

FARM ENVIRONMENT PLANS – HELPING FARMERS THROUGH THE FOURTH AGRARIAN REVOLUTION

Authors: Alastair Taylor, C Finlayson and L Aubrey

*Ballance Agri-Nutrients, Private Bag 12503, Tauranga, 3143
farm.sustainability@ballance.co.nz*

We are in a brave new world. For the first time in human history, an agricultural revolution is not merely focussed on producing more food.

The First Agricultural Revolution, which took place between 10,000 and 2,000 BC saw the transformation of human societies from hunting and gathering to farming. The Second Agricultural Revolution occurred alongside the Industrial Revolution during the 17th and 18th Centuries and was a period of technological improvement and increased crop productivity. It saw the mechanisation of many agricultural activities. The Third Agricultural Revolution of the mid-20th Century was a period in time when new agricultural practices were created to help farmers all over the world. It was an international effort that was planned to eliminate hunger by improving crop performances, which was often associated with the work of Norman Borlaug. It saw agronomic changes in many third world countries and the increased industrialisation of agriculture across the developed world.

We would hypothesise that since 2003 we have been in the Fourth Agricultural Revolution. This change was started by the 2003 Mid-Term Review of the European Union’s Common Agricultural Policy farm subsidies and regulations, which began to focus on agricultural sustainability rather than production maximisation. The Mid-Term Review introduced the concept of “modulation” and the shifting of economic support from production to “environmental goods. Farming was encouraged to produce safe, healthy and nutritious food; responsibly manage the countryside; and contribute to thriving rural economies. These ideas went global with the 2015 launch of the United Nations Development Goals, which include a goal of “Zero Hunger” alongside those striving to achieve clean water, unpolluted land, scientific innovation and responsible consumption. Closer to home, the same sentiments can be seen in the New Zealand Resource Management Act and the National Policy Statements on Freshwater that have led to the introduction of tighter regulations on diffuse pollution from agriculture.

With these changes of policy and technology come changes for farmers and their advisors. Farms are requiring better data and decision support. They need well trained people around them to develop that data and decision support. In 2016 Balance Agri-Nutrients commissioned market research to establish the wants and needs of New Zealand farmers. Nearly 2,000 farmers were questioned in person, with encouraging results.

- 93% of farmers believe that they have a real responsibility to look after the environment.
- 83% class themselves as passionate about the environment
- 68% will “happily do what they have to keep the Council happy.

These measures, together with the transcript comments from the farmers clearly showed that New Zealand farmers have a desire to leave their farms in a better condition than when they took them over, and that they are looking for help to be able to achieve that. In response to this study, Ballance has developed four streams of activity to support our farmers,

1. Engagement with policy makers and industry
2. Farm Sustainability Services
3. Decision Support Tools
4. Continued support for the Ballance Farm Environment Awards

Engagement with Policy Makers and industry

“Together” has become an important word for the sustainability work being done by Ballance. Prior to a review in 2014 much of the influencing work which the company engaged in was focussed on implementation. Having developed a database of over 300 stakeholders across National and Regional Government, Crown Research Institutes, levy bodies and agri-business, considerable work has been put into engaging with those stakeholders. This has seen Ballance take a much more active role in “Team Ag” groups around the country, and in producing submissions to regional plans that focus on:

- Agreement with farmers reaching the Good Management Practices standards
- Reducing complexity
- Reducing frequency of reporting / auditing
- Sensible and achievable implementation timeframes

Farm Sustainability Services

As a signatory to the Sustainable Dairying Water Accord Ballance accepted a role in assisting the dairy companies to meet their annual N loss reporting requirements. Since the first SDWA round of work was conducted in 2013, this has seen the Farm Sustainability team develop into a nationwide service which helps farmers and shareholders to produce meaningful environmental change on farm. Since 2016, this has been a “fee for service” business, reflecting the regional and individual need to meet compliance requirements.

Figure 1. Ballance Farm Sustainability Services offering

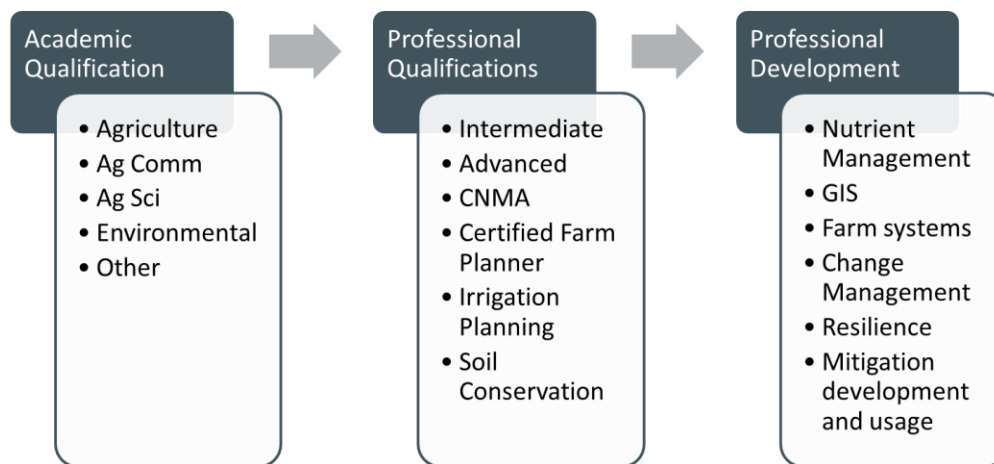


In 2015 ECAN sat down with the fertiliser co-operatives and several agricultural consultancies to assess how many resources were currently available in the Canterbury region to deliver baseline nutrient budgets. By that stage, both companies had small teams operating Year End nutrient budget services. At the meeting it was determined that despite the existence of those teams, and because of the demands of the SDWA, irrigation schemes and farm sales only 1.5 FTE (full time equivalent) was available across the companies to provide Baselines. At the time ECAN expected to need 6000 of these.

On day one of the 2018 FLRC workshop, Alan Campbell of Waikato Regional Council referred to PPC1 Healthy Rivers/Wai Ora needing 5,000 Farm Environment Plans created. On average, Ballance have found that a meaningful Farm Environment Plan takes around 40 hours to produce. A skilled consultant can achieve around 60% chargeable hours, given the other work requirements placed on them. This means each consultant could produce up to 31 Farm Environment Plans each year. This means that for Healthy Rivers alone, Waikato Regional Council will need around 161 consultant years available. With only 8.5 years for those plans to be delivered Waikato Regional Council will be hoping that at least 20 consultants turn their hand to this work as quickly as possible.

This raises the question of where are these consultants to come from. Traditional farm business consultants do not necessarily have the nutrient management or soil conservation understanding required to provide meaningful FEP's. Fertiliser sales representatives may have the nutrient management knowledge but lack the farm business and soil conservation experience. Increasingly we are seeing this part of the industry populated by recent agriculture or environmental science graduates, whose knowledge needs considerable development. The path from recent graduate, to a qualified CNMA (Certified Nutrient Management Advisor) with soil and farm management knowledge currently takes between 2 and 5 years, at a cost to the employer (usually a fertiliser co-operative) of \$200,000 - \$300,000. If fifteen regions are to meet their requirements under the National Policy Statement – Fresh Water, a conversation needs to take place between Universities, agribusiness, levy boards, councils and other stakeholders of how we as any industry upskill graduates and provide more consistent professional development pathways.

Figure 2. Building capability – commercial organisations need more help from academia



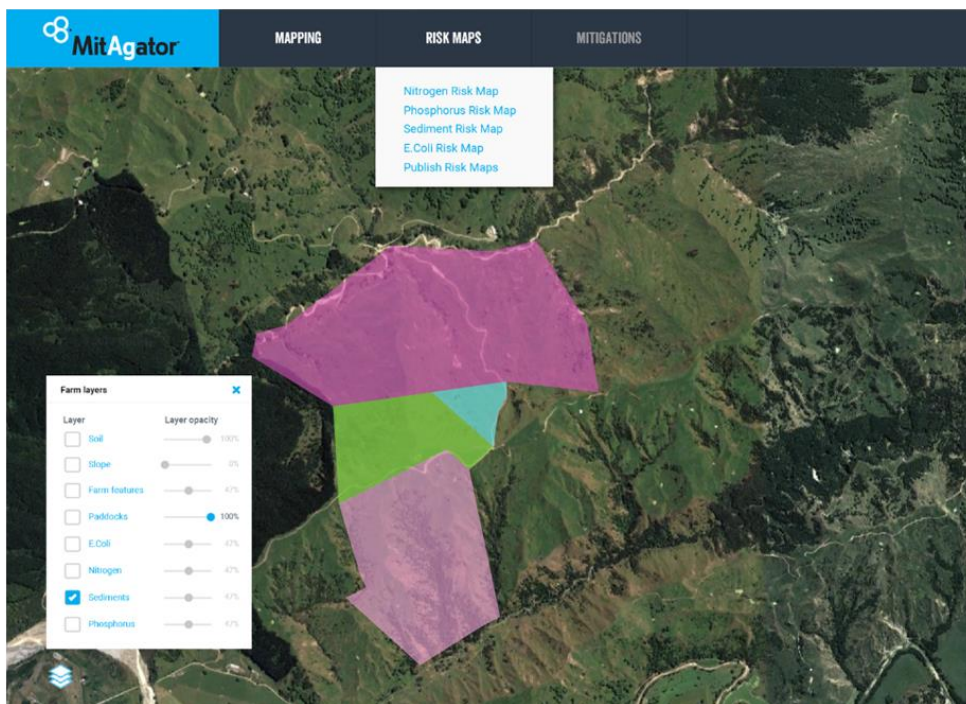
Decision Support Tools

In recent years, Ballance (and others) have invested heavily in mechanisms to help farmers to produce meaningful environmental change on farm, and how that can be demonstrated in a Farm Environment Plan. 2018 will see the commercial launch of the MitAgator™ decision support tool, developed with New Zealand scientists to achieve this.

MitAgator has been developed through the Clearview Innovations PGP programme. The aim of the Clearview innovations program has been to develop a range of new products which would improve nitrogen and phosphorus use efficiency and reduce losses to the environment. MitAgator is one such product – it is a GIS-based water quality decision support tool that links with OVERSEER® to refine the latter models output. It combines OVERSEER® inputs / outputs with additional GIS data layers to allocate N & P loss spatially, and extends to sediment and bacteria loss. MitAgator provides an understanding of where losses occur spatially and identifies critical source areas (CSA's) across farm landscape. This allows more efficient targeting of nutrient, sediment and e-coli loss by strategic application of mitigations to areas where they are required. It provides a flexible approach with an optimal mix of the most effective mitigation strategies. By identifying CSA's it provides the ability to use mitigations that may otherwise not be economic to use farm wide.

User Acceptance Testing of the MitAgator prototype demonstrated the importance of allowing for colour blindness in the provision of an electronic mapping tool. Around 8% of the male population are colour blind and so an appropriate colour palate has been selected for the identification of Critical Source Areas.

Figure 3. Example of a sediment loss map from MitAgator™, showing CSA's



The prototype model of MitAgator was delivered to Ballance early in 2016. Testing on pilot farms in Waikato and Hawkes Bay revealed how powerful the risk maps and mitigation scenarios can be for prompting farmer engagement and action, “I thought it was all about riparian planting but it’s not... you need a range of options. Somethings always going to surprise you.” was feedback from one dairy farmer in South Waikato.

The on farm testing demonstrated how quickly the maps engaged the interest of farmers. However it also quickly showed up some technological issues. With the increasing availability of more detailed datasets, it was found than an individual consultant’s laptop often lacked the processing capacity to run the model in a timely manner. No farmer wants a consultant sitting at his or her kitchen table for thirteen hours. Consequently, a decision was made to adapt the tool to work as a web based application. This has given the opportunity to update the MitAgator engine with three additional mitigations that AgResearch have calculated. It has also allowed integration into the new MyBallance online customer platform, which Ballance launched to shareholders late in 2017.

The on-going development of MitAgator and Farm Sustainability Services reflects our belief that achieving meaningful change on farm, which delivers water quality improvements, is about much more than N loss numbers or the number of Farm Environment Plans produced. The market research referred to earlier demonstrated that New Zealand farmers want to do the right thing, and leave their farms in a better condition than they found them. To do that they need decision support tools, used by skilled, experienced advisors, to recommend cost effective mitigations and farm management actions. Ballance deliver this through the Farm Environment Plans produced by the Farm Sustainability Services team, and followed up annually by our team of Nutrient Specialists.

There is a question which regulators and Central Government still needs to answer. In the era of the fourth agricultural revolution, society is asking our farmers to produce “social goods” – green landscapes, clean water, healthy food which the New Zealand economy needs for export earnings – whether through tourism or consumption. The healthy food produced by farmers attract market returns. The question is more who should pay for the green landscapes and clean water, which help to attract both domestic and international tourism. It is right that some of these costs should lie with the landowner, but all of them? Should the broader New Zealand population contribute to creating these benefits? Is that best done through national or regional schemes? Or through some market based initiative similar to the LEAF (Linking Environment and Farming) scheme based in the UK. The discussion can continue @alastairtaylor2 on Twitter.

Acknowledgements

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