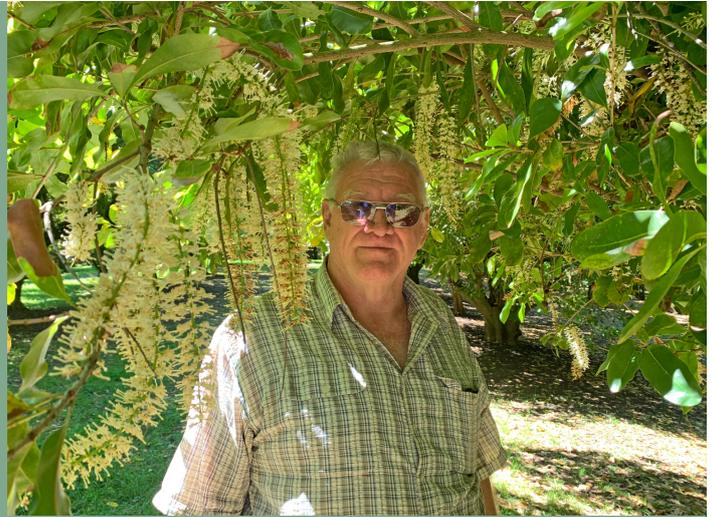


Rejuvenation breathes new life into an old orchard

Key facts

Farm	Ferndale
Owner operator	Steven and Cathy Ferndale
Location	Dorrroughby, New South Wales
Size	3280 trees 10.5 hectares
Average age	34 years
Spacing	10 × 10 m, 10 × 5 m, 10 × 2.5 m
Varieties	660, 246, 508, 741, H2, 816, 842 and 849



Yield and quality

	NIS/ha	SK/ha	SKR (%)	RKR (%)
Avg. 2009–2014 before current IOM program	3.0	0.9	32	4.5
Avg. 2015–2020 current IOM program	4.5	1.4	34	3.2

Steve and Cathy Ferndale own a macadamia farm bordering the idyllic Whian Whian state conservation area in Dorrroughby, NSW. The farm is at one of the highest altitudes in the district, meaning it is isolated from other farms and potential pest threats. However, the altitude also comes with challenges, including very steep slopes, which result in soil, nutrient and nut loss. Despite these challenges, Steve and Cathy's orchard has consistently featured in the top 25% of the benchmark sample. Steve believes most answers to issues affecting orchards are simple, and taking action is what produces results. He states that while growers will have different solutions to address their unique situation the principles of good integrated orchard management (IOM) remain the same.

Approach

Canopy management

Steve observed his older trees growing closer together over time. In 2015, he decided to open up his trees and interrows to improve productivity, achieve better spray coverage and re-establish ground cover.

Steve removed limbs growing into the interrows, allowing light back into the canopy and orchard floor, which has encouraged productivity lower in the canopy, growth of ground cover and reduced erosion on the steep slopes.

Steve's approach was to remove major limbs from the trees. By removing a section of the limb halfway between the dripline and the trunk, a window is created in the canopy. By doing so on a three-year cycle on a third of his orchard each year, there has been no reduction in yield.

'Don't leave it too long or you will lose the centre of the tree. If you lose the centre, it will mean a longer turnaround to get back into production. It's usually a three-year turnaround between visiting the same tree and my production hasn't gone backwards since commencing the program.' said Steve.

Although Steve was initially apprehensive, he is now convinced that this approach works consistently, especially if timed correctly.

'My aim is not pruning – I do not use the word pruning – it is tree rejuvenation. The whole thing is about the tree getting more growth down low, letting the light in, getting growth down the bottom of the tree, and get more nuts down low,' said Steve.

Prior to 2015, Steve had always undertaken canopy management himself using pole saws, however the game changer for Steve was when he invested in experienced contractors to do the work.

His new three-year program using a contractor has resulted in greater efficiency, getting around the orchard on time by the use of bigger machinery.

Steve has been so pleased with the efficiency gains of using experienced contractors that he now uses them for other orchard management practices, such as drainage works and pest and disease spraying.

Drainage

The slope of the orchard makes drainage difficult to manage. *'Most drainage work has not been in the orchard. We've focussed on drainage around the orchard, either preventing it from entering or moving it out,'* said Steve.

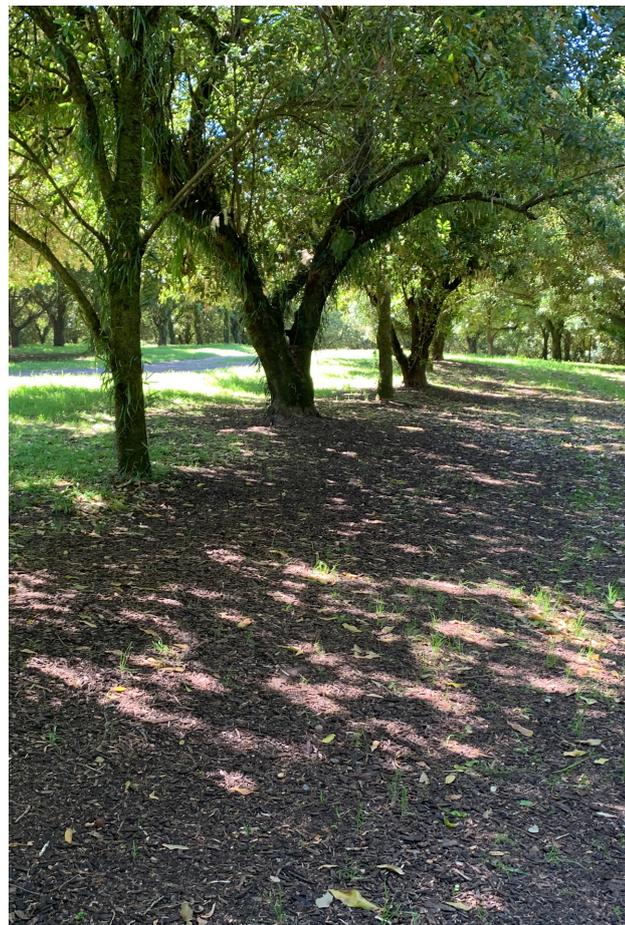
This approach was designed to reduce run-on and the speed of water that enters the orchard. Steve visited other farms looking for solutions, which helped immensely. Putting the ideas into practice has improved drainage and reduced erosion in his orchard.

Orchard floor

Steve sought advice to rectify what he calls the *'horrendous'* orchard floor on his farm. *'The orchard had a lot of root exposure, which not only affected tree health, it also damaged machinery,'* Steve said.

Steve tried using a profiler to cover the exposed roots but found *'the problem with profiling is that you have to have soil to profile. In my circumstance, profiling actually increased the erosion and loss of soil.'*

After attending a field day that focused on improving tree health, Steve began to introduce large quantities of compost to the orchard floor to rectify his issues. *'I've watched some of it wash away, but my production has gone up,'* said Steve. He now applies compost and woodchip under the canopy on the lower side of the tree, putting the woodchip over the compost to prevent it from washing away when it rains.



Nutrition

Steve has soil tests conducted annually and has been on a journey of improving soil health over the last seven years. *'I originally started using chicken manure which disappeared really quickly, but now I've moved to cow manure plus wood chip and nut husk,'* said Steve. *'My organic matter levels are now around 13-16%,'* Steve said.

Although Steve originally used compost primarily to cover exposed roots, he has also seen a big improvement in tree health. *'We started applying 250 L/ tree, we tried other volumes (200 and 150 L), but they were not as good, at 250 L/tree, everything starts to happen'* said Steve. *'The coarse woodchip is also no problem for the finger wheels at harvest, which is a huge bonus'.* Steve explained.

Steve also uses synthetic fertilisers to address any deficiencies.

The future

Steve will continue to build resilience into his orchard by continuing his canopy and orchard floor program and drainage works.

While there has been increased expenditure on the orchard, particularly over the last two years, the investment is seen as essential for maintaining high long-term yield. *'Good farmers reinvest back into the farm. The big drivers are yield and price, costs are less important in the scheme of things. An annual spend of \$20,000 on compost and woodchip seems like a lot until you work it out. If you go up by around four tonnes across the whole farm, you've covered your spend,'* said Steve.

Steve and Cathy are venturing into a new partnership with another couple. *'There's already new energy going into the farm from our new partner's enthusiasm,'* said Steve. This partnership will provide Steve and Cathy with the ability to keep enjoying macadamia farming into the future.

Challenges

Steve's biggest challenges have been from washout and soil loss, which he will constantly be working on. *'We've been trying to get the grass to spread between the rows, which has been hard. Where the light is, grass will grow, however in some areas where there is no soil, the grass will not establish',* said Steve. *'When we get around and spray we tend to scar the ground a bit, particularly when using machinery when it is wet, there's no real way around this though,'* explained Steve.

Steve said the contours of his orchard have made drainage challenging. While drainage work has improved water flow throughout his orchard, Steve said there's still more work to do.

Benchmarking results

Before starting the current IOM program, the Ferndale's farm averaged 3 t/ha (seasons 2009–2014). Over the last six seasons, productivity has increased to an average of 4.5 t/ha (Figure 1). Steve attributes this increased production to two key IOM practices; the improved canopy management and applying compost.

Steve has participated in the industry benchmarking project since 2009. *'I'm a big supporter of the benchmarking project as it allows me to compare my farm with other like-minded farmers who have similar issues,'* said Steve.

'Our report is very helpful, it helps make sure you're on the right track,' said Steve. Steve also regularly attends Benchmark Group meetings, which allows him to compare and discuss his seasonal results and trends with other growers. *'Benchmark Groups are an excellent way of identifying subtle differences in how we do things between similar farms,'* said Steve.

Steve thinks the solutions to many aspects of growing macadamias are slow coming and believes patience is the key when undertaking rejuvenation work. *'Sometimes it might take three years to see if you've made the right decision. Benchmarking is a good learning tool that can track the results of changes you've made in the orchard,'* said Steve.

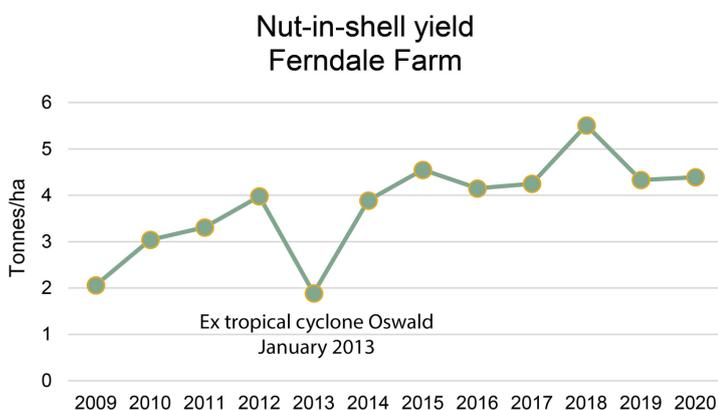


Figure 1 Nut-in-shell yield trend 2009–2020 seasons

This case study has been developed as part of the 'Benchmarking the macadamia industry 2019–2021' project (MC18002), which is funded by Hort Innovation, using the macadamia research and development levy and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture. The Queensland Government has also co-funded the project through the Department of Agriculture and Fisheries.

