

## NOTES

### EFFECTS OF SEEDBED COVERING ON EMERGENCE OF RADIATA PINE (RANGIORA NURSERY)

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#### SYNOPSIS

*Germination of radiata pine seed covered with a coarse (6 to 7 mm diameter) river-washed gravel was much less than when the covering was fine gravel (3 mm diameter). This was especially so in summer, apparently owing to moisture loss by evaporation.*

#### INTRODUCTION

Increasing use of costly orchard seed and the development of precision sowing and improved nursery techniques makes it advisable to examine all aspects of nursery production in order to obtain maximum returns. In the North Island seed is normally covered with nursery soil (Chavasse and Weston, 1969), while in the South Island it is more usual to cover beds with sand or gravel. At Rangiora Nursery a coarse river-washed gravel, 6 to 7 mm in diameter, is commonly used and this was thought to result in reduced germination.

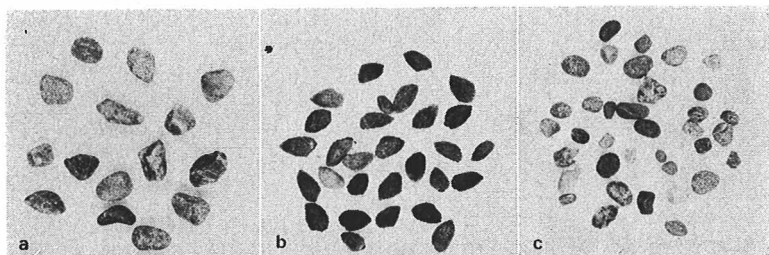


FIG. 1: *Relative sizes of radiata pine seed, fine and coarse gravel. (a) Coarse (6 mm) gravel, (b) Radiata pine seed. (c) Fine (3 mm) gravel.*

#### METHOD

Two nursery beds were precision-sown with stratified radiata pine seed (94% viability) in February 1973. One bed was covered with the standard river-washed gravel, and the other with fine gravel of 3 mm diameter. All further operations were identical for the two beds. Ten weeks after sowing, seedling emergence was assessed on five randomly-located sub-plots, each containing 100 seeds, for each bed. A  $\chi^2$  test of

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independence shows that the differences were highly significant ( $\chi^2$  294.4).

For confirmation, a sample of spring-sown radiata was assessed. Because of different sowing dates (2 weeks between sowings) only a small sample was taken, and results should therefore be accepted with caution. Here also (assuming the timing of sowing had not affected germination), the difference in emergence was highly significant ( $\chi^2$  227.4).

Results of both assessments are given in Table 1.

TABLE 1: RECORDED EMERGENCE OF RADIATA PINE 10 WEEKS AFTER SOWING

				<i>Fine Gravel</i> 3 mm	%	<i>Coarse Gravel</i> 6-7 mm	%
February sowing:							
Emerged	....	....	....	414	83	261	52
Not emerged	....	....	....	86	17	239	48
September/October sowing:							
Emerged	....	....	....	185	93	152	76
Not emerged	....	....	....	15	7	48	24

## DISCUSSION

The main reason for using gravel or sand as a seedbed covering is to avoid soil crusting which inhibits emergence of seedlings, and also to reduce soil splash from rain or irrigation. Using gravel as a covering also helps to maintain moisture at the seed level, while improving aeration, particularly in heavy soils. During early spring the gravel warms up readily and transmits some warmth to the underlying soil. This may improve germination. If coarse gravel is used as a shallow layer, it has little effect in controlling evaporation from the soil surface during periods of dry north-west winds. To get adequate covering the seed may be overlain by 12 to 24 mm of material, which may interfere with emergence. Using fine (3 mm) material allows a depth of cover of some 6 to 9 mm and moisture loss is then minimal. Results, especially for summer sowing, are much improved.

## REFERENCE

Chavasse, C. G. R.: Weston, G. C., 1969: Forest nursery and establishment practice in New Zealand. *N.Z. For. Serv., For. Res. Inst., Symp. No. 9.*