

- **MC03008 - Adoption of quality management systems in macadamia**

The Australian macadamia industry has conducted considerable research on the effects of on-farm practices on macadamia nut in shell (NIS) and kernel quality. These include studies of nut drying, storage, handling and harvesting and agronomic practices. The adoption of these findings provides quality benefits for processors, marketers and consumers, but not necessarily for growers. The adoption of the practices may involve significant additional investment in on-farm infrastructure and major changes in production practices. Some major findings from this work are: 1) Harvest frequency has a strong relationship to the quality of NIS. Frequent harvesting (less than or equal to every 4 weeks on average) gave a mean sound kernel recovery (SKR) of 34.2%, while harvesting intervals longer than every 4 weeks, gave a mean sound kernel recovery of 31.6%. This difference of 2.6 % SKR, using current payment scales that award 10c per kg for each 1% increment increase in SKR, results in a difference of \$260 per tonne delivered to the factory. On a 40 tonne NIS farm, this equates to \$10,400 in additional revenue. The actual payment received could be higher or lower, depending on the reject/bonus category it puts the NIS consignment within. 2) There is also the added advantage from harvesting more frequently of reducing shed losses. Frequent harvesting resulted in shed reject levels of 4.6% of harvested yield while long harvest intervals resulted in shed reject levels of 8.3%. For a 40 tonne NIS farm, this is an extra 1.5 tonne of NIS delivered to the factory. 3) Smaller silos (less than or equal to 20 tonnes) were found to reduce unsound kernel recovery (UKR) on average by 0.34%, compared with larger, taller silos (greater than 20 tonnes). The main effect is on reducing internal discolouration of kernel and this has been identified as a serious problem by the industry. This reduction using current payment scales that awards 10c per kg for each 1% increment increase in SKR, results in a difference of \$34 per tonne delivered to the factory. There are also advantages of smaller silos reducing the consignment moisture content of NIS delivered leading to reduced external discolouration of the kernel. A strong focus upon an extension program to deliver the findings from this and other work relating to quality management would benefit the Australian macadamia industry. This program would need to focus upon the economic costs and returns from adopting these practices. Part of this program would need to promote the use of the re-sort decision support tool developed for growers during this project. The re-sort decisions tool improves the economic basis of re-sort decisions and also has the potential to improve the quality of NIS through reducing on-farm storage times. Consideration should be given to research and development of the factors causing many of the quality issues and quantifying their significance so management strategies can be developed that target these issues. Any future research work carried out into quality management needs to quantify the costs and benefits of changing management practices or investing in capital improvements that address the causes.

This project was funded by the Macadamia Industry levy with matched funding from the Australian Government facilitated through HAL.