

Reforestation: costings and challenges

Many first generation forest owners are not aware of the typical activities and costings (see Table 1) associated with reforestation. These activities include:

- Windrowing (brush, lop and top piled in rows typically 10-12m apart)
- Mounding
- Dipped trees (pre-treated in insecticide)
- Planting
- Fertiliser
- Fencing (if needed)
- Spraying for Pine Weevil infestation (subsequent outbreaks).

The challenges attached to reforesting a premature or normal rotation clearfell are similar. They are:

- To provide an ideal planting environment
- To encourage strong growth of the most suitable trees at the initial reforestation stage
- To minimise losses or delays due to vegetation competition, livestock or insect damage.

“A good start is half the work”

The successful reforestation of a clearfelled site begins at the ground preparation stage. The type of ground preparation depends on a range of site factors including soil type, slope and drainage status. Brush mats and post-harvest branching are normally tidied up into windrows usually by tracked excavator, with additional drainage or ground preparation such as mounding being carried out between rows, according to site demands

Table 1: Reforestation activities & costings range (€/hectare)

Timeline	Operation	Cost per ha (€)
Year 1	Ground preparation-	
	Windrow	330 - 350
	Mounding	450 - 470
	Plants	300 - 500
	Planting	290 - 350
	Dipped for Weevil	150 - 170
	Fertiliser	190 - 220
	Fencing (@100m/ha)	400
Year 2	Filling-in @ 500 stems/ha	240 - 280
	Spray for Weevil	170 - 200
	Vegetation control	150 - 160
Year 3	Beat up @ 5%	70 - 85
	Spot spray/ manual clean	120 - 150

Source: Personal communications

Bundling and removal of brush from site may be an option but only on better sites where existing site nutrition, ground conditions and environmental conditions allow. The target weight for brush bundling is 20 tonnes/ ha, but this figure can range from 16 to 24 tonnes/ ha. The aim should be to remove 75%

Note on Table 1: These prices are net of VAT (if the owner is VAT registered). If VAT has to be included the rate is 13.5% on all items except the plants, which are rated at 23%. The above figures should be seen as a guide as costings will vary, especially when overheads and supervision cost are factored in.

Plant quality

Trees should only be bought from a recognised forest nursery and should be ordered, where possible well in advance of planting. The trees should have strong fibrous root and a straight stem. While more expensive and of limited availability, genetically improved planting stock have been proven to boost growth, stem form and wood properties (Philips and Thompson, 2010). Table 2 outlines the stocking and spacing requirements which apply equally to afforestation and reforestation sites.

of the brush, with the remaining 25% consumed by extraction racks, waste, etc. While brush bundling operations may be cost neutral, the main benefit is the resultant tidier nature of the reforestation area, leading to lower site preparation costs.

Table 2: Tree spacing and stocking (per hectare).

Species	Number of trees required	Plant spacing (metres)
Lodgepole pine (pure)	3,100	1.8 x 1.8
All other conifers	2,500	2.0 x 2.0
Alder	2,500	2.0 x 2.0
Sycamore, other broadleaves	3,300	2.0 x 1.5
Oak, Beech pure	3,300	2.0 x 1.5
Oak, Beech with nurse mix	3,300	2.0 x 1.5

Source: Forest Service (2011)

Weevil risk

In 2016, cases of up to 30% tree plant mortality in reforestation sites were reported to Teagasc advisors. These losses were attributed mainly to *Hylobius abietis* (large pine weevil) damage and will increase the re-establishment costs substantially through the cost of insecticide application, replacing plants and additional weeding. Felling a coniferous crop produces a large increase in breeding material for pine weevil, whilst plant material suitable for adult feeding is reduced. Young trees used for restocking are liable to be heavily attacked by adult pine weevils feeding on the stem from the root collar upwards. Heavy damage can completely girdle stems and cause plant death.

Fertiliser

Phosphorus is the most commonly applied fertiliser on newly planted trees to promote early tree growth, usually in the form of Ground Rock Phosphate (GRP). Fertiliser must be applied between the months of April and August. This is to maximise fertiliser uptake and minimise the risk of environmental damage. It is highly unlikely that an application of Nitrogen will be needed on a site that formerly grew a successful forest crop.

No successful means of controlling the population in the stumps is currently available and it is therefore necessary to protect the plants directly through dipping and/ or spraying with the insecticide Cypermethrin. Knapsack application of Cypermethrin is only effective for approx. six weeks so predicting the optimum time of application is critical.

Reforestation post Storm Darwin

Normally, storm events in Ireland do not give rise to large scale windthrow. However, the duration and strength of the storms of late 2013 and early 2014, culminating in Storm Darwin on the 12th of February 2014, led to extensive damage. While estimates put the area damaged at less than 1% of the total forest area, localised the damage was more severe, particularly in Munster and south Leinster.

The Windblow Taskforce estimated the area, volume and extent of the damage caused by Storm Darwin nationally (see Table 3). Using RapidEye satellite imagery, the damage was estimated to be in the order of 8,300 ha of which 75% is owned by Coillte. Total volume of timber damaged was estimated at 2 million m³.

Queries by landowners initially centred on site assessment, harvesting operations and the marketing and sale of wind-blown timber; insurance and taxation. The focus for many forest owners has now turned to the issue of replanting or reforestation following clearfelling.

Table 3: Estimated area and volume of windblow resulting from Storm Darwin

Sector	Area (ha)	Volume ('000m ³)
Private forest	2,198	483
Public forest	6,122	1,530
Total	8,320	2,043

Source: Forest Service (2014)

Windblow Reconstitution Scheme

The Windblow Reconstitution Scheme provides financial aid to land owners whose plantations were damaged by storm force winds that occurred between the 5th December 2013 and the 12th February 2014. The level of support under the scheme depends on whether the forest was insured or not for the costs of reconstitution at the time of “the storm”. For sites that were not insured for reconstitution, a maximum grant of €1,700/ha is available for both conifers and broadleaves. The maximum grant payable for sites that were insured will be limited to the excess applying to the policy or less where over compensation may occur. Only applications where the total windblown areas is greater than one hectare will be approved under this scheme.

Grant aided forests which contain conifer species with a completion date after the 1st December 1989 will be eligible for funding under the scheme. Funding will also be considered for grant aided broadleaf plantations affected by “the storm” with a completion date after 1st December 1983. The budget allocated to the Scheme can provide funding in respect of a total of 2,000 ha, and the total individual eligible area is capped at 10 ha per original afforestation contract number, as covered by the approved felling licence.

In the event of applications received exceeding 2,000 ha, a selection process will be undertaken after the closing date of the 24th February 2017 for receipt of applications, in an effort to ensure that funding is allocated on an equitable basis to favour those forests which suffered the greatest loss. Scheme details along with the application form are available from the Department's website at <http://www.agriculture.gov.ie/forest-service/grantsandpremiumschemes2015-2016/>.

A road less travelled?

*Two roads diverged in a wood, and I –
I took the one less travelled by,
And that has made all the difference.*
From ‘The Road Not Taken’ by
Robert Frost.

Reforestation allows forest owners to pause and to consider their options before choosing the next rotation's path. Perhaps the owners' objectives have changed to reflect the multi-functional nature of forestry as a whole. Research in terms of improved species, species mixes and management techniques is on-going. Teagasc's Forestry Development Department is available to assist owners, individually and as groups, to access the latest advice and knowledge to maximise the forestry resource.

For information on events, contact your local Teagasc advisor or check www.teagasc.ie/forestry.