Forest Health News

SCION Next generation biomaterials

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BUDDLEIA BIOLOGICAL CONTROL LOOKING PROMISING

The buddleia leaf weevil, *Cleopus japonicus*, was first released in New Zealand by Scion in September 2006. After the first five large releases in North Island plantations (Whakarewarewa, Kinleith, Lake Taupo, Esk, and Rawhiti Forests) many smaller releases of the weevil were made around New Zealand. Each year these sites are checked by the landowners or managers for establishment and damage.

Approximately 40 releases of the weevil have been made. All those more than a year old have resulted in establishment, including a release of only 17adults in Hawke's Bay. The only possible exception to these successful results was the Upper Hutt release made in 2007.

This autumn we have had records of the weevil being found throughout the Bay of Plenty and adjacent areas. Spread from the original release sites has been impressive, with the weevil being found up to 50km from these release sites. This includes the Whakarewarewa Forest site in Rotorua, which seemed to perform poorly in the first three years after release.

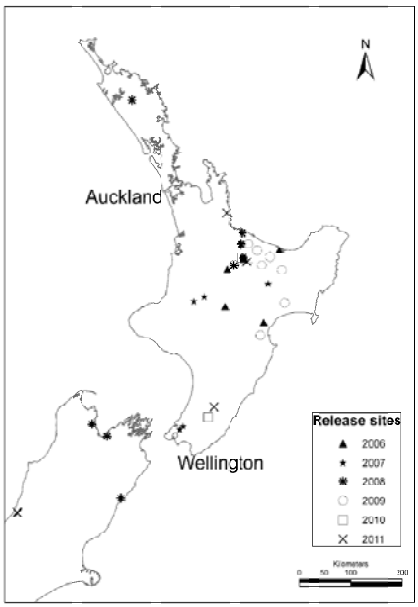
This year we have seen a lot more damage to buddleia, with large areas of buddleia completely defoliated by the weevil. Observations indicate that the weevil is sensitive to microclimate variability. At warmer sites it has often shown a preference for gullies, whilst at cool sites the weevil preferentially attacks the buddleia in more open, sunny positions.

Once again, feeding damage increased rapidly from February onwards and peaked in April and May. As observed previously, there were no larvae during January and no mating adults were seen during this time. This non-egg laying period, when the weevils are relatively inactive, results in a period with very little additional damage to buddleia, but by mid-February huge numbers of larvae can be found. These larvae rapidly defoliate the buddleia. Newly emerged adults can be found searching for buddleia and flying en masse in April and May.

The buddleia leaf weevil has a tendency to over exhaust its resource in autumn so that many larvae run out of food and new adults can emerge with nothing to eat. This results in any new growth quickly being attacked and even tiny buddleia seedlings being eaten. The ability of adults to survive without food for extended periods combined with this high level of attack year after year should lead to a reduction in the growth of buddleia.

Scion is encouraging the further spread of the weevil to new areas. For further information on where and how to collect and redistribute it please contact Scion.

Michelle Watson



Above: Buddleia leaf weevil release sites.
At left: Completely defoliated buddleia in Whakarewarewa Forest.

*Newsletter of the **Scion Forest Protection team**, and the **Forest Health Reference Laboratory** (incorporating the Forest Research Mycological Herbarium (NZFRI-M), the Forest Research Culture Collection (NZFS), and the National Forest Insect Collection (FRNZ). Edited by John Bain, New Zealand Forest Research Institute Ltd, Private Bag 3020, Rotorua. <john.bain@scionresearch.com> Web site < http://www.scionresearch.com/biosecurity >*

DOTHISTROMA CONTROL COMMITTEE

The Dothistroma Control Committee (DCC) is a sub-committee of the Forest Biosecurity Committee administered by the New Zealand Forest Owners' Association. The DCC comprises members from several major forest growers and the Farm Forestry Association. It coordinates the annual spray programme to control Dothistroma needle blight. The DCC buys copper and oil in bulk and organises aerial spray contractors in the most cost effective manner for the benefit of all forest owners – large or small. In any one year the DCC may order up to 80 tonnes of copper and 150,000 litres of oil.

The DCC needs to receive requests for spraying by mid-August to allow it time to order appropriate amounts of copper and oil and to organise the spray contractors. If an owner has any doubt on whether the trees should be sprayed the DCC can advise on whom to contact. The Secretary is Don Hammond and he can be contacted on 07 3323454 or 0274 885940. The postal address is The Secretary, Dothistroma Control Committee, PO Box 1035, Rotorua.

The DCC, which is non profit making, also funds research that might improve the control programme. Recently, the DCC has funded research demonstrating that:

- aerial application of copper to control Dothistroma needle blight does not result in significant built up of copper in the soil and levels are significantly lower than those known to cause environmental damage
- the amount of spray applied can be reduced from 5 litres/ha down to 3 litres/ha without compromising efficacy or operational performance
- there is potential to reduce the amount of copper applied even further.

Twenty years ago 2.08 kg/ha of copper in 50 litres of water was applied per hectare. Now, 0.86 kg copper in 5 litres of water and oil mixed is applied, per hectare. Copper persists on pine foliage much longer than was first thought, in a trial sprayed in late 2009 copper was recovered 4½ months after application. This finding should allow managers to apply a second spray later and thus increase the period over which copper is controlling the disease.

The DCC also funds some fundamental research. It recently funded research at Massey University to develop a quantitative PCR based molecular method for determining the amount of the fungus present in the host. This will support work on biological control of Dothistroma needle blight being undertaken now.

Lindsay Bulman

THE ECONOMIC COST OF DOTHISTROMA NEEDLE BLIGHT TO THE NEW ZEALAND FOREST INDUSTRY

Forest growers in parts of New Zealand consider Dothistroma needle blight to be one of the most serious diseases affecting growth of radiata pine. Currently the disease is controlled by aerial spraying of copper oxides. Silvicultural practices that promote airflow and remove susceptible individuals will also reduce disease. Areas are usually treated if the severity exceeds a threshold of 15%, as assessed from the air, but this varies among forest companies.

Past attempts to place a value on the cost of this disease to the forest industry have varied widely. In 1989 Geoff Sweet assumed volume loss due to Dothistroma was nil because disease was kept in check by spraying whereas Bulman in 2004 estimated loss to be $23 million per year. A modelling project undertaken by Scion has enabled the economic effect of Dothistroma needle blight to be estimated with reasonable certainty.

The modelling exercise, based on data collected from the forest health surveillance scheme, confirmed that severity was highest in moderately warm wet environments in the North Island and on the west coast of the South Island. In contrast, disease severity was lowest in drier eastern and southern regions of New Zealand. Severity increased to a maximum at a stand age of 12 before declining.

The total cost to the industry was estimated at $19.8 million per year and made up of three components. The cost of spraying was estimated at $3.8 million per year while growth losses in sprayed areas were estimated at $3.0 million per year. However, the largest cost component was $13 million per year which resulted from potential growth loss from areas with a severity lower than the 15% threshold for spraying.

The analysis highlighted the general issue of the severity threshold at which Dothistroma needle blight is controlled. Although lowering this threshold will increase costs this decision would need to be weighed against the volume losses in stands with low levels of disease.

Further research is needed to investigate this trade-off more closely. As the disease does not have a marked effect on stands with low final crop stocking it would be useful to investigate the effect of low disease levels on growth across a final crop stocking range.

For more detailed information see Watt, M.; Bulman, L.; Palmer, D. 2011. New Zealand Journal of Forestry 56 (1): 20-22.

Michael Watt, Lindsay Bulman, David Palmer

NEW RECORDS

We are no longer publishing details of new records. For further information on results of MAF funded programmes see MAF's Biosecurity magazine (http://www.biosecurity.govt.nz/publications/biosecurity-magazine/index.htm) where information on new biosecurity identifications is regularly published.

John Bain

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