Reforestation – how to get it right

Forests planted in the 1990s or earlier have reached maturity and been felled. Establishing the second rotation brings a new set of challenges and opportunities

Liam Kelly
Teagasc Forestry
Development Officer

Getting the reforestation job right first time is key. Tasks such as ground preparation, purchasing good trees, planting and vegetation and weevil control are vital. Avoiding or minimising the risk of frost damage (late spring frost), e.g. through species selection, is also necessary for good establishment. Protection for environmental features or zones is another essential part of any plan.

When planning a harvest, a felling licence is required. It is important to apply in good time. Where clear-felling is part of the plan, a detailed replanting plan is a core part of the application.

Reforestation provides the opportunity to reset your objectives. These may include:

- Conifer forest for wood production.
- Broadleaf forest for wood production.
- Mixed forest for wood production.
- Reforestation for continuous cover forest.
- Reforestation for biodiversity and water protection.
- Alternatives, as detailed by the applicant.

CASE STUDY: Sitka spruce clearfell and replanting in Offaly

Denis Kelly and his family farm part time in Lusmagh, west Offaly. Theirs is flat, low-lying, land close to the river Shannon. The land had been used to graze cattle and, on occasion, produce a crop of hay.

"We planted all 13.64 ha (approximately 34 acres) in 1990," says Denis Kelly. All but one hectare was planted with Sitka spruce. The remaining hectare was planted with Pedunculate oak. The Kelly family carried out a lot of the early vegetation control themselves.

"The first rotation crop did well, apart from a setback with frost in the early 1990s," says Denis. Teagasc has held a number of local events on this site since the early 2000s, including a local reforestation event.

The Sitka spruce

The spruce crop grew well, with a yield class (productivity index) of over 22 m3/ha/year. A road was installed on the site prior to thinning, to enhance access. The spruce was thinned in 2009 (slightly delayed) and again in 2013, both of which provided good yields.

It was decided not to thin again in case it would open the site to windblow risk. This did reduce the percentage sawlog at clearfell, but the Kelly family are happy with that decision. "I always wanted to see the crop re-established in my lifetime," said Denis.

In late 2019, the Kellys applied, through their registered forester, to clear the Sitka spruce. The main reforestation objective was to produce another, mainly conifer, crop for wood production, with inclusions of broadleaves to enhance biodiversity and the farm landscape.

A licence was granted in July 2020. Felling commenced in late September, 2020 and continued into November.

Reforestation

In general, there is no support for replanting. The replanting of the site commenced in the spring of 2021. Denis and Neil availed of the same contractor who felled the site. The main species selected was spruce, with appropriate broadleaf inclusions.

The oak

The oak has been thinned twice already and has been high pruned by Denis's son, Neil. Living in Co. Westmeath, he spends many of his weekends working in the oak woodland. The oak will not reach maturity for another 70 years.

"The early thinning provided useful amounts of firewood," says Neil. Stocking is currently approximately 800 stems per hectare, and the plan is to continue periodic thinning to facilitate a valuable final crop.

Ground preparation

All brash and treetops remained on-site to protect the soil from rutting during the harvesting and forwarding activities part of any normal clear-felling operation. The layout design had future thinning and harvesting in mind. The brash was pushed in to windrows (at approximately 12m centres) using an excavator, taking care not to disturb the soil. This left a very clean site and ideal planting medium.

Plants and planting

The plants for restocking were 2+1 (two years in a nursery plus a year in a transplant bed) and were 50cm plus in height. They had a good, fibrous root system and a good stem-to-root

Neil Kelly pictured last August beside one of his three-year-old trees, which is already over six feet tall.

ratio, which is important. Planting was carried out on the flat, along the original rows in March 2021. Species such as alder, birch, and oak were planted along the edges and in groups as the broadleaf component for landscape and biodiversity.

Pine weevil

The large pine weevil, Hylobius abietis, is a major threat to young trees. Clear-felled areas provide ideal breeding sites and adult weevils develop in the stumps. Emerging adults may remain on-site or can move, attracted by the smell of freshly cut timber. Adult insects are brown in colour, with yellow patches, reaching 1.5cm in size. Adults hatch out in April and August and can cause damage.

Deer

Deer can be big issue with young trees. They prefer broadleaves and many of the diverse conifer species rather than Sitka spruce. Deer on the Kelly sites have done some damage to the spruce, but they have had a real impact on the young broadleaves. Filling in or individual tree guards are used to address this problem.

Frost

As this site is low-lying, it can be prone to frost damage, late spring frosts in particular. Thankfully, this year was relatively frost-free and the trees have escaped damage. Some forking did occur in year two because of frost damage. Pruning these forks will improve stem quality.

Weed control

After clear-felling the increased light to the forest floor can produce a mass of vegetation. Establishing a new crop immediately after clear-fell can be helpful to out-compete vegetation.

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Current conditions

On this site, the trees were replanted within six months of felling. They got off to a good start and are keeping ahead of the strong vegetation, perhaps the deer are helping somewhat in that regard. Neil keeps monitoring the site and spot-weeding is done if needed.

There are patches of gorse appearing and these may have to be spot-treated with an appropriate scrub killer. Herbicide use is kept to a minimum and used in accordance with sustainable use directives.

Filling in

Some replacement trees were put in after year one to ensure that the crop develops evenly and that stocking levels are maintained across the site.

Natural regeneration

Some desirable natural regeneration of different species is occurring across the site, including Sitka spruce, oak, birch, willow and some holly.

Overall development

This new forest is now over three years old. The spruce is growing nicely, with good leader growth on most of the young spruce. Growth on the site this year has been phenomenal. While pine weevil has not been an issue, the rising deer population is a concern.

Learnings

The Kellys have learned a lot from the first crop; Neil hopes to put those learnings into practise.

"I hope to be as happy with this crop in 2051 (expected maturity date) as we were with the first rotation. It has certainly started out well," he concludes.