



ForestValue

Kick-Off Seminar, Helsinki, 23-24 May 2019

MULTIFOREVER (36 months, 2019-2022)

Towards intensification of conifer production through multi-varietal forestry based on somatic embryogenesis

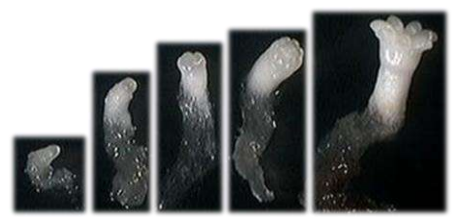
Jean-François TRONTIN, FCBA technological institute, France
Andrea RUPPS, Humboldt University of Berlin (HUB), Germany

➔ Wood biomass / intensively managed plantations

Topic A

ForestValue

Innovative sustainable management of multifunctional forests



How it may have begun ...



Project MULTIFOREVER is supported under the umbrella of ERA-NET Cofund ForestValue by ANR (FR), FNR (DE), MINCyT (AR), MINECO-AEI (ES), MMM (FI) and VINNOVA (SE). ForestValue has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 773324.



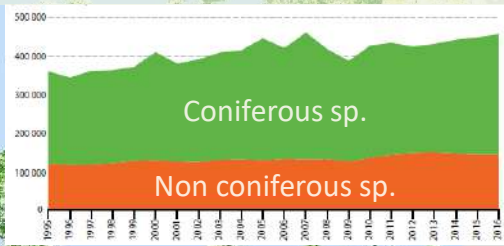
ForestValue

Forestry: mainly conifers

Total EU: 113 Mha

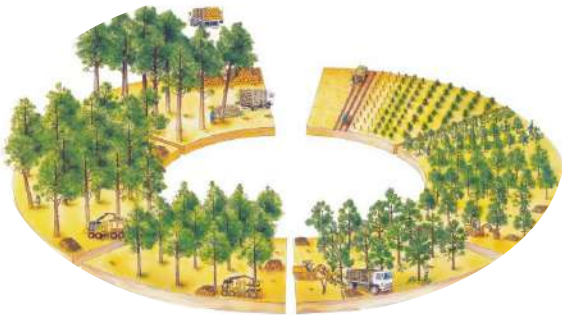
Wood demand increasing

(EU-28, roundwood/1000 m³, Eurostat)

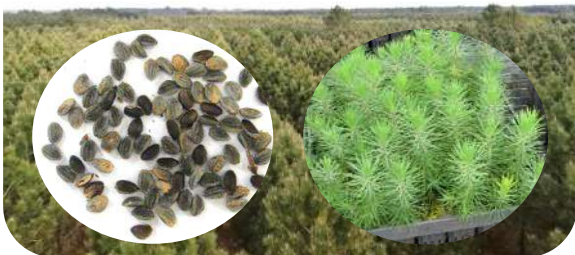


Mainly planted forests

→ Improved varieties



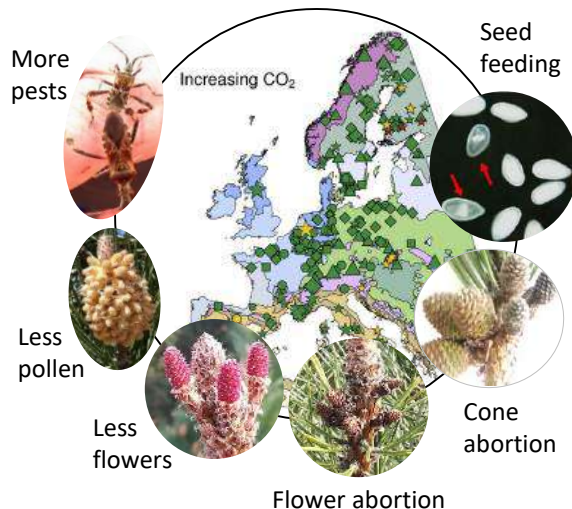
Mostly through seed orchards



The first contact ...

Climate change → Stress

(Lindner et al. 2014)



BUT

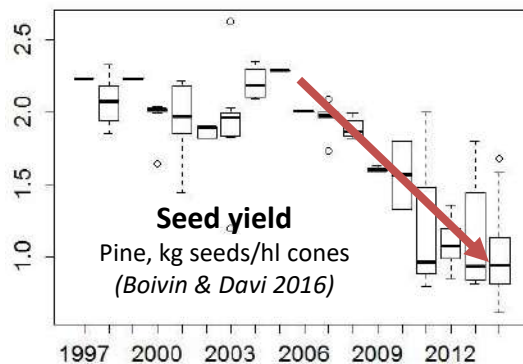
**Limited success
in conifers
(recalcitrance)**



Cutting



Seed shortage



BUT

**Seed-based
Forestry**

→ Sexual
reproduction

IDEA!

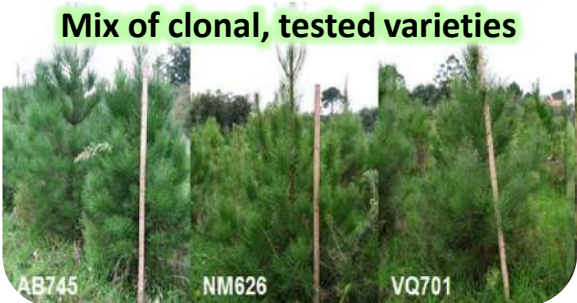
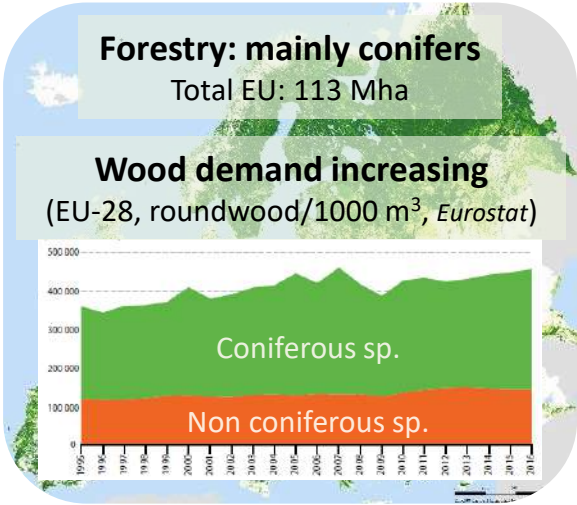
→ Vegetative,
clonal propagation



1

**Tree
Variety**

ForestValue

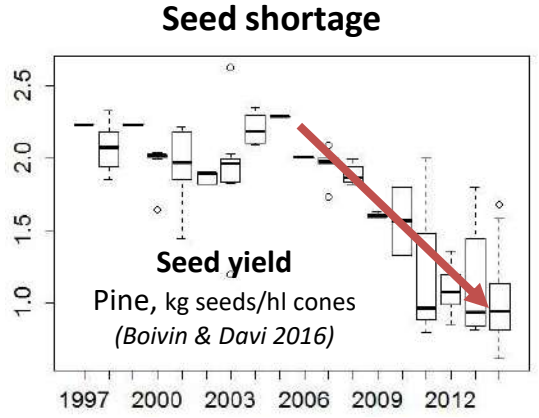
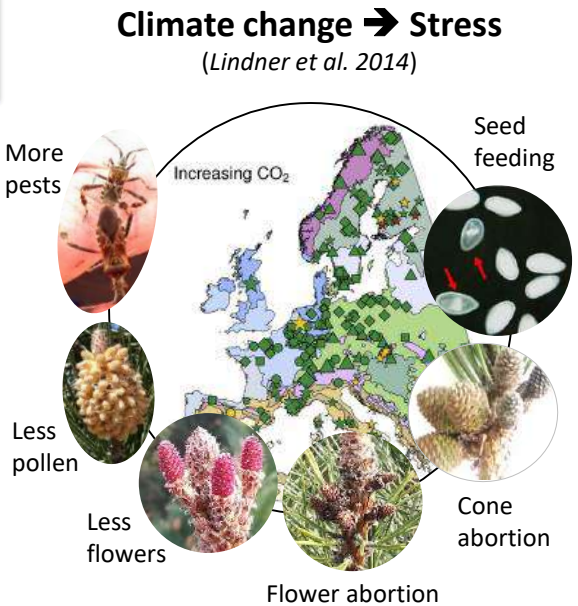


LESS
PROBLEM!

NEW!

Multi-varietal
Forestry
→ Sexual
reproduction

Our great idea!



SUCCESS!



Limited success
in conifers
Somatic seedlings!
(recalcitrance)



Somatic Cutting Embryo



IDEA!

→ By somatic, embryogenesis



1 Seed Variety

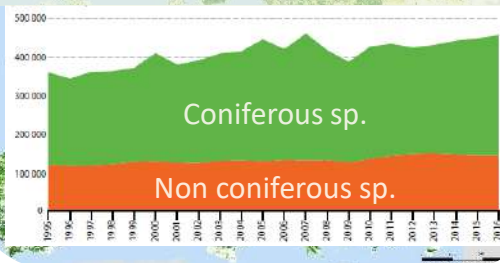
ForestValue

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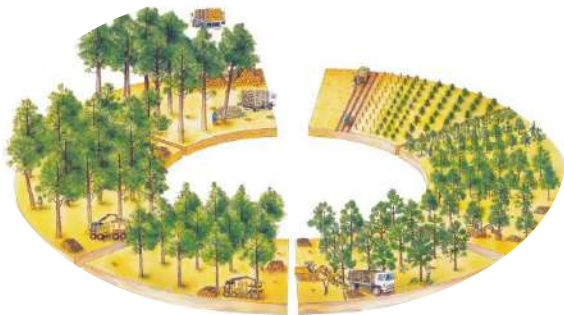
Wood demand increasing

(EU-28, roundwood/1000 m³, Eurostat)

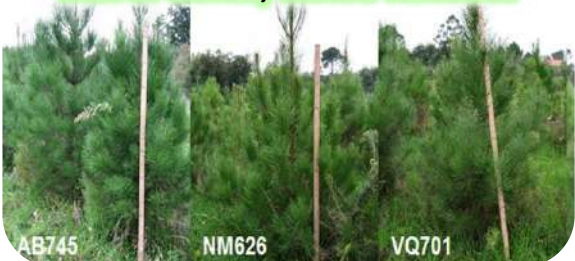


Multi-varietal planted forests

→ HIGHLY productive varieties



Mix of clonal, tested varieties



Conifer MVF:

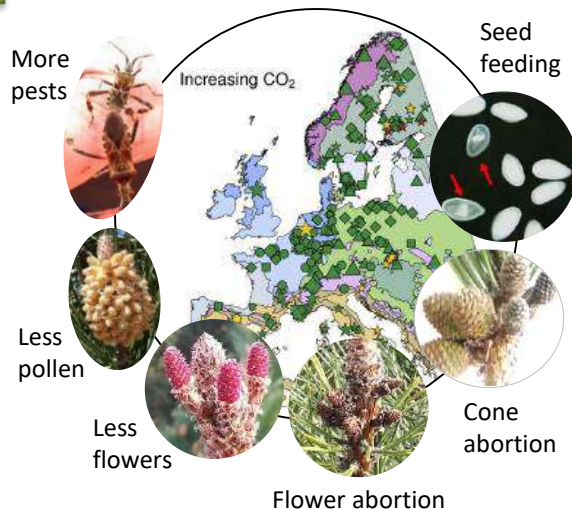
a new strategy for a greener, forest-based bioeconomy!

**LESS
PROBLEM!**



Climate change → Stress

(Lindner et al. 2014)

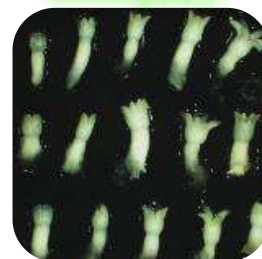


SUCCESS!

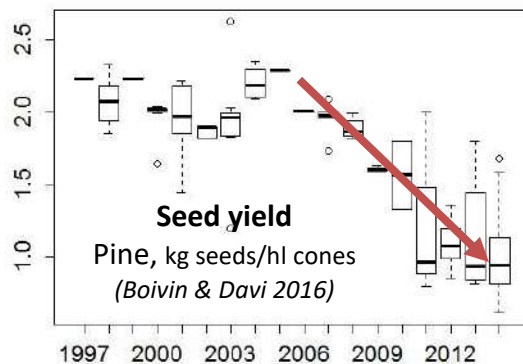
**Somatic
seedlings!**



**Somatic
Embryos**



Seed shortage



IDEA!

→ **By somatic
embryogenesis!**



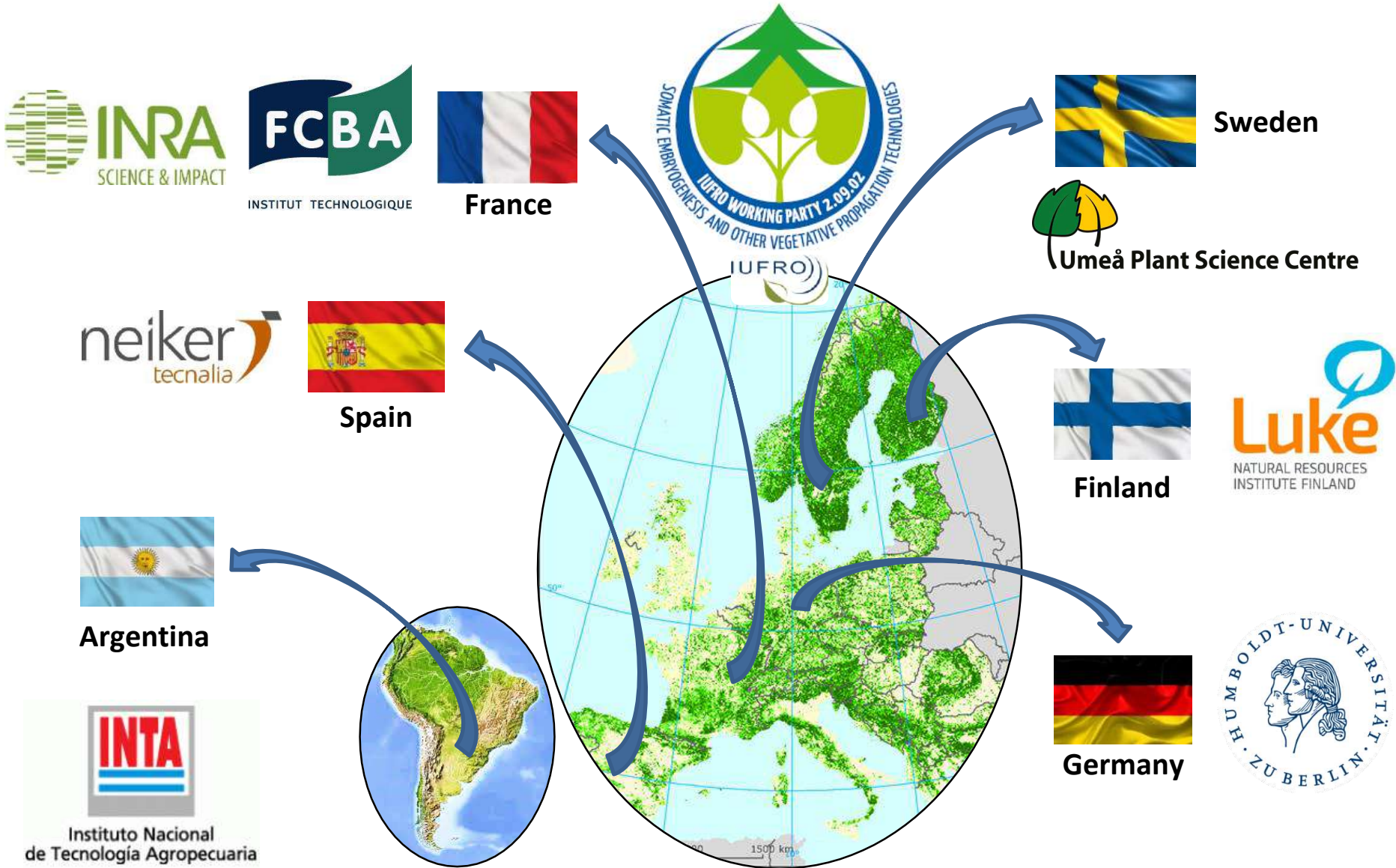
1

**Seed
Embryo**

NEW!
**Multi-varietal
Forestry**
→ Asexual
reproduction



7 expert teams in conifer somatic embryogenesis

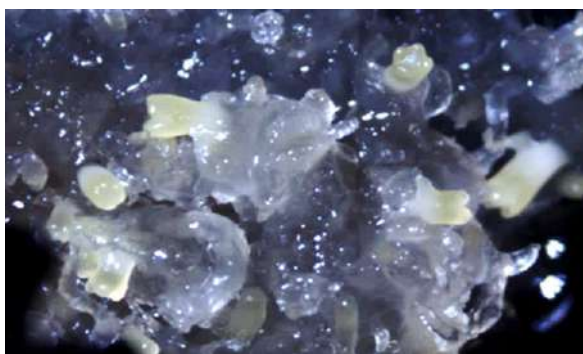




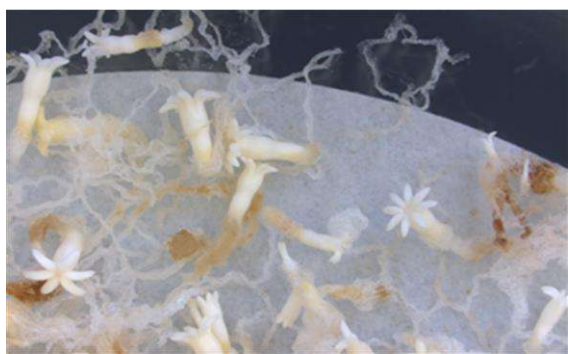
8 important conifer species in EU (7) and Argentina (2)



European larch
Hybrid larch
Douglas-fir



Loblolly pine
Hybrid pine



Radiata pine



Hybrid larch



Maritime pine
Loblolly pine
Douglas-fir



Norway spruce





Our 4 scientific & technical challenges



**Basic & applied
research (TRL 1-3)**



**Advanced research
(TRL 2-4)**



**Technological
demonstration (TRL 5)**



**Advanced research
& demonstration (TRL 3-5)**



« The Holy Grail »

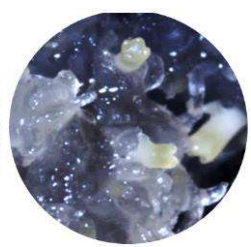
« Streamline the process! »

« It's the mix that matters! »

« Who will make the big bucks? »



**Initiation
Multiplication**



**Cryopreservation
Maturation**



**Germination
Acclimatization**



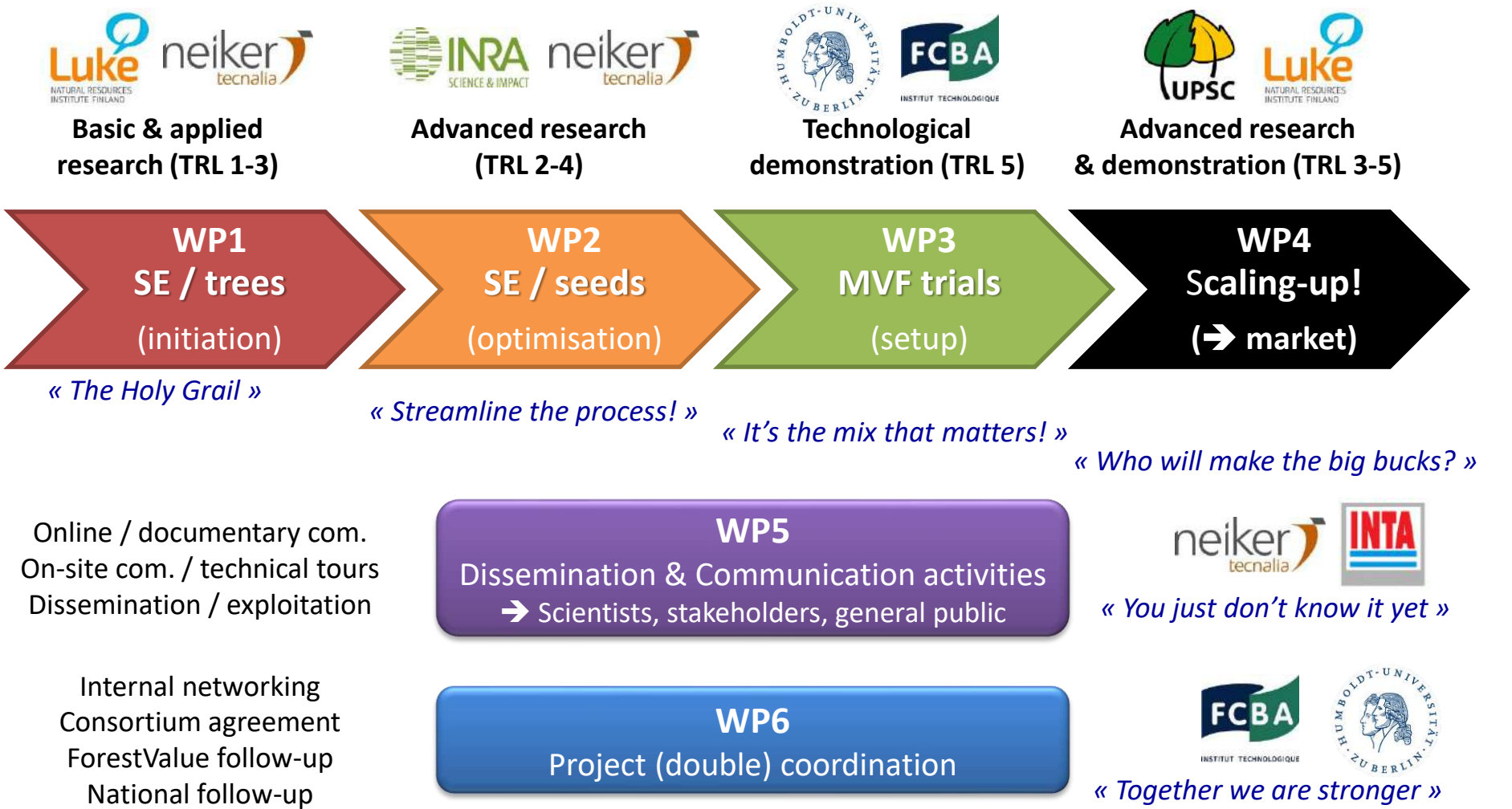
**Field trials
MVF demo**



**Scale-up
Automation
Cost-efficiency**



Our communication & coordination plans





Our transnational support



Stakeholders (8 organizations from 5 countries)



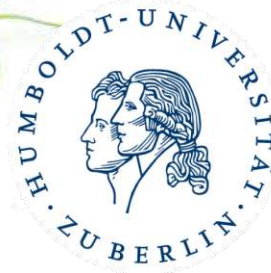
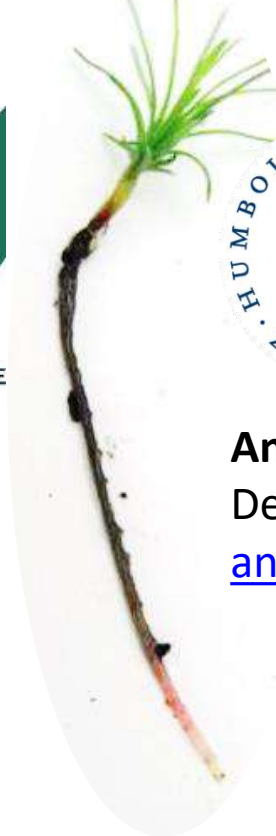
Funding agencies



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Ministerio de
Ciencia, Tecnología
e Innovación Productiva
Presidencia de la Nación



Thank you for your attention!

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P7 - Egertsdotter U, Dobrowolska I, Street N, Eman A (**UPSC**)

Multi-varietal forestry
Vegetative propagation
Somatic embryogenesis
Demonstration trial

Cost efficiency
Scaling-up
Market analysis
Commercialization concept



*The increasingly important role that conifer multi-varietal forestry
could play in the EU and Argentina to deploy high-yield varieties
adapted to environmental and socio-economic constraints*