

the Tospoviruses group, has been reported all over the country. We test for these virus diseases with the Immuno Strip test (Agdia) on site, ELISA test in a laboratory, and do gene diagnosis finally.

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## Raising Forest Seedlings in Vietnam: Current Status<sup>©</sup>

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### INTRODUCTION

In 1995, Oji Paper Co., Ltd., Nissho Iwai Corp., and Dai Nippon Printing Co., Ltd. established a forestry company, Quy Nhon Plantation Forest Company of Vietnam Ltd. (QPFL), in Binh Dinh province, Vietnam, for the production of raw material for pulp and paper.

Binh Dinh province is located in a temperate monsoonal area. The rainy season period is from October to December, and the dry season period is from January to September. The mean annual rainfall is 2400 mm and the mean annual temperature is 24°C.

Annual planting area target covers 1500 ha and harvesting period is 7 years. Therefore, the final planting area target totals 10,500 ha. As of 1999, planted area covered about 7200 ha. *Eucalyptus camaldulensis* and *Acacia auriculiformis* are the species planted and the ratio of these species is 4 : 6. The standing density is 1666 trees ha<sup>-1</sup> (spacing is 3 m × 2 m). The number of seedlings raised annual is nearly 3 millions.

### METHOD FOR RAISING SEEDLINGS

The nursery system is a temporary operation and moves each year because road conditions are terrible and planting areas are scattered widely. Therefore, new working nurseries are established every year near the planting sites. A typical nursery has a mean area of about 0.4 ha and 0.4 million seedlings are raised at each nursery (Fig. 1).

The seedling container is a clear vinyl bag with a 5 cm diameter after adding soil medium and the height is 12 cm (Fig. 2). The seedling density on the growing bed is 400 pots m<sup>-2</sup> and the length of seedling bed is 10 m. The potting soil is a mixture of fertile soil, organic fertilizer, and coconut dust.

The seeding bed has a height of about 10 cm and is covered with a vinyl sheet to prevent root growth into the bed and promote root development in the pot (Fig. 3).

Clonal propagation (Fig. 4) began in 1997 with “plus” trees selected from plantation sites for both species. At first plus trees were selected for growth and trunk form. Later, screening for the rooting percentage of cuttings was carried out. High-rooting ratio trees, those over 80%, were used to establish scion orchards in 1998 and 1999 of plantations of 100 ha and 70 ha, respectively (Figs. 5 and 6).



**Figure 1.** A typical temporary nursery operation for raising seedlings.



**Figure 2.** Eucalyptus seedlings just after transplanting into container.



**Figure 3.** Typical raised beds with a vinyl sheet to prevent root growth.



**Figure 4.** Clonal propagation of plus trees.



**Figure 5.** Scion orchard.



**Figure 6.** Clonal plantation site.