AP1 Resistent plantemateriale til juletræsproduktion

Formål

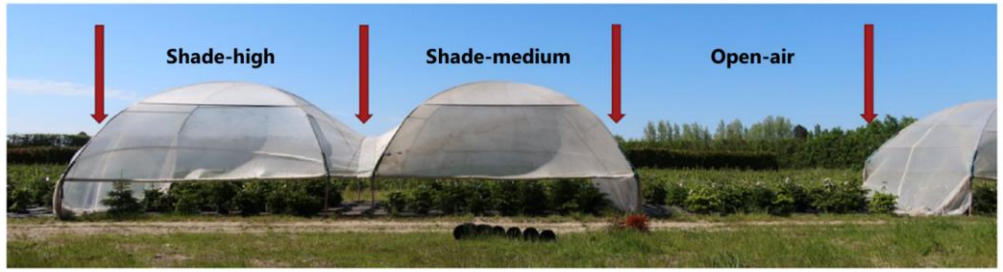
At tilvejebringe plantemateriale, der er egnet til dyrkning uden sprøjtning imod almindelig ædelgranlus i arterne nordmannsgran og bornmüllergran

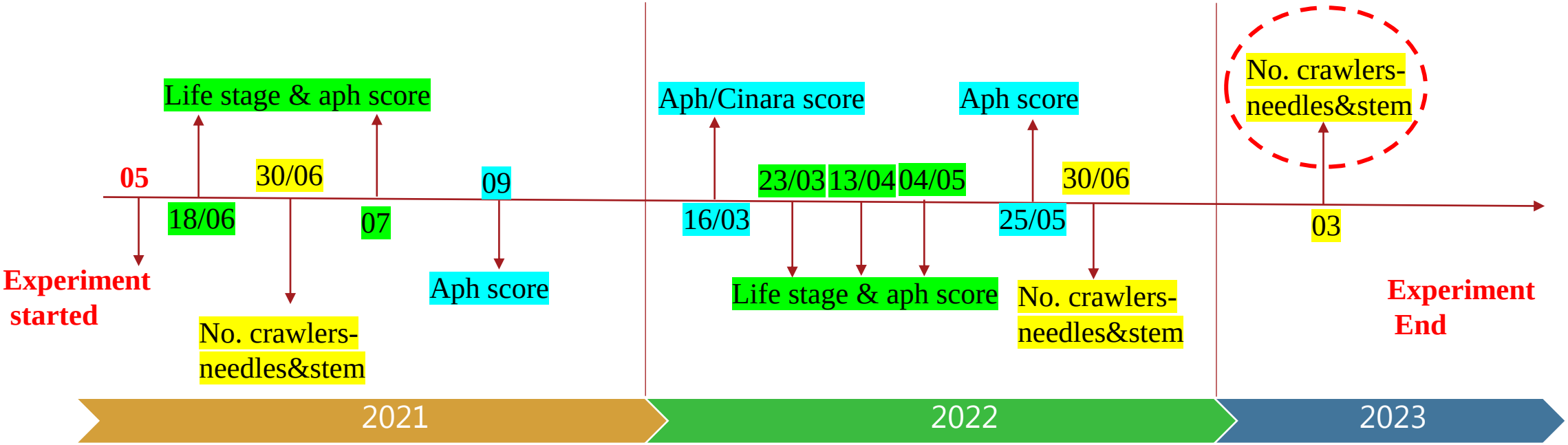
Figures: Nilsen, Ulrik B

Content

- Kirstineberg experiment results summary
- Provenance variation of adelgids study-DK VS US
- Conclusion-Perspectives

Kirstineberg timeline and activities





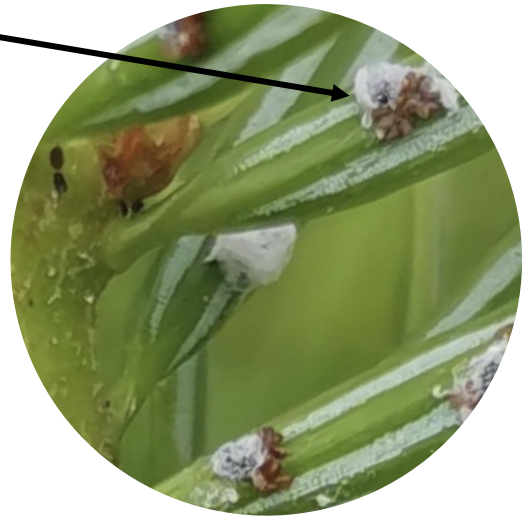
The life cycle of adelgids

End April- End May

Beginning of June

Middle of June

End of June

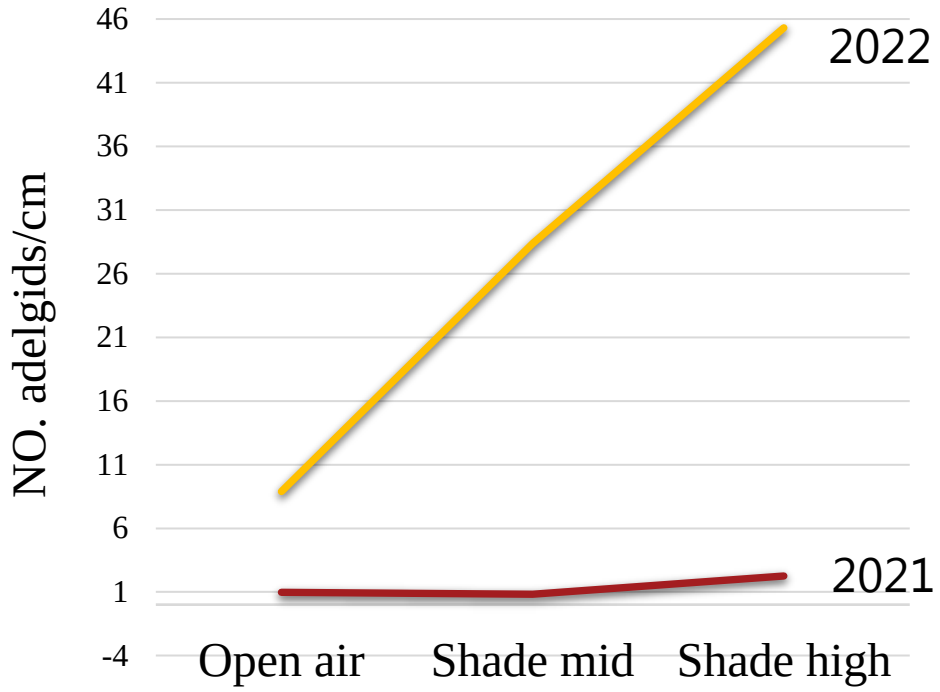


Crawler moves back to the stem and stays like this stage over winter

Figures: Chastagner, Gary A

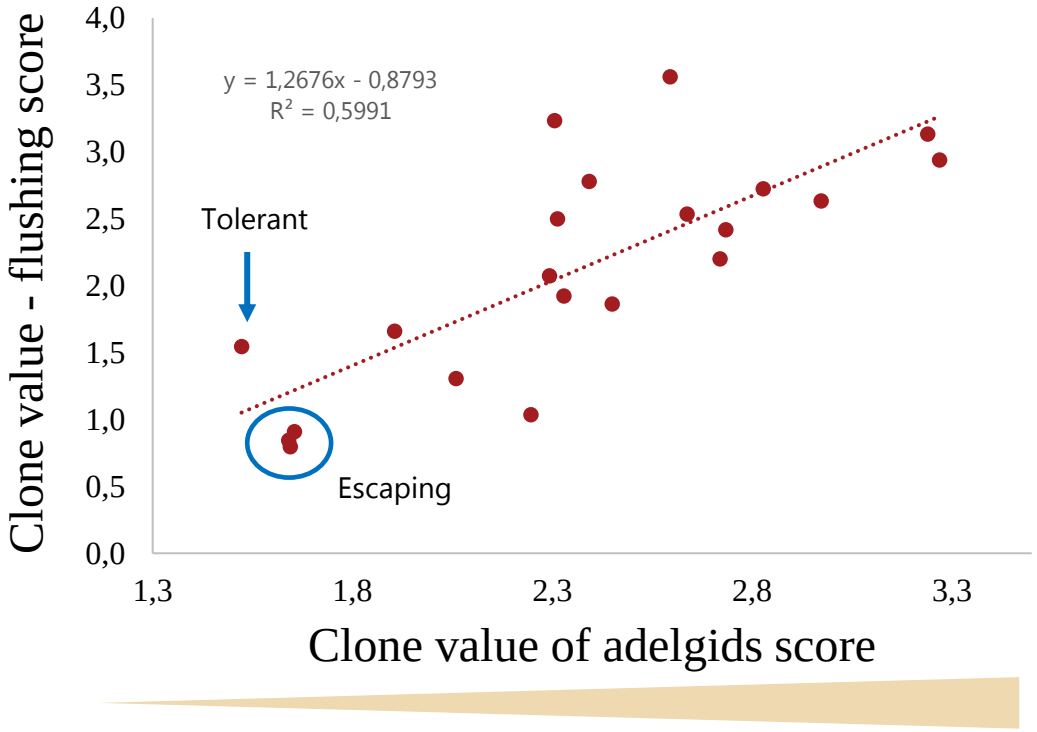
Kirstineberg results summary

- Adelgids population develop more in the shade environment
- Strong genetic control of Nordmann fir against adelgids, H2 = 0.25
- Late flushing genotypes have fewer adelgids infestation

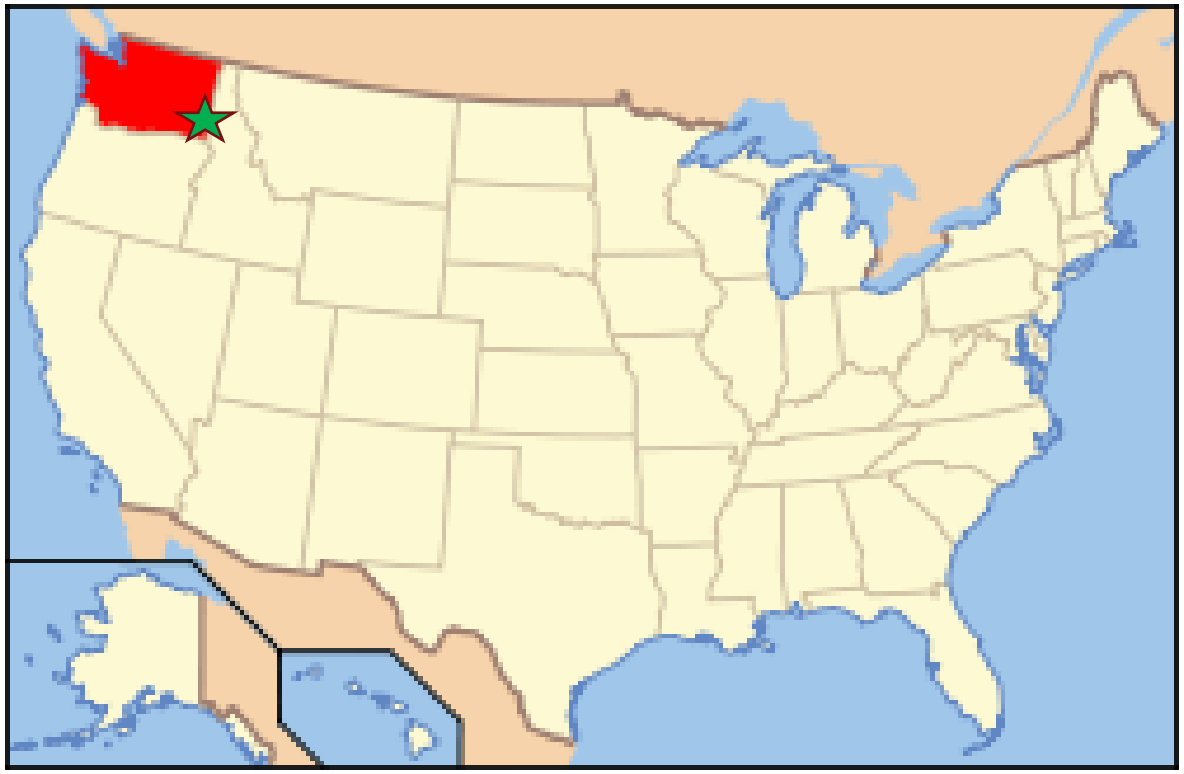


Early

Late



Variation of Species and provenances to adelgids study



USA

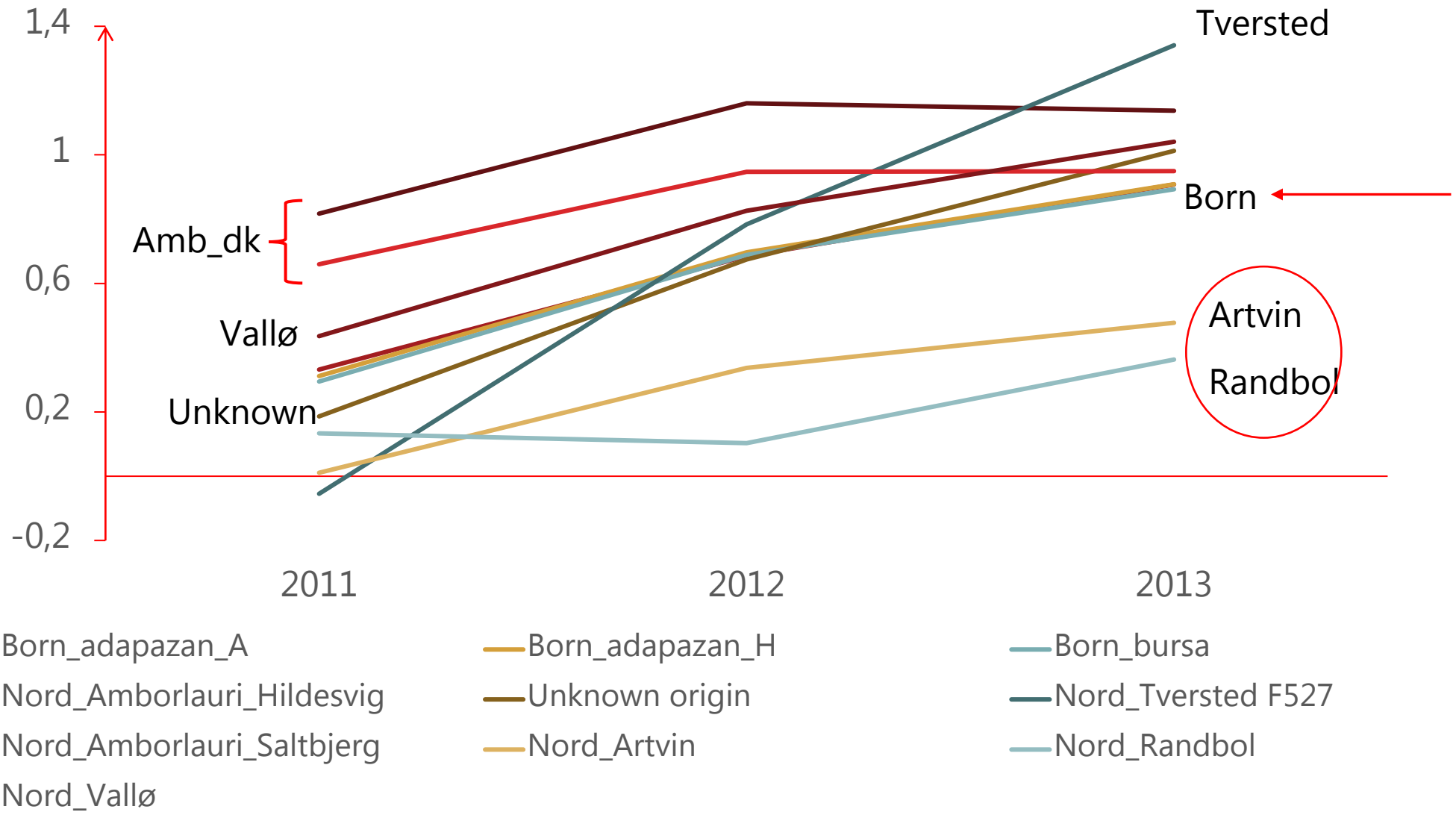
Place: Washington State University

Naturally infested by *Adelgid nordmannianae*, evaluated from 2010 to 2013

***A.Bornmülleriana* (3)**
Kormusu
Hdende
Akyazi

***A.Nordmanniana* (7)**	
Direct import	Artvin, Yayla
Danish material of presumed Amborlauri origin	F690 Saltbjerg
	F665 Hildesvig
Unknown origin	Farum Sønderskov
Danish material of Northern Caucasus origin	FP244 Randbøl
	FP274 Vallø
Danish material of Borshomi origin	F527 Tversted

Adelgids damage score of different species/provenances



Denmark

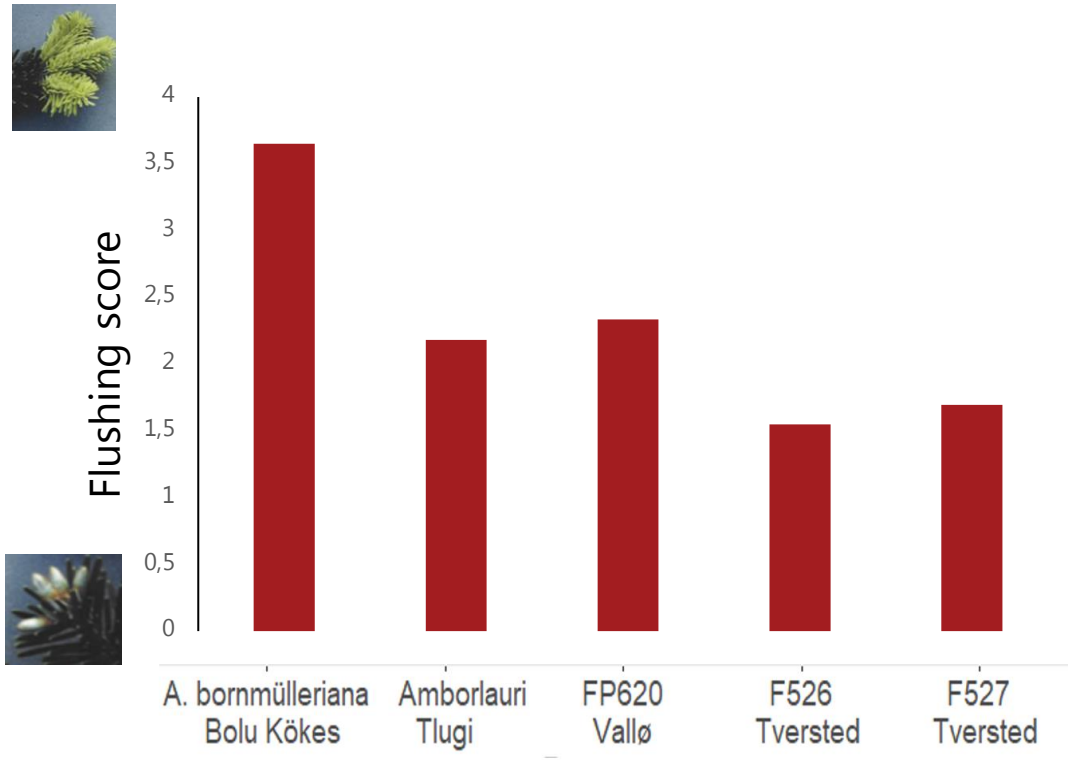
Place: Arboretum Hørsholm in Denmark

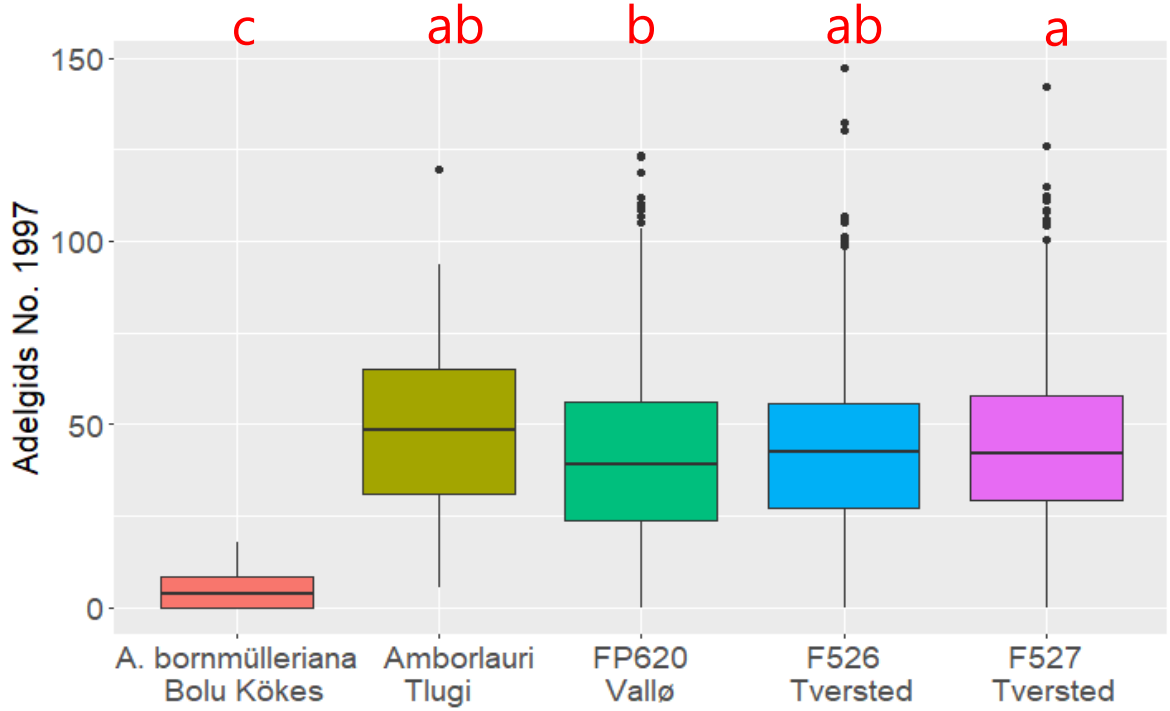
Artificial infestation by *Adelgid nordmannianae,* evaluated in 1996, 1997 and 2005

A.bornmülleriana
Bolu-Kökes

***A.Nordmanniana* (4)**	
Direct import Amborlauri origin	Tlugi
Danish material of Northern Caucasus origin	**FP274 Vallø**
Danish material of Borshomi origin	**F526 Tversted**
	F527 Tversted

DK results-flushing-No. of adelgids

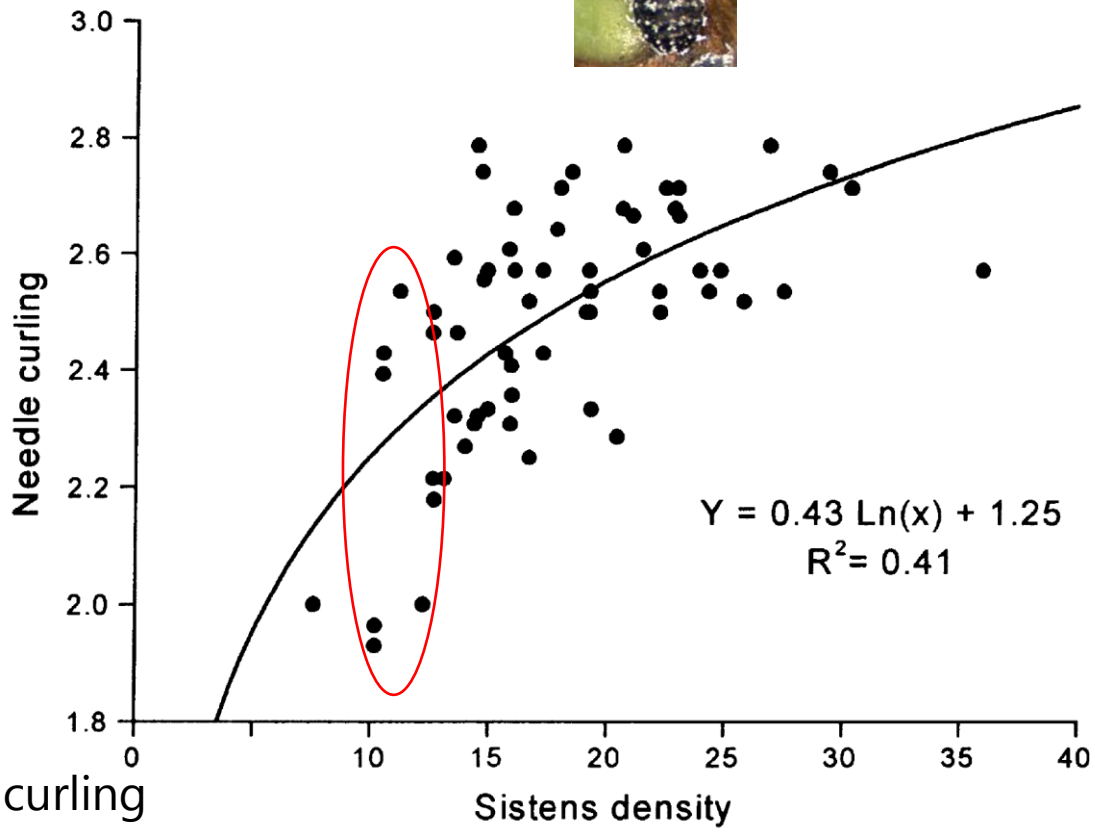




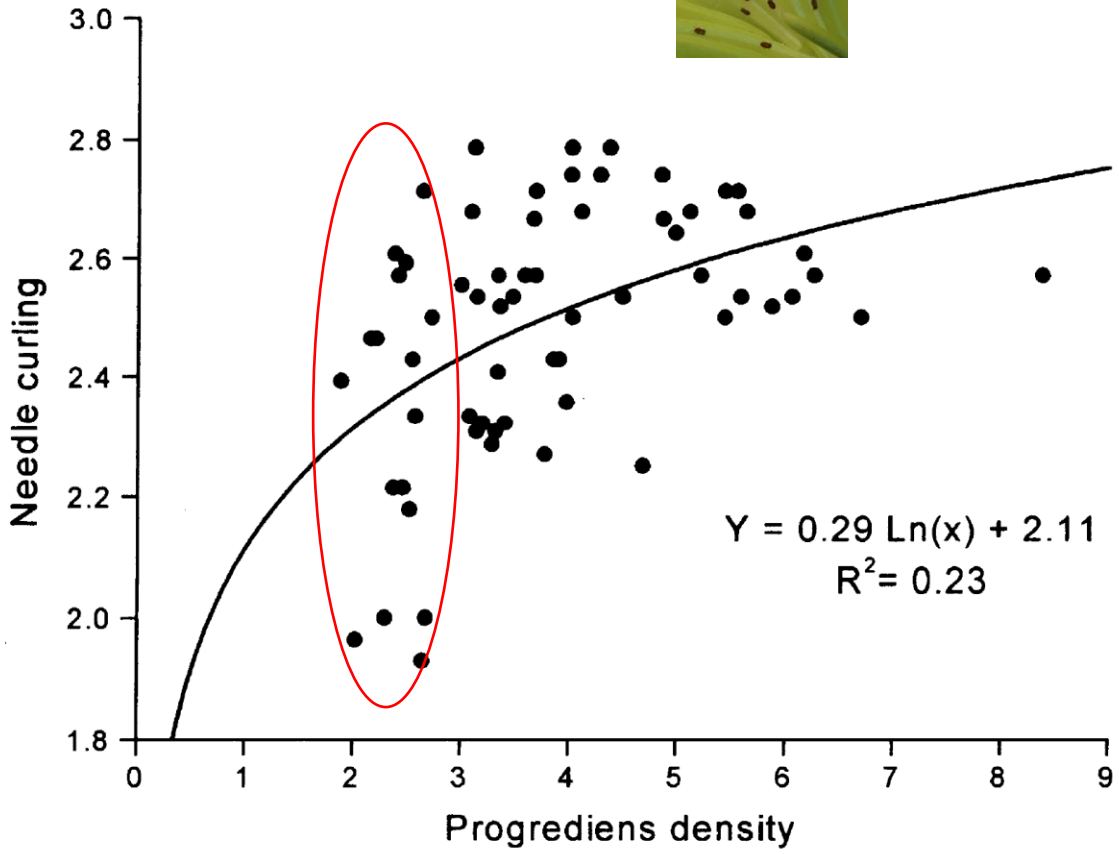
NO. of adelgids vs damage

severe curling

No./cm shoot



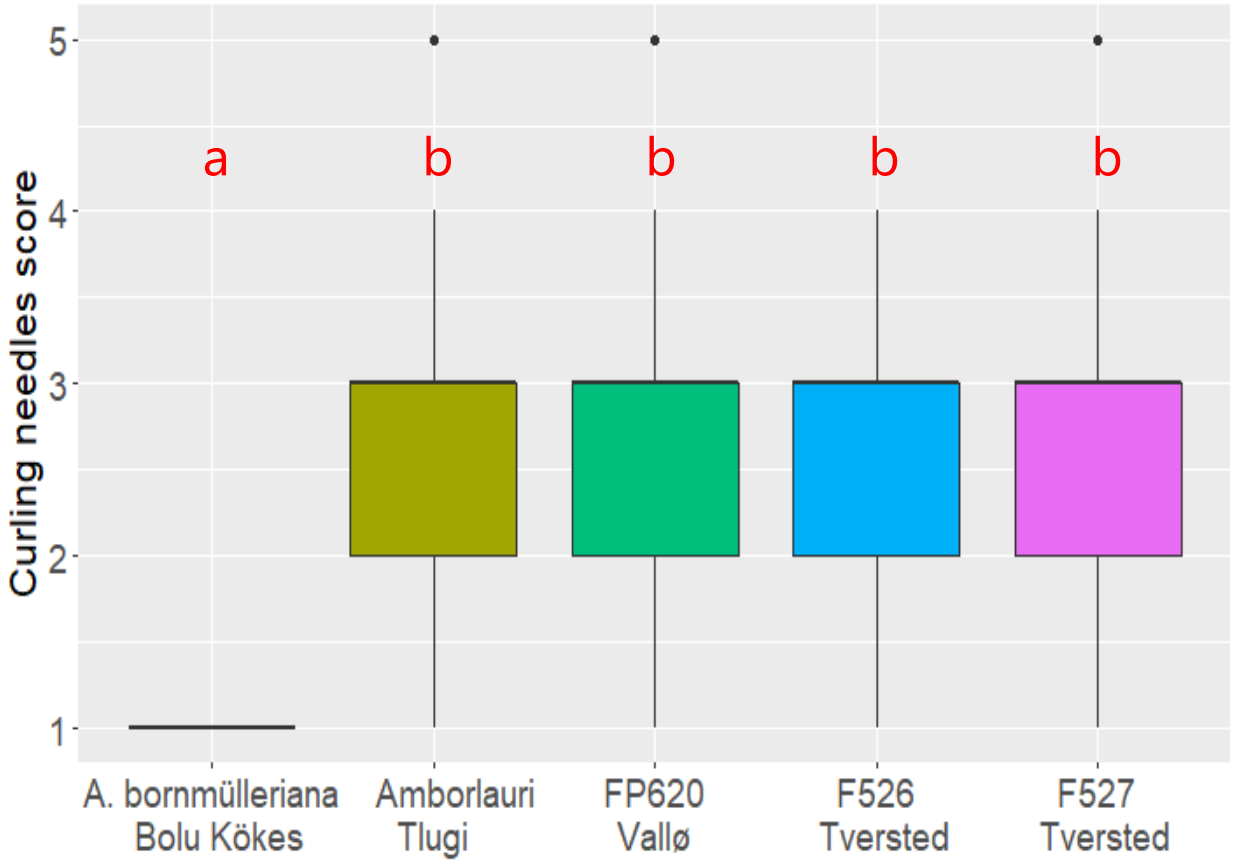
No curling



Nielsen et al. 2002, For. Ecol. Manag.

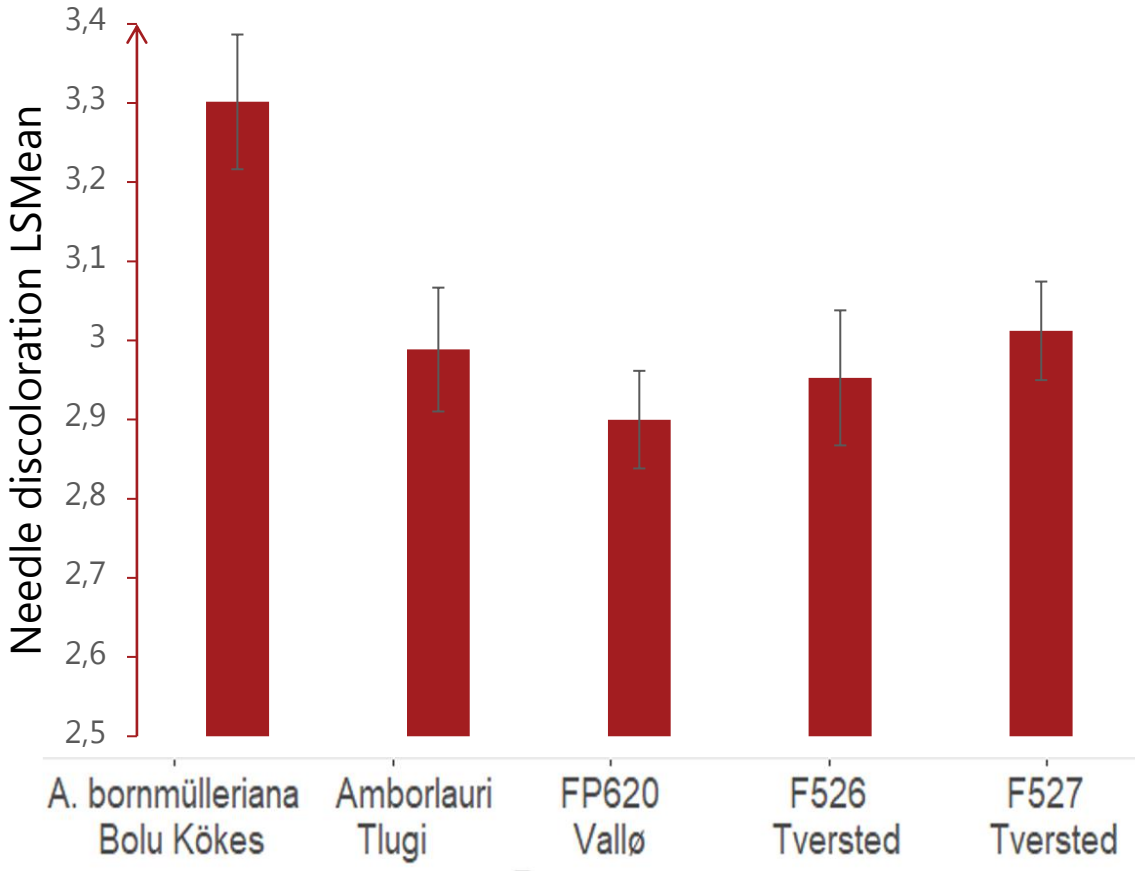
Adelgids damage

1997 (2nd y after infestation)



Greener

2005 (10 y after infestation)



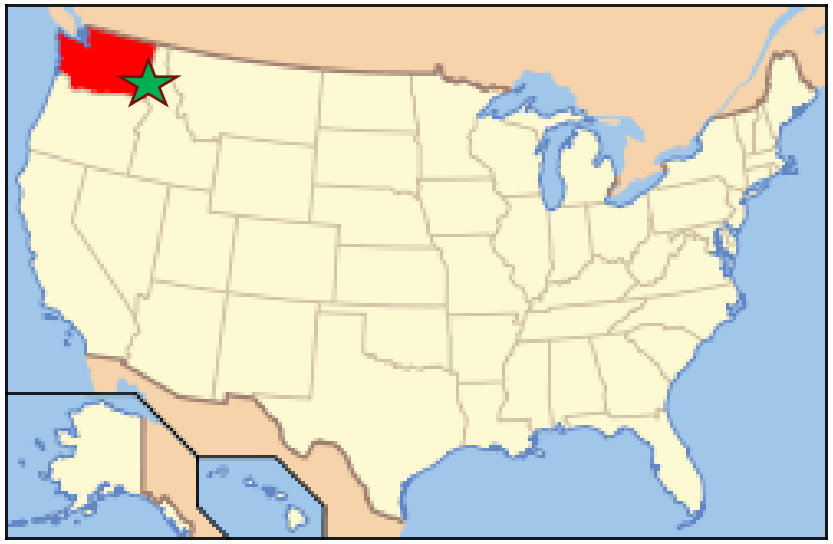
Do we get the same results at different locations?

Adelgids damage score 1997 and 2005

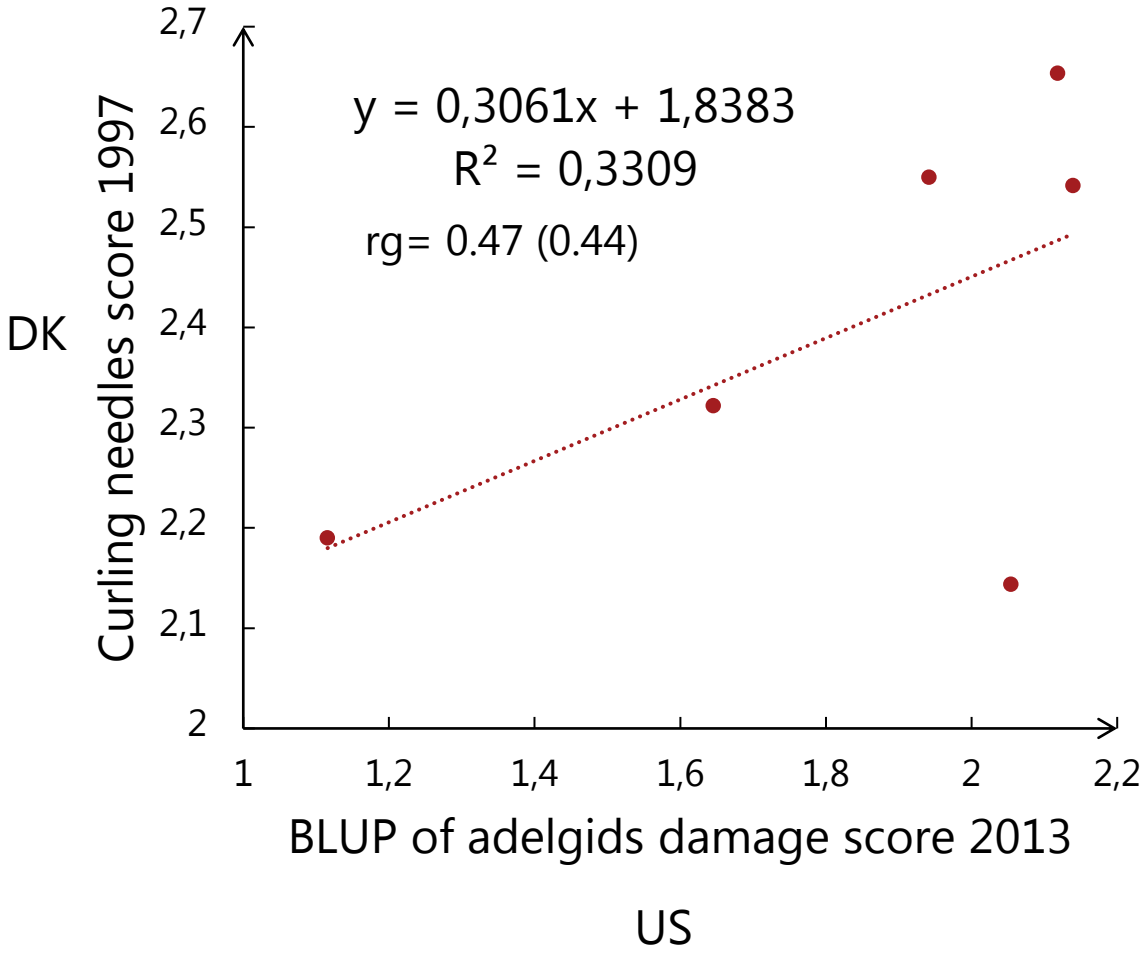
FP620 Vallø

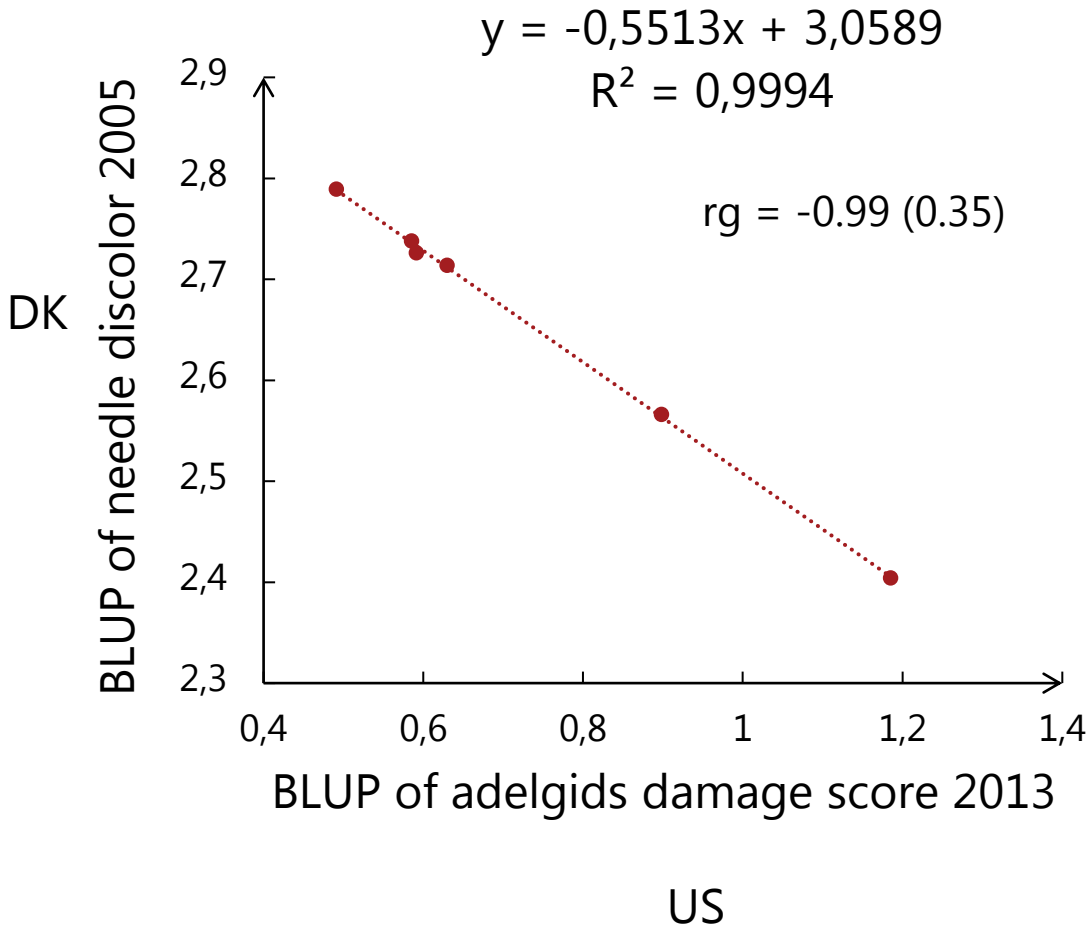
clone1
clone7
clone12
clone13
clone15
clone18

Adelgids score 2011 - 2013



Danish results vs US results





Can clone seed orchard can be used for resistance study?

1997 and 2005 (artificially infested 96)

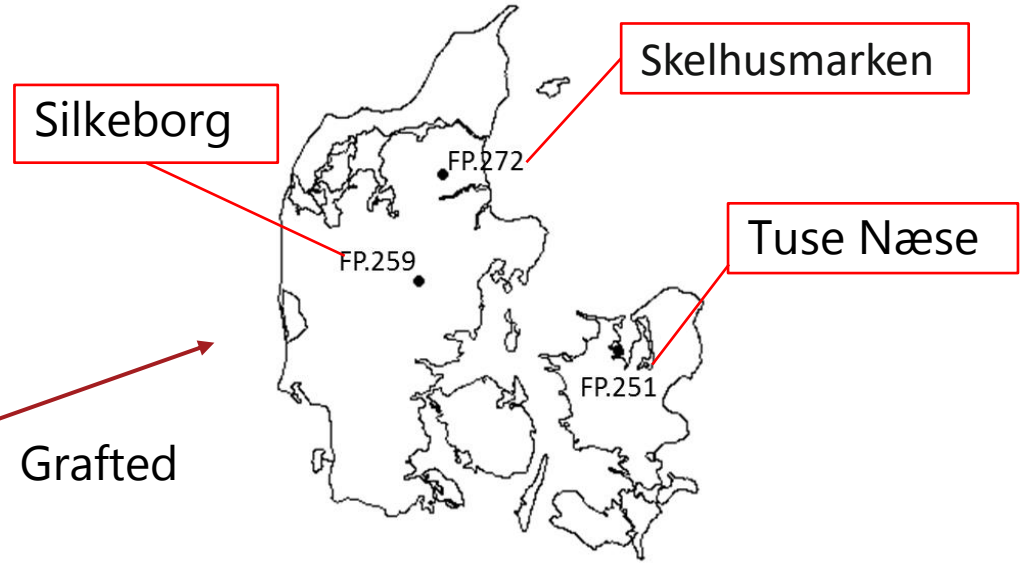
Offspring

A.nordmanniana	
Direct import Amborlauri origin	Tlugi
Danish material of Northern Caucasus origin	FP274 Vallø
Danish material of Borshomi origin	F526 Tversted
	F527 Tversted

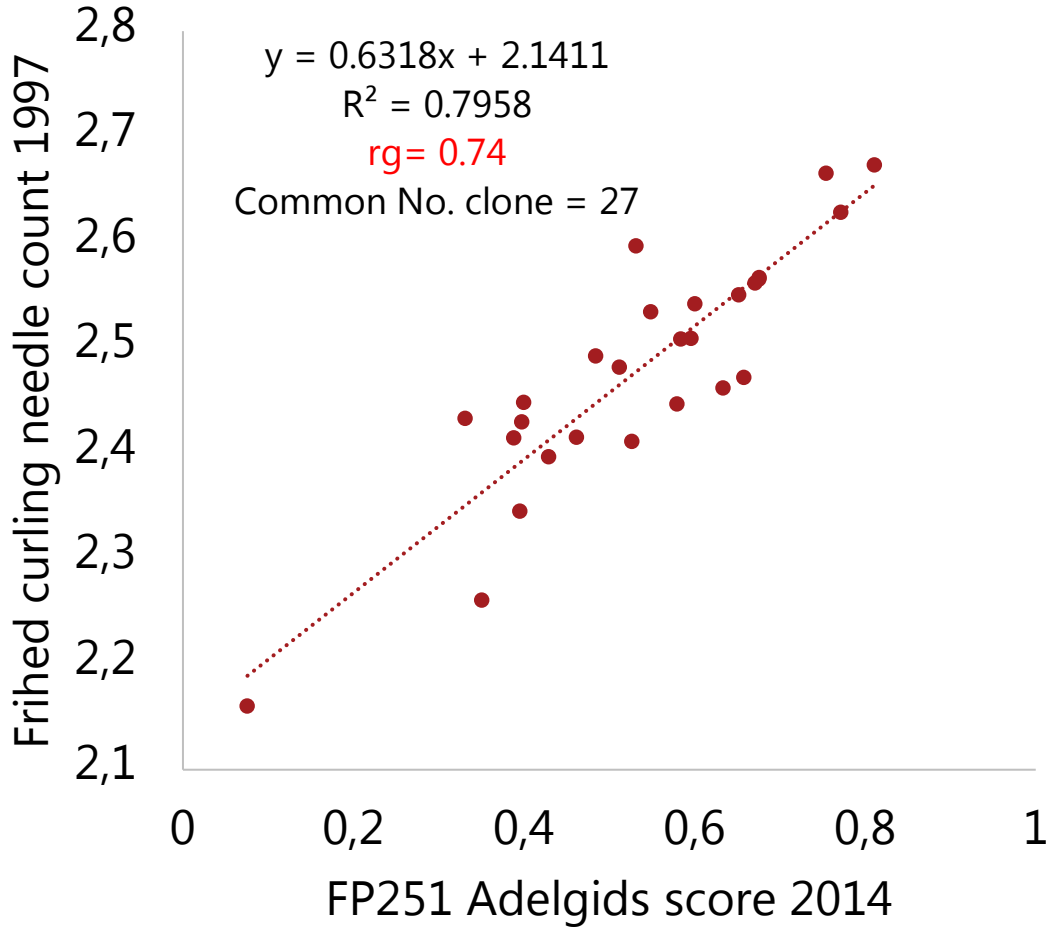
Grafted

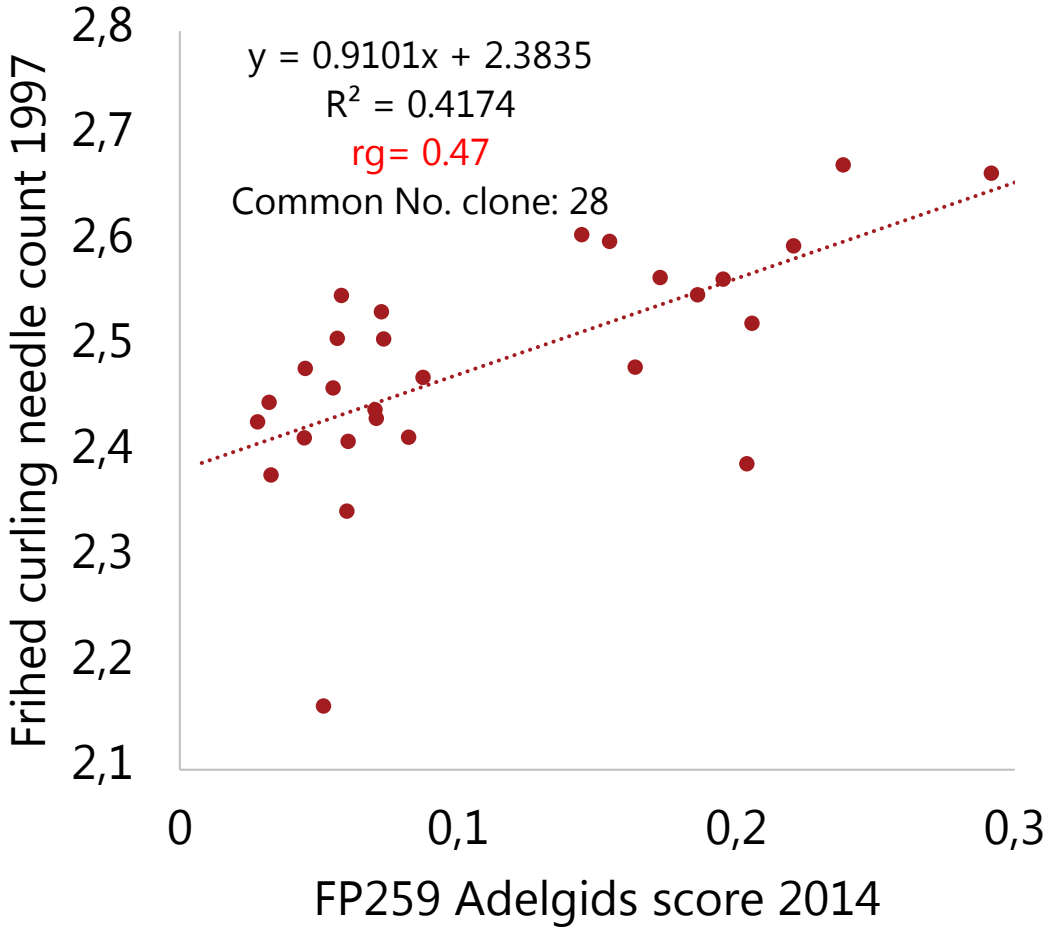
2014 adelgids score (natural infested)

Parents clones

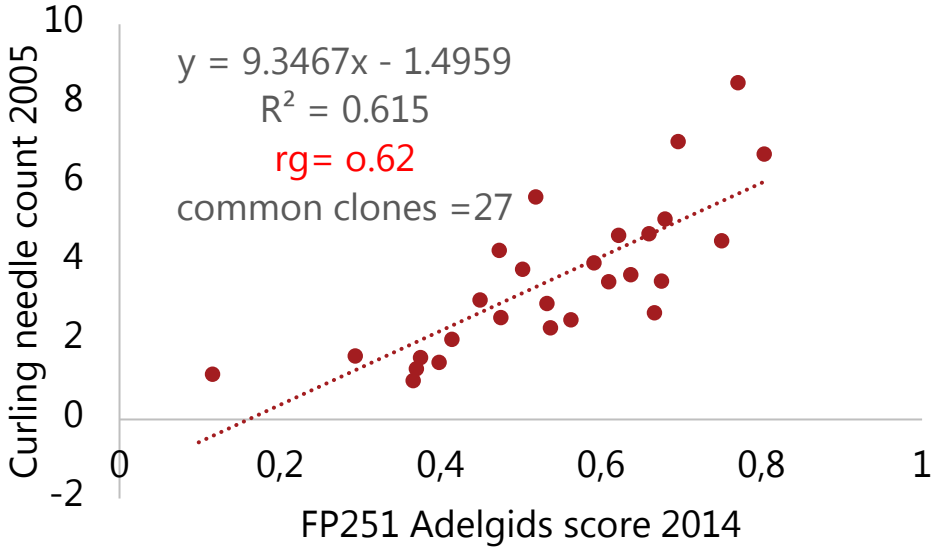


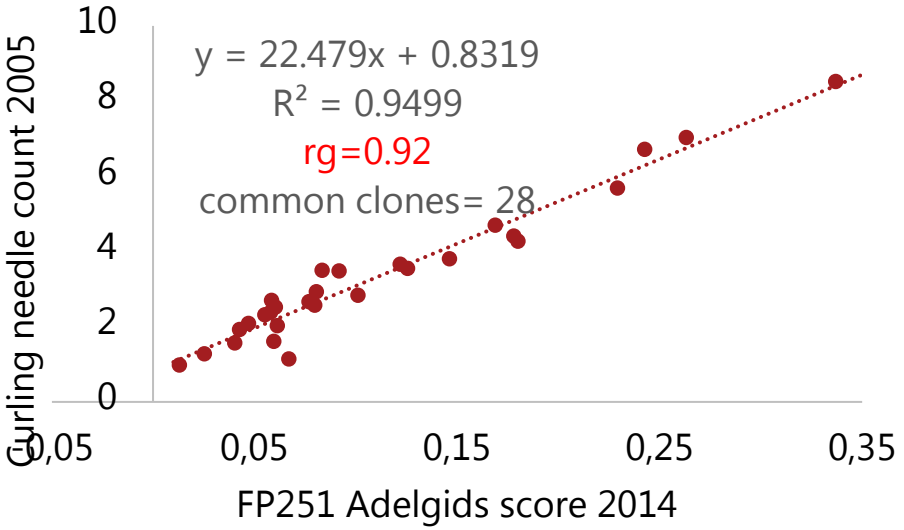
Offspring VS Parents clones – 1997 (2nd year after infestation)

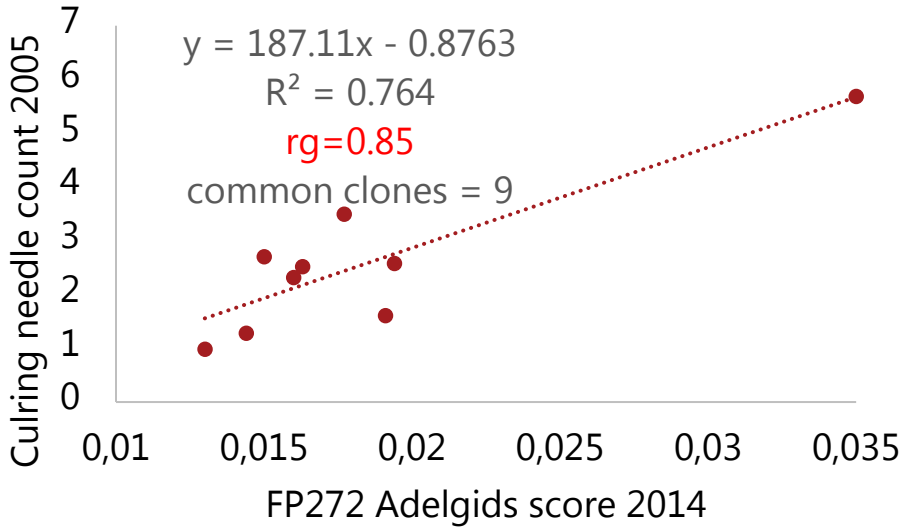




Offspring VS Parents clones – 2005 (10 y after infestation)







Conclusion

- Species and provenance variation is pronounced
- Possible to select more resistant material
- Genetic performance against adelgids is stable
- Early evaluation is reliable for selecting new material
- Clone seed orchard can be used for selecting better material-tolerant

Perspectives -Combine information for better seeds

Quality

Tolerance

Better seeds