

Tapping the tree of life

To Pacific Islanders, the coconut palm is 'the tree of life'. Its fronds furnish village roofs and walls, its wood supplies a furniture market and its fruit provides coconut milk, copra meal and coconut oil. Only one part of the tree – the coconut husks – is wasted. But a recent forestry experiment has found a valuable use for coconut husks, that boosts both villager employment and the growth of young plantation trees destined for the cabinet timber market.

The story begins on Kolombangara Island in the Solomon Islands. Here, CSIRO scientists Dr Paul Reddell and Dr Mike Webb, in collaboration with Kolombangara Forest Products Ltd (KFPL), were looking at alternative potting media for raising valuable plantation species such as teak (*Tectona grandis*), mahogany (*Swietenia macrophylla*), white teak (*Gmelina arborea*), brown salwood (*Acacia mangium*) and kamarere (*Eucalyptus deglupta*).

One standard nursery practice was to grow seedlings in potted soil collected from the forest. However, due in part to the chemically infertile nature of the forest soil, most seedlings grew poorly in the nursery and had disappointing establishment and survival in the field.

'So we began looking at ways to change nursery practice to improve seedling growth and survival,' Reddell says.

'And we came up with a solution that produced better quality planting stock, saved KFPL money and created a new source of income for the village women.'

The scientists found that by using composted coconut husks, or 'coir', as a potting medium, in combination with long-term slow release fertiliser, a direct and continuous nutrient supply around seedling roots could be achieved.

When the seedlings were transplanted, the fertiliser remained entangled in the coir, close to the roots, and continued to nourish the plants during the critical 14-month establishment phase.

The resulting increase in growth meant that canopy closure was faster, increasing



Above: These saplings demonstrate the effect of slow-release fertilisers in enhancing the growth of West Indian cedar in coir, six weeks after sowing in the nursery.

Right: Striking cuttings of white teak into coir. Coir production has provided women on Kolombangara Island with a new source of income.



the ability of the trees to compete with re-growth vegetation and weeds. This helped reduce costs through fewer labour-intensive maintenance operations, such as weeding with bush knives.

Coir production also provided local women with a new source of income.

'To produce coir, coconut husks are piled up in the fields and left to compost,' Reddell says. 'The local women grate these composted husks through a metal screen to produce a more even textured peat-like material. KFPL then buys the coir from them as a potting medium.'

Many of the women are also paid to plant the trees, which they carry to the planting site in baskets on their shoulders. Because coir is much lighter than soil, the women can carry and plant more trees in a day. And the more trees they plant, the more money they earn.

The principle of using cheap locally produced organic waste as nursery media, in combination with slow release fertiliser, is now being applied in Fiji and Samoa. With assistance from Webb and Reddell, local nurseries have experimented with a range of waste materials, including coir, sawdust, brewers waste and seed pods, and different amounts of slow release fertilisers.

'The best combination of media and fertiliser will need to be tested in each

situation as the watering regime, pot types and sizes, media properties and climate, will differ from place to place,' Webb says.

The technology has also been repatriated to Australia. In the humid tropics of northern Queensland, field trials have been established at a number of sites to demonstrate the benefits of improved nutrient delivery to establishing cabinet timber seedlings. As with the Solomon Island experiments, judicious use of long-term slow release fertiliser was found to be beneficial for at least 18 months after planting.

As the inclusion of trees on farms – whether for timber production or improvement of farm productivity – is a rapidly developing industry in Australia, this study could have major economic significance in the future.

'And appropriately adapted, this technology could be widely applicable to other industries and other regions,' Reddell says. This work was funded by the ACIAR Forestry Program.

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