Impacts on Whole Kernel and Kernel Quality

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Kernel damage and loss of kernel quality are major forms of loss for the macadamia industry. Many factors contribute to macadamia kernel damage, including handling methods during harvesting, storing and processing, the physical characteristics of the Nut-in-Shell and kernel, and machinery such as dehuskers and crackers. We aimed to find best-practice industry procedures that both growers and processors may use to maximise percent wholes and kernel quality. We tested different varieties, crackers and dehuskers, and examined effects of dropping on percent wholes and kernel quality.

Variety had a strong influence on whole kernel, irrespective of cracker, dehusker and dropping. We examined rates of breakage in 5 cultivars and found a significant difference between cultivars in the susceptibility to kernel breakage (P < 0.05). This genetic effect was confirmed by x-rays of whole kernels-in-shell in which some kernels were shown to be broken even before cracking. In two of three experiments, mechanical dehuskers did not reduce whole kernel compared with hand dehusking. In a third experiment we found a 5 % reduction in whole kernel for 246. There were no consistent differences in whole kernel due to the 4 mechanical crackers, although hand cracking consistently produced the highest whole kernel.

There were some effects of handling on whole kernel, for example 246 lost 10% of wholes when dropped onto a steel surface at 3 % moisture, and dropping NIS at more than 10 % moisture reduced wholes by 5 %. Handling impacted on the amount of chips, pieces and other damage. We found that dropping at 15 % moisture increased chips by 1.5 % in 246. Damage to shoulders of nuts also increased with increasing drop height and number of drops.