

Impact case study — AP14023 Improved tree and fruit nutrition for the Australian apple industry

Grower	David Finger
Location	Yarra Valley, Victoria
Planted area	25 hectares – JAZZ™, envy™, Smitten® and Ambrosia™

What was the research about

Between 2015 and 2021, AP14023 *Improved tree and fruit nutrition for the Australian apple industry* (delivered by the Tasmanian Institute of Agriculture, and Plant and Food Research New Zealand) worked to develop new knowledge to support apple growers in optimising nutrient management practices. The project was delivered as part of the broader Productivity, Irrigation, Pests, Soils phase 2 (PIPS2) program. The project delivered a series of field trials focused on understanding tree nutrient uptake and produced soil characterisation profiles for apple growing regions. The findings from this research were incorporated into the development of a decision support tool that provides strategic guidance for advisors and growers on the optimization of irrigation and nitrogen application for the major apple growing regions of Australia.

David Finger, a 6th generation apple grower from the Yarra Valley, Victoria, talked about the importance of this research informing a more strategic and evidence-based approach to fertiliser application timing across his orchard and the associated cost efficiencies that are expected as a result.

What is your background and management approach towards soil health and tree nutrition in apple production?

“Our approach has always been evolving but is ultimately grounded in the learnings gained through my time at Ag College which taught me the importance of soil and its role in determining both overall yield, but more importantly packout quality through its ability to facilitate tree nutrition.

I believe the most important aspect of good nutrition management is ensuring that the tree can satisfy the majority of its nutrition requirements through the soil via its root system, supported by ongoing top-ups through the season as needed via foliar application and/or fertigation guided by leaf and/or sap tests. We now use a provider who has developed custom fertiliser blends for us, based off our soil testing results. This soil testing program rotates the tests across our various blocks each year, and has allowed us to correct some imbalances and help get the best out of our trees.”

How did you hear about the AP14023 project, and how did you engage with the research?

“One of the project team’s researchers presented their findings at one of the recent Tasmanian Fruit Growers Association conferences when the significance of the research findings and consequences for nitrogen management practices hit me between the eyes. I’ve since followed the project updates through the industry communications program and have been in touch with the research team directly.”

What was the significance of the research for you as a grower?

“The big takeaway was that the field trials showed how nitrogen applied to the tree was much more efficiently utilised when applied pre-harvest, as compared to the recommended industry practice which was squarely focused on applying nitrogen post-harvest. In addition, the research also demonstrated the influence that water availability can have on the overall uptake which was never really considered before.

The fact that we now have evidence showing how a tree responds to nutrition, particularly nitrogen, throughout the growing season is of major significance for future practice across our industry given we can time when and how much fertiliser we apply to maximise the benefit for the tree. The tree will ultimately do what the soil allows it to do, so if you force feed with things that it doesn’t want then you won’t get the best result.”

What types of results and impacts have you experienced from acting on the findings of this research?

“It’s now been two seasons since we haven’t applied any nitrogen fertiliser across our orchard post-harvest, which is a completely different approach to how we’d previously approached our nutrition management. We now focus on applying nitrogen at the start of the growing season prior to blossom which will typically occur between late August and late September.

The goal behind these adjustments has not been just about improving overall yield. In terms of quality and packout rates we’ll need a few more seasons to understand the impacts. In the meantime we’ve been able to save money on our fertiliser bill, and it’s good knowing that the fertiliser that we do apply is being utilised more effectively by the trees.”

Have there been any challenges along the way?

“It is still early days for us, and I think I’d be better placed to answer this in a few years from now, when we’ll have been able to observe the results over more than just two growing seasons. In any case we have a good understanding of our soil profiles as we’ve spent the time to collect data over the years. Without this data it would have been very difficult to make informed decisions about a suitable approach.”

What do you see as the future opportunities for nutrition management for apple growers?

“I think there is opportunity for providing apple growers and advisors with a consolidated perspective of nitrogen uptake considering the impacts of timing and application rates during the pre-harvest period. We need more detailed guidance on the impacts that these decisions will have for things like fruit colour, sugar content and storage capacity. This also extends to the interaction of nitrogen uptake with watering/irrigation rates, as you can get dramatically different outcomes in a wet year (nutrient leeching) compared to a dry year (poor uptake). Filling this knowledge gap would be really valuable.

The direction that the latest research through PIPS3 (via AP19006) is taking with a focus on developing a grower facing tool to make this more accessible is encouraging and will help to speed up adoption and overall evolution of the industry practice around nutrition management.”

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Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture. For more information visit www.horticulture.com.au.

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