

## Annex 1: FSC®-TPL-30-001

### Application for a temporary derogation to use **CYPERMETHRIN** in the Republic of Ireland (ROI)

#### A. General Requirements

This is a joint application by Soil Association Woodmark (SA) and Control Union (CU) working together in cooperation and assisted by their Clients.

Certificate holders within the ROI have common management protocols with regard to controls over use and programmes to pursue alternatives.

This is therefore a common ROI level application:

Part A for these certificate holders.

Part B will be specific to each of the forest management enterprises.

Confidentiality - The information contained within this application form and all its associated appendices is business confidential to Soil Association Woodmark (SA) and Control Union (CU) and their certificate holders. It is for the sole purpose of a derogation application for their clients in communication with FSC International. Apart from their certificate holders, SA and CU, it may not be passed to other Certification Bodies or third parties verbally or in any written format without prior written permission.

Such written permission shall of course not be withheld to third parties, such as appropriate stakeholders, deemed appropriate collectively by SA & CU or requested by FSC International in prior written collective consultation with SA and CU.

Application submission date	
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<b>Active ingredient for which a</b>	Cypermethrin

<b>derogation is being requested</b>		
<b>Trade name and formulation type of the active ingredient or formulation</b>	Trade name: Forester  Formulation: Emulsion in water (100 g/litres cypermethrin).	
<b>Method of application and the application equipment</b>	Method of application is either by: <b>Pre-planting</b> Dipping plants in insecticide in the nursery using specially designed Swedish equipment <b>Post-Planting</b> - spot spraying in the field using knapsack sprayers by trained operators	
<b>Common and scientific name of the pest species;</b>	Pine Weevil ( <i>Hylobius abietis</i> )	
<b>Names and FSC certification codes of certificate holders for which a temporary derogation is being requested.</b>	Coillte Teoranta	SA-FM/COC-00706
	Coillte Teoranta is an extension application. Irish Forestry Unit Trust is a standard (new) application.	Irish Forestry Unit Trust
<b>Scope for which a temporary derogation is being requested</b>	Republic of Ireland	
<b>Requested time period for a temporary derogation</b>	Five years	

## **1. Demonstrated need**

The large pine weevil (*Hylobius abietis*) is an ongoing pest challenge on most, if not all, conifer restock sites in this country. It remains a threat on such sites for a period of up to five years after clear-felling. Although many alternatives to insecticides have been tested in the past, none have, as yet, proven reliable, efficient or cost effective. Without protection, large numbers of plants are vulnerable to insect attack. In recent trials assessing control of pine weevil, tree mortality in untreated plots, ranged from 60 to 90%.

Insecticides have proven the only effective protection to plants on restock sites since clear-felling began in this country. Because of the withdrawal of various insecticides over the years, however, the insecticides available now to combat pine weevil are less potent than those available in the past. Given the additional problems and time delays in getting new products tested and registered for use, additional time must be made available in which to test alternatives (both other insecticide and non-insecticide options).

At the moment, cypermethrin is the only effective insecticide that can be used in this country against pine weevil. Work has been ongoing for some years now looking for a non-insecticide alternative (see details in Section B below). Many of these have proven to be ineffective under Irish conditions. Further trials have been established and are ongoing but it will be a number of years before these are rigorously field tested. In order to protect trees on all of our restock sites over the coming years, we urgently need to have access to a reliable insecticide until alternative options become available.

Harvesting is almost exclusively by mechanised harvester and forwarder extraction using a shortwood system. Plantation species are usually Sitka spruce (*Picea sitchensis*) and lodgepole pine (*Pinus contorta*) as the majority of sites are on poor, unstable soils in exposed situations and are vulnerable to windthrow, limiting both species and the use of low intensity silvicultural systems (e.g. Continuous Cover Forestry). Restructuring of large even-age plantations is ongoing but these constraints realistically limit the future choice of silvicultural system to clear felling for the majority of conifer plantations in the ROI. Rotations periods are typically 40-50 years and restocking uses natural regeneration where practicable but on the majority of sites, planting is required. Ground preparation is often required silviculturally before planting and is carried out using mechanical mounding by excavator machines. The use of mounding is also one of the mitigation measures taken to minimise weevil damage. (see section B)

## **2. Stakeholder consultation**

**Describe the consultation that has taken place and summarise the results:**

As both Certificate holders have property widely spread across the ROI, the stakeholders for both are the same.

A stakeholder consultation was held from 20<sup>th</sup> May until 4<sup>th</sup> July 2015. This application and a notice about this consultation opportunity

([http://www.coillte.ie/aboutcoillte/about\\_coillte/coillte\\_consultation/](http://www.coillte.ie/aboutcoillte/about_coillte/coillte_consultation/)) were posted on the Coillte website to inform the public in general and all stakeholders with an interest. In addition e-mails were also issued signposting the application and requesting feedback to over 500 stakeholders nationwide covering the following categories; Contractors, Forest Management Plan consultees, Government agencies, Local & National government, local community, NGOs, Professional bodies and Social & Environmental Panel members (SEPs). The SEPs are Coillte's local consultation fora and are organised in each of the Business Area Unit (these align with FMUs for certification purposes).

The National Initiative (NI) in ROI, FSC Ireland no longer exists so they were unable to be offered the opportunity to conduct the consultation.

Results of stakeholder consultation: To be confirmed after consultation process is completed.

## **B. Certificate Holder Specific Requirements**

FSC Certificate Holder: Coillte Teoranta  
FSC Registration Code: SA-FM/COC-00706 Issue No 3

### **1. Specific controls to prevent, minimize and mitigate the hazards**

The current derogation (FSC-DER-30-V1-0 EN Cypermethrin Ireland 04102010) had 5 conditions, compliance with which has been checked at audit. This derogation has run parallel to the current 5 year certificate period. The cypermethrin derogation element of the S4 report is appended to this application providing evidence of 5 years of compliance with those conditions.

#### **Integrated Pest Management (IPM)**

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management which uses information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical and environmentally sensitive means, and with the least possible hazard to people, property, and the environment.

***IPM takes advantage of all appropriate pest management options including, but not limited to, the judicious use of pesticides.***

#### **How does Coillte use IPM?**

Coillte's Environmental Management System (EMS) Pesticide Standard Operating Procedure (SOP) states that:

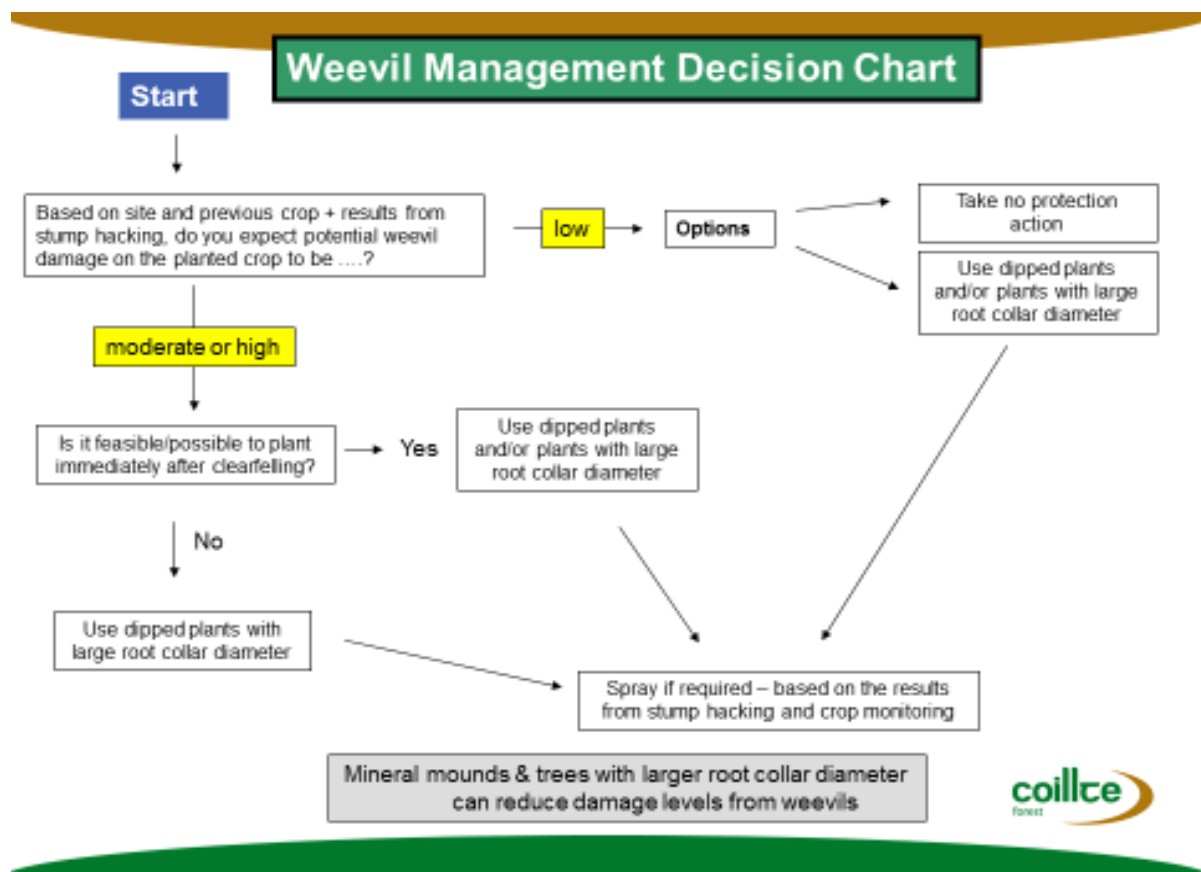
*"Coillte will strive to avoid the use of pesticides, by firstly considering control methods other than pesticide use; and will continue to review and evaluate non-pesticide alternatives as they become available".*

Coillte takes a step by step approach in the implementation of IPM.

## Step 1 – Planning

In our Management Unit Site File (MUSF), the Site manager is asked if he/she has firstly gone through the Insecticide and Herbicide Decision Support Charts **before** any decision is made to progress with a particular pesticide application.

These Decision Support Charts look at and suggest options other than pesticides for dealing with both vegetation and weevil problems on site. The decisions around ground cultivation are considered as part of this early process. The technique of stump hacking to inform the manager (or contractor) on likely weevil population levels on the site plays a major role in our approach to IPM on restock sites and whether or not to apply insecticide.



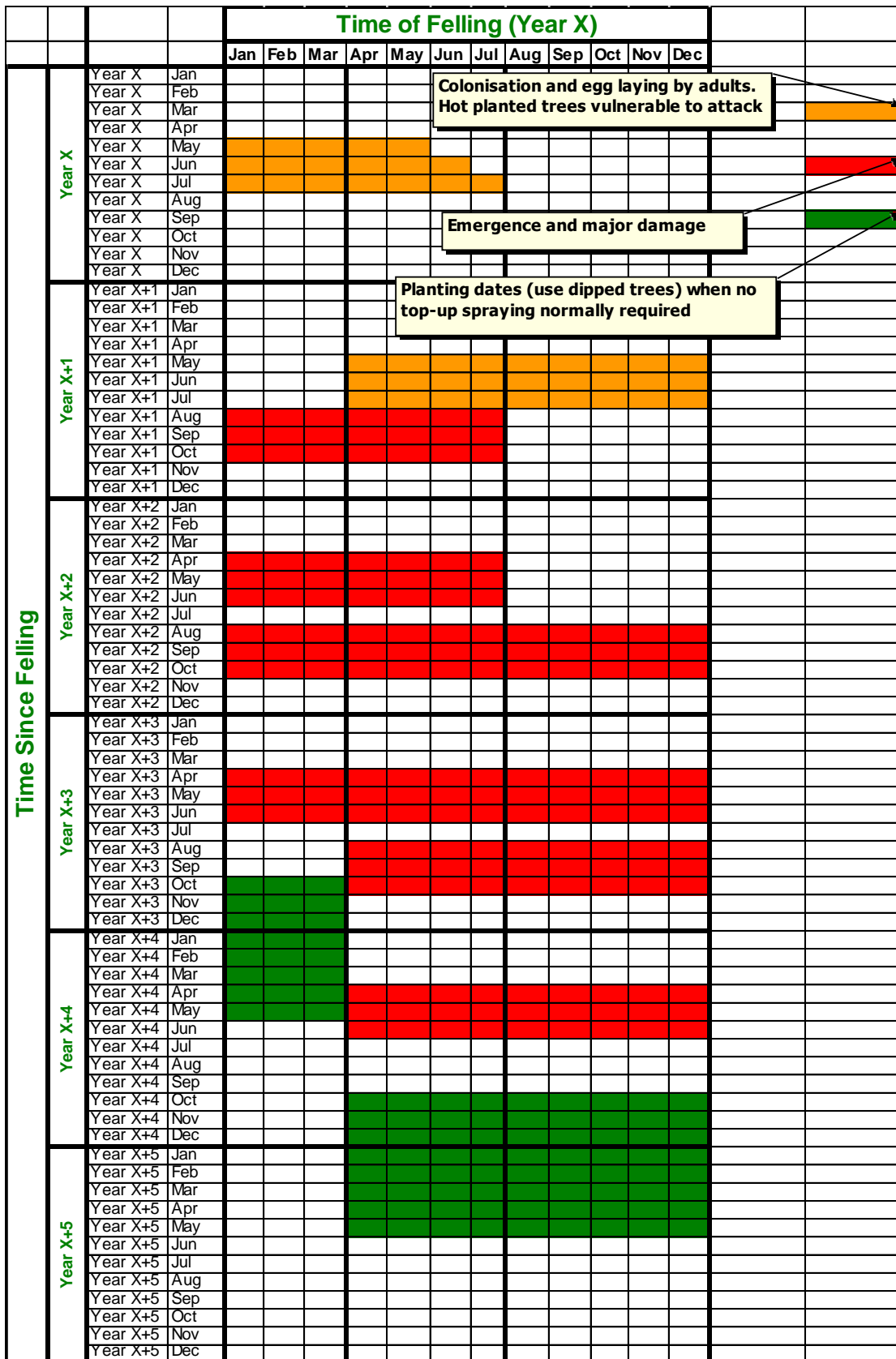
### Timing of operations

Coillte Establishment staff also have available to them the "Prediction of Weevils Table" (below) which estimates the timing of major weevil attacks based on the

date of felling. How quickly sites are replanted after clearfelling can affect the rate at which both vegetation and weevil populations build up.

We have put in place a trial project called "Greensite Planting" in 2014 where 124ha have been planted directly after harvesting. The standard practice is to allow the two years fallow period allowed under Felling Licence conditions before reforestation takes place. This two year delay coincides with the main emergence of the weevil from the stumps in the clearfell area, requiring optimal protection measures. We anticipate that the use of pesticides will be reduced under greensite planting as there should be less requirement for protection measures as the threat of weevil attack is expected to be reduced in the first growing season after planting.

As the main emergence of the weevil should occur in the third growing season post planting, it is expected that weevil attack in year two will also be reduced and that sturdier plants could withstand any weevil attack that may occur. This anticipated delay in weevil attack is never guaranteed, however, as weevils do fly in from adjoining clearfells (if present). Weevil numbers are also highly dependent on the species in the harvested crop – with larger weevil numbers usually anticipated after pine.



Colonisation and egg laying by adults.  
Hot planted trees vulnerable to attack

Emergence and major damage

Planting dates (use dipped trees) when no  
top-up spraying normally required

Time Since Felling

Prediction of weevil attack from clearfell dates (source Forestry Commission UK).

In addition, our field staff and contractors check stumps to confirm the presence/absence and age structure of the weevil population developing within the site using a "Stump Assessment Protocol". Coillte managers and contractors have been trained in "stump hacking assessment" and protection measures are planned, based on the assessment of the likelihood of a weevil attack on the sites. This has changed the approach from a routine planned application of protection measures to application of protection measures only when required as required by the site.

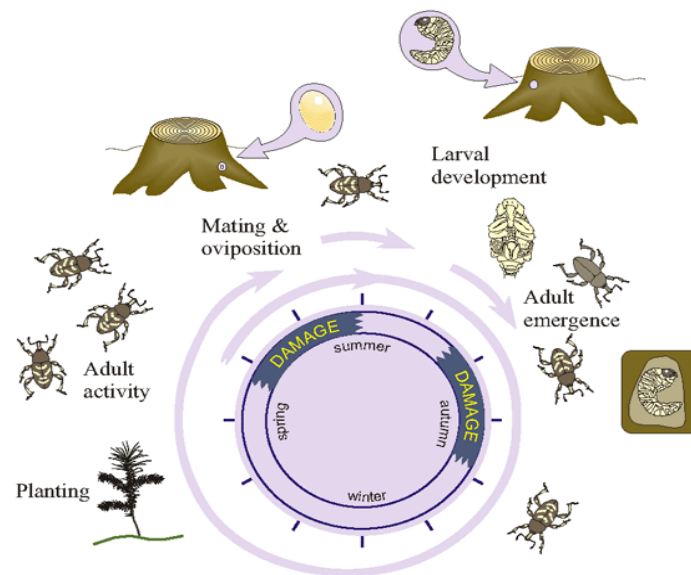


Figure 1. Weevil life cycle (Source: Forestry Commission, UK)

## Step 2 – Non-pesticide Management Options

The way in which sites and plants are managed can affect pesticide requirements. There are a number of methods, either previously tested or currently being used in Coillte, that reduce our pesticide use and related hazards. These include:

### *Use of vigorous planting stock*

Coillte continues to use a **plant testing** programme that ensures that all plants despatched from our nurseries are of top quality. This programme uses the most up to date plant assessment techniques available and results of plant quality are forwarded to Nurseries and Operations Managers on a weekly basis. Both physiological and morphological attributes are tested for and batches of plants that fail are not despatched for planting.



**Root Collar Diameter (RCD)** - The size of planting stock used in this country is generally larger than that used in other countries. Since 2012, Coillte Forest have agreed (in the Contract of Supply of Plants) with Coillte Nurseries a minimum RCD of 6mm for Size 1 spruce plants and 5mm for Size 2 plants being supplied from our Nurseries to reforestation sites. Likewise, a new growing technique (plug plants) in pines has resulted in a minimum RCD of 6mm for Scots and lodgepole pines. This, in combination with high plant vigour, ensures that this type of planting stock is better able to combat weevil attack thus requiring less chemical application; however top up spraying may still be required in the event of a significant outbreak of weevil.

Work is continuing within Coillte Nurseries on a **new grading system** which would increase the RCD of each of the Size 1 and Size 2 plants in spruce. It is hoped to roll out this proposed new grading system on an operational basis in 2016.

Work from Scandinavia has shown that creation of an exposed area of mineral soil around planted trees reduces weevil damage. **Mounding** continues to be favoured on many of our restock sites and, where mineral soil is exposed, will reduce damage and subsequently the need for insecticides. These trials will be monitored for efficacy of protection against weevil attack, but to date no other viable solution other than insecticide application exists.

## **Control options – current research and future plans**

### **1. Insect-killing nematodes**

Insect-killing (entomopathogenic) nematodes are microscopic soil inhabiting parasitic worms. These nematodes have been recovered from soil samples throughout the world, where they naturally infect the soil dwelling stages of a range of insect species. Although nematodes occur naturally in the soil, populations tend to be patchy, so wild populations are supplemented when nematodes are used in biological control programmes. Insect-killing nematodes have been used for decades in horticulture, but their use in forestry is relatively new.

Pine weevil larvae and pupae are more susceptible to infection than the adults, so, for maximum impact, nematodes are applied to stumps containing immature weevils. The larger larvae found in stumps 12-24 months after felling are more easily located by nematodes than smaller, younger larvae, so applying nematodes immediately after felling is not effective. In small-scale trials, when nematodes were applied to stumps 12-24 months after felling, the number of adult *H. abietis* emerging from nematode-treated stumps was significantly reduced.

Based on those, and other trials, the recommended rate of application for pine weevil control is 3.5 million nematodes per stump, applied in 0.5 L of water. Although this rate seems high, the majority of applied nematodes die within

hours of application, as nematodes are easily killed by the ultraviolet radiation in sunlight, desiccation and high temperatures.

Nematodes are poor active dispersers (travelling only a few cm from the point of application), so need to be washed down into the soil to be effective. In horticultural crops, this is usually achieved by applying the nematodes through pre-existing irrigation systems: an option that does not exist in a forest. To apply nematodes in forestry requires a mechanism for dispersing large volumes of water across a site (500 L/ha), access to refrigeration facilities to ensure nematodes are maintained at 4-6°C, and a system for keeping the nematodes aerated, to prevent death by asphyxiation. A number of years ago, the Forestry Commission UK developed a spray-rig to overcome many of these issues.

In 2007, the Forestry Commission UK were contracted to apply the insect-killing nematode species *Steinernema carpocapsae* to 150ha of the Coillte estate. Emergence of adult pine weevil was monitored on sites to which nematodes had been applied. *Steinernema carpocapsae* reduced the number of emerging adult weevils by 37-39%. Conclusions from the 2007 trials were that:

- 1 Nematodes were most suitable for use on sites with intermediate level populations of weevils developing in the stumps. Where weevil numbers were high (e.g. pine sites), weevil feeding still resulted in very significant seedling mortality.
- 2 Replanting should be delayed until the winter after nematode application, as seedlings planted immediately after nematode application remained at risk of weevil damage.

In those trials, the more virulent nematode species *Heterorhabditis downesi* (which was only applied to a small number of stumps) reduced the number of emerging adult weevils by 75-77%. *Heterorhabditis downesi* is not fully commercially available and is currently being tested by NUI Maynooth. Coillte continue to work with the NUI Maynooth team to address this issue.

In 2008 Coillte developed its own nematode treatment unit, which, over the following years, treated over 500ha. Significant plant mortality (>30%) has been recorded on **all** sites where the previous crop was pine. Where the previous crop was either spruce or mixed conifers, significant plant mortality (>30%) was recorded on 47% of sites. Although results were disappointing, and nematodes are significantly more expensive than cypermethrin (€550/ha and €150/ha<sup>1</sup>, respectively), Coillte remain committed to developing, in conjunction with partners, a *Hylobius* biological control programme. Unfortunately, nematodes will never be suitable for all sites as, in order for sites to be suitable for nematode application, the following site criteria must be met:

- 1 Easy access - the nematode rig needs to be transported on a low loader, so the rig cannot be transported onto sites which are classified as requiring 'double handling' for timber extraction

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<sup>1</sup> Chemical control of €150/ha relates to the cost of a pre-planting treatment with cypermethrin (dipping) and a single post planting spray.

- 2 Sites must remain relatively free from vegetation for up to 2 years after felling. If stumps cannot be treated (because they are not visible) then the nematodes will not be effective. Therefore, many productive lowland sites are not suitable.
- 3 Excessively steep sites are not suitable, as this would pose a safety hazard to the spray operators who walk behind the machine
- 4 Sites cannot be mounded or the brash removed prior to nematode application, as the nematode rig needs to travel along the brash mats to prevent soil compaction and/or rutting

## 2. Multi-agent approach: nematodes, fungi and chemical insecticides

To investigate whether a combined application of nematodes and entomopathogenic fungi can lead to synergistic effects, and hopefully higher control in the field, Coillte are now collaborating with the National University of Ireland Maynooth on a new project. This work is part of an EU-wide project, **BIOCOMES (Biological Control Products for Sustainable Farming and Forestry)**. Trials will be conducted across a range of soil types with varying depths of peat (a factor which is suspected to influence the success of nematodes). This project was started in 2014 and further trials are planned for 2015, leading to operational trials, planned for 2016.

This work is being carried out in co-operation with a nematode-producing German company **e~nema**. The work includes:

- Comparison of *Steinernema carpocapsae* (industry standard; currently used against pine weevil in UK) with *Heterorhabditis downesi* (produced by e~nema) for pine weevil suppression. In previous trials we have found the indigenous nematode species *H. downesi* consistently performed best, but this species was not commercially available.
- Effect of soil type on efficacy of EPN (*S. carpocapsae* and *H. downesi*). New meta-analysis of trial results indicated that tree type (pine versus spruce) did not affect the efficacy of EPN, but that soil type did, with EPN performing better in deep peat rather than mainly mineral soils. This is now being tested explicitly.
- Preparation of manuscripts on environmental safety of EPN applied to tree stumps for control of pine weevil.

We are also co-operating with NUI Maynooth, investigating the potential of entomopathogenic fungi (EPF) as a combinable weapon against weevils, in work funded by DAFM (COFORD; MCOP project). Commercially available and indigenous strains of EPF (*Metarhizium* and *Beauveria*) are being tested as stand-alone agents and in combination with other agents: with EPN, for action against weevil larvae in stumps, and with chemical insecticides against adult weevils.

There is also considerable international interest in colonising plants with EPF for sustainable pest control, and this is being tested as a possible strategy for pine weevil.

Findings to date:

- There is strong synergistic action when EPF are combined with neonicotinoid pesticides (cypermethrin, thiacloprid and acetamiprid) against adult weevils. These laboratory experiments are promising, though transfer to the field presents challenges.
- A survey of EPF in the clearfell ecosystem is providing novel indigenous strains as well as the first information on their genetic biodiversity and ecological competence that help guide the choice of strains for testing and methods for their deployment. Most notable is the finding of pine weevils naturally infected by the EPF *Beauveria caledonica*.
- EPF colonise pine and spruce seedlings endophytically. Optimisation of inoculation methods and/or selection of better adapted EPF strains is required to increase the colonisation success rate. No adverse effect of EPF on plant growth was detected – in fact, seedling growth was enhanced in EPF treatments.
- EPF applied against pine weevil developing in stumps do not result in adequate suppression alone, and synergy with EPN has not been detected in field trials. Alternative application strategies and/or better adapted strains might give improved results.

### **Feeding barriers**

Over the last ten years, Coillte have trialed a number of feeding barriers against adult weevils, including WeeNets and Trunkcoat.

**WeeNets** are light-weight nets which are fitted to containerised trees in the nursery, with the net positioned around the root plug and the lower part of the stem. WeeNets were tested on five sites in 2006-2007. The protection achieved was insufficient, as weevils climbed up the nets to feed on the upper part of the plant; a result similar to that observed in some other countries where this product was tested.

**Trunkcoat** is a latex type paint which, when applied to the lower 50% of the plant, should, theoretically, act as a physical barrier to adult weevil feeding. Trials using Trunkcoat were carried out on four sites. Although weevil feeding was reduced, the latex treatment appeared to be phytotoxic, with significant plant mortality, even on plants which showed little or no weevil feeding damage. Further trials are planned to be carried out in 2015 utilising wax treated plants from Forestry Commission nurseries in Delamere.

Another system, referred to as **Conniflex**, deters the adult weevils from feeding by coating the lower 60% of a plant in fine sand (grain size = 0.2 mm) embedded in an acrylate dispersion. Seedlings are treated in the nursery by a large-scale

application procedure involving four steps: (i) spraying the seedlings with water; (ii) application of fixative to the lower sections of the stems, (iii) application of fine sand to the fixative; and (iv) drying of the fixative. A field experiment in Sweden over three seasons demonstrated a significant increase in survival for coated seedlings compared with untreated seedlings.

Coillte have been in contact with Svenska Skogsplantor to discuss the possibility of trialing this product. At the moment this technology can only be applied to containerized seedlings, so is not suitable for Irish operations where we plant bareroot stock. Coillte do not plant large numbers of containerized plants as, given the smaller root collar diameter (usually 3-4mm compared to 6-9mm in bareroot), containerized plants cannot withstand weevil feeding pressure in Ireland, even where chemical insecticides are used. Furthermore, on productive lowland sites the use of containerized plants may actually lead to an increase in herbicide usage, given the smaller size of the plants and the increased competing vegetation issues.

### **Step 3 – Alternative Chemicals**

In 2013, Coillte, in conjunction with Waterford Institute of Technology (WIT) established a series of trials to assess alternative insecticides to cypermethrin. The project looked at four alternatives: Intercept (imidacloprid), Steward (indoxacarb), Gazelle (acetamiprid), and Calypso (thiacloprid) on four different sites in the Waterford, south Tipperary region. All sites were planted with Sitka spruce. On three of the sites, the pesticides were applied after planting while on one site, the plants were dipped prior to planting. Results from this study show that Calypso (Thiacloprid) appears to be a viable alternative to Forester and that dipping the plants prior to planting gives better protection against weevil damage. These types of trials will need to be replicated over multiple sites and years and additional insecticides will also need to be tested.

### **Ayeflex**

To protect against large pine weevil, Coillte has been using a Flexcoat and cypermethrin mix on plants prior to dispatch from our nurseries. Flexcoat is an adjuvant (a substance that enhances the effectiveness of the chemical) and combining Flexcoat with cypermethrin ensures that the insecticide adheres to the plant, thus reducing the application rate and prolonging the efficacy of a single treatment. Results suggest that this combination has facilitated a 25% reduction in cypermethrin usage in the nurseries.

The company anticipates that prolonging the efficacy of cypermethrin, through the use of Flexcoat will reduce the need for top-up sprays after planting.

As Flexcoat is no longer available, Coillte now uses a similar adjuvant called "Ayeflex". We have initiated trials on different concentration levels of Ayeflex.

Ayeflex manufacturers claim that the product will enhance the effectiveness of the cypermethrin such that it will be retained on the plant for up to two years. If it works, this could be a major development as it has the potential to reduce the amount of cypermethrin applied in the forest. To test the efficacy of this product, trials will have to be in place for a recommended minimum of two years.

#### **Step 4. Other hazard reduction measures**

For the control of pine weevil, we have only ever used insecticides specifically authorised for that use by the Pesticide Registration & Control Division (PRCD) of the Dept. of Agriculture and Food. To be authorised by the PRCD, all pesticides have to undergo a rigorous approval process. As a company, we keep comprehensive electronic records of our use of pesticides.

Records show both the total amount of pesticides used in our forests (in kg of active ingredient (a.i.)) and the amount used per treated area (kg a.i./ha) have shown a general downward trend over the last ten years.

#### **Hazards to people**

##### ***Our forest workers and contractors***

Coillte operates a health and safety management system structured in accordance with the requirements of OHSAS 18001:2007. Anyone who applies pesticide on Coillte lands must be specifically qualified to do so and must wear appropriate personal protective equipment (PPE) to the relevant standard associated with the operation. Where weevil control involves the use of insecticides, operators must be trained to City and Guilds standards, including PA1 (plant handling for planting treated plants) and PA6 (spraying operations).

These requirements are monitored regularly by our Operations Field Technicians through ongoing site monitoring protocols and by our Stewardship & Public Goods Quality Assessors carrying out quality audits through on-site inspections. Possible hazards to forest workers have also been reduced through the introduction and use of dipped plants. This reduces the amount of field spraying required.

##### ***Neighbours and forest users***

It is important that neighbours and forest users are aware that only those pesticides that are registered to be used in forests are used by Coillte. As an extra precaution, warning signs are erected where necessary to advise the public of spraying operations.

##### ***Hazards to the environment***

Coillte has adopted an Environmental Management System (EMS) to demonstrate its commitment to the continuous improvement of our environmental

performance. Coillte achieved accreditation to the international ISO 14001 from the National Standards Authority of Ireland in 2014. This demonstrates that the company conforms to the requirements of the ISO 14001 international standard which represents best in class in environmental management.

All applications of pesticides in Coillte forests are governed by:

1. Forest Service "Code of Best Forest Practice"
2. Forest Service "Forestry and Water Guidelines" *and*
3. Forest Service "Biodiversity Guidelines"
4. Coillte's EMS Pesticide SOP 2015

These requirements are monitored regularly by our Operations Field Technicians through ongoing site monitoring protocols and by Stewardship & Public Goods Quality Assessors carrying out quality audits through on-site inspections.

## 2. Program to identify alternatives to cypermethrin pesticide including preventative silvicultural measures.

### Summary programme to identify alternatives to cypermethrin

The table below summarises the extent of work which has taken place on the Coillte estate, either working ourselves or with partners in looking at alternatives to cypermethrin.

<b>Control Strategy</b>	<b>Time</b>	<b>Trial Area</b>	<b>Description</b>	<b>Conclusions</b>
Education	Constantly	Nationally	IPM training to Operations teams (including new Operations Managers) & Contractors. This work has concentrated on H&S, alternatives and stump hacking techniques.	Staff working in this area fully up to date with developments. Stump hacking technique now accepted as part of management of restock sites.
Hylobius Management Support System (Forest Research, UK).	Evaluated for a number of years	450ha of Coillte forests	This model predicts when weevil attacks can be expected on any specific site. We found the system to be unsuitable for our estate as it over estimated risk period on pine sites	Difficult to link in with long-term contractors (LTC)/tendering due to the narrow sampling window (April or Aug only). Not utilised here since 2012 as stump hacking procedure is now considered more effective as it can be utilised by LTC's on ground.
More robust plants	Since 2011	Nationally	Plant size has increased. SS root collar diameter > 6mm for size 1, > 5mm for size 2	Continuous improvement programme at nursery level. Work is continuing within Coillte Nurseries on a new grading system which would increase the RCD of each of the



			Since 2013 - move to plugs with pine with RCD of >6mm	Size 1 and Size 2 plants. It is hoped to roll-out this proposed new grading system on an operational basis in 2016.
<b>Control Strategy</b>	<b>Time</b>	<b>Trial Area</b>	<b>Description</b>	<b>Conclusions</b>
Insect-killing nematodes <i>Steinernema</i>	Working with NUI Maynooth since 1998. Operational in 2007	30 sites (500ha)	<p>Specific nematode application spray-rig assessed at an operational scale on a range of restock sites around the country.</p> <p>BIOCOMES project</p> <p>Trials conducted across a range of soil types with varying depths of peat soil (a factor which is suspected to influence the success of nematodes).</p> <p>This project was started in 2014 and further trials are planned for 2015. Operational trial are planned for 2016.</p>	<p>Discontinued as an operation as was found to be ineffective where previous crop was pine. Even where previous crop was spruce, significant plant mortality (&gt;30%) was found on 47% of sites.</p> <p>Early results from BIOCOMES:</p> <p>Both species of entomopathogenic nematodes are effective in controlling the weevil in deep-peat soils</p> <p>Control was inadequate on the shallow peat site (Killurney)</p> <p>Parasitism rates are declining with depth and distance</p> <p>Method of application does matter. <i>H. downesi</i> provides more control when applied on top whereas <i>S. carpocapsae</i> provided more control when applied around the stump</p> <p>Applications on top of the stump kill more weevils deeper and at distance, however H.</p>

				downesi applied on top kills more beetles closer to the stump
<b>Control Strategy</b>	<b>Time</b>	<b>Trial Area</b>	<b>Description</b>	<b>Conclusions</b>
Insect-killing fungus ( <i>Metarhizium</i> ) either alone or in combination with insecticide	Since 2008	2 sites	<p>With the fungus alone, we found a 35% reduction in numbers when applied to late instar larvae. No reduction occurred when applied to early instar larvae.</p> <p>Coillte continues to liaise with NUIM on the following projects:</p> <ul style="list-style-type: none"> <li>• Interreg Synergy project (nematodes &amp; fungi) - ran 2010-2013.</li> <li>• Multi Agency Control Options for Pine Weevil – 2011 -2015.</li> </ul> <p>We are also investigating the potential of entomopathogenic fungi (EPF) as a combinable weapon against weevils, in work funded by DAFM (COFORD; MCOP project). Commercially available and indigenous strains of EPF (<i>Metarhizium</i> and <i>Beauveria</i>) are being tested as stand-alone agents and in combination with other agents: with EPN, for action against weevil larvae in stumps, and with chemical insecticides against adult weevils. There is also considerable</p>	<p>Not effective as currently used.</p> <p>This work in NUI Maynooth has shown that, when combined with insecticides (cypermethrin, thiacloprid and acetamiprid), there is strong synergistic action against adult weevils. These laboratory experiments are promising, though transfer to the field presents challenges.</p> <p>A survey of EPF in a clearfell ecosystem is providing novel indigenous strains as well as the first information on their genetic biodiversity and ecological competence that will help guide the choice of strains for testing and methods for their deployment. Most notable is the finding of pine weevils naturally infected by the EPF <i>Beauveria caledonica</i>. EPF colonise pine and spruce seedlings endophytically. Optimisation of inoculation methods and/or selection of</p>

			international interest in colonising plants endophytically with EPF for sustainable pest control, and this is being tested as a possible strategy for pine weevil.	better adapted EPF strains is required to increase the colonisation success rate. No adverse effect of EPF on plant growth was detected – in fact, seedling growth was enhanced in EPF treatments. EPF applied against pine weevil developing in stumps do not result in adequate suppression alone, and synergy with EPN has not been detected in field trials. Alternative application strategies and/or better adapted strains might give improved results.
Feeding Barriers <ul style="list-style-type: none"> <li>• WeeNets</li> <li>• Trunkcoat</li> <li>• Conniflex</li> </ul>	WeeNets tested in 2005/2006 Trunkcoat tested in 2008 & 2009 Conniflex yet to be tested	5 sites 4 sites (2 in 2008, 2 in 2009)	WeeNets – applied to containerised planting stock before planting  Trunkcoat – deterrent to feeding by weevils  Conniflex – physical deterrent to feeding applied to container stock	WeeNets – results not consistent enough for operational use  Trunkcoat – ineffective and phytotoxic  Conniflex for bareroot stock may become available in the future and will be tested as soon as the product becomes available
Fallowing	2008 onwards	270 ha 2008 838 ha 2011-2015	Assessed the potential to not restock areas for periods of up to 5-6 years after clearfelling to allow weevil populations to peak before planting	Results very inconsistent as weevils attracted in to adjoining clearfells. Might be an option on upland sites where competing vegetation is not a major issue, but will require a change in existing national legislation if this is to be implemented. Not exercised for 2010-2015 FL application.

'Hot planting'	2014	Nationally 124ha	Plant immediately after harvesting to avoid peak weevil populations	Year one of trial shows positive but mixed results. Adjacent clearfell areas are source of potential infestation of weevil. Trial sites to be continued to be assessed in 2015 to observe potential benefits
Stump removal	2012	4 sites	This project looked at viability of stump removal across a range of areas, including effect on weevil populations	Results suggest very little, if any, effect on weevil populations
Alternative insecticides (Waterford Institute of Technology)	2011-2012 onwards 2013	Laboratory trials Field Trials	Imidacloprid, acetamiprid, thiacloprid & indoxacarb all repelled adult weevils.  Field trials established in conjunction with WIT assessing four pesticides: Intercept (Imidacloprid), Steward (Indoxacarb), Gazelle (Acetamiprid), and Calypso (Thiacloprid) on four different sites in the Waterford south Tipperary region.	Lab trials encouraging but field trials required  First year results from this study show that Calypso (Thiacloprid) appears to be a viable alternative to Forester and that dipping the plants prior to planting gives better protection against weevil damage.

## B. Certificate Holder Specific Requirements

FSC Certificate Holder: Irish Forestry Unit Trust  
FSC Registration Code: CU-FM/COC-806994

### 1. Demonstrated Need

The Irish Forestry Unit Trust (IForUT) was established in 1994 to facilitate pension fund and charity investment in forestry. Its unit holders include most of the major Irish pension funds and fund managers.

IForUT has a forest investment portfolio in Ireland amounting to 14,202 Ha. Of this 6014 ha is held as Leasehold cutting rights on Coillte managed land (no restock obligation), with the remaining 8,188 ha held as Freehold and managed by a selection of Forest Management companies. This temporary derogation application is only applicable to the Freehold forestry area.

IForUT's primary forest management objective is to achieve a financial return from the ownership and management of conifer plantations in Ireland. IForUT is committed to achieving this objective by managing its forests and related activities in compliance with the Forest Stewardship Council®<sup>1</sup> (FSC) Irish Standard for Forest Management Certification.

The large pine weevil (*Hylobius abietis*) is an established pest on conifer restocks sites in Ireland. Based on the life cycle and feeding requirements of large pine weevil, it is regarded as a serious threat for the first 4 years on replanted clearfell sites. Numerous trials of alternative non chemical control methods have been developed and tested on a national basis by educational and state agencies, but to date no reliable, efficient or cost effective controls have been found. Without protection, large numbers of conifer restock plants are vulnerable. Once weevil populations meet endemic levels, mortality will range from 30-100%.

### 2. Specific Controls

#### Site Monitoring

Monitoring of Large Pine Weevil on restock sites is carried on a site by site basis. Visual monitoring for weevil damage and larval counts from stumps are used to quantify population levels and predict endemic outbreaks. All replanted sites are monitored for large pine weevil in the first 3 growing seasons after planting at which point strong tree growth is generally beyond weevil damage. Slower growth sites are monitored for an additional year after which the localised population life cycle will have diminished.

IForUT has found in practice that replanted clearfell sites in heavily afforested localities suffer significantly greater rates of mortality. Management prescriptions are site specific and not applied on a FMU level.

## **Non Chemical Management Options**

To date IForUT's use of cypermethrin has been limited due to the locality of sites and the non-chemical management practices applied by IForUT. IForUT's policy has been to re-establish clearfell sites as quickly as possible after felling to encourage quicker establishment to get trees beyond the period of susceptibility to large pine weevil. In general, mortalities rates incurred to date have been at manageable levels. To mitigate against moderate levels of weevil damage, IForUT has successfully applied the following management practices:

1. Planting higher tree numbers initially (+10%) to absorb moderate weevil mortalities.
2. Using improved nursery stock for quicker tree establishment.
3. Using larger planting stock to encourage quicker tree growth.
4. Utilising ground preparation to promote faster tree growth.
5. Replanting immediately after felling to stay ahead of weevil population cycles.
6. Beating up (filling in) by 10% in years 2 or 3 if required.

The above management practices have proved to be effect with low to moderate weevil populations. Where large pine weevil populations have become endemic, the above management strategies are not effective and in such scenarios IForUT requires the option of cypermethrin application.

## **Chemical Use Procedures**

When chemical use is required the following management procedures are applied by IForUT Forest Managers as part of its Management Systems and Practices

### **Contract Documentation/ Planning:**

- i. Chemical Application Contract
- ii. Site Environmental Impact Assessment
- iii. Hazards & Sensitivities Map
- iv. Hazards Identification & Risk Assessment
- v. Pollution Control Plan
- vi. Emergency Response Details
- vii. Issuing of chemical use warning signs

### **Contractor Compliance:**

- i. NPTC Spraying Certificate
- ii. First Aid Training Certificate
- iii. Public Liability and Employer Insurance cover

### **Forest Manager Supervision:**

- i. Start-up site meeting
- ii. Bi weekly sites visit to monitor work progress/ controls/ weather conditions/chemical storage
- iii. Water quality inspection if required
- iv. Recording site visits of IForUT 365 Management Database
- v. Recording chemical use on IForUT 365 Management Database

All applications of pesticides on IForUT forests are governed by:

1. Forest Service “Code of Best Forest practice”
2. Forest Service “Forestry and Water Guidelines”
3. Forest Service “Biodiversity Guidelines”

### **3. Programs for Alternatives**

Presently, cypermethrin is the only effective insecticide that can be used in Ireland against pine weevil. Work has been ongoing for some years to investigate non-insecticide alternatives and it is expected that a further number of years are needed before viable alternatives are found.

As a private forest owner, IForUT does not view itself as having a research remit into the development of new controls. IForUT’s views this role as being that of the State Forestry body Coillte and the State Forest Research and Development Council COFORD, supported by Irish universities. If requested IForUT will assist as required.

<sup>1</sup> FSC licence code FSC- C005714