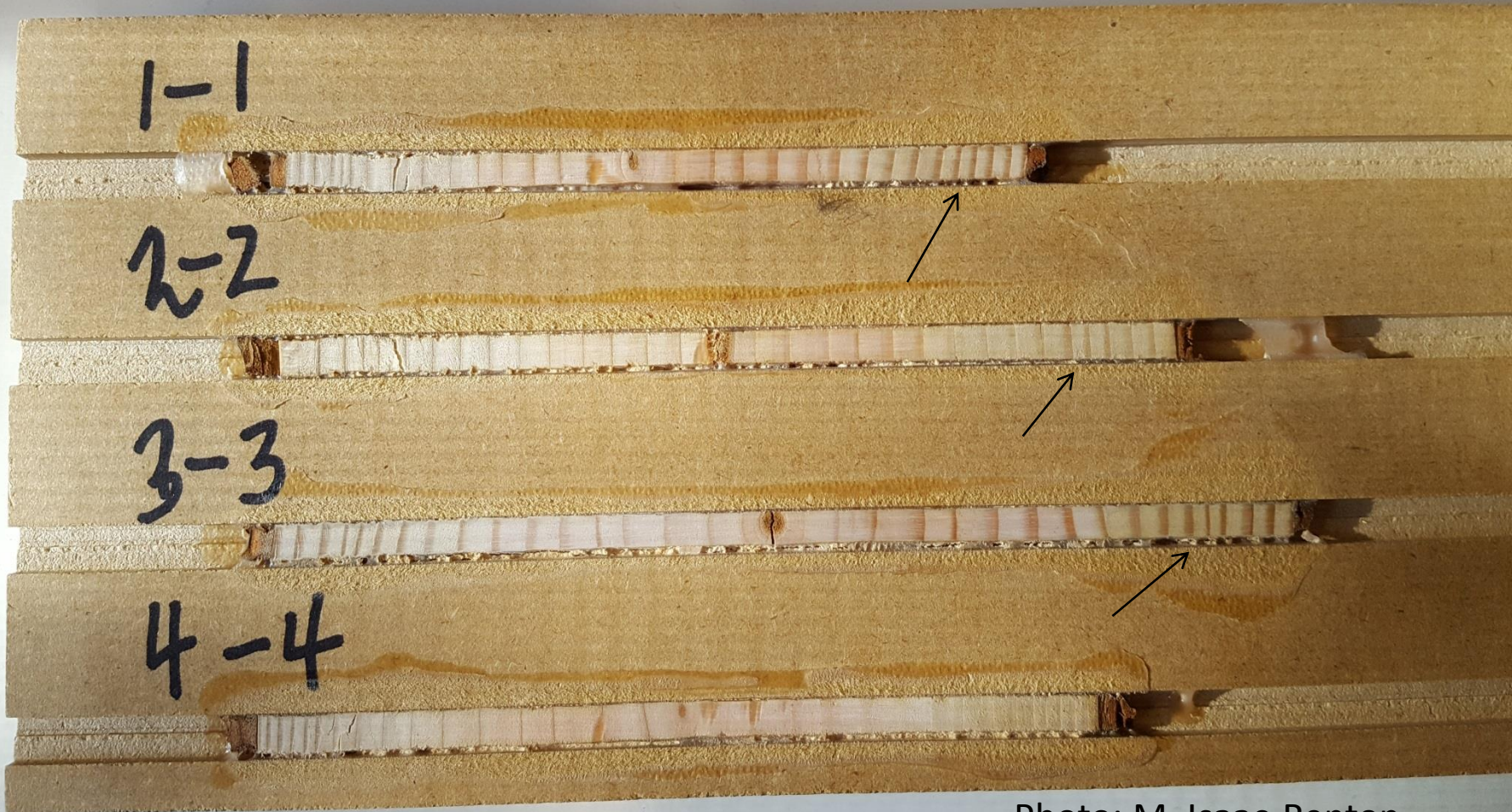


Photo: M. Isaac-Renton

Example of BEC variant climate changes on the coast

