

Breeding of the new Australian cultivars

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Recently, elite new cultivars specifically selected for Australian conditions have been released. These were developed from an improvement program initiated in 1993 by CSIRO. Progeny seeds were produced by reciprocal crossing industry standard cultivars (A4, A16, HAES 246, HAES 344, HAES 660) with the cultivars that had the greatest kernel production per unit projected canopy area (Daddow, HAES 781, HAES 814, HAES 816, HAES 842, HAES 849, Own Venture). Seedlings grown from these progeny were planted in trials in NSW in 1997, and Bundaberg in 1997 and 1998 with replicated grafted plants of parents on H2 seedling rootstocks throughout at two densities (2m and 4m along row). Trials were assessed for commencement of flowering, growth, yield, kernel recovery, and components of kernel quality over 8 years, and best lineal unbiased predictions of clonal values of progeny were made using a pedigree based additive and dominance individual mixed model. A bio-economic model was developed to estimate economic weights for a selection index of clonal values to identify elite progeny. Final approval of the 20 candidates for 2nd stage assessment were made by Australian Macadamia Industry Varietal Improvement Committee using rankings guided by the selection index, and field observations of tree structure and kernel quality.