Farm Forestry: An important ally in the quest for agricultural sustainability

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Teagasc Mission

• Support science based innovation in the agri-food sector and wider bioeconomy so as to underpin profitability, competitiveness and sustainability.
Teagasc Forestry Research

Tree improvement

Breeding for disease resistance

Broadleaf silviculture / restructuring
Teagasc Forestry Research

Forest thinning / potential of other species

Wood utilisation

Continuous cover systems

PW-IPM: Towards Integrated Pest Management for Pine Weevil in Ireland

FOROWN Project
Teagasc Forestry Advisory

Advisory clinics
Forestry Management Events
International Day of Forests

Conferences
Tullamore Show
Timber Marketing
Teagasc Forestry Training

Ballyhaise College

Harvesting Simulator

Hosting National Events

QQI Accredited L5 / L6 courses

Short Courses
Over 21,000 private owners
83% farmers
378,623 ha (49.2% of forest area)

Ireland’s woodlands & forests and Forestry Programme supporting...

Forestry sector worth €2.3 billion

12,000 jobs (mainly rural)

Ecosystem services delivery

770,020 ha
11% of land area
Grant and Premium Categories (GPCs)

**GPC 3:** 10 Diverse Conifer/Broadleaf
- Sitka Spruce
- 10% Birch

**GPC 4:** Diverse Conifer
- Eg Scots Pine

**GPC 6:** Pure Oak

**GPC 8:** Pure Alder/Birch
Native Woodland (GPC 9/10)

- Integral to Ireland's natural heritage, history and culture
- Unique in terms of biodiversity
- Numerous ecosystem services

Native Woodland Establishment
- Grant Aid €5,880 - €6,220/ha
- Annual premium €665 - 680/ha (15 years)

Native Woodland Conservation Scheme
- Grant aid: €2,500 (emergent), €5,000/ha high forest
- Annual premium €350/ha (7 years)
Agro-Forestry (GPC 11)

- Silvo-pastoral: combining forestry and pasture
- Oak, sycamore, cherry
  - Continued access to land
  - Reduced fertiliser/chemical inputs
  - Animal welfare
  - High quality timber
  - Biodiversity
  - Water quality
  - Landscape quality
  - Improved drainage/shelter
  - Carbon sequestration
- 5 year premium €645 - €660/ha
Forestry for Fibre (GPC 12)

• Growing productive trees to produce biomass in 10-15 years

• Eligible species
  – Italian Alder, hybrid aspen
  – Eucalyptus, popular

• Grant €3,815 /ha

• 15 year premium: €510 - €520 /ha
Sustainability

Intersection of:

1. Environmental
   • Climate change mitigation
   • Water quality
   • Biodiversity

2. Economic

3. Social
Stand Level Processes

- Substitution of energy intensive materials
- Bio-energy replacement of fossil fuel energy
- C stored in harvested wood products
- Managed forest carbon
- Unmanaged forest carbon

Adapted from Perez-Garcia et al., 2005
## Indicative Sequestration Rates

<table>
<thead>
<tr>
<th>Forest Type</th>
<th>Indicative Mean Sequestration *</th>
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<tbody>
<tr>
<td></td>
<td>Less productive site</td>
</tr>
<tr>
<td>Mainly conifer (10% diverse spruce/broadleaf)</td>
<td>4.5</td>
</tr>
<tr>
<td>Fast grow broadleaves</td>
<td>3.5</td>
</tr>
<tr>
<td>(birch, alder, sycamore)</td>
<td></td>
</tr>
<tr>
<td>Slow growing broadleaves</td>
<td>2.5</td>
</tr>
<tr>
<td>(oak, beech)</td>
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*Potential sequestration rates normalised over 2 rotations*
• Irish milk has a very low carbon footprint

Our grass-based systems are very efficient in terms of greenhouse gases per kg of milk or meat

Climate Challenge

• Mitigating of Agricultural Greenhouse Gases (GHGs) -target

• 30% reduction relative to 2005 levels
  – 2005 level: 18.70 Mt CO$_2$e
  – 2016 level: 19.24 Mt CO2e
  – Higher animal numbers, increasing trend

Climate targets extremely challenging
Marginal Abatement Cost Curve (MACC)

Way of assessing mitigation options: for their efficacy and costs
Teagasc produced an updated MACC for greenhouse gases in 2018

Mitigation Pathway 2: Land use, Land use change & Forestry

Abatement Cost \(\text{€/tCO}_2\text{e}\)

- Grassland Management \((262 \text{ kTCO}_2\text{e})\)
- Water Table Management (Organic soils) \((444 \text{ kTCO}_2\text{e})\)
- Cover Crops \((107 \text{ kTCO}_2\text{e})\)
- Straw incorporation \((60.5 \text{ kTCO}_2\text{e})\)

Assumed price of carbon credits

Potential \text{kTCO}_2\text{e} saving/year
Forestry measured using a 20 year window

- Current levels of planting will have significant impact in the post 2030 commitment period
- Significant increase in planting rates are essential in order to maintain mitigation capacity
Water Quality

Protection of water:

- Key component of DAFM assessment for licencing of forest operations
- Strongly features in Sustainable Forest Management
Woodland for Water

Combining undisturbed water setbacks and new native woodland

Adjoining land use:
- agriculture
- forestry
- built environment

Woodland for water measure
Environmental Enhancement of Forests
Forest Biodiversity Enhancement

- Well sited, well planned, well maintained designed forests
  - Inclusion of broadleaves (15% mandatory)
  - Inclusion of Areas for Biodiversity Enhancement (ABEs)
    - hedgerows
    - retained habitat
    - setbacks
    - Open areas

- Implement sustainable forest management
  - Forest edge management
  - Create/maintain wildlife corridors
  - Thin for vigour

- Environmental Enhancement of Forests
Financial Sustainability

- Forestry - complementary farm crop
- Optimum use of marginal land
- Diversification of enterprises
- BPS eligible
- Tax efficient
- High return on labour
- Capacity to significantly enhance farm viability
**Indicative Returns**

### Productive diverse Sitka spruce forest
- Total area 8 hectares
- 15% diverse, 15% open areas/retained habitat
- Normal thinning
- Rotation 34 years

**Net present value/ha:** €8,500  
**Annual equivalent value /ha:** €525

### Productive fast growing broadleaf species
- Total area 8 hectares
- 15% open area/retained habitat
- Normal thinning
- Rotation 50 years

**Net present value/ha:** €6,475  
**Annual equivalent value /ha:** €355
See Micheal tell his story: https://www.teagasc.ie/crops/forestry/advice/establishment/michael-owens/
Case Study 2

“...My forest is a growing pension pot, forest premiums enable me to lease in better land for farming...”

Andrew O’Carroll
RDS Award Winner

Woodland Environment Fund

- Access point for businesses to
  - Link in with farmers
  - Join in effort to expand Ireland’s native woodland resource
  - Provide additional financial incentive to encourage planting of native woodland

- Corporate Social Responsibility Project
- Contributing to delivery of a tangible environmental asset
- Enhances business reputation
- Building social cohesion
Social Sustainability

Our farm forests are a key resource

- 12,000 employed
  - Spread evenly in every region
- Forest output set to double in 10-15 years
  - Expansion largely by private forestry
  - Additional 10,000 jobs
  - Additional €2 billion in economic activity

(Source: Ibec, 2016)
Development Opportunities

Castlecomer Discovery Park

Source: www.discoverypark.ie

Source: Coillte.ie
Summary

Farm Forestry is a very significant ally in the quest for agricultural sustainability

- Farm viability, climate mitigation, water quality and biodiversity, local development

**Key drivers:**

- Whole farm planning
- Well sited and planned farm forests
- Using appropriate species & planting categories to promote sustainable growth
- Ongoing sustainably management of exiting forests
- Opportunities for multiple use and added value
How to keep up to date…

- Your local Teagasc forestry advisor
- www.teagasc.ie/forestry
- Teagasc Forestry e-Newsletter