



Productive Woodlands:
A researcher's perspective

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Teagasc



Acknowledgements

- Teagasc
 - Forestry Advisers
 - Jerry Campion (ret)
 - Derek Gibson
 - Ignacio Sevillano
 - Ted Wilson
- Jerry Hawe
- DAFM
- Woodland Trust
- NUIG Galway
 - Annette Harte
 - Daniel Llana
- UCD
 - Conor O'Reilly
 - Aine Ni Dhubhain
- Coillte
- Private owners

Introduction

- My background
- My research
 - Broadleaf silviculture
 - Alternative silviculture
 - » Short Rotation Forestry
 - » Continuous Cover Forestry
 - » Remedial silviculture
 - » Ash dieback
 - End-uses

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Broadleaf silviculture (2010-16)

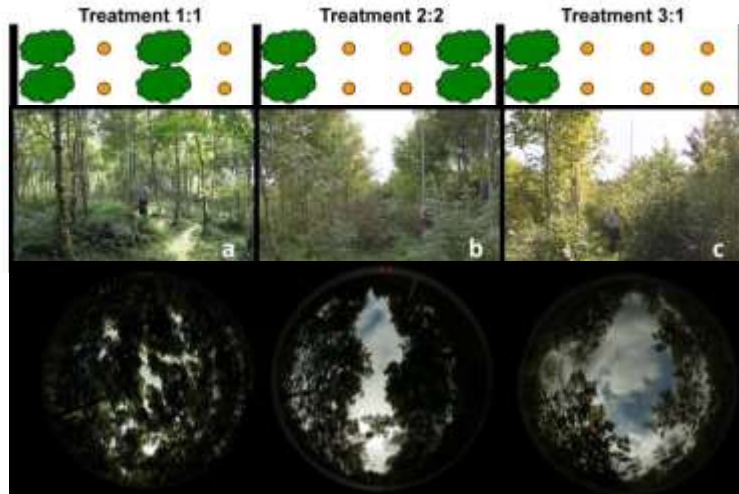
- Establishment
 - Mix configuration
 - Nelder
 - Shelter-in-advance
 - Shade tunnels
- Thinning
- Remedial
 - Coppice-with-standards
 - Free-growth
 - Underplanting



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Remedial

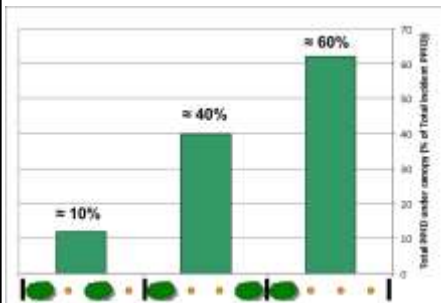


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Relative illumination (sycamore)



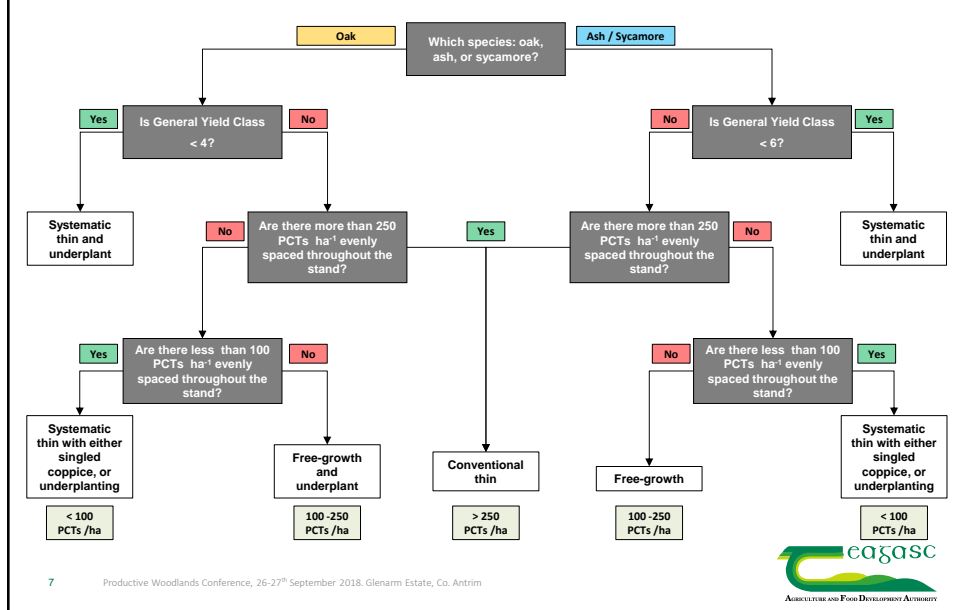
	Treatment		
	1:1	2:2	3:1
No. stools in plot	33	29	59
No. dead stools in plot	4	5	5
No. live stools in plot	29	24	54
% of stools that are alive in plot	88	83	92
Mean no. shoots per live stool	7.4	8.6	11.5
Mean no. shoots >1m tall per live stool	2.8	6.3	8.6
Mean % shoots > 1m tall per live stool	37	74	75
Mean ht of tallest 2 shoots per stool (cm)	139.1	194.8	239.1
Mean dia of tallest 2 shoots per stool (mm)	13.1	20.1	22.4

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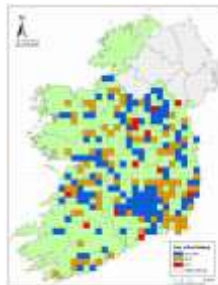


Provisional protocols



Ash dieback

- 2012
- Eradication policy
- Wider environment
- 2018 - Change in focus
 - Living with ash dieback



"It is clear from the latest scientific advice that eradication here is no longer considered feasible. Given this updated advice, our policy response must also change. The Reconstitution Ash Dieback scheme will be reviewed to ensure its continued relevance and value for money, and to ensure that **the forest owner is provided with a broader range of silvicultural and management options**,"

Minister of State for Agriculture Andrew Doyle. April 2018

Clearfell & replant

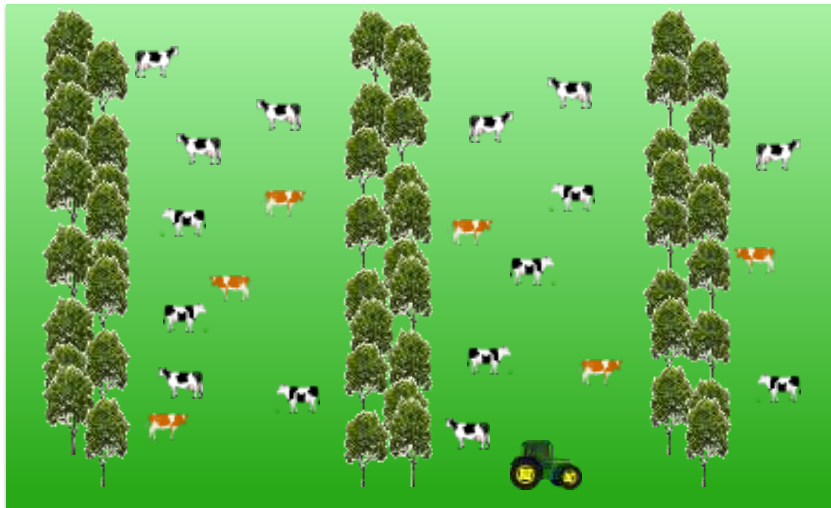


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Agroforestry



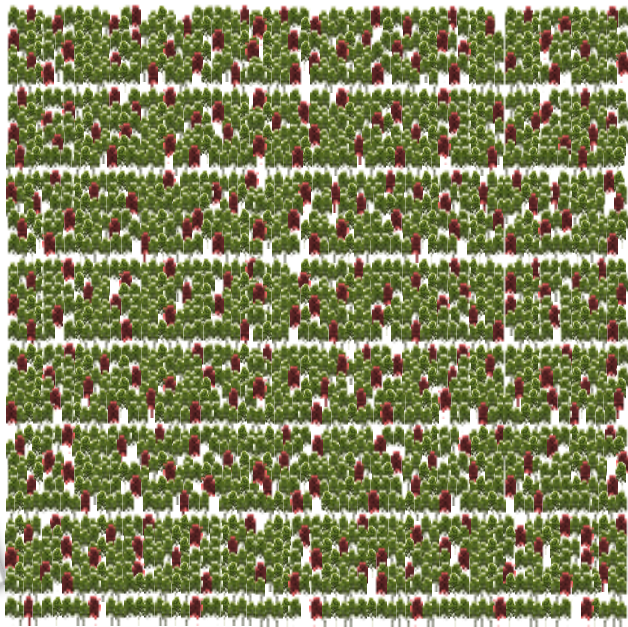
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Selection thinning

1 ha
 1.5 × 2 m spacing
 Racks 14 m
 300 PCT ha⁻¹
 Crown thinning



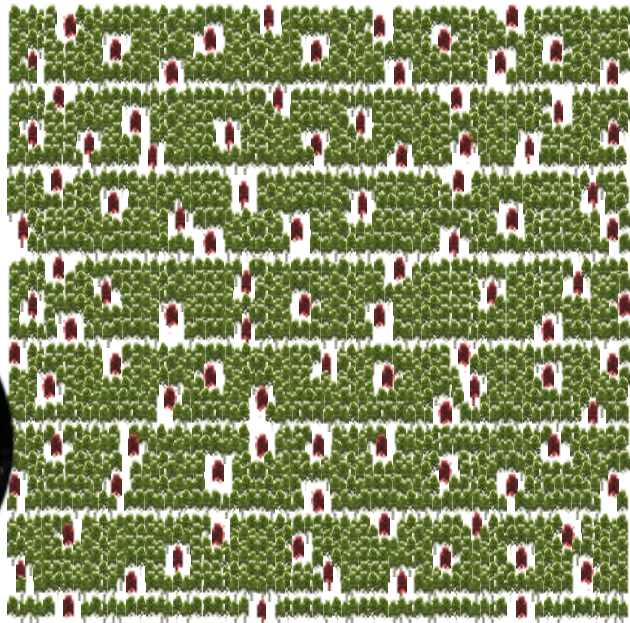
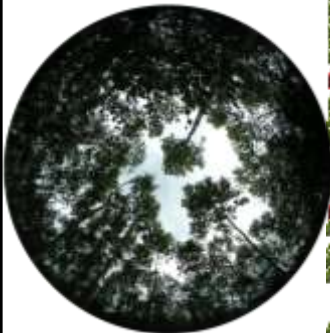
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Free-growth

1 ha
 1.5 × 2 m spacing
 Racks 14 m
 100 PCTs
 Intensive crown thinning



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Free-growth

1 ha
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 Racks 14 m
 100 PCTs
 Intensive crown thinning



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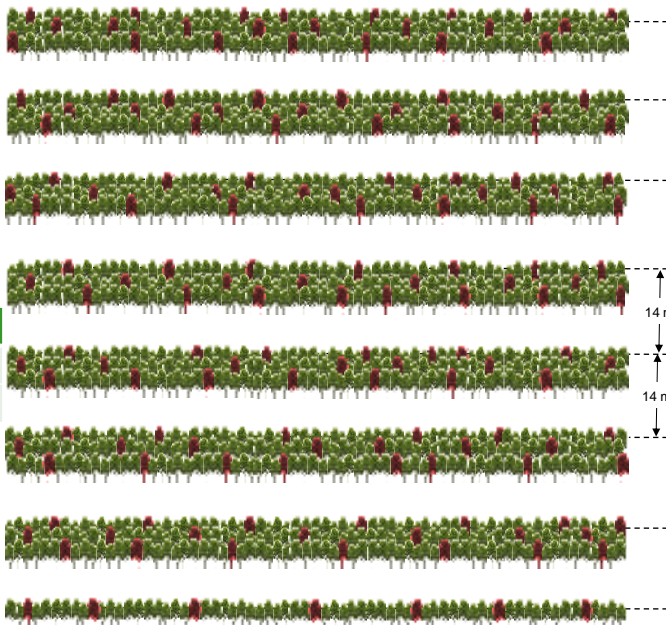
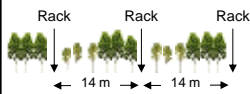
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Bands – 3 line

1 ha
 1.5 x 2 m spacing
 Racks 14 m
 Replant 43 %

Fell 4	Remain 3
Replant 3	
Rack 1	



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Systematic thinning 6:2

1 ha
1.5 x 2 m spacing
Racks 16 m
63 % replanted

Fell 6	Remain 2
Replant 5	
Rack 1	

Rack Rack Rack
16 m 16 m

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Systematic thinning 6:2

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63 % replanted

Fell 6	Remain 2
Replant 5	
Rack 1	

Rack Rack Rack
16 m 16 m

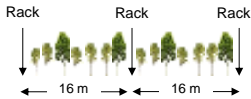
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Systematic thinning

6:2

1 ha
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 Racks 16 m
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Fell 6	Remain 2
Replant 5	
Rack 1	



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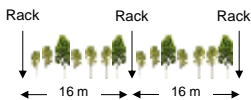
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Systematic thinning

6:2

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Fell 6	Remain 2
Replant 5	
Rack 1	



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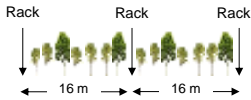
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Fell 6	Remain 2
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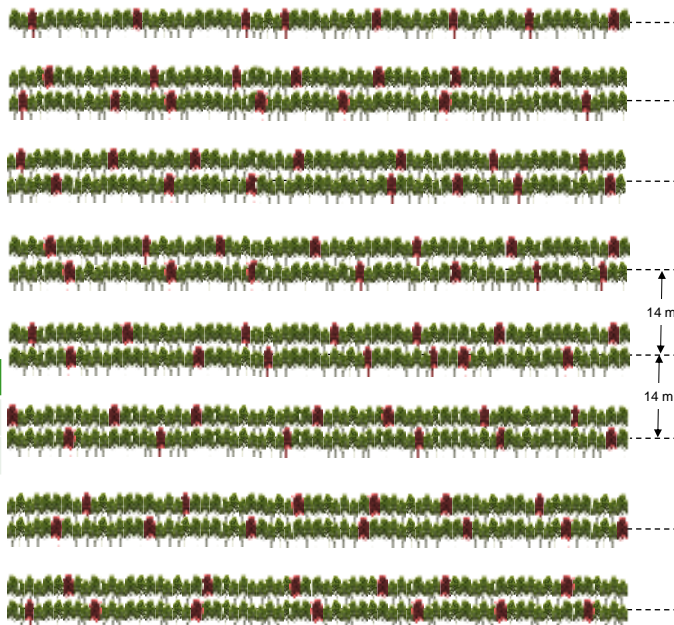
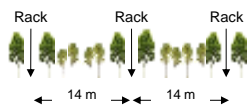
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Systematic thinning 5:2

1 ha
 1.5 x 2 m spacing
 Racks 14 m
 57 % replanted

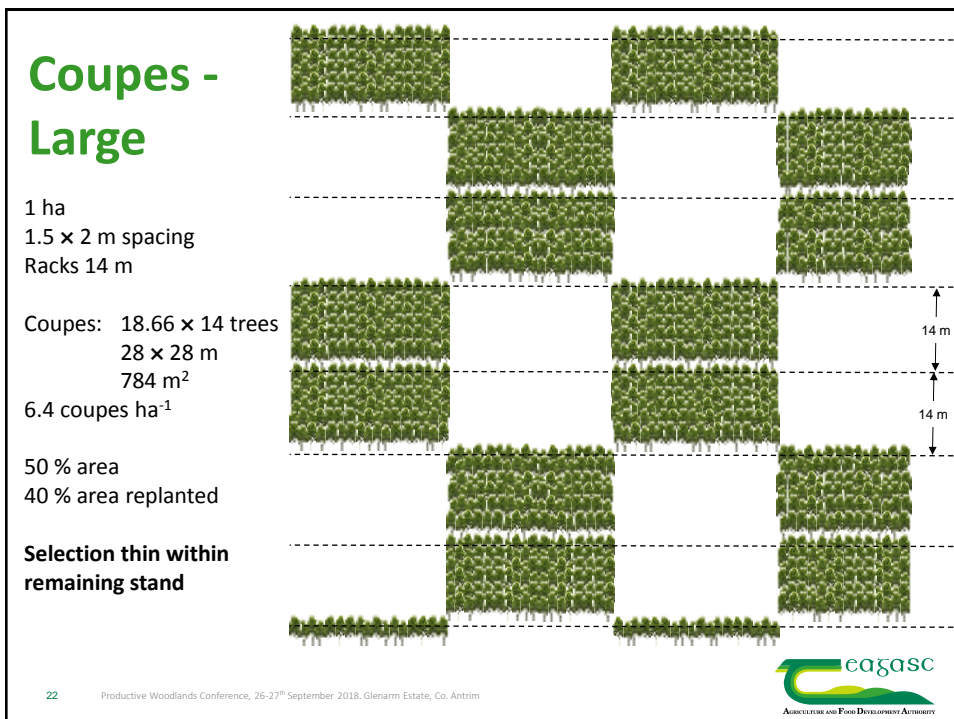
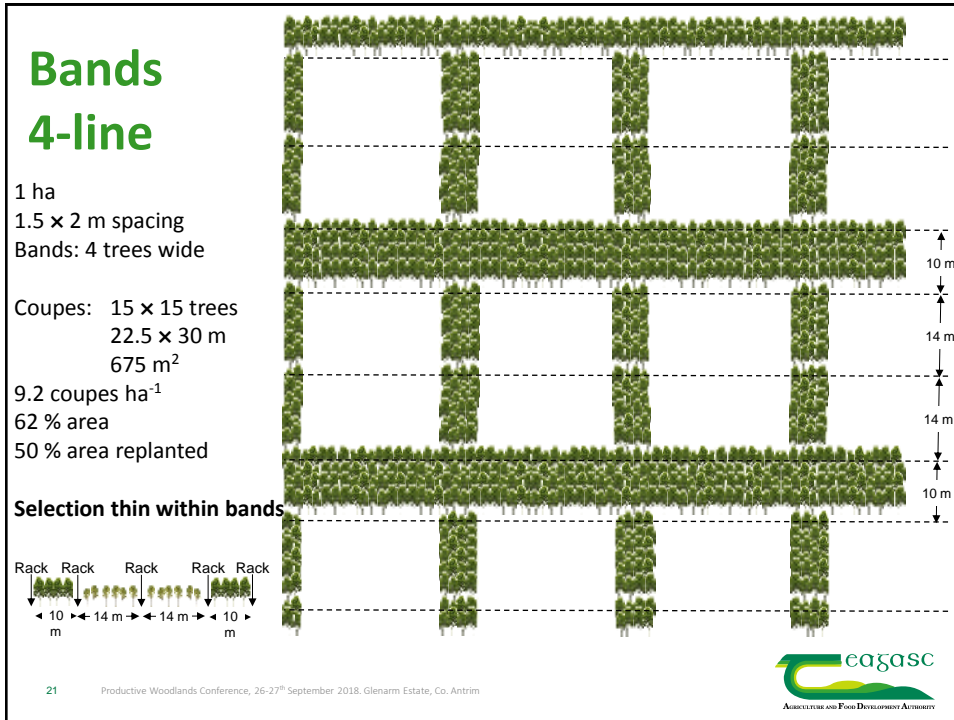
Fell 5	Remain 2
Replant 4	
Rack 1	



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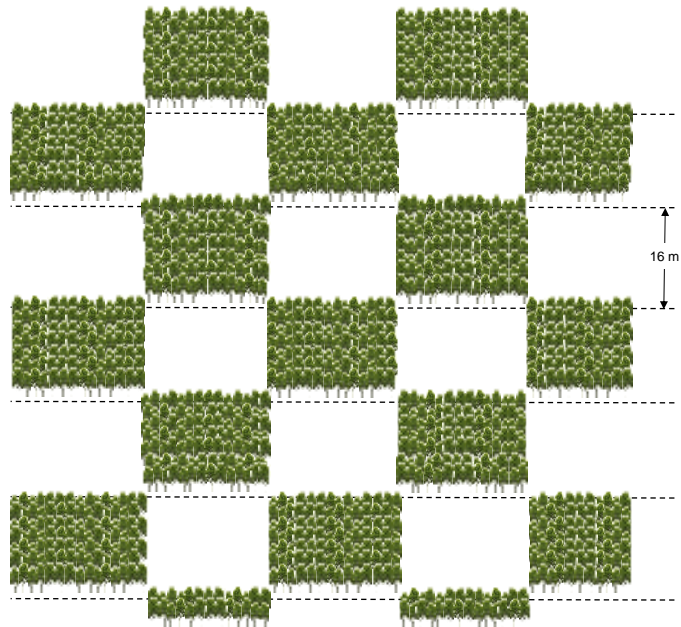
Coupes - Small

1 ha
1.5 × 2 m spacing
Racks 16 m

Coupes: 14 × 8 trees
21 × 16 m
336 m²
15 coupes ha⁻¹

50 % area
44 % area replanted

Selection thin within remaining stand



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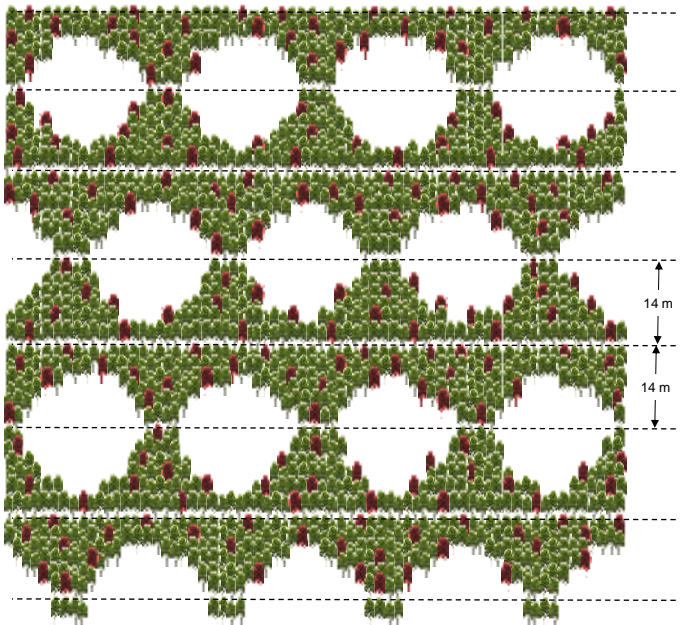
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Circular coupes

1 ha
1.5 × 2 m spacing
Racks 14 m
300 PCTs ha⁻¹

Circular coupes 20 m dia
0.031 ha
50% area

Selection thin within remaining stand



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Drumnaph

- 32 ha reserve (15 ha ancient woodland)
- 12 ha planted “Woods on Your Doorstep” millennium project
 - 4 ha ash dominated
- Thinned 2017/18
- Coupes
- Diversify spp structure



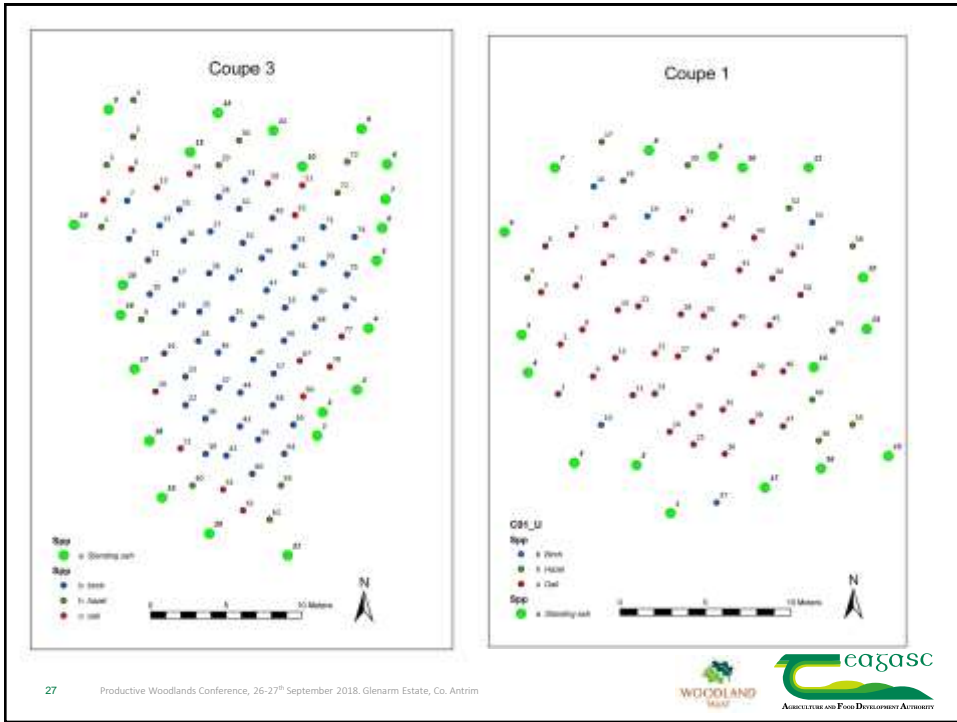
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Coupe replanted with oak, birch and hazel.
Inset: mulching head

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WOODLAND MARK

eaGASC
AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

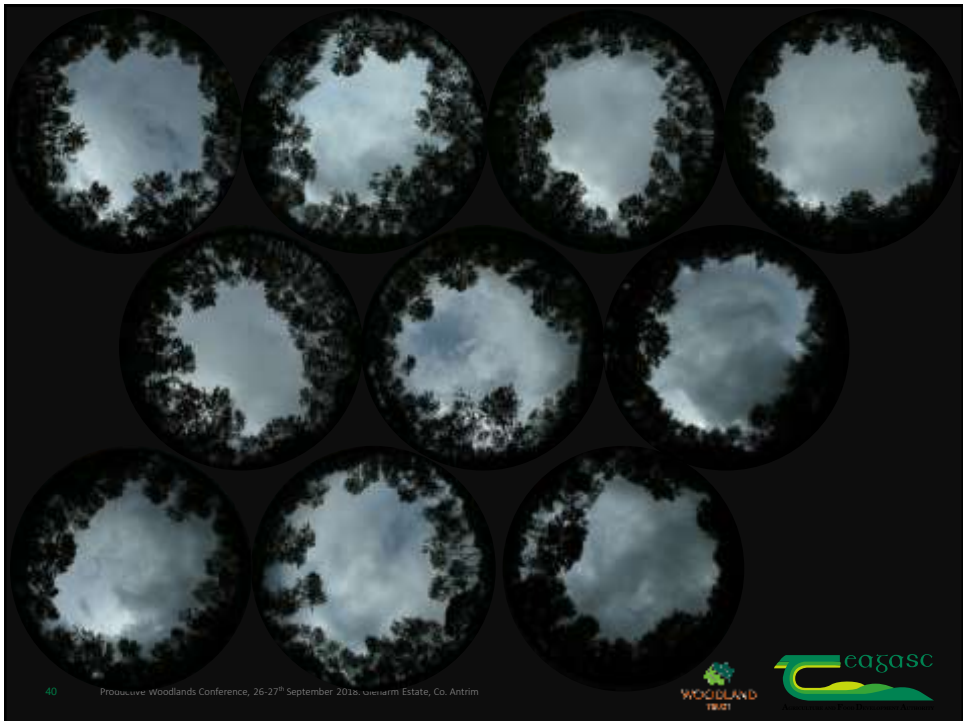








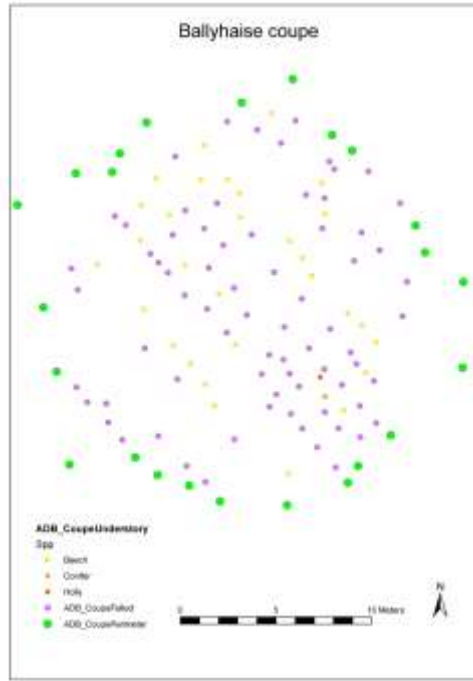




Ballyhaise demo 23rd Oct



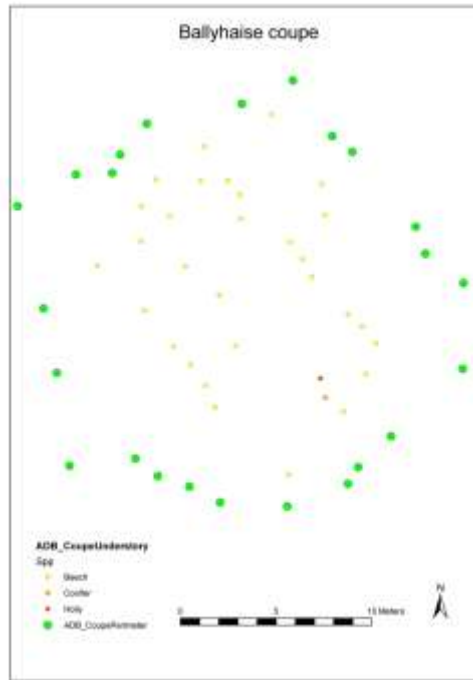
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Ballyhaise demo 23rd Oct



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Ballyhaise demo – 23rd Oct



Considerations

- Planting area width
 - Light requirement of spp to be planted
 - Height of adjacent trees
 - Trials required



Considerations

- Planting area width
 - Light requirement of spp to be planted
 - Height of adjacent trees
 - Trials required



- Coppice regrowth
 - Control required?
 - » Reduce competition for replacement spp
 - » Reduce spore loading??
 - Herbicide?
 - » Flash-back?
 - Buffer zone?
 - Trials?
 - Manual control
 - » Brush cutter?
 - Mulch stumps

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Future positives from ash dieback?

- Improved silviculture?
 - Amelioration of poor-performing stands
 - Better soils for tree establishment
 - Shelter present?
- Greater emphasis on thinning
- Greater owner (and public) interest
- Less prescriptive silviculture, more site specific silviculture
- Greater emphasis on establishing mixtures?
- Improved planting stock made available?

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E.A.R.T.H. project



- Alternative uses of 1st and 2nd thinnings
 - alder; ash; birch; sycamore
 - Increased income to the forest owner
- 20 x 20 m (0.04 ha)
- Stem diameter
- Height
- Tree selection
 - PCTs
 - Thinnings
- Random sampling of thinnings
- TreeSonic
- Felling and log samples
- MTG



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NUI Galway
O'Gallimh



AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

Timber quality assessment



- Non-destructive testing (NDT) measurements:
 - Treesonic (on standing trees) → ToF → $V=L/ToF$
 - MTG (on green and dry logs) → Natural frequency → $V=2*f*L$



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NUI Galway
O'Gallimh



AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

Timber quality assessment



- Mechanical testing
 - Four point bending test (EN 14251)
 - MOE; MOR; Density (from a slice)
- MOE & MOR estimation from NDT
- Drying – Kiln, Air 
- Durability
- Potential end-uses



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Oí Gailimh

Small diameter alder (20 – 30 cm)

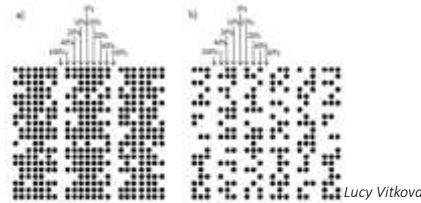
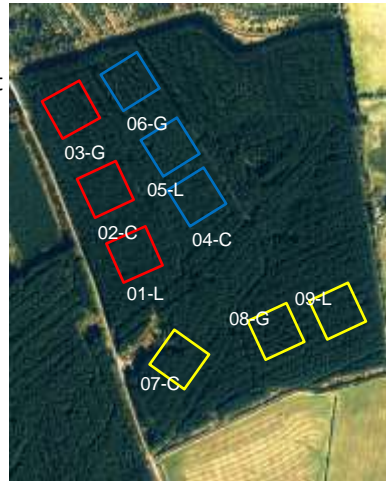
- 2-year project
- Characteristics, properties and utilisation potential
 - Conversion; Drying; Processing; Nailing/Screwing; Bonding; finishing
- Develop product prototypes
- Walsh Fellowship M.Sc. - David Monson

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CCF

- 5-year project
 - Continuation of 2010-14 LISS project
 - PhD Walsh Fellowship – Ted Wilson
- Transform SS plantation to CCF
- Low; Crown; GDT
- Thinned 2011, 14, 18



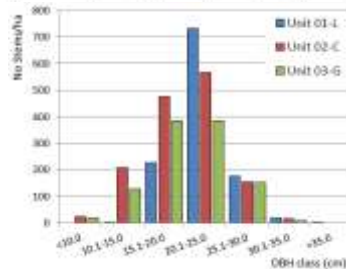
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Ted Wilson



- Clumpiness
- Small sawlog
- Nat. regen.



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Dissemination

- Researcher
- Advisor
- Owner



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Publications

- Journals
 - Open Access?
 - T-Stór
 - » T-stor.teagasc.ie



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Publications

- Journals
- Technical



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Publications

- Journals
- Technical
- Press
- Newsletters



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Field-days

- Owners
- Industry
- Students
- Training



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Social media

- Teagasc Forestry Website
- YouTube
 - Teagasc Forestry channel
- Facebook
 - forestry.teagasc
- Twitter
 - @teagascforestry
 - @IanShort_Forest
- e-Newsletters



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Feedback

- Always welcome
- Constructive criticism
- Knowledge gaps
- Industry requirements

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Thank you

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