Reducing herbicide use for weed control

Marcel Van Leeuwen
Selwyn Plantation Board Ltd.
Darfield

One of the key environmental outcomes that the Forest Stewardship Council (FSC) is trying to achieve through forest certification is a reduction in and potential elimination of chemical use (herbicides, pesticides, fungicides, fertilisers) in forest management. Two FSC criteria specifically address this issue:
Criterion 6.6: “Management systems shall promote the development and adoption of environmentally-friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides.”
Criterion 10.7: “Plantation management should make every effort to move away from chemical pesticides and fertilisers, including their use in nurseries.”

During FSC audits of New Zealand plantations there has been a strong push for a reduction in chemical use for both animal pest and weed control, with auditors seeking evidence of such a reduction between successive audits. Chemical use is, however, essential in New Zealand plantation forestry to meet both biodiversity and economic goals. A range of pesticides are critical for the control of invasive animals such as possums and mustelids; without their use it would be extremely difficult to sustain many native animal populations. Herbicides have a number of uses in plantation forestry including control of weeds competing with plantation seedlings, control of weeds that threaten biodiversity values, roadside and firebreak maintenance, and meeting regional council weed control requirements (e.g., for gorse).

Elimination of pesticide use it not at present feasible for New Zealand forestry companies if they are to run sustainable forestry businesses. The challenge therefore is to find ways to reduce the use of these chemicals without compromising biodiversity or production values.

Selwyn Plantation Board Ltd. (SPBL) have used non-herbicide weed control for many years, especially in their plains plantations where mechanical control is used. However, in some situations, especially hill forests, chemical control is essential. SPBL are, however, committed to seeking ways to reduce herbicide use and have been running a trial to assess the effectiveness of reduced herbicide application rates for roadside weed control, the results of
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which are described in this note.

In this trial the herbicide Trounce® was sprayed onto road-surface and road-verge vegetation on eleven sections of road in Dalethorpe forest, Canterbury foothills. The chemical was applied to a 4 m wide strip using a vehicle mounted boom at two application rates, 2.0 kg/ha (the normal rate) and 1.5 kg/ha (25% reduction in application rate). Road-surface and road-verge vegetation comprised a range of exotic grasses and herbs including cocksfoot, sweet vernal, browntop, Yorkshire fog, clovers, thistles, woolly mullen and catsear. Four road sections were treated with 2.0 kg/ha and seven sections with 1.5 kg/ha. The objective of the trial was to assess if the reduced herbicide application rate would yield the same amount of weed control as the normal application rate.

Photopoints were established at each application site and photos taken to document the effectiveness of the two application rates on the initial knock-down of weed growth and subsequent re-growth. The trial was established in December 2004. By the end of January 2005 there was a marked reduction in weed growth on both the road-surface and road-verge, but with little obvious difference between the two treatments. By December 2005, one year after herbicide application, some weed re-growth had occurred but there was still little difference between the two application rates. The results of this initial trial suggest that it should be possible to reduce herbicide application rates by 25% while still achieving the desired level of road weed control in SPBL foothill plantations. Further trials are being established and the relative cost and efficiency of mechanical versus chemical control of road-surface and road-verge weeds is also being investigated.

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