Re: Action for healthy waterways

To whom it may concern,

The New Zealand Institute for Plant and Food Research Limited (Rangahau Ahumāra Kai) is a science provider supporting the sustainable production of high quality horticultural, arable and seafood products that earn a premium in international markets.

We have read with interest Action for healthy waterways and submit the following observations on two aspects of the discussion document for your consideration. We applaud the initiative, and we support the overview that ‘… the health of our nation depends on the health of our freshwater’.

National nitrogen fertiliser cap

Regarding 8.4 Immediate action to reduce nitrogen loss; Option 2: National nitrogen fertiliser cap, we recognise the need to reduce excessive nitrogen leaching arising from poor management practices. But we do not consider the introduction of national fertiliser caps to be the most effective approach.

This is because of the complexity of establishing appropriately tailored caps for fertiliser inputs across the wide range of crops and growing conditions encountered in horticultural and arable production systems in New Zealand. Crop type and cultivars, plus rotations, and other management interventions such as irrigation and pest and disease controls add complexity to our production systems. Along with the impacts of climate, soil type, aspect and topography, they will all influence the physiologically optimum nitrogen fertiliser input for any given crop at any given location.

We consider that these interacting variables are most effectively balanced at the orchard, paddock or farm scale where the experience and site-specific understanding of the individual grower and farmer can be leveraged by an understanding of both the physiological requirements of the crop and the environmental consequences of poor decision making. Well-considered, site- and crop-specific fertiliser management will deliver good environmental and economic outcomes while a nutrient cap risks being a blunt instrument that might not achieve either.
An additional consideration is that the requirement for a cap on the total nitrogen applied in fertiliser per hectare per year could constrain innovation in horticultural and arable production systems. It may do this by preventing or delaying the introduction of new crops and practices with lower nitrate leaching risk but lacking a national fertiliser cap value.

Modelling approaches
We welcome the proposal in 9.3 Making good decisions based on good information to ‘expand the range of farm systems and conditions modelled, connections between support tools, and accelerate the recognition of new, more environmentally-friendly technologies in tools, such as Overseer®.

We consider robust modelling of environmental outcomes from horticultural and arable production systems to be essential for three reasons.

1. A regulatory approach based on accountability for the outputs such as nitrate leaching, rather than capping nitrogen fertiliser inputs, is highly dependent on effective modelling to predict losses to the environment.
2. The proposed approaches to restricting further intensification in Action for healthy waterways (8.2 Restricting further intensification of rural land use) are dependent on modelling to establish baseline losses and predict future losses associated with land use change, coupled with the future impacts as a result of climate change.
3. Understanding how far ‘good management practice’ (GMP) can be expected to deliver reductions in environmental impacts requires modelling to predict nitrate leaching losses under GMP. Additionally, modelling approaches enable rapid and cost-effective refinements of GMP to realise even better management practices.

Specifically regarding Overseer®, Plant & Food Research scientists have had some input into designing the original crop model algorithms both for arable and horticultural systems, and they contributed to an independent review of Overseer® led by the Foundation for Arable Research in 2012. They have started work on a selection of improvements under contract to Overseer Limited in October 2019. However, we consider the model to remain seriously under-developed for predicting nitrate leaching losses from the wide range of annual and perennial crops and the diverse and complex production systems practiced in New Zealand’s horticultural and arable sectors.

Accordingly, we would encourage a substantial and rapid acceleration of the development and application of support tools including but not necessarily limited to Overseer® to reflect better the diversity of orchard, vineyard, arable and vegetable farm practices. We consider this to be essential for delivering the outcomes that Action for healthy waterways seeks and to ensure a healthy New Zealand people, environment and economy. Together these are critical for New Zealand’s well-being.

Yours sincerely,

Chief Sustainability Officer

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