CHEMICAL THINNING OF 13 YEAR OLD P. RADIATA USING ROUNDUP HERBICIDE

INTRODUCTION:

Chemical thinning by notching may be a cheap alternative to thinning steep slopes (>14°), where mechanical operations are too difficult. Thinning by age 10 in these sites is vital because of potential drought deaths or increment loss on crop trees. This trial was established to determine what quantity of Roundup (glyphosate 360 gm/l) herbicide will kill 13 year old P. radiata when it is applied by notching.

The experiment was located in Ellis plantation and planted in 1976. Trees were 13.3 years old when the experiment was established; tree stocking was 880 sph^{-1}); hectare basal area was 23.2m^3 and mean top height was 21.7 metres.

METHOD:

Hatchets were used to notch unwanted trees at waist level with notches placed 8cm apart around the trunk. 1 ml of the treatment solution was injected into each notch. The number of notches per tree was related to tree diameter at breast height viz. mean number of notches was 4.5/tree and mean diameter was 17.75cm.

Treatment rates were:

(1) 1ml neat Roundup;
(2) 50% solution (0.5ml Roundup);
(3) 25% solution (0.25ml Roundup).

An untreated, notched control was also used. Treatments were replicated 3 times and applied in November. 200 sph^{-1} crop trees were retained and not notched.

At 3 and 9 months, all trees were assessed using a 0-5 rating where: 0 = healthy; 1 = <25% crown reduction (C.R.); 2 = 25-50% C.R.; 3 = 50-75% C.R.; 5 = dead.

Unfortunately, the trial area was thinned by contractors 5 months after treatment, with 57% of trees remaining over the trial.

The presence of ipps grandicollus bark beetle was also recorded at 3 months to a height of 2.5 metres.

RESULTS:

Three months after treatment, 37% of trees had died in Treatment 1. A further 23% had >75% crown reduction and 60% were affected with ipps grandicollus bark beetle. 22% of trees died in Treatment 2, 24% had >75% crown reduction and 36% were affected by ipps.

Treatment 4 was unaffected by notching. See Table 1.

There were no visible chemical affects on crop trees after 3 and 9 months. Nine months after treatment, all notched trees had died in treatments 1 and 2. 73% of trees were killed in treatment 3 and ipps bark beetle was present in all dead trees from treatments 1, 2 & 3.

TABLE 1: Effect of Roundup on 13 y.o. notched P. radiata 3 months after treatment.

Treatment /notch Roundup	*Health Code % 0	1	2	3	4	5	% Ipps Affect
1) 1ml neat	-	2	17	21	23	37	68
2) 0.5 ml (50%)	-	10	22	22	24	22	36
3) 0.25ml (25%)	-	39	30	17	11	3	4
4) notched control	77	17	5	1	-	-	-

*Health code: 0 = healthy, 1 = <25% crown reduction (C.R.), 2 = 25-50% C.R., 3 = 50% C.R., 4 = >75% C.R., 5 = dead.

DISCUSSION:

This trial showed that an average of 4.5 notches per tree at rates of 1ml of neat Roundup and 0.5ml Roundup per notch will kill unwanted trees after 9 months.

There were no visible chemical effects on nearby residual crop trees. This contrary to an earlier study where 15 year old crop trees at 400 sph^{-1} were affected by Roundup, possibly through root translocation. It is possible the crop trees at Ellis were unaffected because of a 57% reduction in stocking (by thinning) after 5 months.

Notching unwanted trees is a quick technique. In this trial, 4 trees per minute were notched, which included walking time.

It is recommended that an operational trial using 0.5ml per notch be carried out to test these results.

R.A. Hingston
SENIOR TECHNICAL OFFICER

13 February 1991

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

Form CLM 808

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Subject: **CHEMICAL THINNING OF 13 YEAR OLD P. RADIATA USING ROUNDUP HERBICIDE**

Please find attached report for the above trial at Ellis plantation.

This experiment was initiated following a request from Silviculture branch.

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13 February 1991

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SP. to note.
JK

RF - would you please prepare a Tech. Inst. on this basis.