

**BEFORE THE HEARING COMMISSIONERS
AT CHRISTCHURCH**

IN THE MATTER of the Resource Management Act
1991 ("**the Act**")

AND

IN THE MATTER of the Resource Management Act 1991
and the Environment Canterbury
(Temporary Commissioners and
Improved Water Management) Act
2010

AND

IN THE MATTER of the hearing of submissions on
Variation 3 of the Proposed Land and
Water Regional Plan

**STATEMENT OF EVIDENCE BY ANGELA PHYLLIS HALLIDAY
FOR HORTICULTURE NEW ZEALAND**

25 SEPTEMBER 2015



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QUALIFICATIONS AND EXPERIENCE

1. My name is Angela Phyllis Halliday. I am the Advisor, Natural Resources and Environment with Horticulture New Zealand ("**Horticulture NZ**"). I have been in this role since April 2014. I have been involved in the Product Development Group for the Matrix of Good Management Project and am currently on the OVERSEER® Guidance Governance Group to develop guidance for the use of the OVERSEER® model in a regulatory context for Regional Councils.
2. Prior to that I was in a compliance role at the Southland District Council which focused on Resource Management and Environmental Health. Prior to this I worked in an Economic Development Agency in Southland in a marketing based role and was a member of the Southland Conservation Board from 2008 – 2010.
3. I have qualifications in science (BSc) with a major in Zoology from Otago University and a graduate Diploma of Wildlife Management. I am currently studying extramurally towards a Graduate Diploma of Environmental Health at Massey University. I am involved with District and Regional Council policy and planning processes throughout New Zealand in both the pre-plan collaborative process and post plan facilitation process.
4. In my role at Horticulture NZ I am responsible for implementing Horticulture NZ's wider resource management and research programme.
5. As a result of this role, my qualifications, and previous experience, I consider that I have an understanding of farming systems and the impacts of water related policy decisions from both a farming/growing perspective and a from an environmental health/ecosystem health perspective. In this evidence I have tried to outline the issues regarding land and water resource management and primary production from an industry perspective in relation to Canterbury and in particular the South Coastal Canterbury Streams catchment.

BACKGROUND TO HORTICULTURE NEW ZEALAND AND ITS RMA INVOLVEMENT

6. Horticulture NZ was established on 1 December 2005, combining the New Zealand Vegetable and Potato Growers' and New Zealand Fruitgrowers' and New Zealand Berryfruit Growers Federations.
7. On behalf of all active growers Horticulture NZ takes a detailed involvement in resource management planning processes as part of its national environmental policy. Horticulture NZ works to raise growers' awareness of the RMA to ensure effective grower involvement under the Act, whether in the planning process or through resource consent applications. The principles that Horticulture NZ considers in assessing the implementation of the Resource Management Act 1991 (RMA) include:
 - The effects based purpose of the RMA;
 - Non-regulatory methods should be employed by councils;
 - Regulation should impact fairly on the whole community, make sense in practice, and be developed in full consultation with those affected by it;
 - Early consultation of land users in plan preparation;
 - Ensuring that RMA plans work in the growers' interests both in an environmental and economic production sense.

HORTICULTURE IN NEW ZEALAND

8. Nationally, the sector represents 5600 growers producing around 110 crops (focused on producing food for people). Roughly \$2.9 billion in domestic revenue is generated yearly, and another \$3.2 billion of fresh on board value is produced for export.
9. The industry body is committed to continuous environmental improvement, and has spent significant resource on a good management practice program for growers, covering issues of significance to markets and regional councils, known as NZGAP.
10. Horticulture NZ manages issues that cover and affect the whole horticulture industry (excluding winegrowers and winemakers).

11. Many of the issues are common between plans, so Horticulture NZ also provides input to policy at the national level, which is focussing currently on matters that affect growers in District and Regional Planning processes.
12. Horticulture NZ is the umbrella organisation for 21 separate product groups covering 110 crops that are outlined in the Commodity Levies (Vegetables and Fruit) Order 2007. Product groups are also levy collecting organisations working on sector specific matters in collaboration with Horticulture NZ which is working on industry specific matters.
13. The two key vegetable product groups for the Canterbury region are the Process Vegetable Product group and the Fresh Vegetable Product Group (VegetablesNZ). These groups are significant contributors to our research efforts on nutrient management.

HORTICULTURE IN THE CANTERBURY REGION

14. With over 16,800 ha of production, Canterbury is the third largest horticultural sub region in New Zealand. It is particularly significant for vegetable production, with the main crops including onions, peas, potatoes, pumpkin, green beans, carrots and broccoli. There is also significant fruit production with the main crops being blackcurrants, berry crops, apples and grapes for wine production.
15. There are 497 registered vegetable growers in the Canterbury region, and 54 fruitgrowers.
16. Generally speaking the 2012 figures for the year ending 30 June indicate that Canterbury production was approximately: 5,700 ha of potatoes, 4,200 ha of peas and beans, 1,000 ha of onions, 255 ha of sweetcorn, 323 ha of brassicas, 823 ha of carrots, 29 ha of asparagus, and 23 ha of lettuce. "Other" vegetable crops comprised 651 ha.
17. The approximate total hectares planted for vegetable cropping in Canterbury in 2012 was around 13,048 ha.

THE SIGNIFICANCE OF CANTERBURY'S HORTICULTURAL PRODUCTION TO NEW ZEALAND HORTICULTURAL PRODUCTION.

18. Horticultural production in New Zealand makes up roughly 8.3% of total fresh on board export value, with the main categories for export being in wine, kiwifruit and apples.

Onions, other fresh vegetables and potatoes are also significant contributors to a total export value in 2010 of over \$3 billion.

19. Equally important to note are the contributions to domestic food supply and domestic food production with approximately the same value again from horticultural production in terms of domestic value (\$2.9 billion).
20. Canterbury domestic vegetable supply is integrated with approximately 9 other vegetable production nodes across the country. These are all interrelated parts of the domestic food supply chain.

HORTICULTURE IN SOUTH COASTAL CANTERBURY

21. Horticulture is not a major farming type in the South Coastal Canterbury area. There are potatoes, yams, berries, blackcurrants and pipfruit grown in the Waihao-Wainono area. In terms of area there is approximately 250 hectares of potatoes, 40 hectares of yams, 28 of carrots, 15 hectares of apples and 70 hectares of berries and currants.
22. Potatoes are grown in a 5 – 8 year rotation and often this is on leased land from dairy farmers. It is important to have these long rotations to ensure the soil has time to recover and there is not a build-up of pathogens in the soil. Yams are grown on the Boyce property in conjunction with a sheep farming operation (see the Evidence of Alistair Boyce for Horticulture NZ), and again rotations are important.
23. Vegetable cropping varies by rotation, by season and by property. One typical aspect of broadacre vegetable cropping is the use of shared and leased land with as much as 100% of the land sometimes being shared or leased.
24. Whilst berryfruit, blackcurrants, summerfruit and pipfruit used to be commonplace in the area (which is host to an annual Strawberry Festival) fruitgrowing has decreased in the area with now only one major berry grower (Butlers Berries - see the Evidence of Jackie and Donald Butler for Horticulture NZ).
25. There is also arable cropping in South Coastal Canterbury area. At present there are no horticultural crops in the arable rotation, although these do remain an option for growers and they have planted root crops as part of their rotation in the past. Therefore, a regulatory regime that ensures business

flexibility for horticultural and arable growers is important to the sector.

MAIN ISSUES FOR HORTICULTURE UNDER THE PROPOSED REGIME

26. The main issues for horticulture in this catchment relate to landuse flexibility and the uncertainties that arise from the proposed rules. These issues may adversely affect the ability of growers to change crops to meet market demand or lease land to plant crops due to the potential of such crops to impact on the OVERSEER® limits proposed.
27. Horticultural and arable systems are complex and are often incorporated into other systems. These mixed systems, whilst complex and difficult to model, are robust systems that can respond to market demand and future-proof farmers from major setbacks such as disease, climate change, biosecurity issues and major market fluctuations.
28. I set out below a list of uncertainties that may affect horticulture that Horticulture NZ would like to address:
 - The Matrix of Good Management and how this will be addressed under the proposed regime;
 - OVERSEER® for horticulture, including version control and the issues for cropping in the current model;
 - Landuse flexibility – the flexibility ‘cap’ and how this might work in the proposed plan;
 - The balance within the proposed catchment cap considering new irrigation, intensification and farmer flexibility.

Matrix of Good Management (MGM)

29. Horticulture NZ has been involved in the development of the Matrix of Good Management (“**MGM**”).
30. The focus for the MGM project has been solely on vegetable and arable cropping rotations. Fruit crops and viticulture are not currently included as due to their lower nitrogen leaching profile they are not seen as a high priority. Indeed some of the crops (such as blackcurrants) cannot be modelled in OVERSEER at all and surrogate crops need to be used (as outline in the Evidence of Stuart Ford for Horticulture NZ).
31. As recognised in the section 42A report, the MGM project variation (Variation 5) will not be included in Var3 which is not

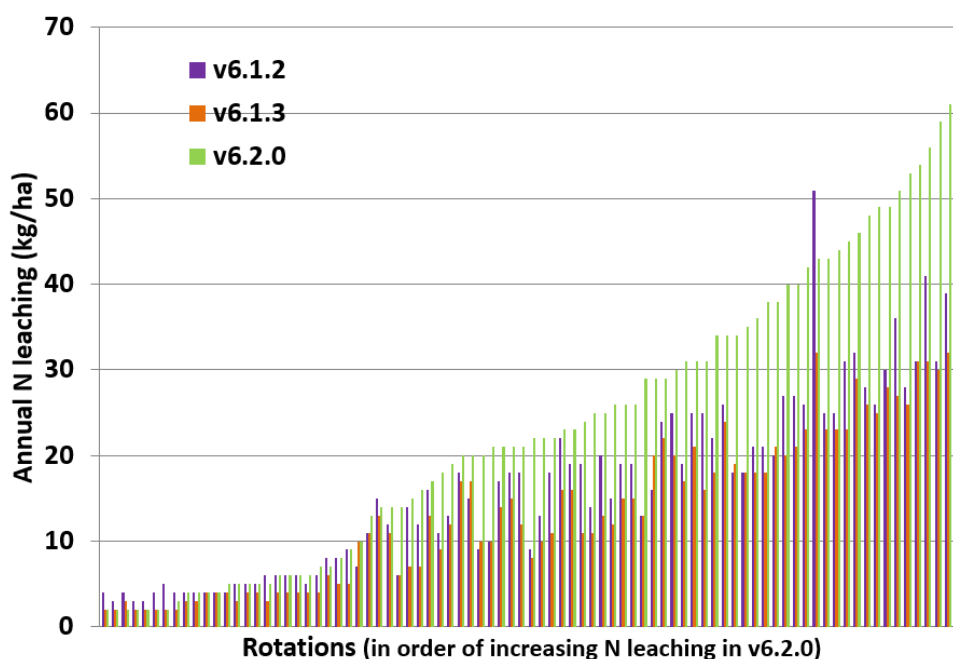
going to be slowed down to take the information from the MGM project into account. As such, Var3 is forced into a situation that relies on capping of OVERSEER® numbers and the inherent complications this poses.

OVERSEER®

32. Horticulture NZ is very supportive of a regime to move all farmers to Good Management Practice (“**GMP**”). Horticulture NZ has developed a Code of Practice for Nutrient Management and has several research projects looking at nitrogen and phosphorous management on cropping farms. The MGM project relies heavily on being able to model these practices in OVERSEER®. However as discussed below and by Mr Ford this is very difficult if not impossible under the current cropping model in OVERSEER®.
33. As outlined by Mr Ford in his evidence there are issues with the cropping model in OVERSEER®. These include the problem that not all crops are represented and so some crops have to have a surrogate chosen to represent them. Also it is not possible to model sequential planting and harvesting of a paddock with the inputs averaged out monthly. This does not always fit with the way horticultural crops are planted and harvested.
34. Mr Ford's evidence highlights the limitations of OVERSEER® for horticultural crops. Of particular concern in the South Coastal Canterbury catchment is the ability of the model to accurately predict leaching losses for land in berry crops which, as outlined in Mr Ford's evidence, is not available at present.
35. As such Horticulture NZ suggests that at this point in time, given the very small footprint and low nitrogen leaching profile and difficulty in modelling fruit crops using OVERSEER®, that fruit crops are exempted from requiring an OVERSEER® baseline or subsequent OVERSEER® reports, until such a time as OVERSEER® can adequately model the crops.
36. Horticulture NZ recognises that the difficulty with the model may well be resolved over time, however for crops that are not included in the current model, to avoid leaching numbers that are completely unrepresentative (such as some of those predicted under the berry crops in question), it is advisable that a substitute number such as a leaching rate from

SPASMO is used until such a time as the model accurately reflects the crop in question.

37. Horticulture NZ is concerned that the proposed regulatory regime will stifle potential for this particular catchment to diversify into cropping or berry production due to modelling being too difficult or the leasing out of blocks being fraught with compliance and regulatory red tape due to these modelling difficulties. This may put growers off leasing land for crops and diversifying which, in a catchment that is heavily reliant on one type of farming, should be encouraged.
38. Version control in OVERSEER® is an issue that has been and will continue to be a concern to the horticulture industry as outlined in Mr Ford's evidence. Below is a graph prepared by Plant and Food Research of vegetable and arable cropping rotations in Canterbury that have been run through Versions 6.1.2 6.1.3 and 6.2. These were modelled over the same soil type with the same climate to make the comparison more comprehensive. All were fertilised at GMP and irrigated with 'linear and centre pivot' at GMP (variable depth and return period based on soil moisture). There were 94 crop blocks in total with arable and horticulture represented. The graph highlights the difficulty of a model providing a moving target and a limit in the Variation providing a solid target.



Caveats:

Only level 1 soils information is used in these files.

In v6.1.2 and 6.1.3, irrigation is modelled as a method with the rate left blank (OVERSEER decides amount applied based on soil water deficit to 150cm).

In v6.2 the previous irrigation modelling defaults to a variable depth and return period strategy based on a 70% PAW60 trigger and 95% PAW60 target.

The change of irrigation monitoring from 150cm to 60cm and the subsequently more realistic irrigation applications is the main driver of the increase in NLost in v6.2.

39. Horticulture NZ is supportive of the development of the OVERSEER® model and has several research projects underway to help enhance the model, in particular the cropping module within it. However it has concerns over how it is used in a regulatory context and the focus that this has placed on a 'nitrogen number'. Horticulture NZ supports a natural capital approach whereby flexibility is provided to lower leachers in order not to limit potential of the industry to change/expand in an environmentally sustainable manner whilst slowly moving higher leaching activities to GMP and beyond to reach catchment based objectives.
40. Var3 recognizes the need for flexibility, however at present this is only afforded to nutrient user groups, farm enterprises and irrigation schemes which can 'move' allocation around as required. Unfortunately this has an adverse effect on individual land owners that are not part of a group in a catchment and places limitations on those lower leaching activities. New users that are to be part of a new scheme can intensify whilst other existing users cannot. A question of equity is raised here - to which there is no easy answer, given the requirement of the variation to allow for the consented irrigation schemes' proposed intensification, whilst managing the environmental effects on the catchment particularly in respect to the Wainono lagoon.

Horticulture New Zealand would be supportive of an increase in flexibility cap from 10 to 15 in the Waihao-Wainono Area for lower leaching activities with all activities being required to implement GMP and for the highest leaching activities to come down as necessary. Obviously as there have been questions (as outlined in Stuart Ford's evidence) regarding calculation of the current load for the catchment. It would also be prudent to recalculate the load and subsequent allocations, however unfortunately, as the 'limits' and 'caps' will be decided by this process, another variation may be required to incorporate the new information.

41. Horticulture NZ notes an indication that a move towards defining narrative limits for maximum cap numbers and the anticipated level of land-use enabled or restricted (Section 42A Report page 300). Horticulture NZ is supportive of this approach to deal with version changes in OVERSEER® and modelling variations that do not actually affect the real like nitrogen leaching profile or impact of the property in question.
42. Unfortunately this recognition has only been afforded to PD and PDL soils as follows:

I recommend that only the maximum cap for Pd and Pdl soils requires updating for comparison with OVERSEER® V6.2; from 20 to 35 kgN/ha/yr. The need for this increase is not because there is a significant difference in outputs between OVERSEER® versions, but primarily because the earlier LUT (OVERSEER® V6.0) numbers (e.g., 20 kg/ha/yr) incorporated an allowance for denitrification in these two soil types (i.e. a reduction of nitrogen loss to waterways) which is not accounted for in raw OVERSEER® outputs. (Section 42A report page 300)

43. This recognition of the changes in versions and modelling assumptions is very important. The latest version of the model is much more detailed in relation to the irrigation module in most cases increasing leaching N numbers for properties. It is not just a case of denitrification not being taken into account for these soils – it is a case of extensive changes to the modelling and refining of modelling assumptions to better reflect farming systems. This is an ongoing process as the model and the knowledge of the nature of the soil types is developed. To lock in these numbers when the knowledge base and technical capacity to define soil, climate, plant and biophysical characteristics is developing is not a good proactive solution to the issues facing the catchment and the community, and will not help when implementation of the plan in terms of regulation and compliance is required in a practical on-farm setting.

Landuse flexibility

44. Landuse flexibility is key in a dynamic environment with fluctuating markets, climates and other pressures such climate change and biosecurity.
45. Horticulture production has decreased in many areas in New Zealand and the South Coastal Canterbury area is no

exception. The ability and potential of horticulture to grow in the catchment and throughout New Zealand is of key concern to Horticulture NZ.

46. As rules in the Plan and Variation have been written without the benefit of the hindsight of the pressures and opportunities the market and the environment may bring, it is requested that consideration be given to encouraging cropping and mixed farming systems rather than these systems falling into the 'too hard basket' in terms of regulations.
47. Horticulture NZ is currently working closely with Horizons Regional Council on the implementation of the One Plan. The approach for horticulture in this instance was to require farm plans that are focused on Good and Best Management Practices, recognising the current difficulties and gaps in the ability to model the majority of the cropping operations in the region using OVERSEER®. Implementation of the One Plan has been a long slow process which has been facilitated in part by the industry organisations.
48. The implementation regime, the resource consenting requirements, and the capacity to deliver and ensure compliance of these rules need to be key considerations of the Panel during this process.
49. If the issue of flexibility is not addressed during the plan development process it will have to be considered at the implementation phase - as anomalies with the modelling are ironed out and new compliance regimes developed to meet the new policies and rules. This will require compliance to be focused on the land uses that have the highest impact on water quality in the catchment.
50. In light of this process, and recognising the requirement to keep a balance, Horticulture NZ would encourage a balanced view and further research on the OVERSEER® cropping model to be done for those crops that are not represented prior to hard and fast limits or baselines being developed for the farms in question. In the meantime proxies could be developed using expertise on these crops to ensure they are not misrepresented.
51. Keeping the balance is important and this should be considered not only for the now but also for the future. The decisions made in this process will dictate the ability of primary production to adapt and change to meet future

demands and may determine if farms are economically viable moving into the future. Horticulture NZ considers that the ability to intensify should not be limited to irrigation scheme members alone and that if necessary transfer and trading be considered in the future to address inequities that may develop as farm systems change to accommodate the new rules.

52. Finally as outlined above and in the planning and technical evidence provided by Mr Hodgson and Mr Ford the main issue of concern to Horticulture NZ is ensuring that the growing of horticultural crops in South Coastal Canterbury Streams is allowed for in the rule framework. The farming systems and complexities of managing using the OVERSEER® model under the rule framework need to be taken into account in the package so as to not unduly restrict growing, and the diversification of farming systems to include growing and leasing land for growing.

Angela Halliday

25 September 2015