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Improving farm productivity and competitiveness in the Australian macadamia industry supported by the Queensland Department of Agriculture, Fisheries and Forestry, New South Wales Department of Primary Industries, University of Southern Queensland, Australian Macadamia Society, and Horticulture Innovation Australia.

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STABLE PRODUCTION COSTS MEAN YIELD IS THE KEY TO PROFITABILITY

Team members from the *Benchmarking the macadamia industry project* (MC15005) have analysed costs of production from macadamia farms over the last three financial years (2012-13 to 2014-15) and compared the results with figures collected a decade ago (2003 to 2006) as part of the *On-farm economic analysis in the Australian macadamia industry project* (MC03023). We found that average annual production costs increased by just \$330 per planted hectare over that ten-year period.

The analysis also found that revenue from yields of saleable kernel per hectare varied much more than production costs between participating farms. Increased productivity (i.e. yield per hectare) meant that the top performing farms achieved much higher profitability each year than the average for all mature farms in the benchmark study.

Other key points from an analysis of production costs included:

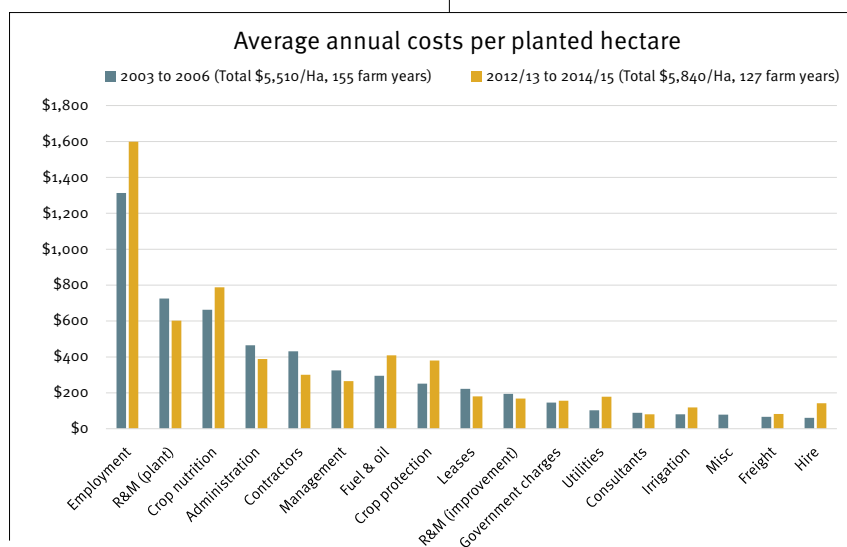
- employment was the most significant expense in macadamia orchards, representing more than a quarter of total production costs
- both total costs and the breakdown of those costs among heads of expenditure varied significantly between farms
- on average, participating farms with higher costs also achieved higher yields.

The term 'farm year' is often used in the benchmarking study to describe a record for an individual farm for a given year. There were 155 farm years of financial data analysed from 2003 to 2006 and 127

analysed from 2012-13 to 2014-15. Only bearing farms were included in both studies. The heads of expenditure used in both studies are based on a standard chart of accounts that was developed as part of the original economic analysis project. This enables direct comparison of costs from both analysis periods. All average cost calculations in both studies were unweighted, which means all farms exerted equal influence on the average regardless of farm size or productivity.

Figure 1 shows the heads of expenditure as average costs per hectare for both the 2003-06 and 2012-15 analyses. The average annual cost of production increased from \$5510 per planted hectare in 2003-06 to \$5840 in 2012-15. Costs of production varied widely between farms in both studies. These variations were related to individual farm characteristics, farm management and the stage of orchard development.

Figure 1. Production costs by head of expenditure for 2003-06 vs 2013-15.



There were some significant differences in averages for specific heads of expenditure between the two studies. Employment represented the largest proportion of total costs per hectare in both analyses. Average employment costs increased from \$1313 to \$1599 per hectare (up \$286/ha). This includes all costs associated with employment including permanent and casual wages, superannuation, training and expenses incurred as part of occupational health and safety and worker's compensation.

Other average costs that increased significantly included crop nutrition (up by \$125/ha), fuel and oil (up by \$114/ha) and crop protection (up by \$128/ha).

Figure 2 shows the relative proportions of expenses by head of expenditure for the 2012/13-2014/15 study.

Some average costs were actually lower than those recorded a decade ago. These included repairs and maintenance, management, contractors, leases and consultants. From the available data it's not possible to identify whether these reductions are the result of efficiency gains, changes to farm management or other potential factors. Variation in the farms submitting data between the two studies and also high variability of cost data between farms limit the potential for interpretation of these cost trends at this stage.

The relationship between expenditure and productivity

The latest cost data collected for the 2013 to 2015 seasons was analysed in conjunction with production data to identify any correlation between expenditure and orchard productivity. This analysis showed that productivity is significantly positively correlated with total expenditure per bearing

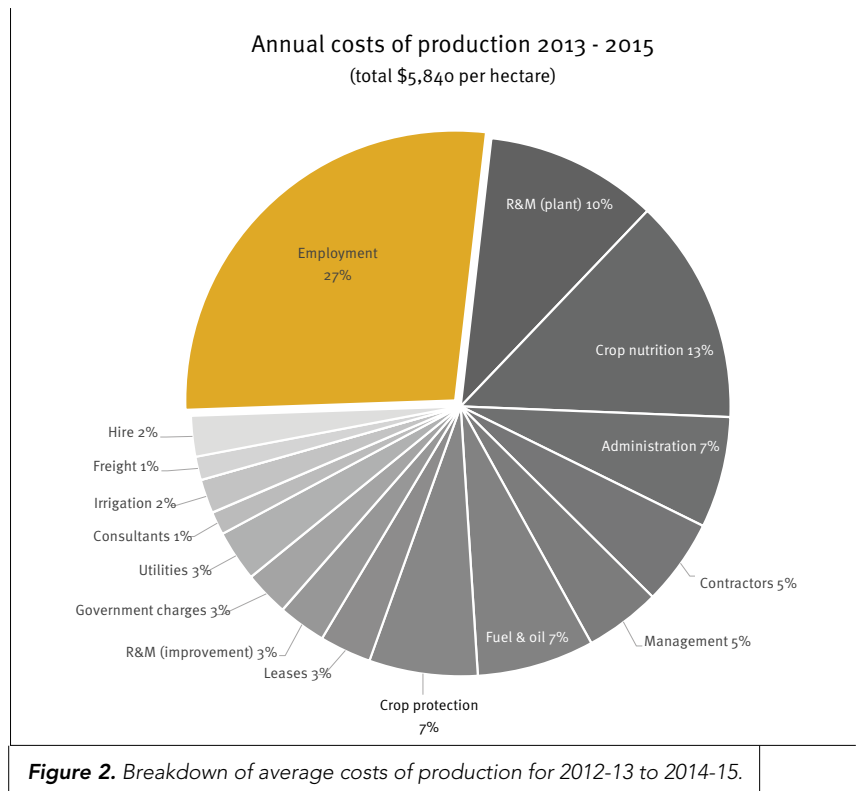


Figure 2. Breakdown of average costs of production for 2012-13 to 2014-15.

hectare. This means that on average, participating farms with **higher expenditure** also achieved **higher yields** of both nut-in-shell and saleable kernel per bearing hectare.

Further analysis of individual heads of expenditure showed a strong positive correlation between orchard productivity and expenditure on both **crop nutrition and crop protection**. As with total production costs, this means that on average, the participating farms that spent more per hectare on crop nutrition and crop protection also achieved higher yields per hectare.

Collection and analysis of cost data will continue for the next two seasons as part of the latest benchmarking project. Additional data should help clarify expenditure trends and their relationship with orchard productivity.

What is the value of higher productivity?

The latest industry benchmark report includes an analysis of farms that have consistently achieved high productivity over many seasons. Participating farms were ranked by their average saleable kernel production performance over a minimum of four seasons including 2015. The annual saleable kernel production and kernel recovery of the top 25% of this group (52 farms) was compared with the average of all mature farms in the benchmark sample (see Figure 3).

Over the last seven seasons the top 25% of farms produced an average of 380 kg more saleable kernel per hectare each year than the average of all mature farms participating in benchmarking. These same farms also averaged 35.1% saleable kernel recovery over the seven years compared with 33.1% for all mature farms in the benchmark study.

Yield and quality trends 2009 - 2015

Top performing farms vs all mature farms
 Saleable kernel production (bars) and kernel recovery (lines)

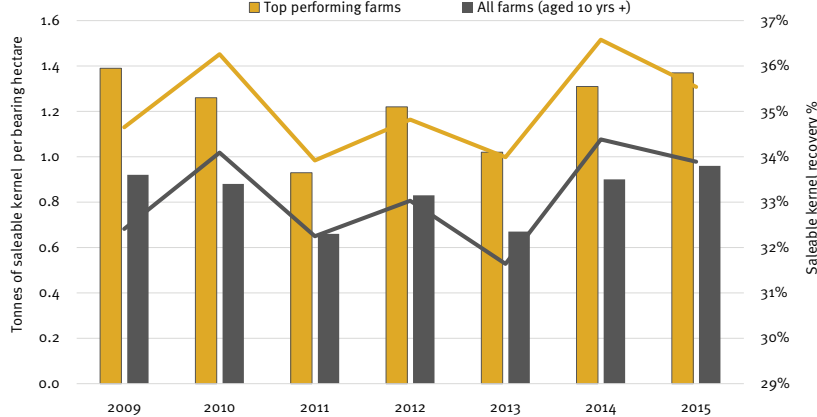


Figure 3. Yield and quality trends for top performing farms vs the whole benchmark sample (2009 – 2015).

For a copy of the latest industry benchmark report or for information about participating in the benchmarking project, contact one of the following team members or email macman@daf.qld.gov.au.

- Queensland: Grant Bignell, DAF Queensland on (07) 5381 1334
- New South Wales: Jeremy Bright, NSW DPI on (02) 6626 1346 or 0427 213 059
- Costs only: Geoff Slaughter, USQ on (07) 4631 1863 or 0437 548 897

Standard seasonal NIS price tables were used to estimate the approximate value of annual differences in yield and kernel recovery. At typical 2015 prices the difference in revenue amounted to more than \$6,000/ha, which is enough to cover operating costs on most farms. Based on an average farm size of 37 ha for the benchmark sample this equates to **additional revenue** of more than \$227,000 for the 2015 season alone.

Despite significant fluctuations in NIS prices between 2009 and 2015,

the net difference in revenue over these seven seasons based on standard price tables and average yield differences for each year amounted to more than \$1,050,000 for a 37 ha farm. That's an average of \$150,000 per season.

Information about benchmarking
 Participation in benchmarking is free. It provides growers with an opportunity to confidentially compare their yield, quality and optionally costs with averages of similar farms.

The macadamia benchmarking project (MC15005) is a joint initiative of the Queensland Department of Agriculture and Fisheries, the University of Southern Queensland, NSW Department of Primary Industries and the Australian Macadamia Society. The project has been funded by Horticulture Innovation Australia Limited using the macadamia levy and funds from the Australian Government. The Queensland Government has also co-funded the project through the Department of Agriculture and Fisheries.

THE TIME IS RIGHT

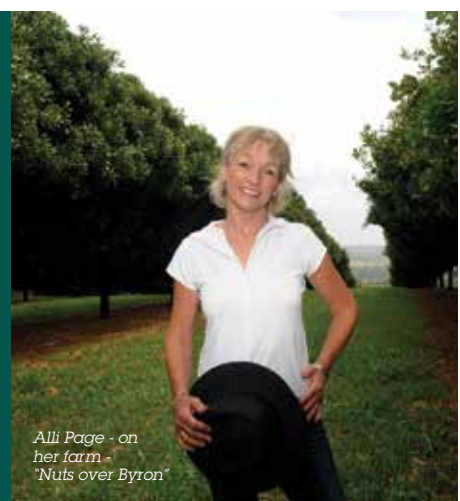
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