

## Summary

NIRS shows tremendous potential to be used as a rapid tool to assess Sandalwood oil (*a*-santalol) content in chipped sandalwood samples. The technique of utilising NIRS technology for sandalwood quality and quantity determination needs to be further developed to be utilised as a tool for commercial applications. The technology offers the potential of being a rapid, non-invasive tool for assessing not only oil sample purity and quality of liquid oil samples, but also core wood samples in a processing plant situation, seedlings and trees in a field environment. This has enormous possibilities for field selection of plants for processing and may be linked to selective breeding programs. This would enable genetic improvement programs to not only focus on quantity but also on the quality of the raw material, thus targeting the raw material to specific processes and products.

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## About the Rapid Assessment Unit

The Rapid Assessment Unit (RAU) is a collaborative initiative between the Queensland Department of Primary Industries (QDPI&F) and James Cook University (JCU), and is located within the JCU Centre for Tropical Agri-Tech Research on their Cairns campus. The RAU has an ongoing program of research encompassing non-invasive rapid assessment technologies such as near infrared spectroscopy (NIRS) to rapidly and non-destructively evaluate food and agricultural biological products.

## Short Communication.

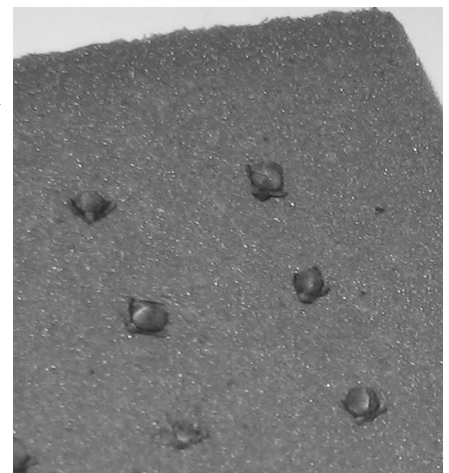
### An effective technique for performing *in-vitro* pollination experiments with flowers of *Santalum spicatum* and *Santalum album*.

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Experimental investigations of plant breeding systems frequently employ *in-situ* bagging of inflorescences to exclude natural pollinators so that hand pollinations can be carried out (Kearns and Inouye 1993). In a similar fashion, pollination experiments were performed for the Western Australian sandalwood *S. spicatum*, the Indian *S. album* and the Quandong, *S. acuminatum* (Sedgley 1982; Sindhuveerendra and Sujatha 1989; Rugkhla et al. 1997; Ma et al. 2006). The flowers and fruits of *S. spicatum* and *S. album* are, however often loosely held on the branches of the tree and abscise easily on contact (Fox and Reeve 1992). The aim of the present project was therefore to establish an effective technique for performing *in-vitro* pollination experiments for these two species.

OASIS® Floral foam has been successfully used to maintain viability of flowers and shoots (Jefferies et al. 1982; van Tuyl et al. 1991; Salom and Broeckling 2003; Wise et al. 2006). OASIS® Floral foam is an open-celled phenolic foam that resembles the biological make-up of plant stem cell structure. The foam draws water through capillary action and retains it in the cells. OASIS® Floral foam was soaked in a diluted solution of the fungicide Previcur (Bayer, active ingredient: 600 g/l propamocarb) (1.5 ml previcur/ 1l water) and then immersed in a container filled with tap water. Flowers were cut before anthesis and placed immediately with the pedicel first, into the foam. The flowers of *Santalum spicatum* and *S. album* remained viable and healthy for up to two weeks (the approximate lifetime of the flowers *in-situ*) (see also Barrett 1987; Ma et al. 2006) using OASIS® Floral foam. The porous nature of the foam drained nectar from the sandalwood flowers. Pollen viability and stigma receptivity were evaluated and hand pollinations were successfully performed using flowers stored in Oasis foam. Sandalwood flowers (of both species) stored in the foam experienced a change in colour (from green to pink to dark red), and related to it, in stigma receptivity in a similar fashion as those maturing on the tree (for *S. spicatum*: Muir 2004; for *S. album*: Bhaskar 1992). Further research is required to refine this *in-vitro* technique to enable



**Figure 1.** Excised flower buds from *S. album* positioned in OASIS® Floral foam (image is black & white).

detailed observations on pollen viability and morphological and physiological changes in individual flowers with maturity and under different environmental conditions.

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