

Four new Macadamia Varieties for the Australian Industry

B. Topp¹, D. Russell², J. De Faveri³, C. Hardner², D. Bell⁴, S. Mulo² and G. Bignell²

¹Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of Queensland;

²Department of Agriculture and Fisheries (DAF), Maroochy Research Facility; ³Department of Agriculture and Fisheries (DAF), Mareeba Research Facility; ⁴Hidden Valley Plantations, Alf's Pinch Rd, Beerwah, Queensland, Australia

bruce.topp@daf.qld.gov.au

Four Macadamia varieties have been released by Queensland Department of Agriculture and Fisheries (QDAF) after eight years of Regional Variety Trial (RVT) evaluation at eight Queensland (QLD) and New South Wales (NSW) sites. The field trials were planted in 2008 and consisted of 20 superior clones derived from populations bred by the Commonwealth Scientific and Industrial Research Organisation, five standard industry varieties, 'HAES 741', 'HAES 344', 'HAES 816' and 'A16', and five Hidden Valley Plantation selections. The trials were planted over a range of 1400 Kms from the northern most site at Mackay (21.288299 S, 149.061305 E) in central Qld to the southernmost site at Macksville (30.847997 S, 152.871968 E) on the mid-north coast of NSW. Multi Environment Trial analysis using Best Linear Unbiased Predictions for nut in shell (NIS) yield, kernel yield, kernel recovery (KR) and tree volume, and economic traits modelling to year 20, aided in selecting new varieties for industry release.

Variety G is precocious and ranked one for cumulative kernel yield (CKY) at Booyan RVT from 2011 – 2016 with 12.1kg compared with 'HAES 816' with 10.4kg and 'HAES 741', 10.2kg. Variety G out-yielded standard industry varieties in three out of eight RVT sites for NIS and KY in 2016. It ranked seven for CKY (2013 – 2016) and four for NIS (2016) in Alstonville making G suitable for both QLD and NSW growing regions. Variety P is precocious with similar CKY to 'HAES 741' to year eight, however P is 36% smaller in tree volume at the Booyan site. P is best suited to the Bundaberg region as canopy density is considered too dense by local growers in northern NSW. Variety J has a high KR of 44%, ranks better for NIS than industry varieties in the Bundaberg region and second only in CKY to variety G at the Booyan site with 11.4kg. At Alstonville in NSW variety J ranked 19 in CKY proving it is best suited to the Bundaberg region. Variety R ranked four for CKY at Alstonville compared with 'HAES 344' that ranked 19.

Discounted Cash Flow (DCF) estimates have been calculated for a 30 ha farm using economic modelling of NIS over 20 years. The average DCF of the four new industry varieties compared with the average of the five standard varieties shows an increased profitability of 11%.