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TO FORESTRY

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2018
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SEPTEMBER 20-22

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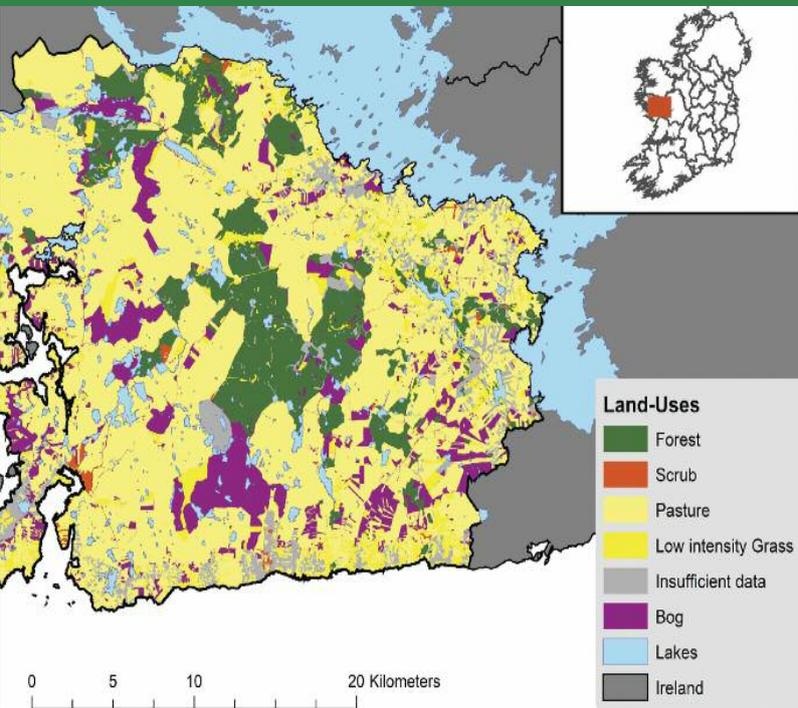
Forestry & Energy

REVIEW

Volume 8 Issue 2 Autumn/Winter 2018
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THE VOICE OF FORESTRY & RENEWABLE ENERGY



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Volume 8 Issue 2
Autumn/Winter 2018
Foreword

Welcome to the Autumn/Winter Edition of Forestry & Energy Review Magazine.

Sucklers to Forestry: In this Issue, Noel Kennedy of Teagasc Forestry discusses with Paddy Rhatigan the positive impact it has made to his life by switching most of his land use from sucklers to forestry. His work life balance and his income are much improved. For those considering change it is well worth reading.

ALTERFOR: As we all prepare for, and see the effects of climate change on a more regular basis, the team from UCD have been conducting research into "alternative forest management types". In western peatland forests it is suggested that there would be a transfer from Sitka spruce to lodgepole to reduce the impact of fertilization on establishment. A detailed and interesting article.

Native Woodland Regeneration: Declan Little of Woodlands of Ireland gives an in-depth account of the various options available to landowners under a number of different schemes, with increased incentives.

Innovation At Interforst: Tom Kent visited Munich for this Trade Fair which had 450 exhibitors from 28 countries. He even found an exhibitor from Ireland www.go2mill.com which have developed a chainsaw attachment to cut roundwood into dimensioned boards.

Biomass: It appears that private operators are moving ahead of the curve in the supply of biomass. Worrell Harvesting recently took delivery of a second chipper which will enable them to process seventy to one hundred thousand tonnes of woodchip per annum.

APF 2018

The largest forestry exhibition in the UK is again being held at Ragley Hall in Warwickshire on the 20/21/22 Sept. We are sure that Ian Millward and his team will deliver a professional show to remember. Please visit us at Stand D13.

We trust you enjoy reading this publication which will continue to provide a voice for the Forestry and Energy sectors.

Until the next time.....

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Can new types of forest management provide a more appropriate mix of ecosystem services from Ireland's future forests? By Anders Lundholm, Edwin Corrigan, Charles Harper and Maarten Nieuwenhuis of UCD.

30 NATIVE WOODLAND EXPANSION & MANAGEMENT

Considerable planning and management expertise in native woodland management has been developed in the past two decades, writes Declan Little.

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The development of new technology in the management, harvesting and end use of forestry products was very much the theme at interforst, writes Tom Kent.

40 APF 2018 HEADING FOR ANOTHER RECORD SHOW

The APF Exhibition is the place to be if you sell machinery, equipment and services into the forestry, woodland, arboricultural and fencing industries.

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Paddy Rhatigan has found that forestry gives him as much job satisfaction, and a better work-life balance than sucklers. His income is higher too. Noel Kennedy, Teagasc Forestry Development Officer, reports.

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The Afforestation Scheme offered by the Department of Agriculture, Food and the Marine, includes a range of options (Grant and Premium categories 'GPCs') for landowners considering planting forestry.

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All stages of the forest cycle are included in the course content at Ballyhaise College from nursery and establishment to thinning, harvesting and reforestation, writes Marianne Lyons.

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Ballyhaise College would like to thank all the participants in their recent open day which was both enjoyable and informative, by Kevin O'Connell.

76 WORRELL HARVESTING LEADING THE WAY IN WOOD BIOMASS

Forestry & Energy Review visit Worrell on site near Tullamore to witness new developments in this fast expanding enterprise.

82 THE EU TIMBER REGULATION (EUTR)

The EU Timber Regulation, or EUTR as it is also known, is an important tool in the fight against illegal logging. Noel O'Connor (DAFM) discusses.



GROWING EUCALYPTUS FOR FUEL AND FIBRE IN IRELAND

As improved grants come on stream for this sector, analysis is needed to identify strengths and weaknesses. By Tom Kent, Enda Coates, Ana de Miguel, Brian Cronin & Chris McGurren (Waterford Institute of Technology).



Figure 1. Recent changes to the Afforestation Grant Scheme may increase the establishment of Eucalyptus in Ireland.

The Department of Agriculture, Food, and the Marine (DAFM) recently implemented changes to the grant and premium rates available to growers establishing Short Rotation Forestry under the Forestry for Fibre scheme. The scheme, which aims to promote the planting of forests which can provide a clearfell crop within 10 – 15 years, had not attracted many landowners, but this may change with establishment grants of up to €3815 per hectare to offset establishment and early maintenance costs, and an annual premium payment of up to €520 per hectare guaranteed for 15 years.

The management objectives of Short Rotation Forests are to produce fibre material for use primarily in the panel board and wood energy markets rather than for sawn timber. This scheme, in combination with the Agro-forestry scheme, has a target of planting 3,300 ha by 2020. The scheme supports single-stem forests that will have stem dimensions larger than woody multi-stemmed energy crops such as willow coppice, and that can be managed using standard forest operations and methods. Eucalyptus, Italian alder (*Alnus cordata*) hybrid poplar and aspen are supported under the scheme. Specifically, *Eucalyptus glaucescens*, *E. gunnii*, *E. nitens*, *E. rodwayi* and *E. subcrenulata* are the species supported, though other Eucalyptus species may be approved by the Forest Service on request.

SHORTFOR - EXPLORING THE POTENTIAL OF SHORT ROTATION FORESTRY (SRF) IN IRELAND

Researchers at Waterford Institute of Technology are working with a multidisciplinary team from University College Dublin, Trinity College, University of Limerick and Teagasc to evaluate the potential of Eucalyptus and other Short Rotation Forestry species in Ireland. The project is funded by the Department of Agriculture, Food and the Marine, as research is needed to investigate ways to offset some of the predicted shortfall in supply of timber for biomass and assist in achieving renewable energy targets. While Ireland's renewable energy targets are set to increase to 16% by 2020 under European directive 2009/28/EC, there is a predicted shortfall of 1.7 million m³ of forest biomass in Ireland, with demand set to increase to 3.1 million m³. The requirement of renewables for electricity generation is set higher at a target of 30% of Ireland's electricity needs by 2020. There is perhaps a potential role for short rotation forestry (SRF) and other sources of fibre to supply much of this predicted shortfall.

SUCCESSFUL ESTABLISHMENT OF EUCALYPTUS

A survey of 4 – 7 year old Eucalyptus plantations in Ireland has identified a high rate of mortality on many surveyed sites, ranging from 11% to 62% of the original planted stock. Recent research on establishing field trials supports the view that incorrect planting technique may contribute to tree mortality in the first year of planting. Planting staff should be trained in correct procedures and supervised regularly to ensure the following good practice is upheld. While Irish tree planters are experienced with planting bare-root conifers and broadleaves, handling and planting Eucalyptus plugs requires a different treatment.

Eucalyptus is produced for planting in the form of containerised seedlings or plugs. Plugs are typically 20 – 40 cm in size and smaller plants may do better on exposed sites. The plant is fragile at this point so care and attention is required in handling and storing Eucalyptus seedlings. Plugs should be protected from frost and from drying out. Seedlings should be stored in a cool location and planted within two days of delivery.

Suitable sites are enclosed land under 200 m elevation, on fertile, free-draining mineral soils or surface water gleys. *Eucalyptus nitens* should only be planted within 50 km of the coast outside frost prone sites. Effective pre-planting weed control is important, and compacted soil may need to be loosened sub-soiling with a ripping bar. A narrow spade may be used to prepare a suitably loosened hole of adequate size to accommodate the root plug. Soil compaction and smearing should be avoided when preparing hole in soil. Dibbles are not suitable as they compact and smear



Figure 2. *Eucalyptus nitens* in Cappoquin, Co. Waterford: standing volume of 660 m³ per ha and mean tree volume of 0.8 m³ after 23 years.

soil in the hole. Spreading out the roots may be good practice for other species but it is not advised for Eucalyptus as the root system is particularly sensitive to damage. Plugs should not be planted into rocky or stony debris or with air pockets in the hole. The plug should be planted upright and straight firmly in soil by pressing the soil around the stem with your heel. Most importantly, the planted plug should neither be too shallow nor too deep in the soil. The top of the plug should be 2-4 cm below the surface of the soil with the top covered with soil to prevent desiccation. Planted too deep, the seedling stem may rot at soil level.

EUCALYPTUS PRODUCTIVITY & PROPERTIES

Fifteen sites were measured for current productivity: twelve *E. nitens* sites, two *E. gunnii* sites, and one *E. delegatensis* site. The majority of the sites were five to seven years old, with two of the sites being more mature at 22 and 23 years of age. All the stands had been established on reforestation sites. Mean stand top height for the 7-year-old plantations ranged from 7 m to 13 m. The 22 and 23-year-old plantations had top heights of 28 m and 33 m, respectively. Overall, the aboveground biomass productivity at the younger sites ranged from 0.4 oven dry tonnes per hectare per year (odt/ha/yr) to 6.4 odt/ha/yr. The older sites had a productivity of 8.2 odt/ha/yr and 12.6 odt/ha/yr. These two older sites had mean tree volumes of 0.80 m³ and 0.88 m³.

Basic wood density averaged at 450 kg/m³ for 60 measured samples. Gross calorific value for wood was 19.4 Mega joules per kilogram. Ash contents were higher than typically quoted wood biomass values for both stem and bark partitions. The ash content of the stem was 1.2%, slightly higher than the EN value range of 0.2% to 1.0%. The ash content of the bark was nearly twice the upper range of typical values quoted in EN literature at 5.7%. One cause for concern, using Eucalyptus for bioenergy, was high chlorine concentration, with stem and wood partitions were both on average over twice the typical wood biomass range. The bark partition was observed as having a chlorine content of 0.34%, which is approximately seven times the typical wood bark value.

EUCALYPTUS MARKETS

A survey was carried out of 30 companies in the energy, fibre and sawmills sectors to assess their perceptions on the suitability of Eucalyptus as a raw material. Also data was gathered on current company production, scale, material requirements, species used, price paid and source of supply. The objective was to identify market opportunities, if any, for growers. The raw material intake for interviewed companies ranged from 400 to 650,000 tonnes per annum and the price they paid at the mill gate for softwood roundwood varied from €34 to €108 per tonne, with price aligned with piece size but not quality. Most of the interviewees (76%) were not familiar with using Eucalyptus, however 30% of



Figure 4. Eucalyptus is very sensitive to damage when handling and planting as a plug.

companies were favourable towards using it, in particular for wood fuel and for pallet manufacture. Security of raw material supply and scale of supply were two of the biggest concerns raised by end users, particularly when there is little Eucalyptus currently and future supply may come from diverse private plantations.

A comparative survey was completed in Oregon, USA, where a short rotation forest resource was successfully developed based on hybrid poplar. The key findings



Figure 5. Due to straight stems, self-pruning branches and small crowns, Eucalyptus can be mechanically harvested, such as in this 17 year old stand in Co. Tipperary.

were: research into the matching species and site; managing plantations for productivity and timber quality; and information provision of wood properties were management systems, were vital to give landowners and end users confidence to work with a new system. Large scale plantations, local supply chains and efficient use of all parts of the standing tree through optimised product allocation during harvesting made wood supply chains cost-effective. Fuel and fibre markets alone were not sufficiently profitable so sawnwood markets for higher value products were necessary to generate roundwood prices at a level profitable to the grower.

FURTHER INFORMATION:

Further information on the SHORTFOR Project may be found here: <https://www.teagasc.ie/crops/forestry/research/shortfor-project/>

Further information on the biomass properties of Eucalyptus may be found here: <http://iwfdb.forestenergy.ie/eucalyptus.php>

Further information on the survey of Eucalyptus plantations in Ireland may be found here:

Enda Coates, Brian Cronin, Ana De Miguel, Chris McGurran & Tom Kent, 2017. *A characterisation of eucalyptus short rotation forestry plantations in Ireland*. Irish Forestry, Volume 74. www.societyofirishforesters.ie

Further information on the Forestry for Fibre scheme may be found here:

<https://www.agriculture.gov.ie/media/migration/forestry/grantan/dpremiumschemes/2016/ForestryFibreWEB220816.pdf>



Figure 6. Eucalyptus is capable of yielding large quantities of roundwood for fuel, fibre and potentially sawn timber on a short rotation of 15 – 20 years