Reforestation

Challenges and opportunities

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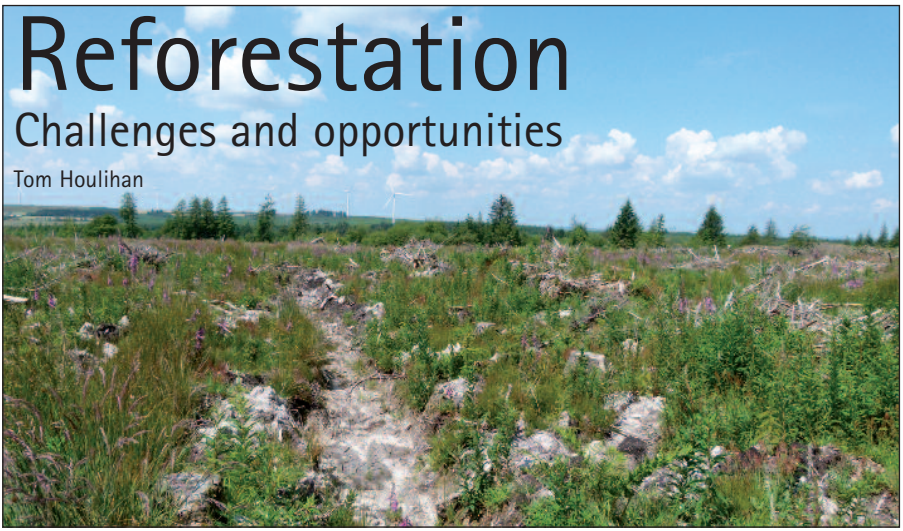

Up to recent times, the main focus in private forestry has been the establishment of new forest enterprises and optimum management of existing forest crops, including thinning of conifers and broadleaf species. A considerable number of forest owners, including those with older plantations and particularly those affected by Storm Darwin in February 2014 have a new focus: the establishment of a second forest rotation on some or all of their property. Such reforestation brings a new set of challenges and opportunities.

Planning

Planning is an essential first step when embarking on reforestation. Planning can facilitate changes and improvements to what was created in the first rotation. It can incorporate opportunities for forest restructuring, higher productivity, species diversification, improved crop stability as well as protection and enhancement of environmental features. Time and resources invested in planning can result in an improved and sustainable future forest.

A robust site assessment should be used to identify zones or compartments within clearfelled areas, and to develop appropriate plans. Lessons can also be learned from the previous rotation. Species selection is a major decision and a range of issues must be addressed in order to inform appropriate choices. These include the owner's objectives, local site and growth factors, the performance and resilience of the previous crop and adjacent forests as well as preferred

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silvicultural systems (future clearfelling, continuous cover, or shelterwood systems). Decisions on the type, extent and layout of site preparation required will also be critical.

The forest layout should aim to improve on the provision of site access, ensuring its design will protect aquatic zones and integrate well with drainage plans. This can help facilitate future management, minimise site disturbance and improve crop stability.

Planning to protect environmental features or zones is an essential part of a forest restructuring plan and may often be done with low impact levels on forest productivity. For example, Forest Service guidelines require planning for buffer zones (adjacent to aquatic zones) with either natural ground vegetation being allowed to develop or additional planting of suitable riparian tree species. These zones, as natural landscape features, can also provide natural windfirm breaks between forest compartments.

There may also be potential for inclusion of diverse species along or within compartment boundaries, providing potential crop protection, stability and biodiversity benefits.

Establishment

The type of ground preparation suitable for reforestation sites will be dependent on a range of site factors including soil type, slope and drainage status. Brash mats are a frequent feature on such sites, resulting from harvesting operations. These brash mats will be tidied up into windrows usually by tracked excavator with additional drainage or ground preparation being carried out between rows, according to the assessed demands of the site.

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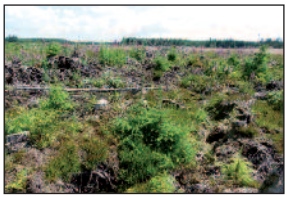
Growing conditions and fertility will generally be enhanced in the second rotation due to site amelioration by the previous crop. The availability of genetically improved planting

stock also offers a good opportunity to increasing volume yields and quality. Most studies indicate that additional costs incurred using improved trees are more than offset by improvement in growth, stem form and wood properties (Philips and Thompson, 2010).

Prompt replanting with suitably sized and sturdy transplants can also result in benefits to the forest owner. Rapid establishment of the successor crop can help minimise the period during which trees are vulnerable to both competing vegetation and to an insect pest new to many forest owners, the large pine weevil.



Rapid establishment of the successor crop can help minimise the period during which trees are vulnerable to both competing vegetation and to an insect pest new to many forest owners, the large pine weevil Hylobius abietis.

Weevil threat

The large pine weevil, *Hylobius abietis*, is a major threat to young trees in replanted sites. Clearfelled areas provide ideal breeding sites and adult weevils develop in the stumps in a period between 1 - 3 years. Emerging adults may remain on site or can move to nearby sites, being attracted by the smell of freshly cut timber. Adult insects appear mostly brown in colour with yellow patches, reaching 1.5cm in size. They have a broad host range, feeding on a variety of broadleaved and conifer trees, including spruces and pines.

When a clearfelled site is replanted, adult weevils feed on the lower stem of young transplants. Without effective control, feeding activity of weevils causes needle loss, reduced growth and severe levels of mortality through ring-barking of young trees. Adult weevils have two peak periods of feeding, the first between April and June and the second between July and October (Ali Ansari *et al,* 2013). These peaks periods should be considered when planning control treatments. Damage can be severe where some or all of the following circumstances arise:

- Pine species present in clearfell
- Large felling/replanting area
- Reforestation site is less than 5km from a recent clearfell
- Small transplants are used in restocking
- Ground preparation and vegetation control is not adopted.

The current method to prevent weevil damage is to use plants dipped with insecticide prior to planting or to spray the transplants post planting. Additional spray treatments may be required into the second year following planting until such time as the transplants are robust enough to

withstand the insect threat. Biological control trials on the potential of entomopathogenic nematodes and parasitic fungi are ongoing. Such treatments may have a role to play in future integrated pest management techniques as part of the EU-wide Sustainable Use Directive.

Early management

Since growth conditions are usually enhanced in restocked areas following the previous rotation, fertiliser is unlikely to be required on higher yield class sites. Trees established on mounds also tend to get an initial growth boost that aids establishment but decisions on ground preparation will be site specific. Fertile site conditions can present challenges in terms of competing vegetation, which is generally a much bigger issue in reforestation.

Vegetation such as briar, furze and willow can establish on site and timely control of competing vegetation as well as filling in with replacement trees, as required, are vital to ensure rapid, unhindered forest establishment.

The development of natural regeneration on site can also provide both challenges and opportunities according to management objectives.

A new resource

Reforestation is a new forest venture for forest owners. It is a time when informed decisions are necessary in order to provide the foundation for an improved and sustainable forest crop.

The Teagasc Forestry Development Department will be available to assist owners in meetings the challenges and availing of the opportunities to develop a new forest resource. For information on upcoming events, visit the Teagasc website www.tegasc.ie/forestry or contact your local Teagasc forestry staff.

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References:

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