Desirable planting delay following preplant spraying with Escort in Northland

P.J. Smale

Abstract
A trial was established to determine the effect on P. radiata growth following the application of the herbicide Escort on volcanic, clay loam and sandy soils in Northland. Only with high application rates (300g/ha) and a planting delay of one week or less was there any significant loss of growth.

Introduction
The herbicide Escort (metsulfuron) is being used increasingly in Northland plantations for the control of bracken, blackberry and inkweed prior to planting. Although it is primarily a foliar herbicide, there is some residual activity which may significantly reduce growth of P. radiata seedlings. As a result, the label recommendation is to ensure a delay of at least two months between application of Escort and planting.

Forests are being established on a wide range of soil types in Northland. As the residual activity of Escort is likely to depend on soil type, this trial was established to define the required delay period between spraying and planting on three broad soil categories (sand, clay loam, volcanic).

Method
The trial was established in the 1986 planting season. The soil types selected were as follows:
1. Te Kie reddish clay loam (volcanic) with a 20% covering of bracken fern.
2. Waimatenui clay loam with a 100% grass cover.
3. Te Kopuru sand with a 30% cover of manuka.

Each site had three blocks of each of the following treatments:
1. Escort at 150g product per hectare plus Triton X45 at 0.5% in 240l water per hectare.
2. Escort at 300g product per hectare plus Triton X45 at 0.5% in 240l water per hectare.
3. Control: No Escort spraying but on the sites with fern and manuka, comparable vegetation control was obtained with Roundup (glyphosate). On the grass site total weed control was maintained in all treatments with Gardoprim (terbuthylazine) and Gallant (haloxyfop).

Following spraying, 10 P. radiata seedlings were planted in each plot at intervals of one day and one, two, four, six and eight weeks. Although the seedlings were graded to the same root collar diameter and height and came from the same nursery, they were lifted from different beds and planted under different weather conditions. Therefore it is only possible to compare growth differences for any given delay interval and not compare the differences within one treatment over several delay periods.

All seedlings were fertilised with 100g of N.P.K. (8.13.8) per tree.

Results
The root collar diameters (r.c.d.) and heights of all seedlings were measured during the winter of 1987 (approximately one year after establishment). An analysis of variance was carried out and the results for the one day and one and two week measurement are shown in the table.

As there was no statistical difference between treatments with planting delays of four, six and eight weeks and the survival was the same for all treatments and delay periods, these data have not been shown in the table.

On the Te Kie reddish clay loam there were significant losses in height and r.c.d. for planting delay periods of one day (2.7mm r.c.d. and 10.7cm height) and one week (3.0mm r.c.d. and 10.8cm height) following the application of 300g/ha of Escort. The application of 150g/ha of Escort caused no significant losses.

On the Waimatenui clay loam there has been a significant reduction of 10.6cm height for the one day delay period following 300g/ha of Escort but no effect on r.c.d.

For the Te Kopuru sand there is no significant difference between any of the treatments. Even planting the day following the application of 300g of Escort per hectare has not affected growth.

Discussion and Conclusions
Because there were only three replications of each treatment the results are not so sensitive to statistical analysis as is perhaps desirable. However, it is clear that only with a planting delay of up to one week on volcanic soils following a 300g/ha application of Escort is there likely to be any reduction in growth.

The vegetation cover plays an important part in determining how much herbicide reaches the soil. The results would therefore possibly be different if bare soil had been used in each case. However, the vegetation type was typical of that usually found on the soil types used to establish P. radiata in Northland.

The results have indicated that there are losses associated with the use of higher rates of Escort when applied close to the
time of planting. However, for forestry use in Northland application rates would generally be lower than the rates causing growth depression. Careful planning of burning, preplant spraying and planting programmes should eliminate any cause for concern.

(1) TM of E.I. Du Pont do Nemours and Co. Inc., USA
(2) TM of Rohm and Haas Co., USA
(3) TM of Monsanto Co., USA
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<th>Soil Type</th>
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<td></td>
<td></td>
<td>1 day</td>
<td>1 week</td>
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<tr>
<td></td>
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<td>r.c.d. (mm)</td>
<td>height (cm)</td>
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Notes: 1. If there is a statistically significant difference (P < 0.05) between treatments this is indicated by a different subscript letter following the measurement.

2. For reasons noted in the text it is only valid to compare treatment within a given planting delay period and not to compare the effect of planting delay within a given treatment.