TESTS OF A TRANSPIRATION INHIBITOR

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The State of Victoria has some 41, 000 acres of exploitable, government owned and administered softwood plantations of which Pinus radiata D. Don is the major species.

There are about 12 small nurseries operating at the present time. In the past owing to the inability of a local nursery to supply local departmental and private requirements or because of losses or some other factor, it has been necessary to transfer relatively large quantities of nursery stock. The majority of stock raised for private sale and departmental use is 2 years old (1-year transplants), and seedling stock raised at one nursery may be shipped to another for another year of growth before being planted out in the field.

In the past considerable losses have been experienced in shipping stock. The species P. radiata does not stop growing through our relatively mild winter (May-August), and clear, sunny days with air temperatures of up to 68° F. are not rare. The rapid growth phase of P. radiata begins in early August. Normally both field and nursery planting begins in May or June and ceases by mid-September but may go on into early October. Thus, it is quite possible that stock may be shipped while in its rapid growth phase, or that stock may encounter periods in midwinter when weather conditions are conducive to rapid transpiration.

Last season two trials were conducted to examine the effects of a transpiration inhibitor S/V Ceremul 'C'. First-year seedlings were used in both trials. In the first trial, stock from Nursery 1 only was used. In the second trial, stock from both Nurseries 1 and 2 was used; the stock from both nurseries was raised from the same seed batch and was sown on the same date. The two nurseries are 3-1 /2 miles apart, and differ by 1,450 feet in elevation and also in soil type.

All stock was lifted by hand, graded, counted, tied into bundles of 50 and labeled with aluminum labels. The tops of the treated pines were dipped immediately after bundling into a 1 in 4 mixture of Ceremul 'C' and water, and then removed. The excess solution was allowed to drain while the remaining bundles were being prepared. The stock was then

baled in the conventional U. S. Forest Service type bale using wet sawdust as the packing medium. For use in the first trial, four bales were prepared with an equal number of treated and control bundles in each bale.

On 5 July two of the bales were shipped by normal goods rail transport to another nursery. This railed stock was not delivered until 13 July and because of a severe frost was heeled in and not transplanted until the 14th. Also on 5 July the remaining two bales were shipped by road transport to the same nursery. This journey took 5 hours, but the stock was allowed to remain in bales until arrival of the railed stock; then both were transplanted at the same time.

On 25 August the above trial was repeated with the following differences: (1) Only two bales, each containing treated and control bundles, were dispatched; (2) no road transport-was available so the variant from Nursery 2 was added. Stock from this nursery is notoriously difficult to ship, and it was believed that a transpiration inhibitor would be really tested if it could raise the survival figures of this stock.

The stock dispatched in this second trial was received on 3 September and held until the 4th as was the first trial.

On 14 April after a very dry, late summer, the survival of the different classes of stock was assessed. The layout of the two trials had been statistically designed and the results were statistically analyzed. A summary of the results and the significance of these are given below.

Trial 1:	Bale (number)	Survival Road (percent)	Survival Rail (percent)	Average, all shipments (percent)
Treated	1	90	88	89
	2	95	82	88
Control	1	95	96	90
	2	87	90	88
Average	-	92	88	89

Trial 2:	Survival Ex Nursery 1 (percent)	Survival Ex Nursery 2 (percent)	Average, all shipments (percent)
Treated	90	85	87
Control	87	69	78
Average	88	77	83

In Trial 1 statistical analysis indicates no significant difference in survival of treated or control pines. In Trial 2 survival of treated stock from Nursery 2 was significantly superior to that of untreated stock; however, there was no significant difference in the results of stock from Nursery 1 /

Thus, the use of the transpiration inhibitor was definitely associated with increased survival of the poorer quality stock from Nursery 2 and 40 some degree may have influenced the survival of stock from Nursery 1 .if the second shipment. The survival of stock shipped in midwinter was not influenced by the use of the transpiration inhibitor, and from an understanding of the normal development of the pine during this period, it is that transpiration inhibitors would be of little or no use. This theory may be confirmed or confounded by further trials especially those conducted during spells of warm winter weather.

When the trial was conducted during the early rapid growth phase, it appears at present that if the stock is of good quality and well baled, transpiration inhibitors may be of only moderate benefit. However, because of the low cost of the treatment, any consistent positive benefit may well be worthwhile.