ADOPTION OF AGROFORESTRY OPTIONS IN LAND USE POLICY MEASURES IN NORTHERN AND SOUTHERN IRELAND

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Original objective : Sustainable Intensive Grassland Farming

Problems:-

- Low biodiversity
- Homogeneous habitat
- Impoverished landscape
- Eutrophication
- Soil degradation
- Rural depopulation

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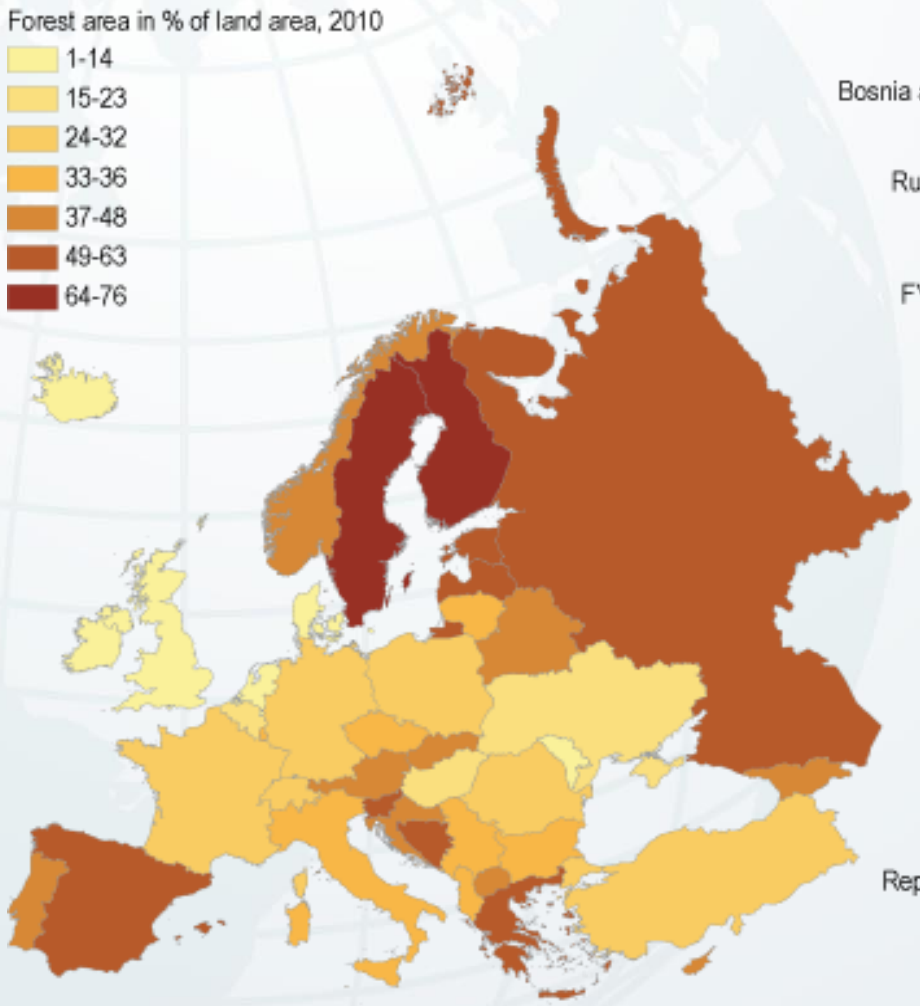
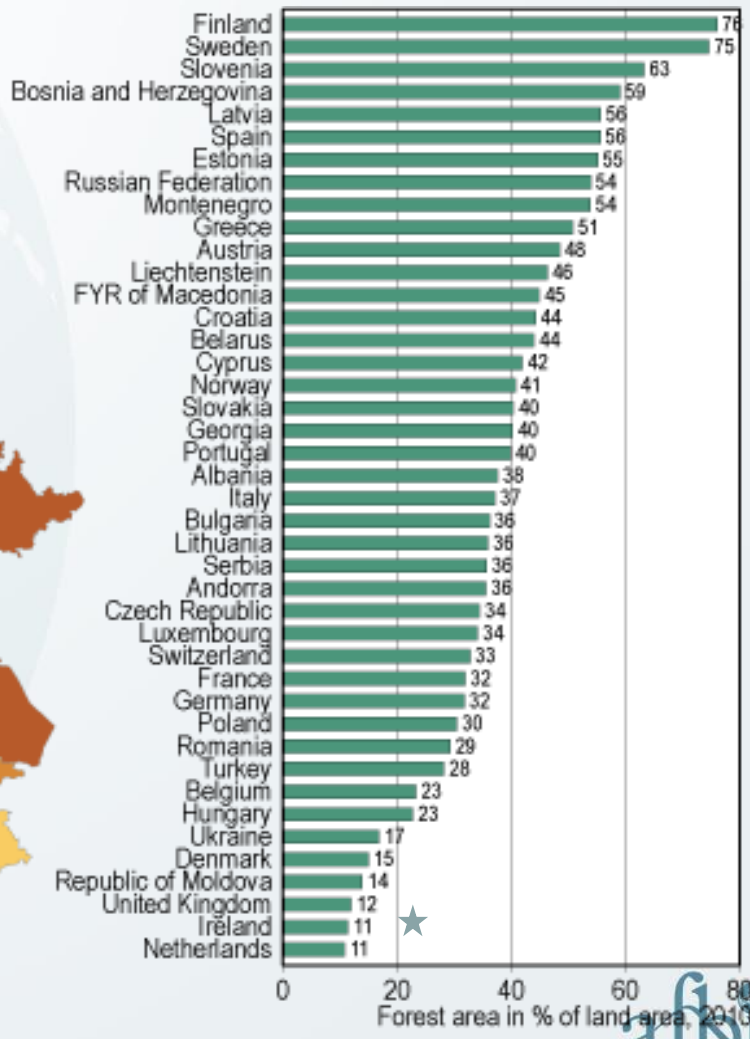
European Forest Cover





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Proposal-

Silvopastoral agroforestry (wide-spaced trees in grassland) can make these intensive grassland landscapes more sustainable by-.

- **Delivering a wide range of ecosystem services**
- **Aligning with a sustainable intensification land management strategy**

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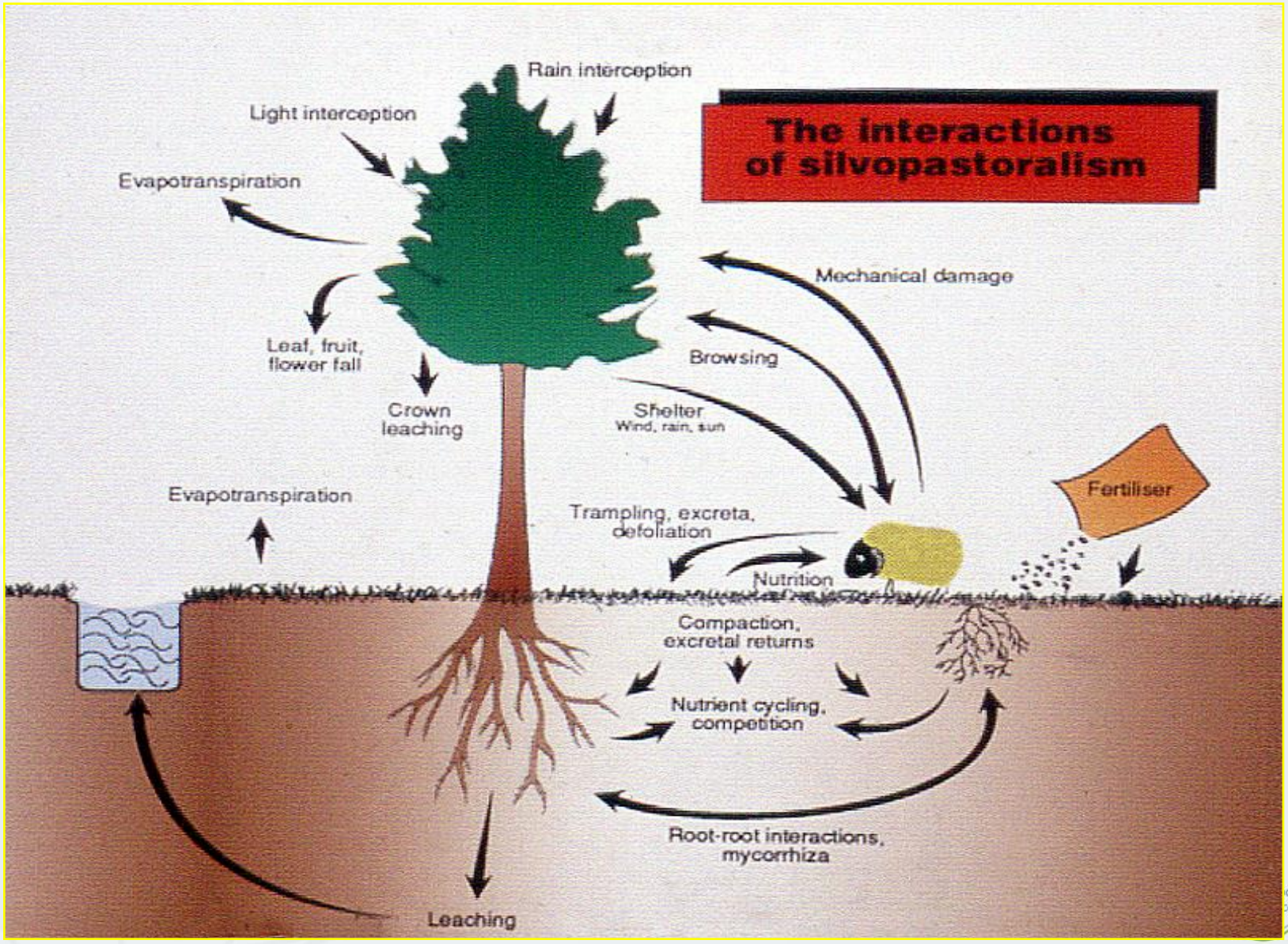
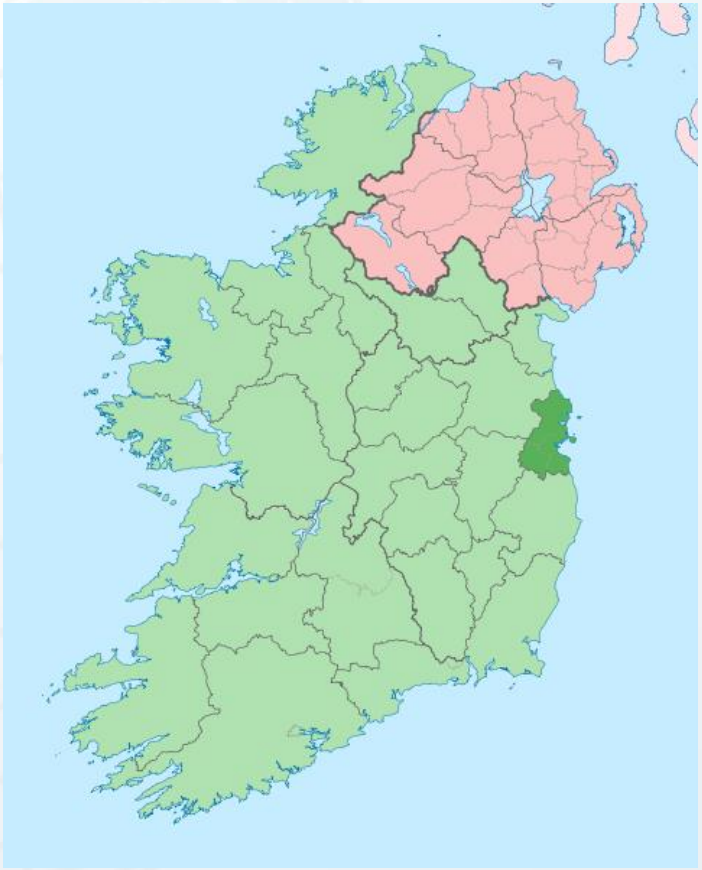
From an ecological perspective



There are 2 juristictions on the island of Ireland



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Programme history

- In the UK the main driver was to increase tree cover and deliver a range of ecosystem services
- Interest started in 1989 and AFBI was part of a UK group to site a centrally- coordinated National Network Silvopastoral Experiment
- Considerable investment went into establishing a replicated trial comparing grassland, silvopastoral and woodland systems at Loughgall

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Treatments

Pasture with perennial ryegrass(*Lolium perenne* L.)

Silvopastoral system planted with ash trees (400 stems ha-1)

Woodland planted with ash trees (2500 stems ha-1)

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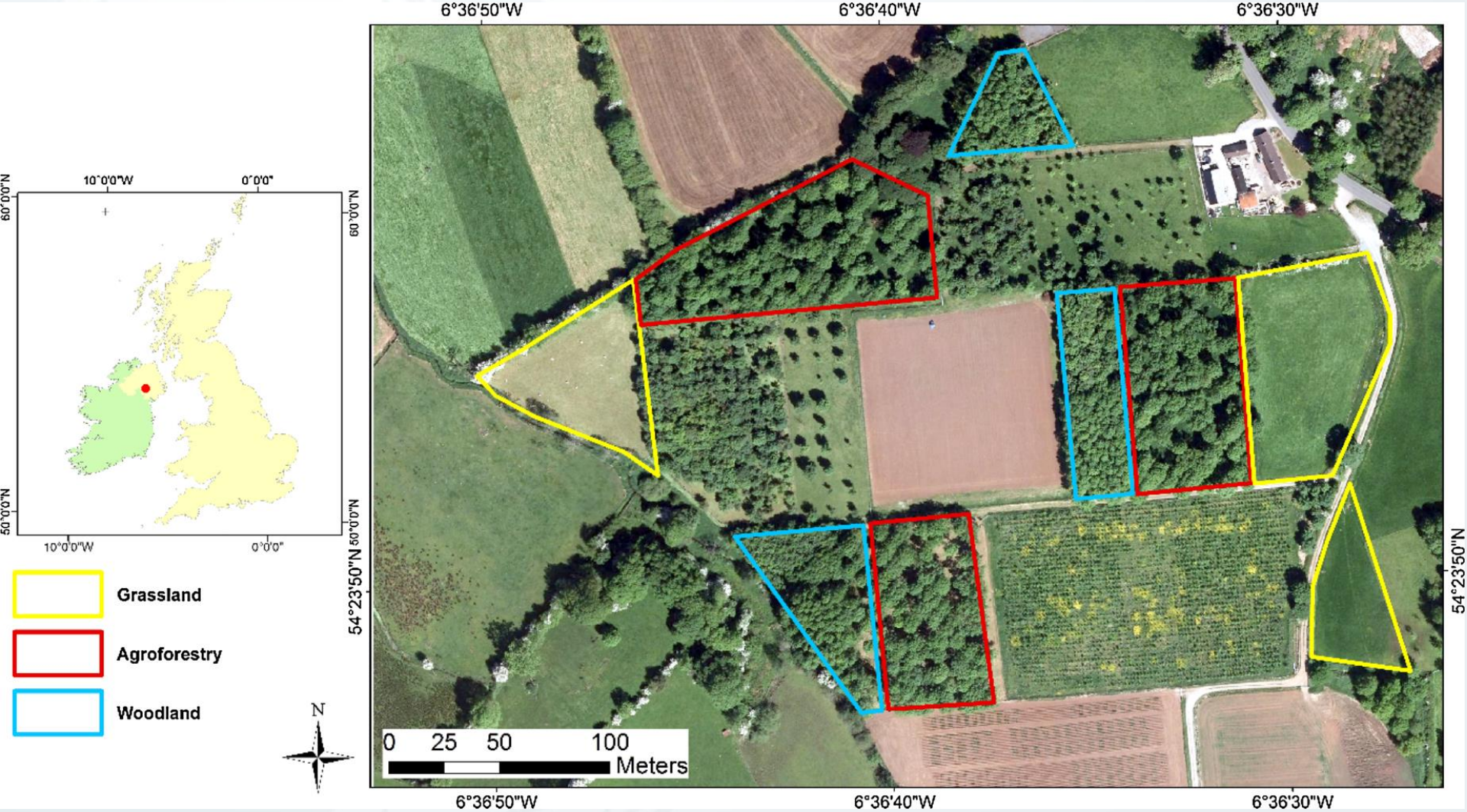

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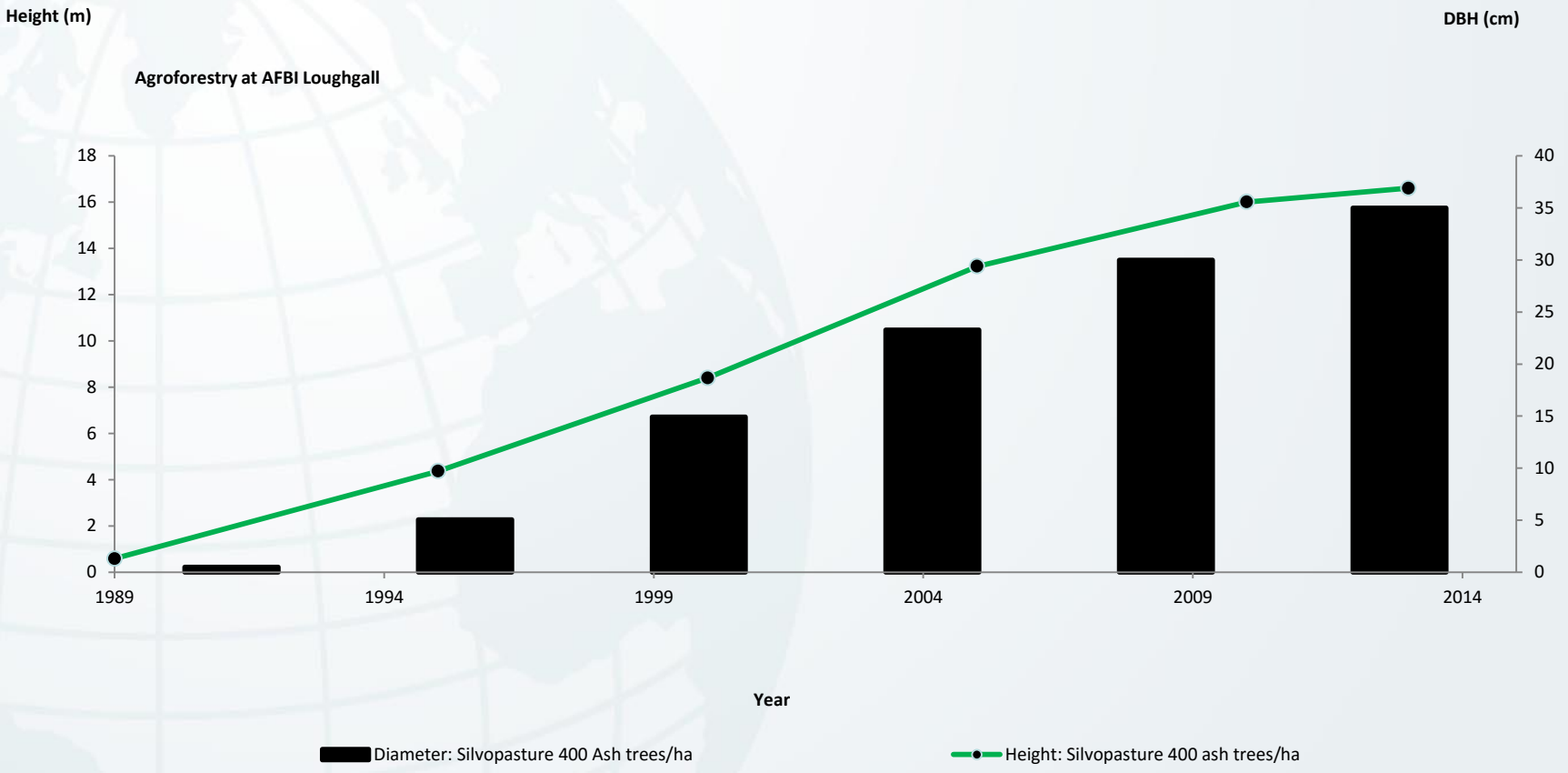
19 Yr Old

Tree growth



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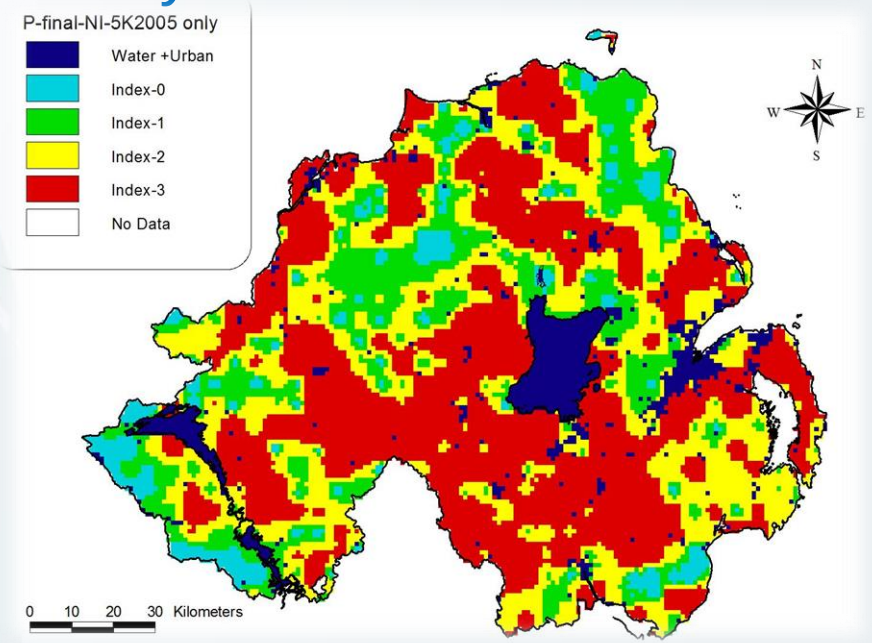
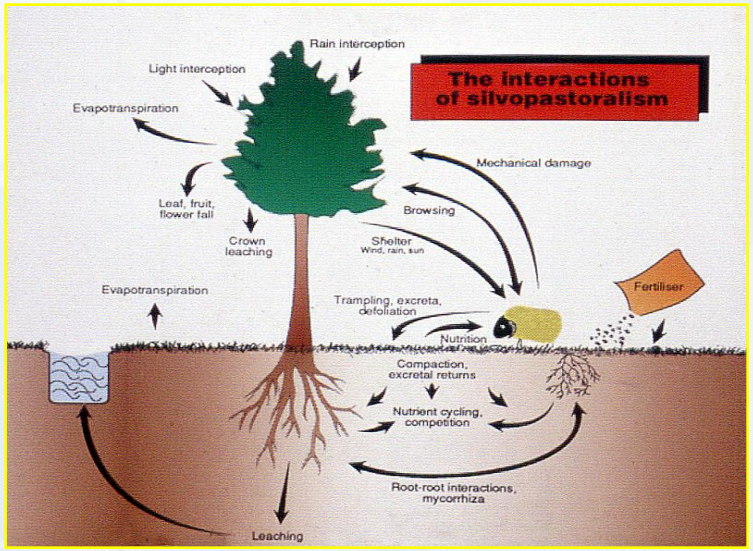
Silvopastoral systems are environmentally sustainable and deliver a range of ecosystem services

- Improved nutrient cycling
- Reduced nutrient leakage
- Carbon sequestration
- Biodiversity enhancement
- Opportunity for nutrient sustainability





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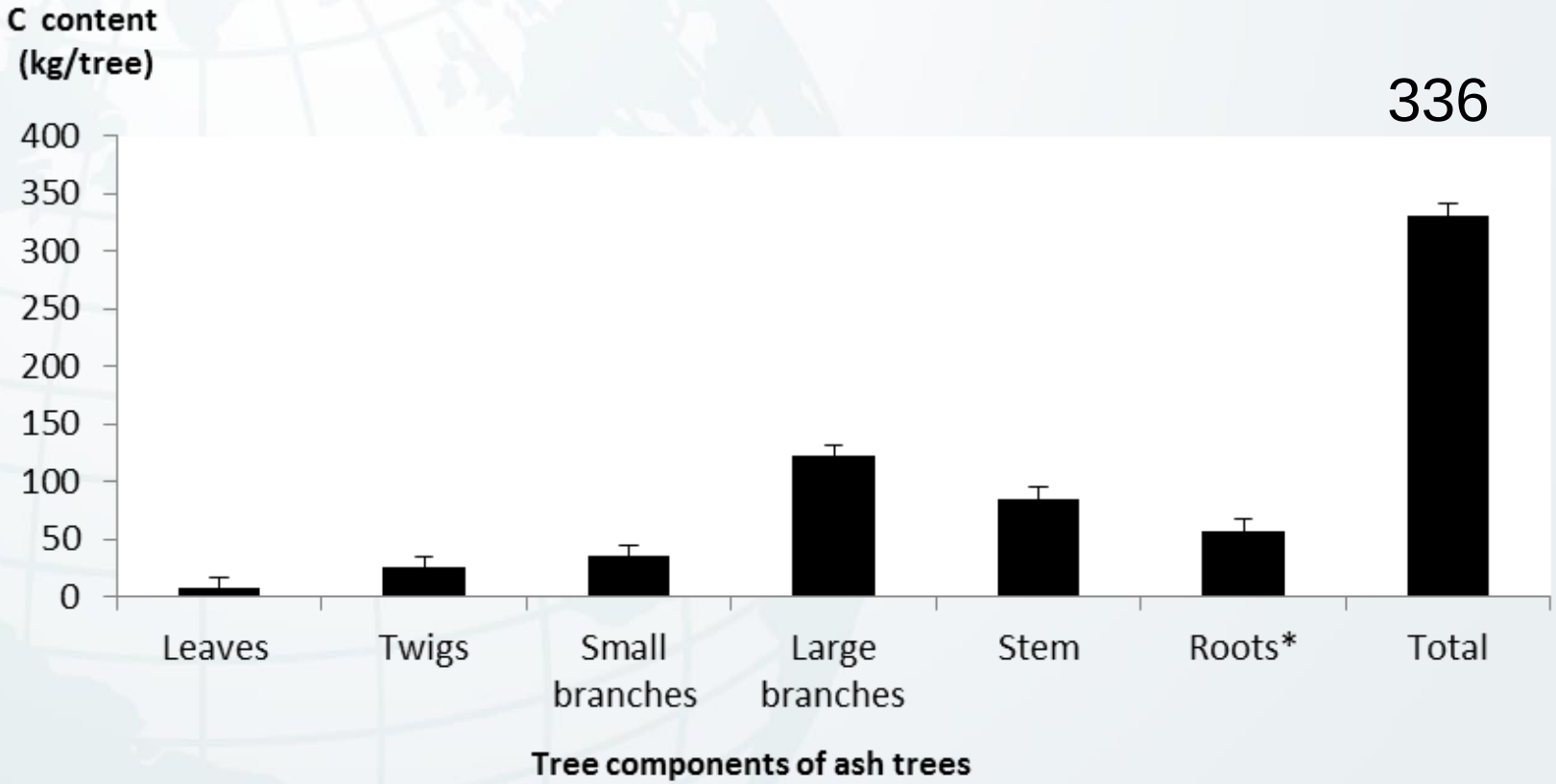
Carbon stored in ash trees (dry weight) growing in agroforestry (21 years old)



Total C in woody biomass- **77.28 t/ha**

Source: Olave, R., Higgins, A., Sherry, E., Fornara, D., McAdam, J (2016). Agroforestry as a land use option to sequester carbon in a cool temperate climate. World Congress Silvo-pastoral Systems 2016. University of Évora, Portugal. 27-30 September 2016. 32-33.

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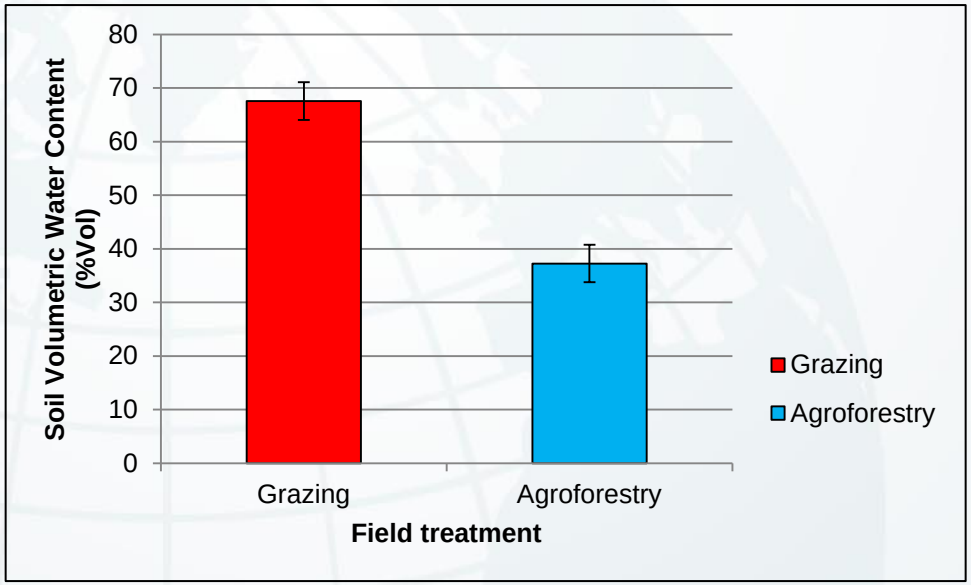
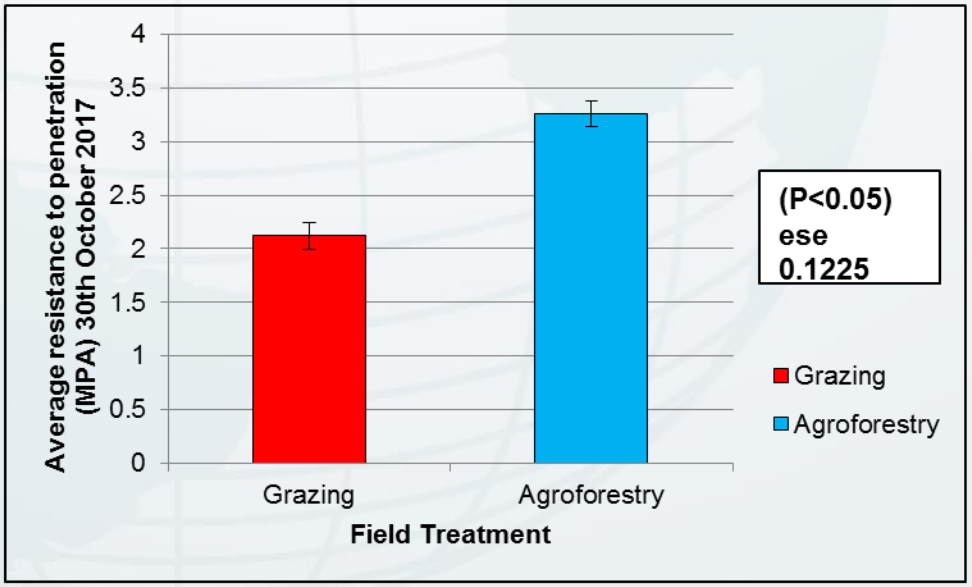
Soil carbon

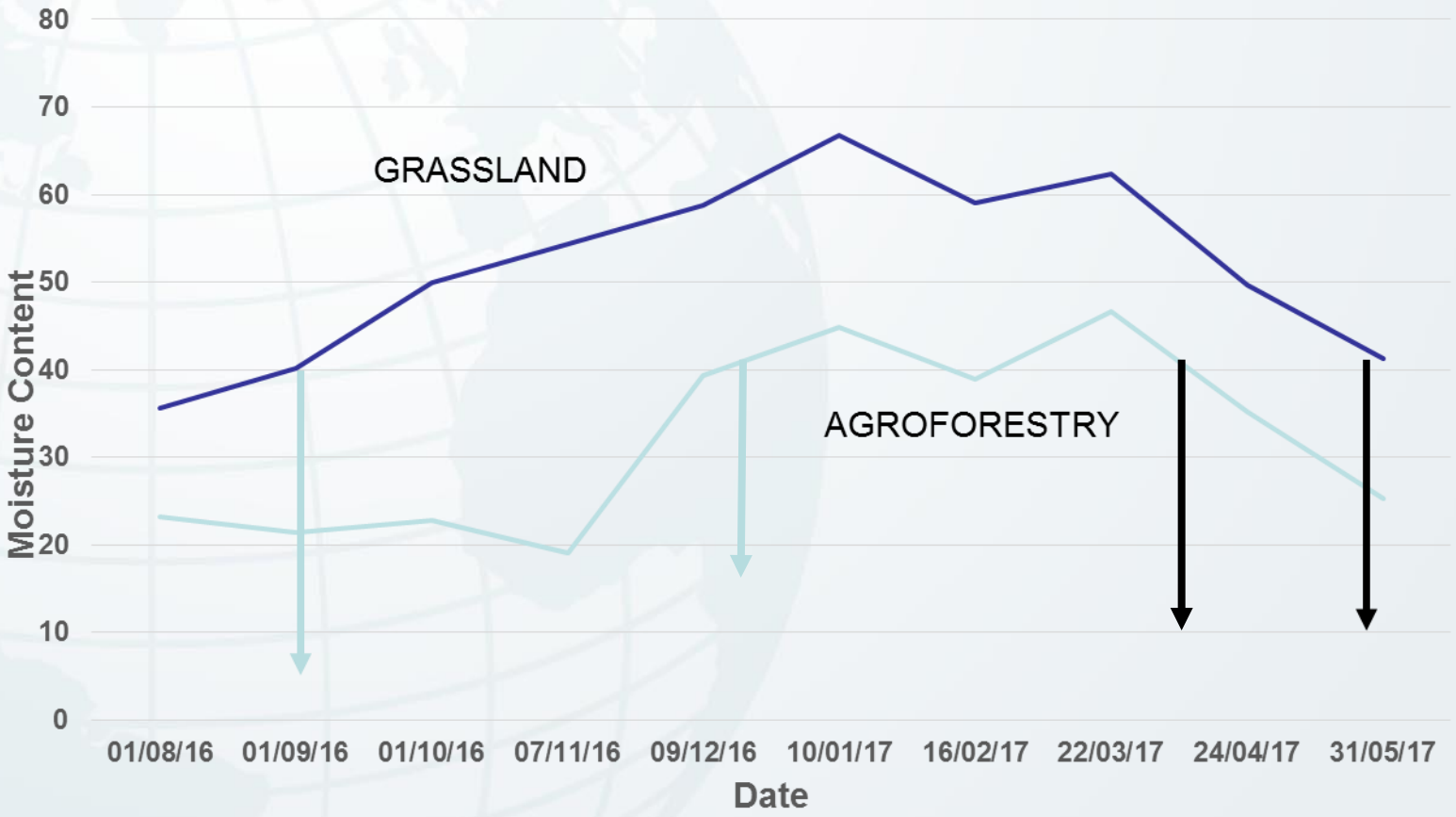
- The ash silvopastoral and woodland system have higher C pools in micro-aggregate and silt & clay fractions which are considered more 'recalcitrant' and stable when compared with large macro-aggregate fractions which are more labile
- When the carbon stored in the wood is added in, these systems have the potential to store ”long term” and “short term” carbon

Ability to sustain grazing-soil trafficability





Extended grazing season under agroforestry



Assume 40% soil moisture content as a cut off, we have 17 weeks longer “season” under agroforestry-5 in spring, 12 in autumn.

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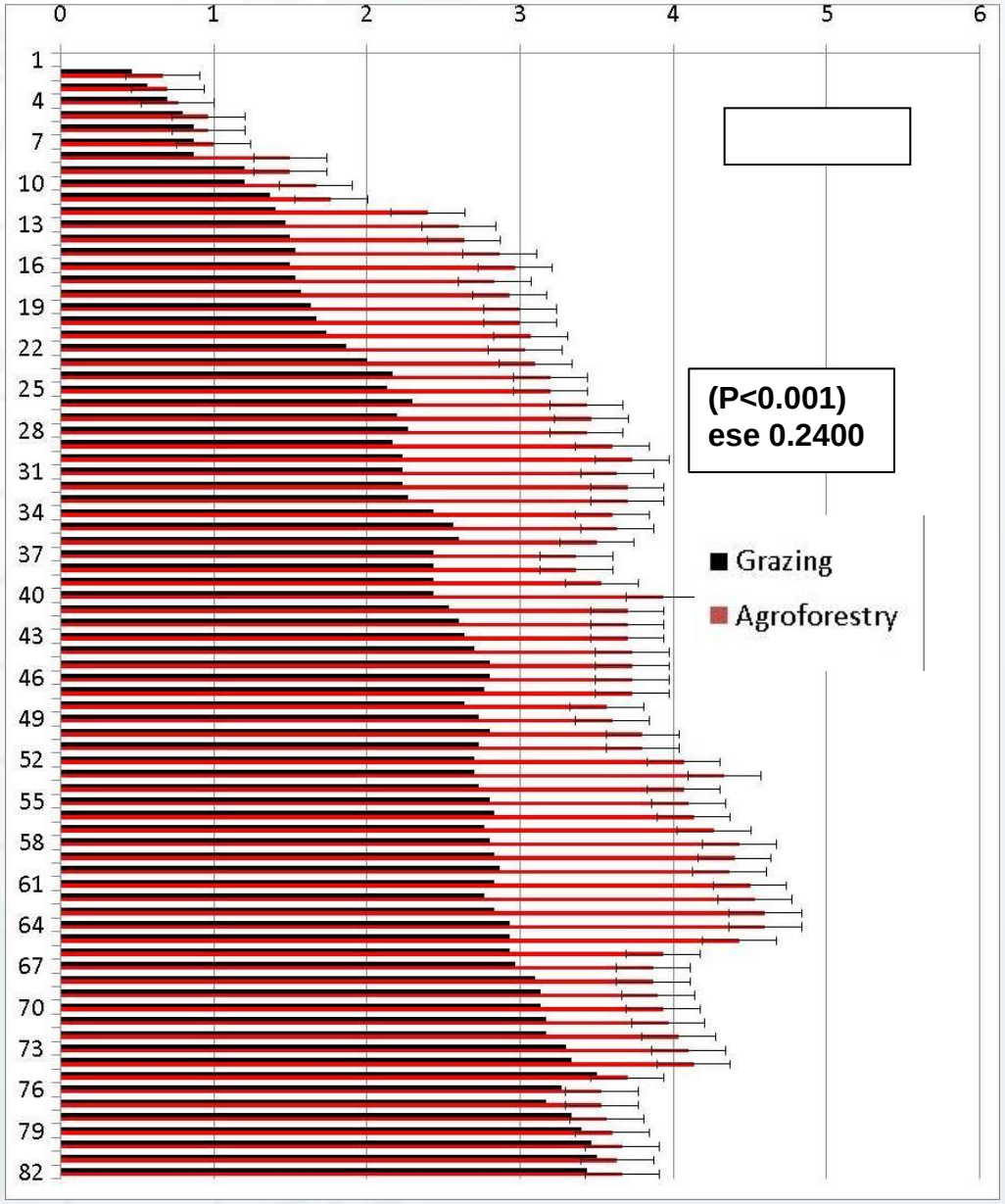
Average resistance to penetration (MPA)- Infiltration Potential



Resistance to penetration (infiltration potential) was greater in the agroforestry than the grassland treatment down to 76cm (Sept-Nov 17)

AGFORWARD
Agroforestry for Europe

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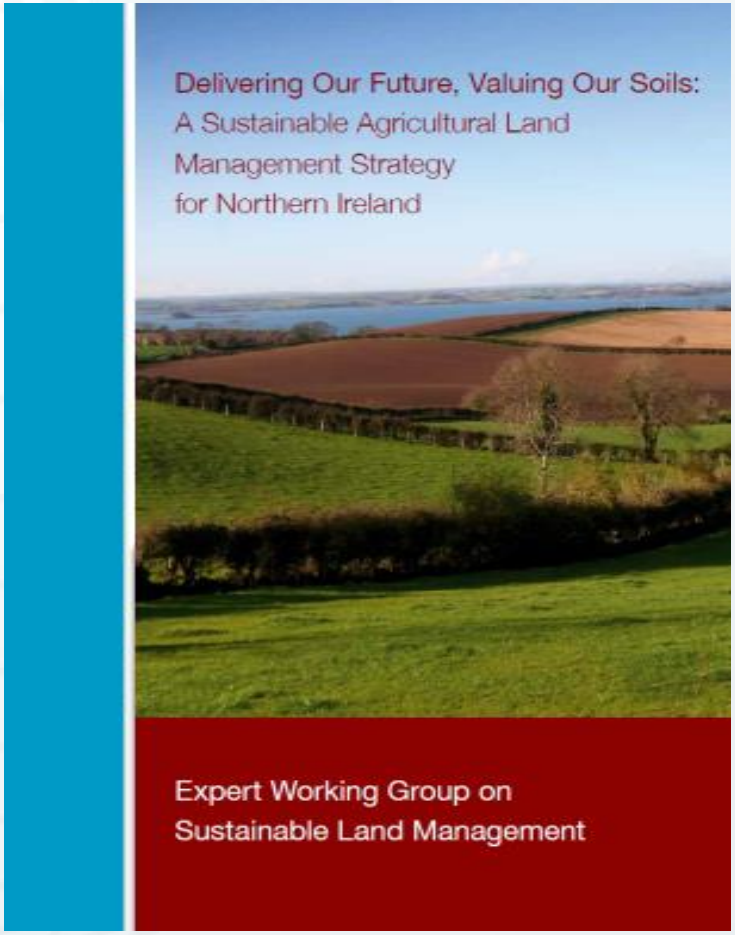
Lunny, R (AGFORWARD project)

Future policy driver-

Sustainable Agriculture Land Management Strategy



DAERA, 2017

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The Details – Delivering Change

- **Pasture Agri Forestry,** used to extend grazing season to help higher grass utilisation & give resilience to grazing during extreme rainfall, while increasing biodiversity, carbon sequestration, reducing water run off and providing renewable fuel. **"Mine" P from greater volume of soil**.

- **Woody Bio Security Corridors** to reduce spread of diseases such as BVD, while delivering the benefits above.

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Success in policy adoption is a major step forward…..

Establishment of Agroforestry in Northern Ireland under the new Environmental Farming Scheme 2017 (under RDP)

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Details of the Measure

Under Priority 4 – *Restoring, Preserving and Enhancing ecosystems related to agriculture and forestry,*

Option Name:

Establishment of agroforestry

Option aims

To increase the area of agroforestry **which will provide carbon sequestration benefits**. The Option will also contribute to biodiversity, nutrient cycling and water quality. Agroforestry will integrate trees with crops and /or livestock on the same plot of land.

Option payment:

Year 1: £1637.00 per ha ; Years 2 – 5: £65.00 per ha each year

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Uptake (tranche 1)

- Overall target- **52ha**
- Tranche 1 - 24 applicants, **32.5 ha** 64% uptake
- **All are farmers**
- Very encouraging. We will now work with this group of farmers. There will be a wide diversity of situations and objectives.

- Policy Leader has said:
- "Hopefully we can ensure these 24 applicants make a success of Agro Forestry and spread the word. That will encourage further uptake in the next tranche"

AGFORWARD
Agroforestry for Europe

cafre
College of Agriculture, Food & Rural Enterprise

afbi
Agri-Food and Biosciences Institute

Distribution of applicants

CAFRE/AFBI has run training/information sessions for these applicants at Loughgall

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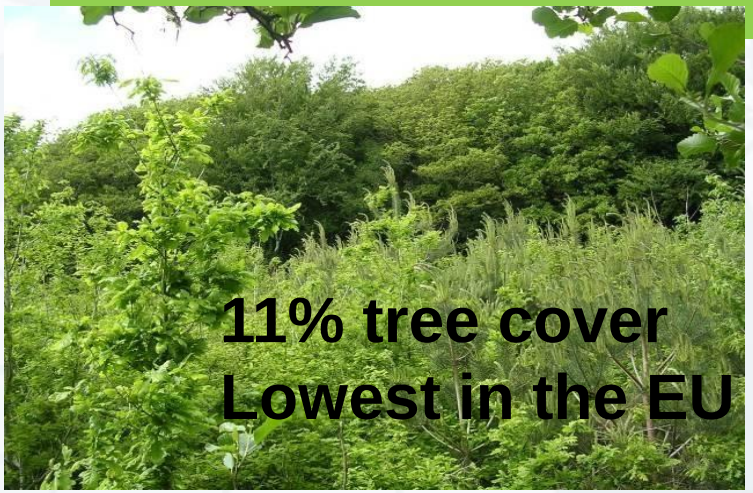
Grass + Animals +Trees ?



Loughgall (Armagh)

- Agri-Food and Biosciences institute (AFBI).
- Agroforestry silvopastoral trials with ash/sycamore and sheep (29 years old).
- Tree shelters removed and replaced with plastic mesh.
- 10 ewes/hectare
- 5 cattle /hectare

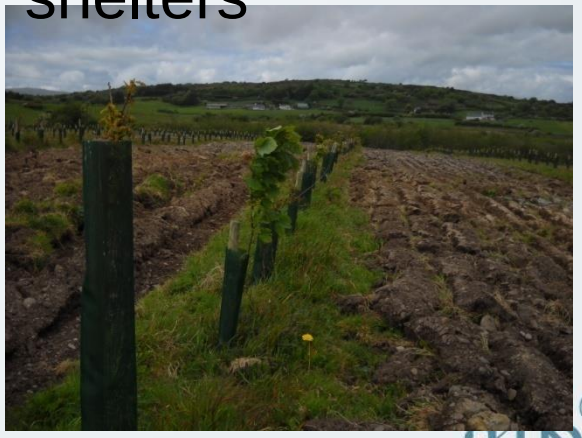

It appears to work

Demonstration Plots

Shropshire sheep and Elm.

Different tree shelters

Shropshire sheep and Paulownia



Silvo-arable

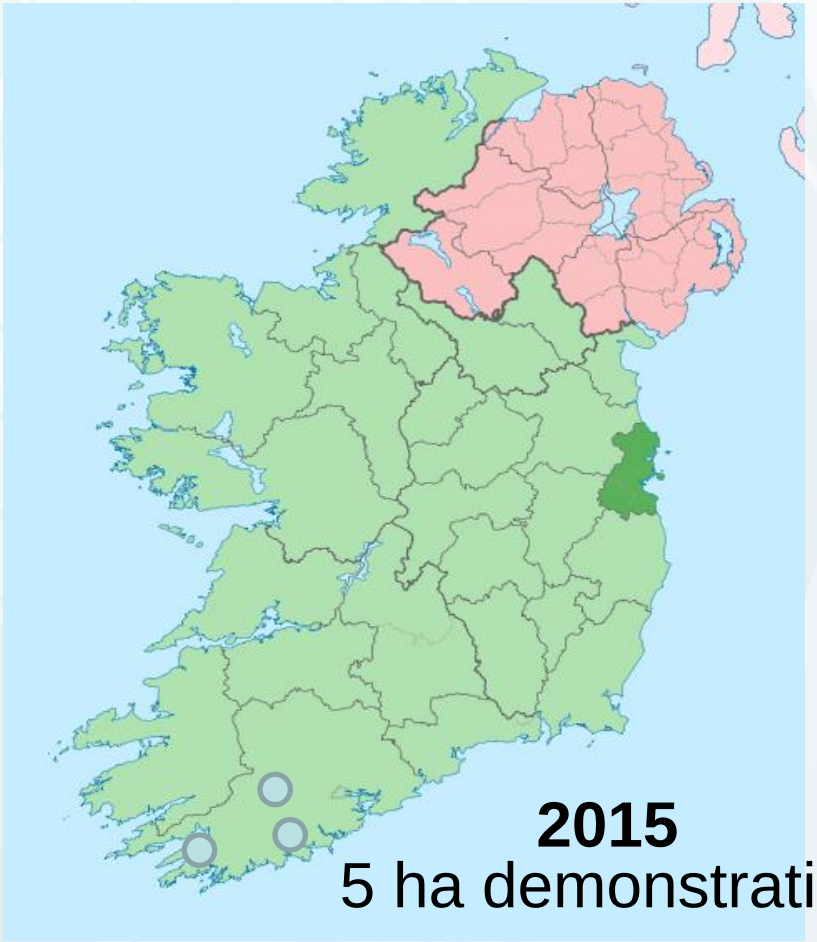
Reforestation

Area cleared of stumps, cultivated re

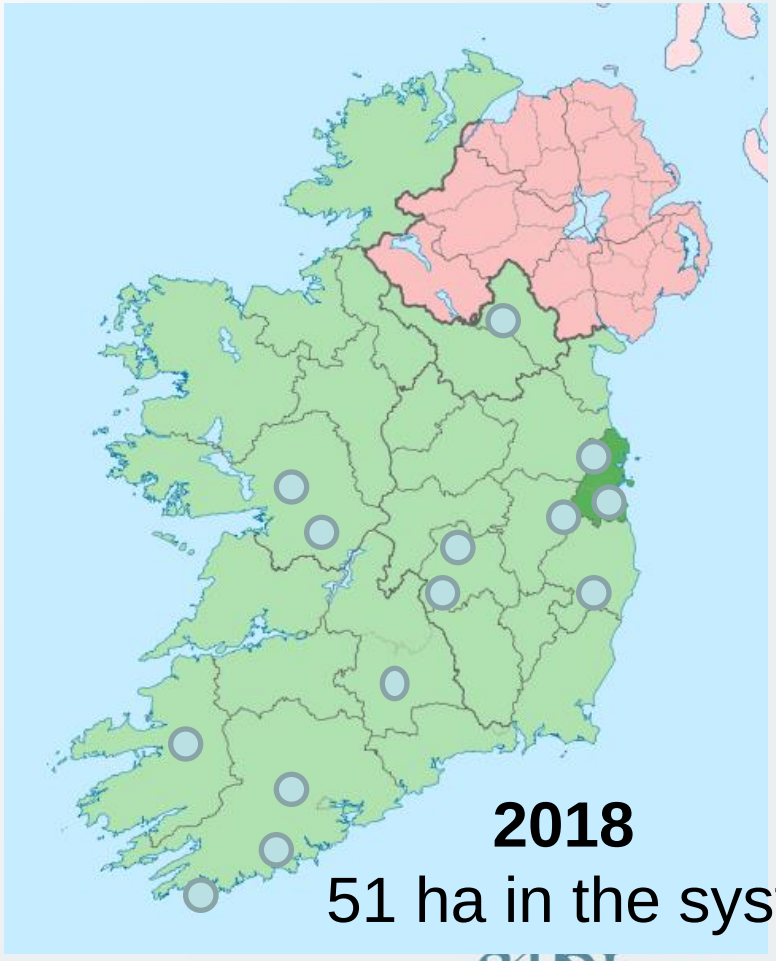
Before grazing.

After grazing.

New Applications



2015
5 ha demonstration



2018
51 ha in the syste

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New Plantations

60cm plants/with shelters.

Leo Murphy, Co. Kildare .

Christoph Eisele, Co. Cork.

3-4 metre plants/no shelters

Mid Term Review

Agroforestry (GPC 11)

- Combining forestry and pasture
- Increased grant from €4450 to €6220
- Annual premium increased from €260/ha to:
  - €645/ha (Under 10 ha)
  - €660/ha (Over 10 ha)

  } 5 year premium
- Mainly Oak, Sycamore and Cherry
  - Can include 15 % fruit and nut trees
  - Initial stocking of 400 -1000 trees / ha - reduces over time to 60 - 250 trees/ha by thinning - continued grass growth
  - Protect with tree shelters
  - Minimum plot size of 0.5 ha, plot width of 20 m
- 80% of eligible costs can be funded

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

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New Specifications

Square stake

Half round

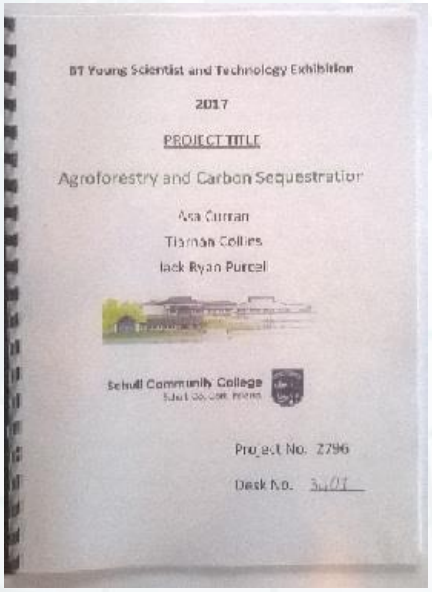
Wire through one side

BT Young Scientist Competition
(Agroforestry and Carbon sequestration)

Field work

Analysis

Presentation


BT Young Scientist and Technology Exhibition

2017

PROJECT TITLE

Agroforestry and Carbon Sequestration

Asa Curran

Tiarnan Collins

Jack Ryan Purcell

Selsdl Community College

Project No. 2796

Desk No. 3.07

Results

- Soil Carbon levels were higher in agroforestry compared to fields in pasture
- They concluded that agroforestry could offset approximately 3.3% of farm emissions

Prize winners

Future ? Very Bright

Large increase in Enquiries from all over the country

Thank you