



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences



Biocontrol of cherry spruce rust disease caused by *Thekopsora areolata*

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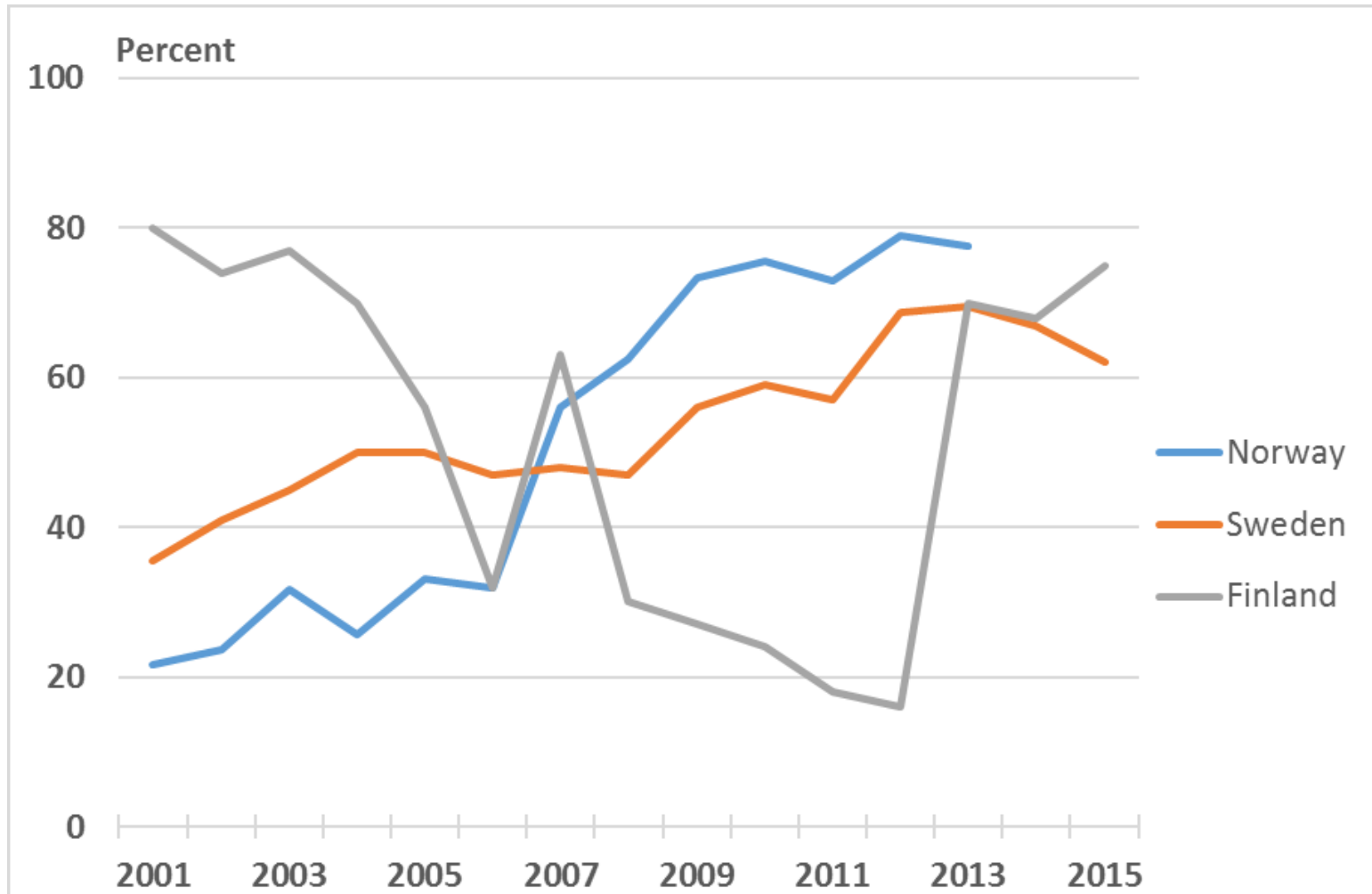
- Ongoing project (2015-2017), financed by Skogssällskapet
- Project leader: Åke Olson, SLU
- Co-workers:
Malin Elfstrand, SLU and Curt Almqvist, Skogforsk



Background

- Increased demand for seed orchard seed
- Establishment of new SOs programmes are almost completed in Sweden and Finland
 - Sweden: TreO – third batch of SOs
 - Finland: 1.5 Gen SOs
- Norway spruce seed production in SOs has two main problems:
 - Irregular flowering
 - Damages by insects and rust fungi

Seedlings from SO seed in the Nordic countries



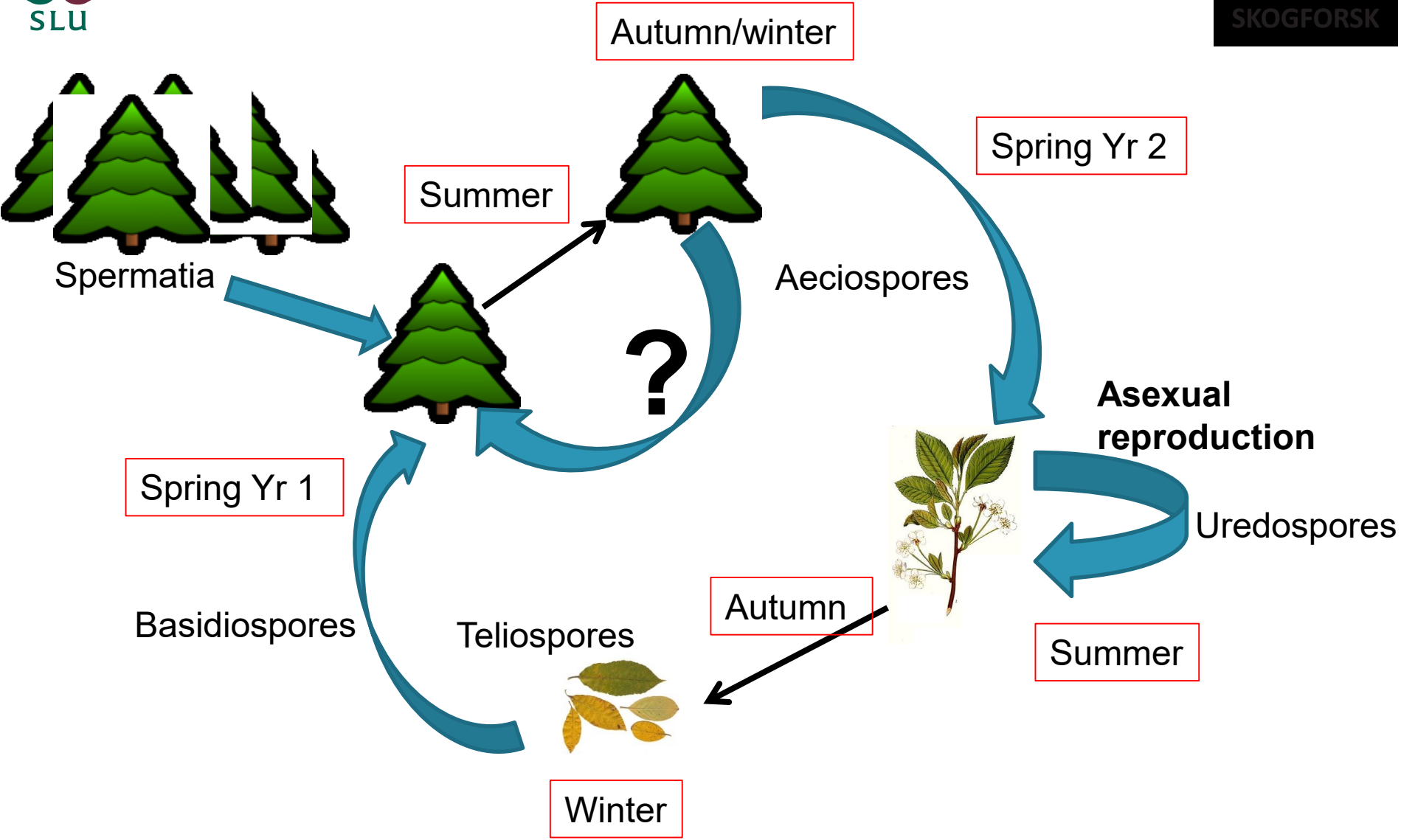
What to do to increase SO seed production?

- Increased intensity in management
- Flower induction treatment (GAs and root pruning)
- Control of insects
- Control of Cherry spruce rust

Cherry spruce rust

Thekopsora areolata

- Rust fungus
- Infects Norway spruce (*Piceas abies*)
 - Cones and young shoots
- Alternate host *Prunus* species
- Occurs in Europe and Asia



Lifecycle of Cherry spruce rust



Goal

To identify potential biological control organisms active against Cherry spruce rust

Sampling strategy

Spring

Female flowers

Autumn

Healthy cones

Infected cones

Sampling

Region	Seed orchard	# flowers	Healthy	Infected
North	Hissjö	50	8	8
North	Sävar	50	8	8
North	Domsjöänget	50	8	8
Central	Jung	50	10	10
Central	Ålbrunna	50	12	12
Central	Brunsberg	50	Problem with freezer	
South	Nedre Sandby	50	No rust	
South	Maltesholm	50	9	9
South	Maglehem	50	No rust	

Identification of the micro flora

- DNA extraction from flowers/cones
- Sequencing of ITS (Bar code)
- Identification of the fungus society
- Sample size
 $(4 + 4 + 4) \times 8 \times 6 = 576$



Thank you for your attention

IUFRO Seed orchard
Conference

Uppsala
September 4 – 7, 2017

”Seed Orchards – The
Key to a Sustainable Bio-
based Economy”

