An integrated pest management strategy for Hylobius – the holy grail of forestry?

Kerstin Leslie and **Tim Liddon** (Tilhill Forestry) have a closer look at weevil control strategies

As an industry we are striving towards an effective and economically viable Integrated Pest Management (IPM) strategy for pine weevil control. Estimates have put the cost of damage due to Hylobius at around £4m/year but this likely to be conservative. The Pesticide Notebook in the FTN February edition[1] painted a bleak picture for post-planting weevil control, with the imminent end of derogation on Cypermethrin leaving Acetamiprid as the only alternative pesticide – whose future is also uncertain. Pesticides are quite rightly coming under scrutiny across the world. And it is clear that a we need to find a robust IPM quickly. The real challenge for us is how and when can we get there?

The story so far

Over many years, a huge amount of effort and resources has been invested in the hunt for alternatives to Cypermethrin, demonstrating that there is no easy answer. Ongoing work by Forest Research has been complimented by projects such as BIPESCO[2], led by Swansea University focusing on biological control, by work on the biological pesticide Neem at the University of West Scotland, and by the Hylobius Plant Protection Group (HPPG) which includes a significant range of industry partners. These Industry partners pull together resources and knowledge to create efficiencies in the process

Forest Research will shortly be publishing a report on alternative control treatments for Hylobius, which includes trial work carried out in conjunction with Maelor Forest Nurseries and Tilhill Forestry under the umbrella of the HPPG. Since 2009 over 30 different treatments have been trialled. When the group was first set up, the immediate term goal was to find a safer alternative to Cypermethrin. In this goal we have succeeded. Following promising trial results, Acetamiprid (Gazelle) was introduced in 2011. Although still hazardous, Acetamiprid has a safer environmental profile and is less harmful to operators than Cypermethrin. Some particular neonicotinoids have been associated with pollinator decline but Acetamiprid was chosen because it is not considered to be harmful to bees.

Long-term vision

Never losing sight of our long-term goal of a sustainable IPM strategy, the importance of accurate population monitoring has remained at the forefront. A simple method of pesticide reduction is to target applications where populations are known to be high. The Hylobius Management Support System (HMSS), which was developed by Forest Research to help predict populations, is currently being updated to cover a wider range of management regimes. We hope that these upgrades will allow for spatial interactions to be included and modelled. To date, HMSS has only really been used successfully by the FC but it is hoped that new improved version will see wider confidence and uptake across the private sector.

What haven't we tried?

The trials that Tilhill have been involved in have included many other methods of control, including physical barriers, soft pesticides, biologically derived pesticides and biological control agents. Early in 2004, we trailed a granular insecticide. In 2005, we tried Clipstops, (plastic collars), moving on to ladies tights and latex in 2007. Unfortunately, none of these physical barriers were effective and continue to frustrate primarily due to being unable to confidently predict weevil populations. Wax coating and paper sleeve barriers were only effective at low to moderate population densities, making accurate population prediction essential before considering these methods. These physical barrier products are used successfully in Sweden, however, some estimates put Hylobius population levels in the UK at up to seven times higher than in Sweden! The term 'soft' pesticide is generally used to describe pesticides which are not harmful to operators or persistent in the environment. Chlorantraniliprole is one such pesticide which has shown promising results and could play a role in future Hylobius control. Naturally derived pesticides trialled included Neem-based products and Spinosad. NeemAzal failed to give adequate protection, possibly due to rapid breakdown under field conditions. Spinosad did look promising when applied under carefully controlled conditions but this proved difficult to replicate in the field. Stump treatments of both nematodes and Metarhizium fungi are known to act as biological



Left to right:

Swedish wax cracking and falling off

Heavy dernier suffocated the young trees

Fine dernier failed

control agents against Hylobius but effective commercial application has always been challenging. Metarhizium was also trialled as a plant protection treatment with limited success. It does show more promise as part of a 'lure & kill' system where attractants are used to lure weevils towards a trap with a high concentration of Metarhizium.

What about fallow?

But wait a minute, 'Just leave a fallow period!' I hear them cry. In principal, this is an appealing idea, simply delay restocking until Hylobius population levels have fallen. In the private sector we have found this to be unsuccessful and impractical for a number of reasons. As restocking is now well advanced in many areas, weevil populations have built up year on year to the point where 'fly in' from adjacent areas poses a significant risk, irrespective of any fallow period. Delaying restocking for a period of 3-5 years is equivalent to reducing the productive area and natural capital by 10% plus, not only a reduced return to the woodland owner but with knock-on effects all the way down the supply chain to the sawmills and end users. Especially on more fertile sites, a fallow period is just what weeds and pioneer species need to get established – increasing the cost and reducing the success of establishment (and using more herbicides!).

New strings to our bow

Another part of the solution must be tree breeding and genomics. If we can induce the tree's own natural protection, perhaps in conjunction with boosting growth with controlled release fertiliser, we can get trees out of the weevil danger zone quicker. We hope to be working with academia on this subject shortly.

Also in February's FTN edition readers were made aware of the FOREMOD project[3] and were invited to participate in a survey looking into how grant funding could be used to reduce the risk of new pest and disease outbreaks – but could financial incentives also be used to reduce pesticide use for controlling our existing pests? If pesticide reduction is the desired outcome, should taxpayer money be used to subsidise novel methods of control which are showing promise but not yet at a commercial viable stage? For example lure and kill systems require a high density of traps which is not practical or affordable.

Summary

- Withdrawal of pesticides for Hylobius control poses an imminent threat to restocking.
- A lot of work has gone into the development of our elusive Integrated Pest Management strategy.
- We must keep pushing ahead with promising alternatives to get them to a commercially viable stage quickly.

Read also: Hylobius Alert – potential counterfeit insecticides. Pesticides Notebook, page 63

www.tilhill.com

REFERENCES

1 *2017 review of available herbicides and insectides*. Colin Palmer. Pesticides Notebook, FTN February 2017 (issue 79), p59-61.

2 *Biocontrol of Important Soil Dwelling Pests by Improving the Efficacy of Insect Pathogenic Fungi*

3 *Seeing the wood from the trees*. Paul McLean, Forest Research. FTN February 2017 (issue 79), p27-29. http://tinyurl.com/forestmanagementsurvey