

Project number: 5701
Funding source: COFORD & Teagasc

Date: September, 2012
Project dates: Jan 2009 – Jul 2010

Broadleaf silviculture



Key external stakeholders:

Forest owners, forest industry

Practical implications for stakeholders:

- Most broadleaf forest owners are capable of selecting and marking Potential Crop Trees prior to a tending operation after some initial training.
- Guidelines for the tending and thinning of broadleaf forest crops have been published.
- There is a demand from owners of broadleaf forests for silviculture knowledge, as demonstrated by the number of downloads of Silvicultural Guidelines for the Tending and Thinning of Broadleaves.
- An alder tending intensity trial has been established for medium- to long-term research.

Main results:

Silvicultural guidelines for the tending and thinning of broadleaves have been published and proven to be in great demand. Teagasc, in conjunction with UCD and COFORD, continue to research broadleaf silviculture to maximise the potential that the growing broadleaf forest estate can attain.

Opportunity / Benefit:

The broadleaf silviculture guidelines provide forest owners with the knowledge and methodology to ensure that their broadleaf crop can reach its potential. The establishment of a medium- to long-term alder tending intensity trial will add to the available knowledge.

Collaborating Institutions:

UCD
Coillte
Private forest owners

Teagasc project team: Dr Ian Short (PI)
Jerry Campion
Toddy Radford

External collaborators: University College Dublin
Coillte
Private forest owners

1. Project background:

Approximately 32,000 hectares of broadleaves have been planted during the period 1990 – 2007 inclusive (Forest Service statistics, 2008). The demand from forest owners and the wider industry for advice on broadleaf tending and thinning, especially for ash but also for other species, has increased in recent years, as demonstrated by the increase in number of enquiries to Teagasc Forestry Development Officers. The introduction of the Tending and Thinning of Broadleaves grant in 2009 as part of the Woodland Improvement Scheme increased the awareness by forest owners of the need for management interventions in order to realize the full potential of their broadleaf crop. An ultimate aim of this project is to provide owners, and the wider industry, science-based best-practice knowledge on the tending and thinning of broadleaves.

2. Questions addressed by the project:

To secure, maintain and monitor existing broadleaf silvicultural trials and demonstration sites established by the COFORD-funded BROADFORM project
To report on the final measurements of a concluded clonal poplar trial
To establish a new alder tending intensity trial
To disseminate broadleaf silvicultural best practice to practitioners
To provide comments and recommendations on a draft version of 'Growing Broadleaves', a broadleaf silviculture book that is currently being written and is planned to be published by COFORD.

3. The experimental studies:

Growth data (diameter and breast height; stem height) were collected at existing broadleaf tending demonstration and experiment sites. These will continue to add to our knowledge of tree response to tending and thinning.

Alder tending trial

The objective of this trial is to investigate the effect of thinning intensity on Potential Crop Tree (PCT) growth rate. A 1.4 ha trial located at a Coillte property (Kilbride Woods, Arklow) consisting of three treatments in a Latin Square Design, has been established. The three treatments are:

- Light thin (1 competitor removed per PCT);
- Heavy thin (2 competitors removed per PCT); and
- Control (no competitors removed).

Baseline measurements were captured during a previous funding period. The Light and Heavy tending treatment plots were tended between the 2008 and 2009 growing seasons. Data to enable the calculation of volume to 5 cm diameter of each thinned stem has been captured. Stem diameter was measured again after the 2009 growing season.

A number of demonstration days and field presentations were conducted during the project period to disseminate broadleaf silviculture information to forest owners and the industry. These are described below.

4. Main results:

Alder tending trial

A new tending intensity trial in alder has been established for medium- to long-term research. Results one growing season after the tending operation was conducted suggest that there is a positive relationship between intensity of tending and PCT stem diameter increment.

Review of 'Growing Broadleaves' book

The draft version of the 'Growing Broadleaves' book, authored by John Fennessy, Prof. Joyce and Prof. Huss, and due to be published by COFORD, was sent to reviewers during the reporting period. Dr Ian Short and Mr Toddy Radford reviewed the pertinent chapters of the draft publication and sent

comments/suggestions to Mr John Fennessy.

Reporting of concluded poplar trial

The final data from the poplar clonal trial have been analysed. These have been written-up and submitted to a journal for peer-review.

5. Opportunity/Benefit:

Information created by the project is transferred to industry through various means, including presentations by project staff, articles, demonstration days and through technology transfer by the Teagasc Forestry Development officers.

It is apparent from the demonstration days that, after a short amount of training, the majority of forest owners are able to mark their own broadleaf plantation in readiness for a tending or thinning operation or have the knowledge required to check work carried out by a contractor.

6. Dissemination:

Ash tending demo days

Two ash tending demo days were held with approximately 200 attendees at each. Each demo consisted of three 20 m x 20 m plots. The first plot has the PCTs, competitors, extraction rack, wolves and diseased stem marked and this process and methods employed to do this are described to the participants. The second plot is where the participants gain some practical experience in identifying and marking PCTs themselves. The final plot illustrates the result of a tending operation and has the PCTs marked and all competitors, wolves, diseased stems and the extraction rack felled. The PCTs are also high-pruned. The first demo day was held on the 20th May at The Rower, Inistioge, Co. Kilkenny. Dr Ian Short and Toddy Radford also presented at the Forest Service in-house training held directly after the event. The Teagasc "Silvicultural Guidelines for the Tending and Thinning of Broadleaves", written by Dr Ian Short and Mr Toddy Radford, was launched at the demo day. The Guidelines are available on the Teagasc website and have subsequently been downloaded more than 20,000 times. Methods described in the Silvicultural Guidelines have also been transferred to growers by Teagasc Forestry Advisors through demonstrations and the provision of leaflets and Factsheets available on the Teagasc Forestry website e.g. "[The 2-stick method for marking trees](#)" and "[Tending and thinning of broadleaf forests](#)".

The second ash tending demo day was held at Four Mile House, Co. Roscommon, on 22nd October. Extraction methods for small-scale tending/thinning operations were also demonstrated. There was also a stop to discuss chainsaw health and safety issues.

Sycamore tending demonstration day

A demonstration day on the tending and thinning of sycamore was held on 21st April 2010 in Summerhill, Co. Meath on a privately-owned site. This involved the establishment and measurement of three plots as above, including the felled volume of one plot. The procedure for selecting Potential Crop Trees, marking thinnings, diseased stems, wolves and racks was demonstrated. A couple of options for small-scale extraction were also demonstrated. Dr Michael Carey did a presentation on grey squirrel. The owner of the site chips the felled thinnings from his plantation and uses them for heat. This was also demonstrated. Approximately 150 people attended on the day. Two of the plots will be monitored into the future as per previous ash demonstration sites.

Presentations

Project staff were asked to present the tending and thinning of broadleaves at the National Forestry demonstration of Small Scale Harvesting and Extraction, held at St. Joseph's Abbey, Roscrea, Co. Tipperary on Wednesday 30th June 2010. In addition staff marked Potential Crop Trees and thinnings on 1.75 ha of ash in preparation for demonstrations of different methods of extraction by contractors. More than 400 participants took part on the day and good feedback has been received from the evaluation forms completed after the event.

Project staff were asked to attend and present at the Teagasc Farm Forestry Management Walk, Ballyfin, Co. Laois, held on 11th May 2010. The walk concentrated on the management of broadleaves, especially those that are at the age requiring tending and thinning. Over 50 participants attended this local event.

Dr Ian Short and Toddy Radford were invited to present the tending and thinning of broadleaves at the Small-Scale Harvesting demonstration day held at Teagasc Ballyhaise College on 27th May 2009, attended

by more than 200 participants. The Irish Farmer's Association (IFA) also invited them to present the Silvicultural Guidelines at the IFA Forestry Section meeting on 18th June where the IFA county forestry representatives were present.

Main publications:

Short, I. and Radford, T. (2008) *Silvicultural Guidelines for the Tending and Thinning of Broadleaves*. Available at: http://www.teagasc.ie/forestry/docs/research/Teagasc_silvicultural_guidelines_Broadleaves.pdf

Short, I. and Radford, T. (2009) *The 2-Stick Method for Marking Trees*. Available at: http://www.teagasc.ie/forestry/docs/research/Teagasc%202-stick%20method%20-tending_thinning_broadleaves.pdf

Popular publications:

Photo and caption of launch of "Silvicultural Guidelines for the Tending and Thinning of Broadleaves". *The Nationalist*. May 29, 2009.

Teagasc publish broadleaf advice

Irish Independent Farm Supplement. June 2, 2009.

<http://www.independent.ie/farming/news-features/teagasc-publish-broadleaf-advice-1757757.html>

New guidelines for tending and thinning of broadleaves

Donal Magner, *The Irish Farmers Journal*. August 15, 2009.

Teagasc/COFORD publish latest forestry research.

The Nationalist. June 17, 2009.

<http://www.nationalist.ie/news/business/teagasc-coford-publish-latest-forestry-research-1-2244359>

7. Compiled by: Dr Ian Short