#### **Birch and Alder Improvement**

#### **Oliver Sheridan**



#### Introduction

- Birch programme initiated just over 20 years
- The Alder programme just over 16 years
- Native species
  - Downy birch (*Betula pubescens*)
  - Silver birch (*Betula pendula*)
  - Alder (*Alnus glutinosa*)
  - Birch not grown for commercial timber production
  - Birch not on the recommended species list
  - Mainly planted for Native woodlands



#### Introduction

#### Main Objective

- Genetic improvement of birch and alder germplasm for deployment in farm forestry
- Seed collected 1999
  - 27 Betula pubescens & 16 Betula pendula provenances
- Representing a total of:
  - 94 B. pubescens & 27 B. pendula families
- Grafting also carried out on selected genotypes
  - Full sib crosses and polymix crosses
  - Field trials established



## **Birch Improvement**

- 2001 Field trials established
- 2012 Teagasc Indoor seed orchard established
- 2015 Commercial partner
- 2017 Improved birch added to the recommended species list



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#### **Teagasc Clonal Seed Orchard**

2017 – Seed orchard relocated to new facilities at Teagasc Ashtown Research Centre









## **Teagasc Field Trials**

 2017 Two progeny trials established with seed from the indoor seed orchard





7

## **Birch progeny trial Waterford**





## **Birch progeny field trials**



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## **Birch progeny trial Sligo**













#### **Silver Birch**

- Silver birch relatively uncommon
  - Not sufficient numbers to base a native breeding programme
- > 2013 Obtained from FTT colleagues
  - > Scion wood for 35 silver birch plus trees
  - Seed representing 12 of the plus trees
- > 2014 Established
  - > 3 observational field trials (with 12 seedlots)
  - Indoor seed orchard
- > Aim
  - Assess suitability of the Scottish material for growing in Ireland in terms of growth traits and adaptability











### **Birch Seed Orchards**

- Downy birch seed orchard Ashtown
  - Pot grown age 8 years













#### **Silver Birch Indoor Seed Orchard**

- 2022 30 plus-trees
- 3 ramets
- Location Oak Park, Co. Carlow
- 45 It pots
- Aims:
  - Seed orchard granted Qualified status
  - Seed production for progeny testing (backward selection)



#### **Silver Birch Indoor Seed orchard**





#### Alder

- 3 progeny field trials established 2008/2009
- 85 families (seed collected from plus-trees in situ)
- Cavan, Clare and Sligo
- Field trials continue to be assessed
- Indoor seed orchard Ashtown
  - Plus-tree collection x 100
- Aim:
  - Establish progeny field trials to test parent material







#### **Gene Banks**

- Gene banks established in Oak Park
- Downy birch, silver birch and alder





23





## Finally

- Continue to source additional plus-trees
  - Downy and silver birch
  - Alder
- Continue to monitor existing field trials and establish new field trials
- Collaboration with Dheeraj Rathore
  - Tree improvement research projects
    - » BroadGen –studying genetic diversity and resilience
    - » ExAl Exploiting plant and rhizosphere microbiome of Alder trees for isolation of potential bio-agent against Alder dieback caused by *Phytophthora alni*
- Collaboration with Niall Farrelly
- AdaptForRes Adaptation, mitigation and protection strategies to increase resilience of Irish forests to address the impacts of climate change



# **Thank YOU**

