

B-74: Boron treatment and seasoning of rubberwood

H C Perera*, H S Amarasekara

(Forestry Unit, Univ. of Sri Jayewardenepura, Nugegoda)

*(*Present address: Agricultural Engineering Div., Open Univ., Nawala)*

Rubberwood has become popular for manufacturing of furniture and wooden items in Sri Lanka. One of the major drawbacks of using rubberwood is its extreme susceptibility to attack by insects and fungi. Therefore, it is essential to preserve this timber using chemicals. To increase the durability of rubberwood, boron diffusion method of treatment is widely used in Sri Lanka today. This involves treating green timber within 2-3 days after felling. There are practical difficulties in treating the timber within 2-3 days after felling and also this method is known to give less penetration.

This study was conducted to find the most effective way to preserve rubberwood using boron (borax and boric acid mixture) by comparing preservative retention in different preservation methods for air dried and green timber, air seasoning time for rubber wood was also investigated.

Freshly felled rubber (*Hevea brasiliensis*) logs from 3 trees were obtained. Samples of the size 50 mm (tangential) x 25 mm (radial) x 450 mm (longitudinal) were sawn from each log. In each log, 8 samples from the outer wood (close to bark) and 8 from the core wood were sawn. From these 16 samples, 4 from core wood and 4 from outer wood in each log were used for air drying and the rest were kept inside the refrigerator to maintain the green condition. Two ends of all these timber pieces were sealed by using a water repellent paint (under sealer).

For air seasoning, timber samples were stacked in atmospheric condition. Weight losses were recorded daily until it became constant.

Samples were treated using four methods: diffusion in cold solution, diffusion in hot solution (60°C), hot and cold open tank method and pressure impregnation method. Preservative solution was prepared by using boric acid and borax 1:1.54 proportion. According to that ratio Boric acid 1.5 kg and Borax 2.4 kg were used for the preparation of 25% BAE solution. Effectiveness of each treatment was evaluated by measuring the retention of preservative chemicals in a unit volume of wood (g cm^{-3}), and by measuring the penetration (using titrations and using a spot test).

The highest retention of preservative solution was observed in air dried samples treated by pressure impregnation. But the highest penetration was observed in hot and cold open tank treatment. Two diffusion methods were less successful compared with pressure treatment and hot and cold open tank treatment. However, higher penetration was observed in 2 diffusion methods, when samples were in green condition. Differences in penetration levels between diffusion in hot solution and in cold solution was negligible.

In the air seasoning experiment, it was observed that the initial air drying rate during first 10 days was very fast and it reached the equilibrium moisture content during the first month (after 26 days). During the seasoning period no drying defects were observed. Green timber samples reached the fibre saturation point (25% moisture content) within 16 days.

Hot and cold open tank treatment and pressure treatment were found more effective for preservation of rubber using boron solution, when the timber was in dry condition. However, for freshly felled rubberwood (green timber), higher penetration was observed in diffusion methods : diffusion in hot solution and cold solution. When considering core wood and outer wood, more preservatives were absorbed by the outer wood than the core wood. With air seasoning, rubberwood reached equilibrium moisture content after 26 days and drying defects were not observed.