

# What shall we do with the timber?

OPPORTUNITIES FOR IRISH WOOD AND WOOD PRODUCTS



NATIONAL FORESTRY CONFERENCE

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OPPORTUNITIES FOR IRISH WOOD AND WOOD PRODUCTS



Keynote address by  
Tom Hayes TD  
Minister of State  
with responsibility for forestry  
at the Department of Agriculture, Food and the Marine

Johnstown House Hotel  
Enfield, Co. Meath  
Friday, 6 June 2014

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Organised by the Wood Marketing Federation and the Society of Irish Foresters  
Supported by COFORD, Department of Agriculture, Food and the Marine  
and the *Irish Farmers Journal*







# Welcome

Welcome to the National Forestry Conference ‘What shall we do with the timber?’ - a timely topic as Irish forestry and the forest products industry compete in the global timber market.

The conference theme is quality and innovation, beginning in the nursery and continuing along the chain to the forest, sawmill, panel board mill, wood energy outlets and manufacturing before reaching the consumer. There are opportunities to add value at each stage while still producing a competitively priced, quality product from sustainably managed forests.

Few industries have a greater degree of interdependency than forestry. How the various links in the forest chain interact and perform determines the capability of the sector as a whole. These links begin with the quality of our seed and nursery stock, which decides the viability of our forests, the performance of down-stream industries and the effectiveness with which the sector delivers a range of economic, social and environmental benefits.

The conference acknowledges this interdependency. It highlights the need for an integrated approach as a precondition for the optimal development of the forest industry, which now exports close to 80% of its products and has an annual value of €2.2 billion.

Interdependency and partnership also played a part in the organisation and promotion of the conference. In this regard the Irish Farmers Journal , Wood Marketing Federation (WMF) and Society of Irish Foresters cooperated to ensure that the event would address as wide an audience as possible especially woodland owners who establish and manage our forest resource, timber processors, wood energy sectors and timber specifiers along with the various downstream industries.

We thank Minister Hayes for delivering the keynote address and COFORD, Department of Agriculture, Food and the Marine for its continued support of the wood promotion programme. Sincere thanks to all the speakers who readily took up the conference challenge to explore new market opportunities for Irish timber.

We hope you enjoy the conference and find the presentations informative, stimulating and challenging.



Paul Harvey  
Chairman  
Wood Marketing Federation



Justin McCarthy  
Editor  
*Irish Farmers Journal*



Pacelli Breathnach  
President  
Society of Irish Foresters



# Agenda

09.00	Registration and coffee
10.00	Welcome by Pacelli Breathnach, President, Society of Irish Foresters.
10.05	Keynote address: Tom Hayes TD, Minister of State at the Dept. of Agriculture, Food and the Marine.
	<b>Morning chairperson: Justin McCarthy, Editor, Irish Farmers Journal</b>
10.30	Growing quality for future forests and wood processors including research into vegetative production. Mike Harvey, Director at Maelor Forest Nurseries Limited.
11.00	Adding value in the forest. How good silvicultural practice can optimise the forest resource. Dr. Niall Farrelly, Teagasc.
11.30	Acknowledging interdependency – the need for a partnership approach between grower and timber processor in addressing, supply, certification and quality. Traolach Layton, Forestry Manager, GP Wood Ltd.
12.15	Adding value in the sawmill in an export led industry and the importance of quality, price, certification and continuity. Mike Glennon joint Managing Director, Glennon Brothers.
12.45	Discussion
13.00	Lunch
	<b>Afternoon chairperson: Donal Magner, Forestry Editor, Irish Farmers Journal and Secretary WMF</b>
14.00	Market opportunities for wood in renewable energy. Joe O’Carroll, Managing Partner, OC Consulting
14.30	Opportunities for increasing international market share for Irish panel board products. David Murray, Innovation Manager, Coillte Panel Products.
15.15	Exploring new products for Irish timber including engineered wood. Dr. Annette Harte, Senior Lecturer, Civil Engineering, NUI Galway.
16.00	Open forum
16.30	Close of conference Paul Harvey, Chairman, Wood Marketing Federation

# Foreword

## Maximising markets for Irish coniferous species



Paul Harvey  
Chairman  
Wood Marketing Federation  
Business Manager  
Lonza Wood Protection in Ireland.

The buoyant Irish forestry and forest products sector has an annual value of €2.2 billion including exports of forest products averaging €306 million per annum during the period 2010-12.

The total forest cover in Ireland is estimated to be 855,000 ha – north and south – which produces 3.2 million cubic metres annually, mainly softwood.

The species menu has changed over the years from 95% coniferous species for much of the last century to a 60:40 mix of softwoods and mainly native broadleaves in recent years. However, the predominant species is Sitka spruce (*Picea sitchensis*), which is used for construction, pallet or packaging, fencing and wood energy in recent years, while sawmill residue (wood chips and sawdust) is processed for panel board products such as oriented strand board (OSB) and medium density fibreboard (MDF).

The growth rate is defined by the term Yield Class (YC) and typical figures for Sitka spruce in Ireland range from 20 to 24 (cubic metres per hectare per annum). Typical figures in the UK range from 11 to 14, while YC 4 is the average in Sweden.

Therefore, Ireland’s productive coniferous forests can provide yields of between twice and five times greater than northern European countries. This provides challenges on how we utilise these highly productive forests. In Ireland 33% of the annual round wood harvest ends up as construction timber.

This timber is sawn, kiln dried and stress graded to strength class C16 grade, suitable for internal construction such as floors and roof joists.

Fencing and round stakes yield is 36%, most of which requires preservative treatment if used externally. Comparisons are often drawn between low and high yielding spruce especially in construction where slow grown logs may have advantages. However, high yielding spruce has advantages in terms of density and permeability as it renders it uniquely suitable for pressure treatment, ideal for round fencing posts.

Work done to date indicates that once the timber is dried properly and correctly pressure treated, it will comply consistently with current IS and BS treatment standards (accepted standards in Ireland and Britain). This approach will allow Sitka spruce to penetrate fencing markets from which it was once excluded.

There are other opportunities for Irish timber to gain market share and these will be addressed in today’s conference. Later this year to celebrate its 25th anniversary, the Wood Marketing Federation will organise Wood Awards Ireland 2014, which is aimed at architects, engineers and designers who use wood as the inherent medium in their building and design projects.

This is another way to highlight the advantages of wood as a construction and design material. Like the conference, it is compatible with our mission: to promote wood as a renewable, sustainable and versatile natural material.

# Welcome address



Pacelli Breathnach  
President  
Society of Irish Foresters.

Minister, guest speakers, ladies and gentlemen

On behalf of the joint organisers, the Society of Irish Foresters and the Wood Marketing Federation, and our conference supporters, the *Irish Farmers Journal* and COFORD, I have great pleasure in welcoming you. Minister, we are honoured that you have taken the time to open and to address our conference.

Our industry has an annual value of €2.2 billion, much of it generated from export sales. When the construction industry collapsed in 2008, the timber processing sector developed export markets for the timber, so that today close to 80% of the output from the sector is exported. The sector has proved its capability beyond reasonable doubt and we are confident that the industry will process all the timber which is set to increase to almost five million m<sup>3</sup> by 2020.

While this is an impressive performance, we still are well behind the targets envisaged in the 1996 report 'Growing for the Future' which forecast output at 10 million m<sup>3</sup> per annum, and preferably 12 to 15 million m<sup>3</sup> per annum by 2030.

To achieve this, a target of 17% forest cover by 2030 was deemed necessary, based on an annual planting programme of 20,000ha. In recent years we have achieved only one third of this target.

We welcome the 15,000ha annual planting programme in the Forestry Programme 2014-2020. However, it is important that this target is supported by appropriate policies which will ensure that they are achieved. If not, these new targets are no more than aspirations. At the moment, we have a golden opportunity to do this. We have the Forestry Bill going through the Oireachtas; we have the draft report of the Forestry Review Group and the proposed measures for the new Forestry Programme 2014-2020 which is in the consultation phase.

I can assure you Minister, that the Society of Irish Foresters and the Wood Marketing Federation are willing to work with you and your officials in supporting the development of the sector to ensure maximum return to the national economy including job creation, most of which is and will continue to be, based in rural Ireland.

I would like to thank the *Irish Farmers Journal* for supporting this event and special thanks to the speakers at today's conference.

There is a huge amount of expertise and experience in this hall today and I look forward to the papers being presented. This topic is timely given the legislative and policy developments currently in train.

Minister, I have great pleasure in inviting you to make the keynote address and to declare the conference open.

Pacelli Breathnach  
President  
Society of Irish Foresters

# Introduction

## What shall we do with the timber?

### Exploring market opportunities for Irish wood and wood products



Donal Magner  
Forestry Editor,  
*Irish Farmers Journal*  
Secretary,  
Wood Marketing Federation

While nobody knows for certain what we will be doing with timber and timber products in the future, we can be sure that we will be doing things differently with this great renewable resource. Few would believe even a few years ago that high rise buildings up to 20 storeys would be constructed in timber, but it's happening.

Timber specifiers and consumers continuously demand new products and the Irish forestry and forest products sector will have to continuously change to retain and improve market share. Eased edged, planed all over, properly kiln dried and mechanically graded sawn timber didn't exist in Ireland a generation ago. Neither did most of our engineered panel board products. Today these products are the norm as they contribute to an export-led industry which contributes €2.2 billion annually to the economy.

Probably the greatest opportunities lie in the role wood plays in sustainable living. While the Kyoto Protocol acknowledges forests as carbon sinks, in reducing greenhouse gas emission, there has been a reluctance to acknowledge forest products as carbon stores. However, the UN climate change convention in Durban at the end of 2011 accepted that harvested wood products such as sawn timber, engineered wood, panel products and pulp for paper manufacture, could be included in the carbon accounting framework for forests for the period up to 2020.

This recognises the climate change mitigation benefits of harvested wood products in replacing emission intensive products, such as steel, plastic and aluminium. For example, using wood saves energy over the life of a building as its cellular structure provides outstanding thermal insulation, estimated at 15 times better than concrete, 400 times better than steel and 1,170 better than aluminium.

The Timber Research & Development Association (TRADA) maintains that a 2.5cm timber board has better thermal resistance than an 11.4cm brick.

In the past the forest and wood cycle began with seed collection and ended with sawdust but this is no longer the case.

Today, it begins long before the seed is planted and continues after sawdust, which is recycled to make medium density fibreboard (MDF), oriented strand board (OSB), heat logs, wood pellets and other reconstituted products. And this is only the beginning, as we will discover at this conference.

However, despite increased exports, the Irish forestry and forest products industry cannot take markets for granted, which is why we ask the question: 'What shall we do with the timber?' It might appear superfluous during a time of increased demand but we know from experience that markets change and demand can fluctuate.

Currency variations, economic conditions and new market entrants can combine to quickly change the dynamic between growers, processors, manufacturers and ultimately, the end user.

It is only 23 years since the study 'The Irish timber industry – An export development plan for the 1990s' identified timber producers in Scandinavia, Canada, Portugal and even Chile as major threats to Irish timber exports and the domestic market.

# Mike Harvey

## Growing quality for future forests and wood processors including research into vegetative production.



Mike Harvey is Director, Maelor Forest Nurseries located at Fields Farm, Bronington on the Welsh border. Maelor produces approximately 20 million trees a year for customers throughout the UK and Europe. The nursery places strong emphasis on quality and research especially in vegetative propagation (VP) of improved Sitka spruce, root electrolyte leakage testing and pest and disease control.

Wood is increasingly recognised as “the material” of the 21st century. It is recognised for its carbon mitigation effects. The benefits of using sustainably produced wood for offsetting carbon intensive activities can continue indefinitely.

Major research in the development of tree breeding techniques is taking place world-wide as tree breeders seek to establish plantations based on the best available genetic gains for future timber production. It is predicted that the demand for wood products will increase dramatically over the next 20 years. Projected global wood harvest (billions of cubic metres)<sup>1</sup>:

- 2010 – 3.79
- 2020 – 4.39
- 2030 – 5.11

The ability of our plantations to benefit from these developments however does not just rest with the tree breeder alone, but with the whole supply chain including methods of grafting, vegetative reproduction, seed orchard management, nursery practices, forest establishment practices, silviculture, harvesting and processing.

This presentation seeks to demonstrate the work being done on a commercial nursery as part of the supply chain, in delivering genetic gains to the plantation. The demonstration is focused on Sitka spruce as it is the major commercial timber crop in the UK and Ireland.

As the demand for better quality increases together with the development of alternative species (especially in view of the effects of *Phytophthora ramorum*), this places increasing pressure on the nurseries to develop their growing techniques and to widen their knowledge.

At Maelor we have recognised the importance of working together with all those involved in the supply chain from researcher and tree breeder to the sawmills. There will be no value from research into genetic gain or selection of an alternative species unless the supply chain knows how to grow it and sawmills can process it for an identified market.

The current annual production of forest planting stock at Maelor is circa 20 million, of which approximately 25% is from vegetative propagation. The nursery is involved in research projects with universities and forest research in the UK as well as with research institutes overseas. In developing working practices the nursery staff have developed connections to a world-wide network of specialists. The nursery is also involved in established working groups which include representatives from the whole supply chain.

The nursery is developing seed orchards for Sitka spruce, sycamore, birch and Douglas fir.

A decade previously, the then Forest Service – the owner of virtually all the productive forests – could not find markets for almost half of its timber. Due to the collapse of two processing mills and a stagnant sawmilling sector, thinning and clearfelling slowed down. In the late 1970s and early 1980s, the Forest Service reduced the annual volume of available timber to 740,000m<sup>3</sup> but could sell only 420,000m<sup>3</sup>, which is less than the annual capacity of any one of our four major sawmills today.

During the past decade, Irish timber processors have increased market share and seen off almost all international softwood producers in the domestic marketplace, albeit a market that has shrunk dramatically since the collapse of the construction industry.

Could supply again outstrip demand in the future? There is little doubt now that the timber processing sector is much more sustainable than any time in our history but nothing should be taken for granted. Annual production in our forests is now over 3.0 million m<sup>3</sup>, but this is estimated to increase to 4.9 million m<sup>3</sup> by 2020 (Figure 1).

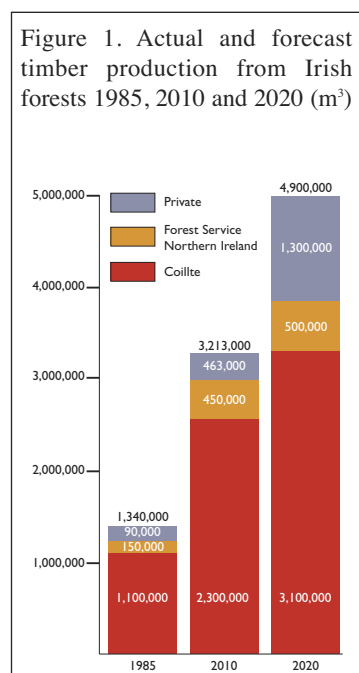
To ensure the continuation of a viable forestry and forest products industry, the disconnect that has existed for years between grower and processor needs to be addressed. Few industries have a greater degree of interdependency than forestry. How the various links in the forest value chain interact and perform determines the capability of the sector as a whole. These links begin with the quality of our seed and nursery stock, which decides the viability of our forests, the performance of down-stream industries and the effectiveness with which the sector delivers a range of social and environmental benefits.

This interdependency has been long acknowledged by the Irish Farmers Journal, representing farmers with plantations and others in the wood chain. It has also been promoted by the Society of Irish Foresters, representing the forestry profession and the Wood Marketing Federation, representing the timber industry.

All three organisations are represented at today’s conference in Enfield which highlights the need for an integrated approach as a precondition for the optimal development of the forest industry. A wide range of expert speakers will address the major challenges facing the sector which now exports close to 80% of its products and has an annual value of €2.2 billion.

The emphasis throughout is on quality and innovation, beginning in the nursery and continuing along the chain to the forest, sawmill, panel board mill, wood energy outlets and manufacturing before reaching the consumer. For most of the last century that consumer was based in Ireland and to a lesser degree in Britain. Now an increasing volume of Irish timber and timber products reach customers throughout Europe, the Middle East and even India.

Irish processors are now paying growers better prices than any other country in Europe. In challenging and possibly controversial presentations, each speaker at the Enfield conference will demonstrate how we can further increase domestic and export market share for Irish timber, thereby creating greater market opportunities for timber growers and processors.



<sup>1</sup> Scion - New Zealand Forest Research Institute. Report 'Challenges and Opportunities for the World's Forests in the 21st Century, p 218. Turner et al. (2006) ISBN 978-94-007-7075-1



## Growing quality for future forests and wood processors including research into vegetative production.

### Identifying heritable characteristics

Of the various factors controlling wood quality a number of them are known to be highly variable and also heritable:

- Density
- Fineness of branching
- Angle of branching
- Grain angle
- Micro fibril angle
- Stem form

Growing quality for future forests and wood processors including research into vegetative production

Mike Harvey

### Economic driver for quality

The most valuable market for home grown softwood in Britain is structural grade sawn timber. Unfortunately most of the timber being felled does not meet the stringent quality requirements for this market. The lower value pallet, packaging and fencing markets currently absorb approximately more than two thirds of the UK production of sawn timber. Timber growers are therefore concerned that a much higher proportion of the second rotation is aimed at the more lucrative structural market. To achieve that then the quality of timber grown has to be significantly improved over the previous rotation.

### Establishment of wind pollinated seed orchards

- Clones from "breeding population" then established in clone banks
- Clones from this material then used to create seed orchards
- Initially emphasis for selection was vigour and form (poor grain angle and coarse branching material had been excluded from the plus tree selection)
- These seed orchards currently account for approximately 75% of the Sitka being planted in the UK
- This material has predicted gains in vigour (over QCl controls) of around 20% and gain in form of around 8% with a loss of density of around 12%

### Selection of plus trees- Sitka Spruce

- In UK 2800 outstanding phenotypes selected
- Intensity of selection:- 1 out of 75,000
- Progeny testing carried out in trial plantings around Britain
- Evaluation of genetic quality lasted 15 to 20 years (final testing for breeding population delayed for pilodyn density measurement at age 15yrs +/-)
- As a result of the progeny testing 200 plus trees selected for the "breeding population"
- Breeding population then developed with new genetic combinations

### Establishment of more recent orchards

- In recent years seed orchards established from clones giving significant improvement in quality traits
- Predicted gains in stem form of circa +20%, with increases of vigour of circa +20% but without any loss in density
- These seed orchards just starting to produce seed





## Production by vegetative propagation

- Direct pollinated "full sibling" seed brought individually at a cost of circa £5 per seed
- Seed germinated in individual containers
- Seedlings grown on for circa 2 growing seasons - becoming a "stock plant"
- Cuttings taken from "stock plant"
- Cuttings rooted and then planted into "stock hedges", after 2 growing seasons cuttings taken and rooted for bare-root production - process takes 6 years to get material from seed into the forest
- Subsequent cuttings from "stock plants" rooted and planted for bare-root production - enables some production from seed to forest within 4 years

Growing quality for future forests and wood processors including research into vegetative production

Mike Harvey



Production from seed orchard



## Production from seed orchard material

- Seed cost relative low circa £1250 for 1kg
- 1 kg equates to around 330,000 seeds
- Most of production is "bare-root" from broadcast sowings of seed
- Seedlings uplited after 1 or 2 growing seasons and transplanted
- Transplanted stock then remains in field for 1 to 1.5 growing seasons before being lifted and sold

## Cuttings from stock plants



Cuttings callousing with initial root growth



Rooted cuttings



Growing quality for future forests  
and wood processors including  
research into vegetative production

Mike Harvey

"Winter cuttings" inserted in controlled  
environment



"Summer-cuttings" inserted in "raspberry  
tunnels"





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 Pearson Education, Inc.

The number of surviving lampjackets between years was significantly improved for the first three years of the study and these were all higher than the average of 1.61. The maximum variability of the 1997 census was seen with males average 1.66 and females a lower 1.44.

- Much higher quality, some crosses producing gains in stem form of +35%, compared to 20% from the best available (over the next few years) seed orchard material
- Newly identified material brought to the market much more quickly - have to wait 15-20 years for seed orchard compared to 5 years for VP
- Far higher confidence in predicted gain figures with uniformity
- Seed orchard production very variable, "panmixis" occurs rarely (equal distribution of cone)
- Scarce material can be maximised earlier e.g. acoustic velocity

- More difficult to establish on most sites; does not have fibrous root system and juvenile vigour of seed orchard material
- Cost - around £50 per thousand more expensive than seed orchard material
- Planting on poor sites can result in prolonged "plagiotropic" growth

- Somatic embryogenesis and cryopreservation- good model developed in Ireland by David Thompson
- Automation?
- Development of genetic material with high acoustic velocity traits
- Other species: work started on Douglas Fir, work in Sweden with Norway Spruce
- Creation of Sitka Spruce Breeding Co-op in the UK  
[www.sitkatopco.co.uk](http://www.sitkatopco.co.uk)
- Clonal?

Parameters	Relative Error of numerical results (%)	Calculated EPR (mW/cm <sup>2</sup> )	Calculated EPR (mW/cm <sup>2</sup> )	Adverse health risk indicator (I <sub>h</sub> )	Stochastic sensitivity analysis (I <sub>h</sub> ) (%)	Stochastic sensitivity analysis (I <sub>h</sub> ) (%)	OTD parameter (I <sub>h</sub> )	OTD parameter (I <sub>h</sub> )
OTD	23.4	0.0207	0.02	0.0207	0.02	0.02	0.02	0.02
Scenario 1	24.4	0.0207	0.02	0.0207	0.02	0.02	0.02	0.02
Scenario 2	25.4	0.0207	0.02	0.0207	0.02	0.02	0.02	0.02
Scenario 3	26.4	0.0207	0.02	0.0207	0.02	0.02	0.02	0.02

[illegible]

QCI v family mixture v best full-sib families v tested clones



Selected clones.  
Genetic diversity  
could be very  
narrow.



Growing quality for future forests  
and wood processors including  
research into vegetative production

Mike Harvey



# Dr Niall Farrelly

## Adding value in the forest. How good silvicultural practice can optimise the forest resource



Dr Niall Farrelly is a research forester with Teagasc Forestry Development Department, specialising in research on forest productivity, management land use and resource analysis. His research programme focuses on how environmental factors and forest management practices affect the productivity, composition and structure of forest ecosystems. Other research involves ecosystem classification and land use analysis.

Ireland has a mild, maritime climate lacking extremes in temperatures which is ideally suited to the growth of trees. The similarity in climate between the latitudes of the Pacific north-west of America and Ireland has resulted in the remarkable success of introduced species which show adaptability to Irish conditions.

Sitka spruce is a remarkable success story and the species occupies over 50% of the forest estate and accounts for over 90% of the harvested volume. Opportunities to achieve increases in productivity which offer significant revenue gains are the focus of this presentation. While very favourable yields can be achieved on former farmland sites, further increases in yield can be achieved by planting the species on better soils with higher fertility levels.

Further opportunities to increase productivity are possible through provenance selection with the choice of more southerly provenances of Sitka spruce offering yield increases of between 2 to 4 m<sup>3</sup> over Queen Charlotte Island sources on the same sites. The use of improved material and continued tree improvement programmes have the potential to further increase yield, additional gains could possibly be achieved by selection of Oregon provenances for more southerly sites with less demanding end uses.

The potential for forest managers to increase yield and profitability exists by thinning which salvages trees that will ultimately die and offers the potential to increase yields by approximately 10%. The improvement in tree quality and an increase in diameter after first thinning are essential and research results indicate that a vigorous selection between the lines in thinning is necessary to at least a grade C thinning or more.

A robust first thinning offers the potential to significantly increase the diameter and volume of trees. The net result is that growing to a merchantable size of 0.7 to 0.8 m<sup>3</sup> log is now possible with prescribed thinning regimes in crops well before the age of 30 on high yield class sites.

Prompt thinning of crops is advised as delayed thinning in the hope of achieving more palletwood and higher revenue is counter-productive. Reductions in diameter increment and individual volume increment are apparent and revenue is only marginally increased by delaying thinning by three years. Mean diameter and tree volume is greatest in crops thinned earlier as a result of the provision of more growing space.

Increasing thinning intensity results in the production of a higher percentage of straight logs and higher revenue returns especially as it is possible to reach a merchantable log in relatively short time.

Adding value in the forest. How good silvicultural practice can optimise the forest resource.

Dr Niall Farrelly

### How good silvicultural practice can increase the productivity and profitability of the forest enterprise






Dr Niall Farrelly

National Forestry Conference, Julestown: Pallas Hotel, Enfield Co. Meath, Friday 6<sup>th</sup> June 2014




The Irish Agriculture and Food Development Authority

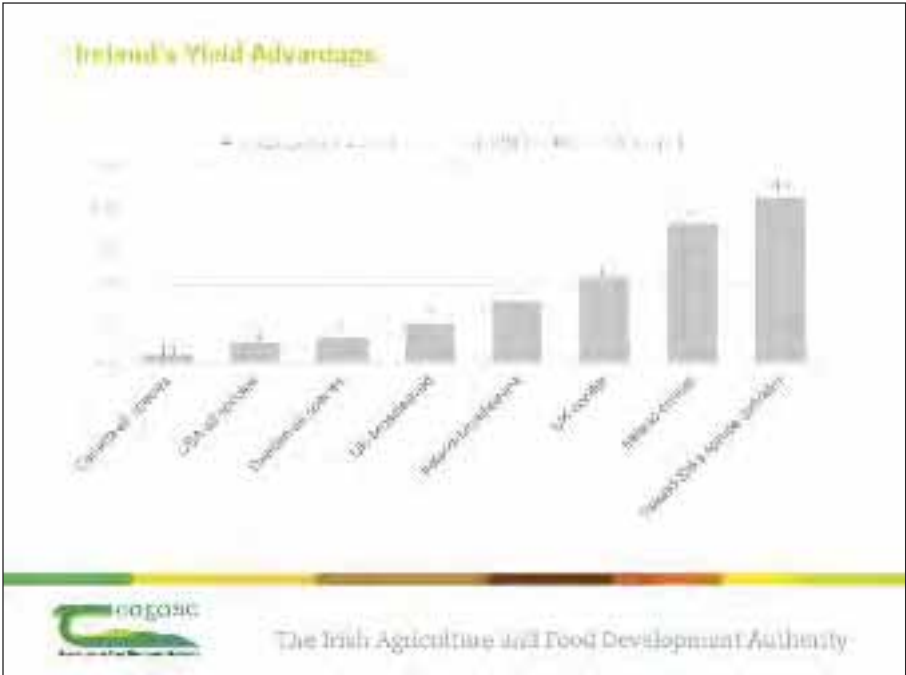
### Starting point Conditions extremely good for tree growth

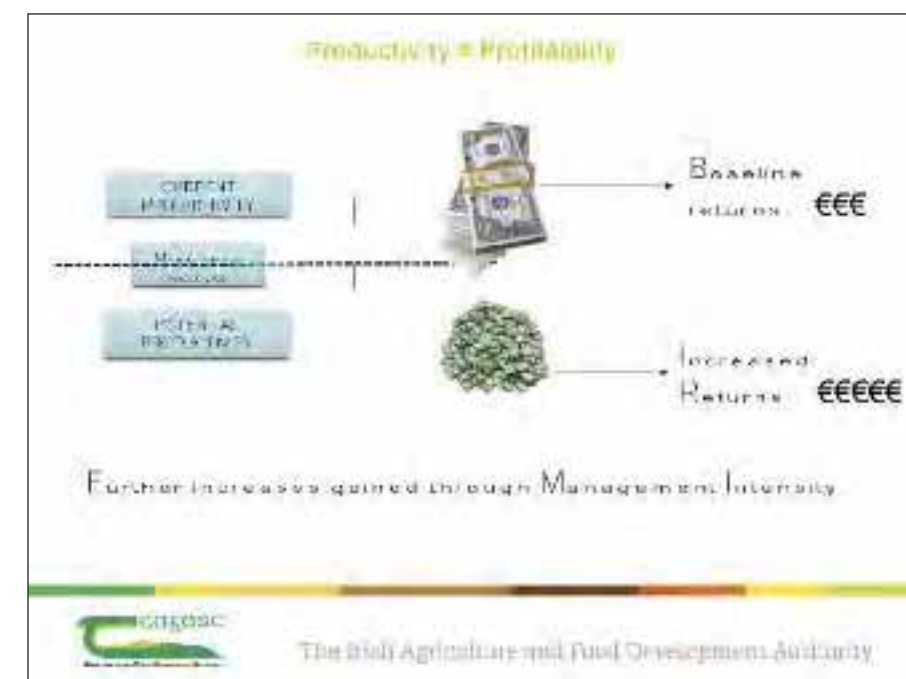
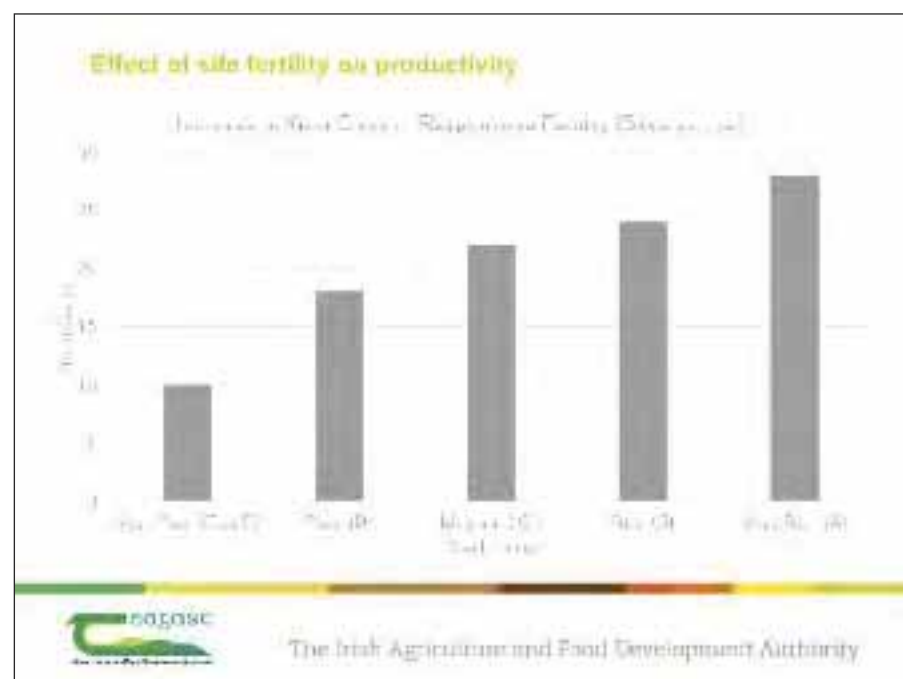


- Optimum growing conditions for high production rates.
- Competitive advantage in growing biomass (grass, forestry, etc)



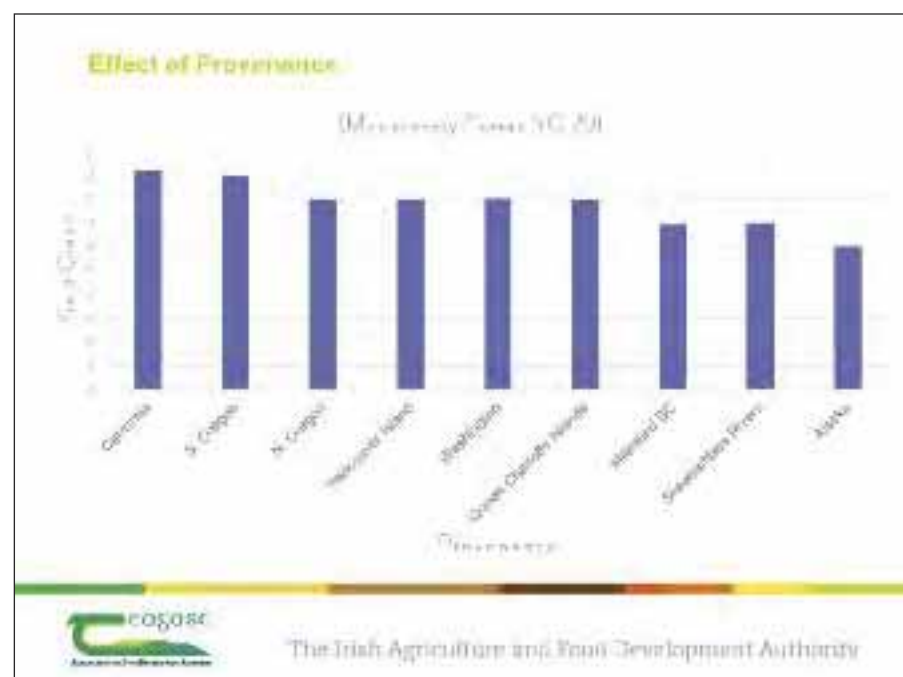
The Irish Agriculture and Food Development Authority



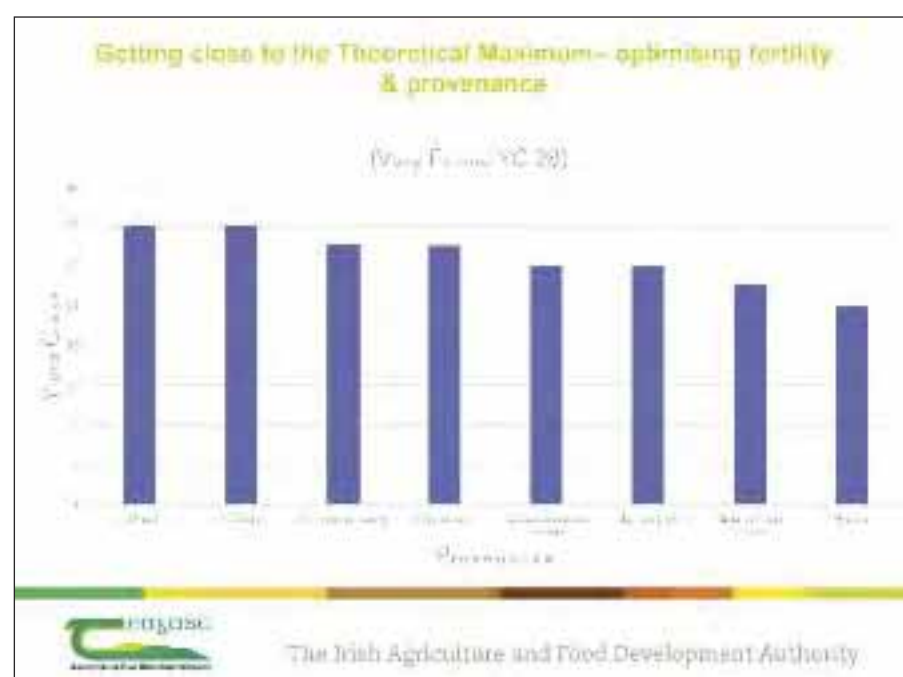


Adding value in the forest. How good silvicultural practice can optimise the forest resource.

Dr Niall Farrelly



- ### Increased Productivity & Profitability through Provenance
- Salvages material that will ultimately die (10% loss in volume)
  - Invest in good quality trees that are more valuable (i.e. sawlog)
  - Provides periodic income
  - Maximises productive potential of site (Potential V Actual)
  - Potential to reductions in rotation times (AMMAI – 20/30%)
  - Opportunities to grow for target volume quicker (0.8 m³ log)
- cofasc**  
The Irish Agriculture and Food Development Authority



- ### Case study on what can be achieved – Thinking Experiment
- Frenchpark, Co. Roscommon (2010), surface water clay, P 1995**
- No drainage
  - Low productivity (grade B)
  - Moderate rotation (grade C)
  - Low productivity (grade D)
  - Late thinned 3 year cycles
  - Moderate thinning 3 year cycles
  - Survival missing 3 year cycles
  - Growth missing 3 year cycles
- Abbeyshrule, Co. Louth (2011), Brown Earth, P 1995**
- No drainage
  - Low productivity (grade B)
  - Moderate rotation (grade C)
  - Low productivity (grade D)
- cofasc**  
The Irish Agriculture and Food Development Authority



**Different thinning types examined:**

**Control – No thinning**

**Grade B –** Removal of all suppressed, diseased, forked and ectomycorrhizal trees (i.e. 20% of basal area removed)

**Grade C –** Removal of all diseased, forked and ectomycorrhizal trees (i.e. 33% of basal area removed)

**Grade D –** Removal of all diseased, forked and ectomycorrhizal trees (i.e. 100% of basal area removed)

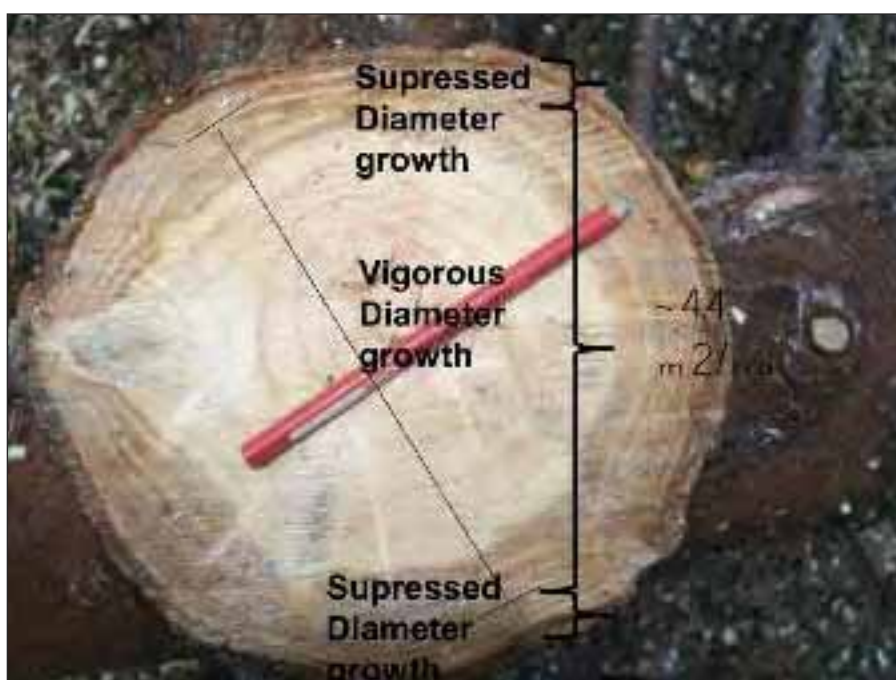
**S- Selection thinning:** Removal of suppressed and all forms of large (diameter >24 cm). This is to allow the wider canopy to grow and to increase the basal area.

**X- Crown thinning:** Removing all diseased and all forms of large (diameter >24 cm). This is to allow the wider canopy to grow and to increase the basal area.

**No thinning – no opportunity to increase productivity**

**CONTROL**

	Before	After
SPH	2104	NC
Basal Area (m2)	44	NC
DBH (cm)	16.3	NC
Volume/Ha	212	NC
Volume/Stem	0.10	0.10
Vol removed	0	0
Revenue €/Ha	0	0



**Grade B – crop parameters**

	Before	After
SPH	2156	1500
Basal Area (m2)	46	35
DBH (cm)	16.4	17.3
Volume/Ha	227	170
Volume/Stem	0.10	0.11
Vol removed		51
Revenue €/Ha		361

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**Grade C – crop parameters**

	Before	After
SPH	2068	1222
Basal Area (m2)	43	30
DBH (cm)	16.4	17.7
Volume/Ha	210	146
Volume/Stem	0.10	0.12
Vol removed		62
Revenue €/Ha		409

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**Grade D – crop parameters**

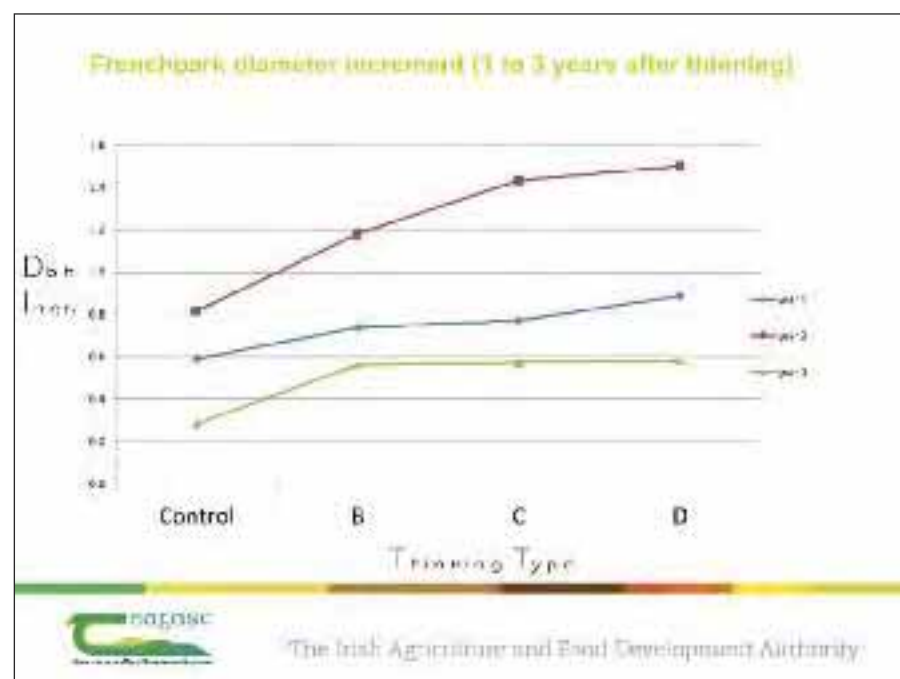
	Before	After
SPH	2018	1008
Basal Area (m2)	42	27
DBH (cm)	16.2	15.5
Volume/Ha	200	133
Volume/Stem	0.10	0.13
Vol removed		67
Revenue €/Ha		442

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Adding value in the forest. How good silvicultural practice can optimise the forest resource.

Dr Niall Farrelly





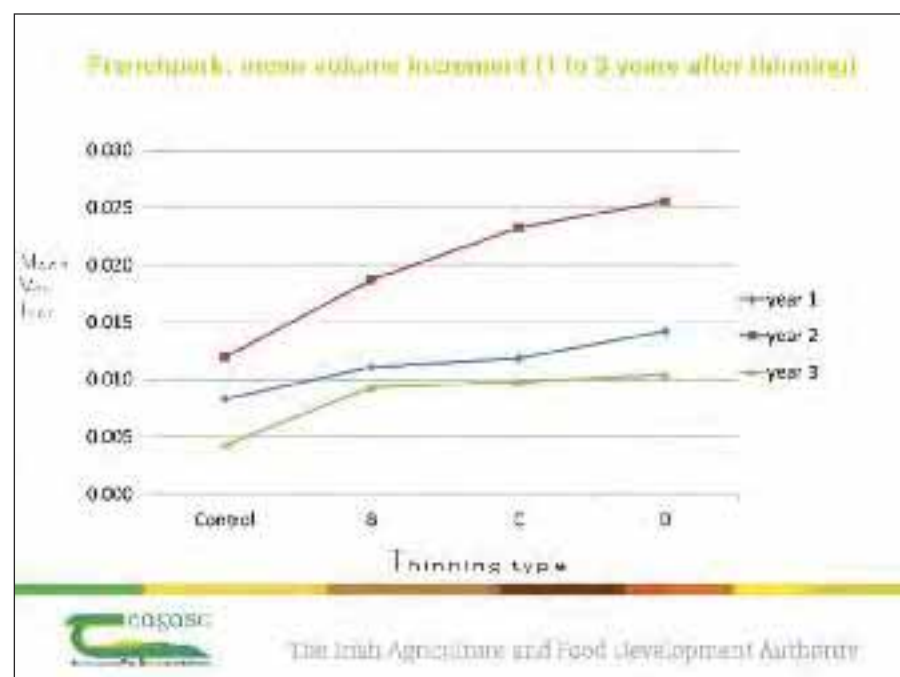
**Comparison of thinning systems (post thinning)**

Thinning Type	Final Thinning Average Cost/ha	DBH (cm)	Vol & Biomass (t/ha)
Control	0	17.7	0.12
Grade B (on time)	€361	19.2	0.14
Grade C (on time)	€409	19.9	0.16
Grade D (on time)	€442	20.9	0.17
Grade B (3 yr delay)	€450	18.3	0.13
Grade C (3 yr delay)	€526	19.0	0.14
Crown	€648	18.2	0.12
Selection	€768	17.5	0.13

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**Projected Rotation lengths & Financial implications**

- Densified stands require rotation lengths of up to 30 years to produce D.I. in 50% - 25 years (balance) versus 16 years (unthinned)
- Densified stands require rotation lengths of 24 years
- For volume or income purposes, thinning can increase production by 35% (Frenchpark) 50% (Aspenwood) very productive sites
- Thinning to 500 stems/ha reduces harvest production from 10 - 15% (at 20 years) and 10% (at 30 years)
- Densified stands produce (best case) 10% more volume than 10% less
- Thinning at 7 years to achieve mean log size in thinning implications for wood where there is a small margin for loss

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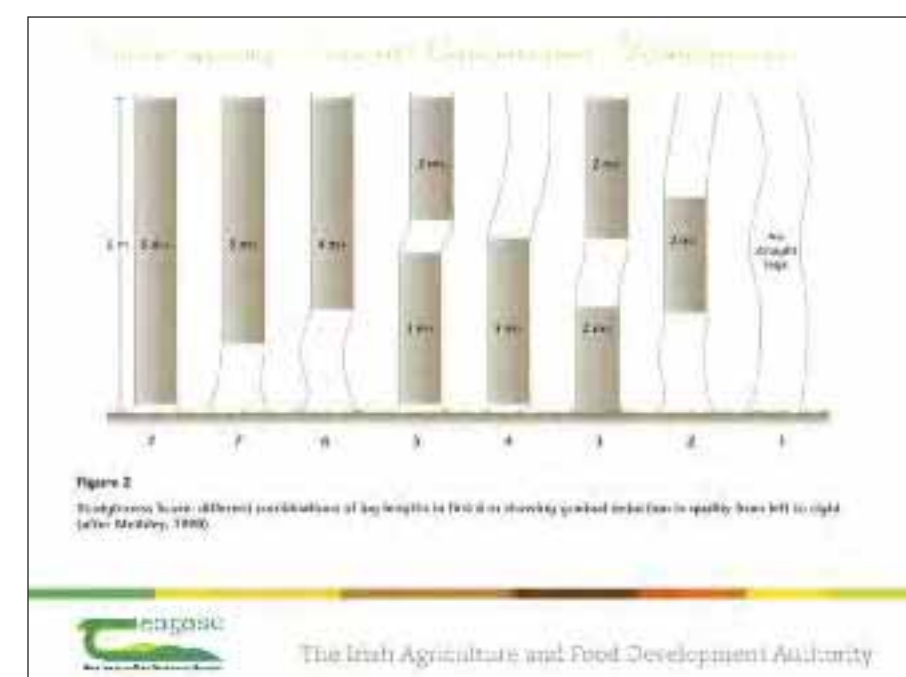
**Summary 2 year Increment details**

	Mean dbh cm	Mean vol m³	Vol Incr m³/ha
Control	1.4	0.020	41.4
Grade B	2.0	0.030	44.1
Grade C	2.2	0.035	42.9
Grade D	2.4	0.040	40.0

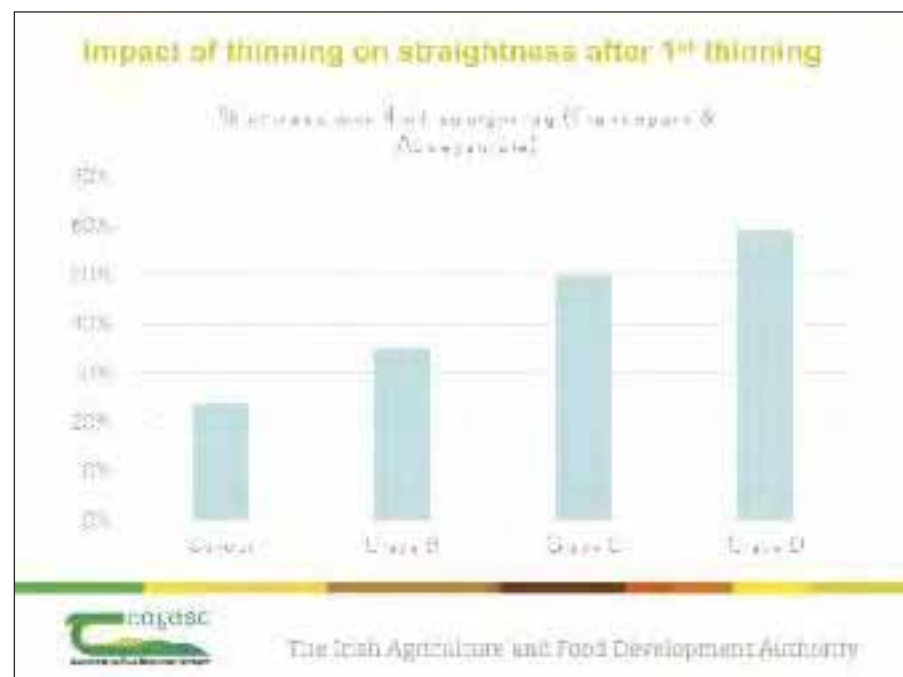
  

Increment as a % of the control	Mean dbh cm	Mean vol m³	Vol Incr m³/ha
% Incr B	40%	47%	6%
% Incr C	57%	73%	4%
% Incr D	70%	95%	-3%

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### Thinning - 15-20% Volume

- Thinning is more profitable than no thinning – crops > YC 14
- To achieve 2 cm increase thinning to grade C/D is necessary
- Largest returns arise in grade D thinning
- D treatment only suitable (stable sites or stands thinned on time)
- Thinning early reduces rotation length
- NO benefit in thinning late (stands overstocked diam decreasing)  
€117 extra for 2 extra years
- Rotation lengths to 0.8 m3 possible after 24 – 28 years (YC 26-34)
- Unthinned stands have sig. longer rotation lengths (windthrow risk)

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## Thank You!

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## Traolach Layton

### Acknowledging interdependency – the need for a partnership approach in addressing supply, certification and quality



Traolach Layton graduated from UCD in 1978 with a degree in forestry. Traolach went on to complete a masters degree in wood technology in the University of Washington, Seattle in 1982. He joined Palfab Ltd. in 1986 where he worked as Forestry Director until 2013 when he was appointed Forestry Manager, GP-Wood Ltd. after the merger of Palfab and Grainger Sawmills. A member of the Society of Irish Foresters, he is a 'registered forester' with the Forest Service.

Every year, in excess of 3.5 million tonnes of logs are harvested in Irish forests and transported to processing mills throughout the country. The planning and operation of this movement requires dedicated people, machinery and systems, all of which have evolved with the development of the State plantations.

In recent years output from State plantations has matured and stabilised. The grant aided private planting programmes of the past two and a half decades have almost doubled the area of forest in Ireland and already begun to yield increasing volumes of log from privately owned forests, mainly thinnings. Future growth in log output will come mostly from privately owned plantations, but the challenge of efficiently mobilising this output is very different.

With over 15,000 individual owners and an average plantation size of 8ha the private forest is not nearly as predictable and well managed as the State forest. Output from privately owned forests will change over time in terms of log type, harvest type and volumes.

Log processors have demonstrated their ability to process and market all the available logs and are always looking for more timber.

From a sawmiller's perspective log procurement is a specific function that involves sourcing, evaluating and buying log lots, contracting and management of harvest operations, liaison with the forest owner, organization of haulage, log sales to third parties, stock and quality control, payment and reporting. All the above need to be in compliance with Sustainable Forest Management.

The harvest and haulage infrastructure is the vital link between the forest and the processor. An understanding of the relationship between the grower, the contractor and the processor, and its effective management, is critical. Planning is everything.

Harvest and haulage contractors have been remarkable in their ability to meet the needs of the existing industry through investment in machinery, personnel and technology. We need significant investment over the coming years to harvest the private forest, as well as the State forest, but investment requires confidence.

To get the best from the private estate we need efficient procurement, harvest and haulage operations. Efficient operation requires accurate forecasts and yearly production plans. Work needs to be offered in viable lot sizes in a consistent and ordered manner. Forest owners need to become more aware and involved in the industry and organised in a way that facilitates the efficient and sustainable flow of logs from the forest to the markets.

We need to understand more about the new forest owners, their motivations and how their forests are growing. We need to build relationships that recognise our mutual dependence and build structures appropriate to industrial needs and social constraints.

We need a partnership approach to building an effective interface between the private growers and the processors which encourages the contractors to develop and service the needs of all.

## Acknowledging Interdependency

- the need for a partnership approach between grower and timber processor in addressing supply, certification and quality
- Traolach Layton - GPWood
- National Forestry Conference June 5<sup>th</sup> 2014

## Private forests -Industry perspective

- Coillte volumes are static
- Development will depend on Private resource
- Huge potential growth in volumes
- Concerns

Acknowledging interdependency – the need for a partnership approach in addressing, supply, certification and quality.

Traolach Layton

## Acknowledging Interdependency

- Forest industry overview
- Private forests - Industry perspective
- Market Overview
- Harvest and haulage Overview
- Harvesting the Private forests
- How growers can influence development

## Industry concerns about Private forests

- Uncertain forecasts
- Location of Plantations and Access to Them
- Forest Harvest Contracting Resource
- Owners Knowledge of and Enthusiasm for Forestry
- Number of owners
- Plantation Size, Productivity & Quality
- Forest Management
- Industry Leadership & Co-ordination

## Forest Industry Overview

- 10.5 % of land now in Forest
- 46% Privately owned with over 15,000 owners
- 12,000 employed – mostly rural
- In 2012 output estimated €2.2 billion (1.3%GDP)
- 73% Sawmill production exported in2009  
82% panel board production exported

## Market Overview

Current Annual log consumption by source

<b>Total Consumption</b>	<b>3.4 million (m3)</b>
Coillte	2,400,000
Forest service NI	400,000
Private	400,000
Imports	200,000



## Markets

- 8 major Sawmills with combined throughput 2.2 million m3
- 2 large pulpwood plants combined throughput 0.8million m3
- Stakes and fuel wood 0.4million m3

All available logs are being processed in Ireland with most of the product exported

- Industry crying out for logs
- Logs being imported

## Harvest and Haulage - needs

- Existing Contractor base needs investment.
- Need continuity of well planned work to invest in specialised machinery and training.
- Need skilled and energetic new operators.
- Need higher level Training and Certification for specialist thinning operators.

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## Harvesting and haulage overview

- Independent contractors.
- Dedicated harvest/procurement managers
- Industry norms for lot presentation, sales, measurement, quality control, site management and payment

## 3. Harvesting the Private forests

- The challenge is to connect the individual owners with the processors in a way that meets the needs of both in an efficient way
- It is not feasible for processors to interact directly with thousands of owners.

## Harvesting and haulage overview

- In 2014 78 Harvest contractors in republic
  - 350 Operators + 50 backup
  - 134 Harvest machines: 78 clearfell 56 thinning
  - 121 Forwarders
  - 101 Haulage Contractors
  - 435 trucks

## Harvest Management - functions

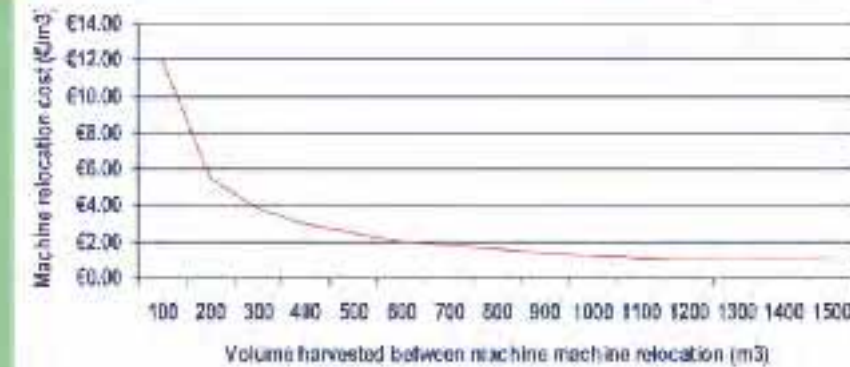
Mapping, measurement, evaluation and sale  
Felling licence approval  
Harvest scheduling  
Harvest Plan  
Health and safety and work monitoring  
Environmental and other constraints  
Access roads and stacking areas  
Haulage  
Security  
Measurement  
Payment

## Planned management and marketing

### This is Coillte

- Provide 10 year production forecasts
- 22 auctions per year
- Large sale Lots
- Comprehensive harvest plans, felling licences etc
- Permit system, Volume/weight measurement and AWS
- FSC Certified
- Centralised management systems
- But ..... Output static

## Optilog study - Influence of Scale of harvest operation on machine relocation overhead



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## Planned management and marketing

### This is Private

- Poor Forecasts
- No planned marketing strategy
- Lot sales are ad hoc and marginal in size
- Poorly controlled harvest operations
- No universal Measurement or permit system
- Usually not Certified
- Thousands of owner/managers
- But..... Huge increase in projected output

## How Growers can influence development

- Consider the needs of Processors and Contractors
- Planned management and marketing
- Affiliate and co-operate
- Certification

## Harvest - Haulage operations and Cost factors.

The major cost factors are :

- Location relative to markets
- Access
- Site features
- Tree size and form.
- Scale of harvest sites and distance from base.

## Processing industry needs

- Reliable forest production forecasts
- Agreed common standards and procedures for Lot Presentation ,Measurement , Sale and Management standards
- Viable work packages for Contractors
- Larger sales packages
- Certification
- Reliable inventory based on standard management plans will allow effective planning and grouping.



## Planned Management and Log sales

- Some private forests are being managed professionally.
- Huge numbers are without clear objectives.
- Need a variety of approaches to servicing the diverse ownership.
- Owners need to affiliate and commit to structured group management and sales

## Conclusions

- We have a broad indication of the potential volumes.
- We are confident that this volume can be processed and marketed.
- We urgently need to support Contractors to invest in equipment and personnel.
- We need structured skills training and certification.
- We need to Motivate growers to commit to group management, certification and marketing.
- We need to develop the range of management structures to meet the diverse needs of owners.

Acknowledging interdependency – the need for a partnership approach in addressing, supply, certification and quality.

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## By Cooperating Private growers can:

- Efficiently engage professional foresters
- Pool information for planning and forecasting
- Agree standards, objectives, group Certification
- Efficiently use available skills and services
- Adopt standard arrangements for sales, measurement and security
- Prepare larger sales packages
- Negotiate the best deals
- Engage with support agencies and influence policy
- Add value

## Certification

- Chain of custody
- Industry requirement
- Group scheme
- Options

