

**BEFORE THE HEARING COMMISSIONERS APPOINTED BY ENVIRONMENT
CANTERBURY**

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

AND

IN THE MATTER of Proposed Plan Change 7 to the
Canterbury Land and Water Regional
Plan

**INDUSTRY STATEMENT OF EVIDENCE OF RACHEL SARAH MCCLUNG
FOR HORTICULTURE NEW ZEALAND**

17 JULY 2020

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SUMMARY

1. This industry statement outlines the position of Horticulture New Zealand (**HortNZ**) on the Section 42A Report recommendations on the HortNZ submissions on proposed Plan Change 7 (**PC7**) to the Canterbury Land and Water Regional Plan (**CLWRP**).
2. HortNZ supports the inclusion of a bespoke regulatory framework for Commercial Vegetable Production (CVP), but seeks greater clarity and equity in the provisions.
3. Vegetable growing systems are complex as vegetable crops are grown in rotations and across different land parcels to maintain both soil health and crop health.
4. HortNZ believe that with the decisions we seek, the policy and rule framework will manage water quality risks, and provide for soil health and human health. The framework we propose provides the flexibility required to ensure an efficient and effective consenting pathway for the activity within an irrigation scheme, within a mixed farming system and for stand-alone intensive commercial vegetable growing.
5. HortNZ has also submitted a policy and rule framework for low intensity horticulture (such as fruit production) that manages water quality risk, and can help contribute to lesser climate impacts on future generations. However, on further reflection and in consultation with Mr Hodgson¹, HortNZ is now of the view that low intensity horticulture can be provided for under the operative plan structure.
6. HortNZ also submitted seeking provision for rootstock and crop survival water, however, again on further reflection we now believe that while provision of rootstock survival water is extremely important to our industry, for the time being it should be considered through section 329 directions that restriction water takes and use in times of drought. Mr Scherberg has provided evidence to demonstrate that the environmental impacts of providing for rootstock survival Water are less than minor.² HortNZ has provided this evidence in this public forum and is signalling that it would like to work with Environment Canterbury (**ECan**) on a future plan change/plan review to

¹ Statement of Evidence of Mr Hodgson, para 95 to 97

² Statement of Evidence of Mr Scherberg, para 59 and 76

appropriately incorporate rootstock survival water into the CLWRP.

INTRODUCTION

Qualifications and experience

1. My name is Rachel Sarah McClung. I am the Environmental Policy Advisor – South Island, with HortNZ. I manage HortNZ's involvement in South Island regional and district planning processes in regions where fruit and vegetables are grown commercially. I have been in this role since September 2017.
2. I hold a Bachelor of Science from Canterbury University (2000) and a Master of Science in Resource Management (Honours) from Lincoln University (2002). I am a full member of the New Zealand Planning Institute (**NZPI**). I have 18 years of post-graduate planning experience. During this time, I have performed the functions of a local authority planner and consultant planner in both New Zealand and the United Kingdom.
3. My planning experience includes preparing plan changes and s32 analyses, notifying and reporting on plan changes and preparing submissions to national and regional planning documents.
4. Since beginning my role at HortNZ, I have visited growers across New Zealand, including Canterbury, to better understand their horticultural operations and how resource management issues impact them.
5. While I am a qualified planner, I am not appearing in the capacity of an expert in this hearing. My role in this hearing is as HortNZ's representative and advocate.

Purpose and scope of evidence

6. This statement provides a commentary on the Officers' s42A report for PC7 as it relates to the HortNZ submission and the likely implications of the Officers' recommendations for commercial vegetable production.
7. In preparing this statement, I have relied on the planning assessment by Mr Vance Hodgson as to how the provisions proposed by PC7 will affect horticultural operations. The preparation of this statement has also been informed by the opinions of other experts presenting evidence for HortNZ.

8. This statement covers:
- (a) A summary of what HortNZ are seeking from the planning framework;
 - (b) An overview of horticulture in Canterbury;
 - (c) The importance of food security;
 - (d) What commercial vegetable production is;
 - (e) Our submission on low intensity horticulture;
 - (f) Our submission on rootstock and crop survival water;
 - (g) The role and importance of audited Farm Environment Plans;
 - (h) Comments on implementation in terms of the relationship that rules have to driving better outcomes; and
 - (i) Conclusions and recommendations.

SUMMARY OF WHAT HORTNZ ARE SEEKING

9. As noted above and further discussed below HortNZ is not pursuing its relief in relation to low intensity horticulture or rootstock and crop survival water. While these are important issues for HortNZ however, we accept that there are scope issues in pursuing these matters at this stage.
10. Mr Hodgson sets out the key elements of the planning framework that HortNZ is seeking so the purpose of this section of my evidence is to summarise the key points from an industry perspective.
11. The key to HortNZ submission is that there needs to be three clear pathways for commercial vegetable growing (**CVG**) in Canterbury as follows:
- (a) CVP in an irrigation scheme;
 - (b) CVP as part of a broader, mixed farming system;
 - (c) CVG as a stand-alone activity.
12. PC7 provides the irrigation scheme pathway and works for CVP within a mixed farming system that has already managed to get a consent. However, for those CVP activities in a mixed system not consented and for stand-

alone CVG the pathway as notified is fraught with difficulties. HortNZ is therefore suggesting modifications, backed up by technical evidence, to ensure PC7 achieves the outcome of allowing for consenting of appropriately managed CVP activities.

13. For clarity, in the evidence of HortNZ experts when they use the term commercial vegetable production (CVP) they are using this to refer to all three consent pathways as identified above. The term 'commercial vegetable growing' (CVG) best applies to the stand-alone activity. In developing our evidence, HortNZ believed the distinction was important to ensure that evidence provided to the panel addresses not only the impacts of vegetables grown as a stand-alone but also that grown in irrigation schemes and mixed farming activities.
14. As noted in the submission and its evidence HortNZ is requesting a shift in the baseline date to the date that PC7 was notified. The change to the date is to ensure that all commercial vegetable growing activities will be covered by the framework.
15. The expert evidence of Mr Ford and Mr Nation sets out best available information about the current extent of vegetable growing within the region, compared with the 2009 - 2013 period. While there has been limited growth in vegetable growing but some activities have changed location since 2013.
16. If the baseline date is not altered then this will likely leave these growers unable to get a consent because their activities will be prohibited. HortNZ understands the concern officers have about moving the baseline date. However, without this change or an alternative, some growing activities will not be able to get consent. The alternative to moving the baseline date to allow for unrestricted movement at a sub-region level.
17. HortNZ also supports a requirement for a Farm Environment Plan to include a commercial vegetable rotation management plan. The plan would detail the crops grown and all the land within the rotation. This and other FEP related recommendations is addressed in the evidence of Mr Farrelly.

18. In terms of the rule framework:
- (a) The scale of the permitted activity should reflect the actual and potential impacts. The evidence demonstrates that a 5ha threshold would have negligible water quality impact.
 - (b) HortNZ proposed a restricted discretionary activity for existing CVG activities and a restricted discretionary activity for an additional allowance to provide for population growth.
 - (c) HortNZ has also proposed a discretionary pathway for expansion that exceeds the restricted discretionary cap, but meets the nitrogen baseline.
 - (d) Finally, a non-complying pathway is proposed and the prohibited activity is removed.

HORTICULTURE IN CANTERBURY

19. In this section of my evidence I summarise the key points made in the HortNZ submission.
20. There are approximately 386 horticultural operations in the Canterbury Region. Growing produce on a large scale all year round, like growers do in Canterbury, can be challenging. The produce is delicate and susceptible to weather events. Despite this, a large range of fruits and vegetables are grown in all 10 of the Canterbury Water Zones.
21. In total, CVP occupies approximately 12, 275ha or 0.003% of the total area of the Canterbury Region.
22. It is also important to understand that growers come and go into the industry. This means that the industry is not static and the rules should reflect this.

The nature of the land and environment required

23. The type of soil in which commercial vegetable growers prefer to grow are deep, free draining soils. These soils are relatively limited across the Canterbury Region and across New Zealand.
24. Soil underpins New Zealand's agriculture, horticulture and forestry industries and contributes to healthy ecosystems by helping to clean water, cycle nutrients, store carbon and

grow plants and animals. Creating new soil is a slow process and can take hundreds to thousands of years, which effectively makes soil a non-renewable resource. Protecting soil is essential for food security and a sustainable future.

25. There is an extensive range of crops which are grown in Canterbury. Some which are very frost sensitive and others require considerable winter chilling in order to reproduce and thrive. Some crops can be grown continuously in the same land and some crops require considerable periods before it can be grown in the same ground again to avoid disease pressure. This means that the total area of land which is used for growing in any one year will be less than the total footprint of vegetable production land.
26. The CVP sector tends to operate with a mix of land owned by the business and land which is leased, both long and short term. However, some growers operate solely on leased land. Access to the right amount of suitable soils on a lease basis is a serious issue for this sector in the Canterbury region.
27. Parts of Canterbury have top quality soils and mild climatic conditions that are vital, but increasingly hard to come by. Other factors that limit access to quality growing environments include; land ownership, District Plan zoning, access to water, access to labour, transport networks and previous land use (such as housing). Access to this type of growing environment needs to be enabled to ensure New Zealanders have fresh affordable food and to sustain our export markets.
28. Furthermore, while irrigated horticulture has similar nutrient discharges to some farming activities (e.g. unirrigated sheep and beef), it has very low rates of bacteria and sediment discharge and therefore lower overall water quality impacts. Therefore, in order to meet CLWRP targets, it can be an attractive option to farmers have a mixed-use farming system.
29. All these factors mean that suitable growing land is limited and therefore Canterbury growing operations often extend across multiple water zones or subregions in order to meet demands. This is a common practice and demonstrated in Case Study 1 – ScottFresh (**Appendix 1**).

FOOD SECURITY

30. The HortNZ submission covered the issue of food security in some detail. I am high-lighting the key points here.

31. There is a general assumption that New Zealand is the land of plenty and we will always have enough locally-grown food to feed our population, supplemented by imported food where there is demand. But things have changed. Prime fruit and vegetable growing land has been squeezed by rapid urban growth. Increasing urbanisation places additional pressure on, and competition for, the natural resources and infrastructure also critical for growing fruit and vegetables.
32. Food security, fear of the unknown, and threats of trade wars (and now a global pandemic) are why countries all over the world, particularly those with growing populations and a food trade deficit, are starting to develop their own food supplies. This is occurring even when it is expensive to do so due to lack of natural resources. Meanwhile, in our own backyard, our own farmers and growers are battling increasing compliance challenges and other are being squeezed off land as other land uses are being preferred by District and Regional Councils.
33. For example, in Canterbury prime vegetable growing land has been rezoned for urban uses. Large areas of Marshlands were rezoned for residential use post the 2010/11 earthquakes and growers were forced to find new land. CVP was therefore relocated to other areas of Canterbury and this has all occurred after the baseline period from 2013-2017. The Scottfresh case study (attached as **Appendix 1**) is one such example, having moved from Marshlands to Conway Flat.
34. Projections around New Zealand's expected population increase and annual food volumes available for consumption show that domestic vegetable supply will not be able to sustain our future population consumption needs.³
35. Many New Zealanders are struggling to meet the recommended daily intake of 3 plus vegetables and 2 plus fruit a day. In 2016/17, only 38.8% of New Zealand adults and 49.8% of children met the recommended daily fruit and vegetable intake.⁴ Those living in the most deprived neighbourhoods were less likely to meet the recommended

³ <http://www.hortnz.co.nz/assets/Media-Release-Photos/HortNZ-Report-Final-A4-Single-Pages.pdf>

⁴ https://minhealthnz.shinyapps.io/nz-health-survey-2016-17-annual-data-explorer/_w_e9a07e83/_w_aa03fb73/_w_320818d4/_w_26fa6ce8/_w_f50ad45f/_w_dbba0f02/#/!explore-indicators

intakes and were more likely to be obese. 1 in 5 children are living with food insecurity.⁵

36. Additional challenges during Covid-19 include reduced domestic market access (fruit and vegetable shops, restaurants, cafes and takeaways not allowed to open during Alert Levels 3 and 4), and borders being closed - meaning that Recognised Seasonal Employer workers from the Pacific Islands and backpackers (not already in New Zealand) were not available. The Level 4 lockdown occurred during the peak harvest of many crops. There will be long-term implications of this on the industry. These implications will exacerbate the projected food volume issues. The extent of which are not yet known as it is too early to tell.
37. When supply is short and demand high, prices are subject to wide variations. This can make healthy food unaffordable for many New Zealanders and often hits vulnerable communities the hardest. Price variations have been topical throughout the Covid-19 pandemic, with the price fluctuations of cauliflower being used as an affordability and price gauging indicator in the news.
38. Horticultural production in Canterbury is an important contributor to domestic food supply across New Zealand, and in meeting export demands. Canterbury accounts for 47% of national productivity of carrots and parsnips, 46% of the potato crop and 16% of lettuce and 38% of process vegetables¹. Horticultural production also contributes to the economic wellbeing of the region and national GDP.
39. There is no doubt that the New Zealand CVP sector provides an essential service to the country by supplying vegetables to our largely urban population throughout the year at an affordable cost. The ability to provide this service has been predominantly driven by the availability of the right soil types in the required climate zones, which are situated in the Canterbury regions. The alternative source of these vegetables would involve significant transport costs which would result in price increases too high for the majority of consumers.
40. The Canterbury region's population is projected to grow by, on average, 0.9 percent a year between 2013 and 2043,

⁵ <https://www.health.govt.nz/system/files/documents/publications/household-food-insecurity-among-children-new-zealand-health-survey-jun19.pdf>

which is higher than the average national growth rate of 0.8 percent a year.⁶ Canterbury's population will increase from 560,000 to 730,000 between 2013 and 2043, with nearly half of that growth occurring between 2013 and 2023. Canterbury's growth contributes 14% of the national growth rate, and sees it maintaining 13% of New Zealand's population as the second most populous region. This equates to the need for an additional 1000 hectares (approximately) in Canterbury for vegetable growing to meet the demand from population growth. As demonstrated in the evidence of Mr Nation and Mr Ford, the water quality impacts of the required expansion for growth are less than minor. I note for completeness that at the time the submission was made the additional area was calculated to be 600 hectares. Since then more fine-grained work has been done hence the number of 1000 now being sought.

41. It is HortNZ submission that PC7 needs to provide a framework to allow for an increase in vegetable growing to at least meet the demand that will be generated by local population growth. The evidence of Mr Hodgson (his Appendix 1) proposes a restricted discretionary activity for new commercial vegetable growing capped at a level that provides for the predicted population growth for Canterbury.

CLIMATE CHANGE

42. The Eat-Lancet Commission (Report) found that food is the single strongest lever to optimize human health and environmental sustainability and without action, the world risks failing to meet the United Nations Sustainable Development Goals and the Paris Agreement.
43. The Report recommended a transformation to healthy diets by 2050 requiring substantial dietary shifts, with global consumption of fruits, vegetables, nuts and legumes having to double, and consumption of foods such as red meat and sugar being reduced by more than 50%.
44. The food we eat and how we produce it will determine the health of people and planet, and major changes must be

⁶

http://archive.stats.govt.nz/browse_for_stats/population/estimates_and_projections/SubnationalPopulationProjections_HOTP2013base/Commentary.aspx

made to avoid both reduced life expectancy and continued environmental degradation.

45. The measure of New Zealand's success in adapting our food production system in a way that contributes to global efforts to reduce global warming, will be to reduce the overall carbon intensity of New Zealand's food production, by changing, but not reducing our production.
46. The Greenhouse Gas Amendment Bill to the Climate change (Zero Carbon) Amendment Act are challenging for existing farmers. However, the changes we make to farming systems in the next ten years will be critical in achieving the long-term climate and water quality outcomes. Farmers need options so they can respond to the challenges now.
47. Where land use change is unlikely to result in adverse cumulative water quality and quantity effects and produces lesser greenhouse gas emissions, it should be encouraged, not constrained.

COMMERCIAL VEGETABLE PRODUCTION

48. As stated in the s32 and the s42A reports, the current nutrient management provisions of the CLWRP are not easily implemented for CVG, primarily due to the rotational nature of these activities. The CLWRP assigns nitrogen loss rates to land, not the activity. This is problematic for vegetable growers when rotating land to avoid soil borne disease. Under the CLWRP they are required to find land with an appropriate nitrogen loss rate. The s42A report correctly identifies that this hurdle prevents growers from being able to move to new land, and also presents significant complications for consenting.
49. Also identified in the s42A report is that the CLWRP's complex framework means that no single set of provisions apply to CVP due to a range of sub-region-specific rules. Many growers grow vegetables in and across multiple sub-regions and therefore the management becomes difficult with varying requirements. This is demonstrated in the Scottfresh case study (**Appendix 1**).
50. Case studies 2 - 4 (**Appendices 2 - 4**) demonstrate the complex nature of obtaining consents that some growers face who grow both within and outside irrigation schemes and on owned and leased land. HortNZ seeks the flexibility for growers in these circumstances to apply for the appropriate

consents under multiple pathways – a ‘bundled’ consent application approach.

Growing Area and Baseline Load

51. It is difficult to accurately estimate the footprint of CVP, because of the variance in the location and types of crops grown years to year.
52. To inform HortNZ's assessment of whether the baseline area for CVP has changed since 2013 the NZGAP data from 2016 – 2019 was analysed. This data indicates the crop area has expanded from 7,014ha in 2016 to 7,521 ha in 2019. This expansion includes all crops, but as noted in the HortNZ submission, the expansion is dominated by expansion in potatoes and onions.
53. From speaking to growers, HortNZ understands that expansion of crop area has typically occurred within arable rotations, displacing other crops. This expansion has also mostly occurred within irrigation schemes or within consented mixed farming activities.
54. Given the majority of the expansion has occurred in root vegetable rotations (onions and potatoes), these rotations have a comparable leaching rate to other land uses (as noted in Mr Ford's evidence). Therefore, it is very likely that the effect of this expansion in crop area has been neutral for nitrogen load, and has had less than minor impact on the total commercial vegetable rotation area.

Change in growers and area since baseline

55. The NZGAP data provides an indication of the rate of change in growers. The graph below illustrates an overall increase in growers. The increase in grower numbers, is not necessarily attributable to an increase in the CVP area. This is because it may likely reflect a greater proportion of growers becoming certified as the scheme has now been adopted by MPI for Food Act auditing purposes (see the evidence of Mr Farrelly).

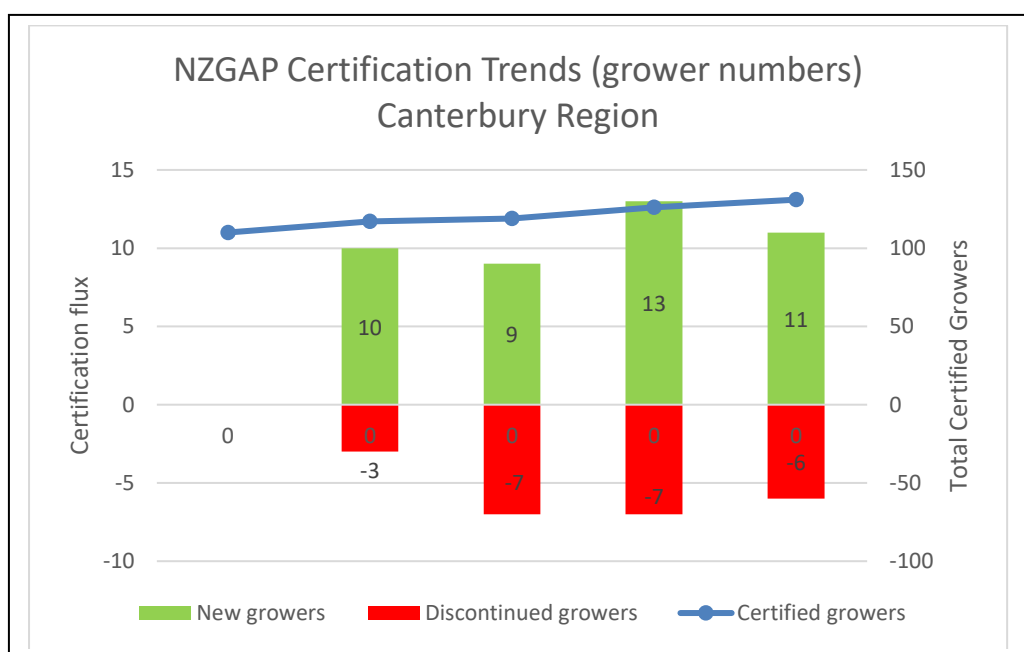


Figure 1: NZGAP certification trends in Canterbury

56. The graph in Figure 1 illustrates that every year a number of growers have ceased growing. The data also indicates that the area of growing has not decreased, and may have increased a small amount.
57. It is uncommon for new or expanding operations to buy land from previous growers. The NZGAP data indicates that 328 ha of land has been de-certified. However, this has been more than replaced by new certified areas. If the baseline date is not changed, these new growers that have replaced exited growers will not be able to access the grand-parented nutrient load modelled in the plan. The proposed provisions will more than likely make this change in area for new intensive and green vegetable growers prohibited.

Crop rotations and Markets

58. As outlined in the evidence of Mr Ford, a broad range of crops are grown in Canterbury. The dominant rotation is root

vegetables at approximately 79%, with the remaining 21% being green and intensive vegetable rotations.

59. Most of the rotations include crops for domestic markets. The green and intensive rotations are likely to include a high proportion of vegetables from domestic markets. Almost all green vegetables grown in NZ are grown for domestic supply.
60. As outlined in the evidence of Mr Ford, the root vegetable rotations include onions and process potatoes for export. Process vegetables are also often grown within arable rotations.

Opportunities for Expansion - Domestic Markets

61. Due to New Zealand's physical isolation, we are dependent on growing our own fresh vegetables. Imported vegetables are limited to frozen and canned vegetables, with a limited range of high value vegetables that are air-freighted. The potential for expansion is linked to domestic population growth, and is therefore modest.
62. To meet the demand caused by the expected population growth in the Canterbury region, an additional 2,000ha (approximately) of land for vegetable growing in Canterbury will be needed from the 2013 baseline. However, if the baseline date is shifted to 2019 as requested, then the expansion would be 1000ha to meet population demand to 2030.
63. Mr Nation's evidence demonstrates that the small amount of expansion of the higher intensity rotations that serve the domestic markets can occur with minimal increases in water nitrogen load.
64. Overly constraining activities that have minimal environmental impact would be to the detriment of human health⁷ with no environmental benefit.

Opportunities for expansion - Export Markets

65. Ms Goodfellow discusses the need to enable horticulture to meet market challenges and opportunities, and the flow on

⁷ Ministry of Health data indicates that the number of people in New Zealand meeting the recommended intake for vegetables declined by 23% between 2012 and 2018.

social and economic effect this can have to our people and local economy.

66. Expansion for export crops can occur largely within the water quality limits through the irrigation scheme and mixed farming consenting pathways.

LOW INTENSITY HORTICULTURE

67. Fruit growing has a low environmental impact as water is only used in dry times to ensure a harvest crop. In addition, minimal fertiliser is used. Please refer to Case Study 5 – Peelview (**Appendix 5**). HortNZ do not consider it either effective or efficient to require fruit growers to go through costly consenting processes when they do not have the environmental impacts on water that other farming activities have.
68. However, the planning evidence of Mr Hodgson explains how the CLWRP can provide for low intensity horticulture and therefore, HortNZ is therefore satisfied that this has been adequately addressed at this point in time.

ROOTSTOCK AND CROP SURVIVAL WATER

69. The HortNZ submission sought provision for rootstock and crop survival water in the Waimakariri and Orari-Temuka-Opihi-Pareora (**OTOP**) zones.
70. The provision of rootstock and crop survival water is very important for the horticulture growers because of the inability to move the crops in times of drought or provide an external food source to maintain farm viability.
71. HortNZ supports an environmental flow regime that includes a minimum flow, an allocation limit and partial restrictions. HortNZ sought that the environmental flow regime provides a water allocation priority in times of restriction for root stock protection and crops for human consumption, similar to the priority given to stock water.
72. While HortNZ are of the view that the provision of rootstock and crop survival water is important to our industry, we are now of the opinion that this is a whole of plan issue that would be difficult to incorporate into just the Waimakariri and OTOZ zones.
73. HortNZ have provided the evidence of Mr Scherberg to demonstrate that the environmental impacts of providing for

rootstock survival water are minimal and we believe that it should be considered through s329 restrictions in times of drought.

74. HortNZ would like to work with ECan on a future plan change/plan review to appropriately incorporate appropriate rootstock and crop survival water into the CLWRP.

AUDITED FARM ENVIRONMENT PLANS

75. HortNZ strongly supports audited farm environment plans (**FEP**) and industry led initiatives to improve practice and achieve environmental outcomes.
76. We are proud that our industry audit scheme – NZGAP is accredited under the CLWRP.
77. As outlined in the evidence of Mr Farrelly, both GLOBAL.GAP and NZGAP operate under the Joint Accreditation System of Australia and New Zealand auditing and assurance framework, which is accountable to the Minister of Commerce and Consumer Affairs.
78. The horticulture industry has recently developed an Environmental Management System (**EMS**) module for NZGAP, to meet both market and regulatory environmental requirement, including ECan CLWRP requirements.
79. Growers support the NZGAP process, because they are already operating under this process and it creates national consistency in environmental standards.

Good management practice and minimum standards

80. The horticulture industry has developed codes of practice that outline good management practices and best management practices for:
- (a) erosion and sediment control;
 - (b) nutrient management; and
 - (c) vegetable wash water
81. The codes of practice are underpinned by research that has been jointly funded by the government and the horticulture industry. This is discussed further by Mr Barber in his evidence.

82. Relevant industry codes of practice are identified in an FEP and compliance (or actions towards compliance) processes. These codes of practice are required to be demonstrated to pass the NZGAP EMS audit. This is discussed further by Mr Farrelly in his evidence.

Nutrient budgets

83. We are pleased that the s42A report⁸ acknowledges the limitations of Overseer as a nutrient budgeting tool for CVP and the complications this will have for consenting. We support the Officers' recommendation to provide a more flexible approach for commercial vegetable growers to determine how they will demonstrate their nutrient losses.
84. The Officers' recommended approach suggests alterations to Policy 4.36A, and Rules 5.42CB and 5.42CC to require a FEP to be prepared in accordance with Part A of Schedule 7, with the exemption of a nutrient budget. However, the exercise of discretion still requires the resource consent application to demonstrate how any nutrient loss reduction and nutrient targets required by the CLWRP will be achieved.
85. Alternative methods for such calculations are discussed in the evidence of Mr Farrelly, Mr Barber and Mr Ford. We are confident that appropriate and robust methods exist to replace Overseer for such assessments for CVP.

IMPLEMENTATION – PROVISIONS THAT DRIVE BETTER OUTCOMES

86. Developing workable regulations for CVP has proven difficult for regional councils in recent years, to the point that in some regions CVP cannot be consented – this includes Canterbury for some types of CVP. It is critically important that PC7 get this right and does not perpetuate the issues.

Implementation challenges

87. The implementation challenges have been outlined by Mr Hodgson in his evidence as follows:
- (a) Fails to provide clarity as to what is and what is not Commercial Vegetable Production.

⁸ S42A report, para's 8.119 – 8.124

- (b) Does not equitably provide a permitted activity status for Commercial Vegetable Production in Canterbury compared to other Farming Activities.
 - (c) Does not acknowledge the fundamental inefficiencies and ineffectiveness of OVERSEER and Farm Portal as tools for calculating N Budgets for Commercial Vegetable Production.
 - (d) Provides no clarity as to the evidence required to demonstrate a Commercial Vegetable Baseline Growing Area and fails to acknowledge that the baseline area is linked to a historic period in time that growers will not legally be required to hold records from 2020.
 - (e) Does not adequately consider the growth in Commercial Vegetable Growing in Canterbury since the baseline period (2009-2013).
 - (f) Does not adequately provide for Commercial Vegetable Production to meet the vegetable consumption demands of a growing population, and indeed prohibits this.
 - (g) Is inconsistent with recent government essential freshwater policy announcements, in particular the newly proposed provisions for Commercial Vegetable Production within the proposed National Environmental Standard for Freshwater Management.
88. The CVP policy framework proposed by HortNZ seeks to maintain people's access to healthy vegetables, while achieving improvements in water quality through the life of the plan.
89. The primary focus of our changes has been to ensure that those CVP activities that have not been able to get consent, can now obtain consent, either as and restrict discretionary activity, or failing that a discretionary activity. The worst case scenario would be a non-complying if nitrogen loss rates cannot be meet.
90. The provisions also ensure a sustainable horticultural industry in Canterbury for the future, and provide opportunities for innovation.

91. Mr Hodgson has provided suggested amendments to provisions in his evidence to address these identified challenges.

CONCLUSIONS AND RECOMENDATIONS

92. HortNZ supports the inclusion of a bespoke regulatory framework for CVP, but seeks greater clarity and equity in the provisions.
93. HortNZ supports three pathways for consenting CVP namely:
- (a) in an irrigation scheme;
 - (b) in a mixed farming system;
 - (c) as a stand-alone activity.
94. We are of the view that the recommendation's in the officers' s42A report go part way to addressing the concerns of our submissions. There are a number of issues still to resolve. Recommended changes to address our concerns are included in Appendix 1 of Mr Hodgson's evidence.

Rachel Sarah McClung

17 July 2020

APPENDIX 1 – CASE STUDY 1: SCOTTFRESH

Name: Scottfresh

Years in operation: 40

Location: Numerous sites throughout Canterbury including;

- 486 Conway Flat Road, Claverley Road,
- 592 Down Roads, Spotswood and
- Gillanders Road, Greendale.

Scottfresh Formally operated at Walters Road, Marshland and North Rakaia Road, Southbridge.

Water Zone: Currently, Hurunui Zone and Kaikoura Zone. Historically, Christchurch West Melton Zone and Selwyn Waihora Zone.

Area (ha): 157 hectares

Ownership (owned, leased or shared): Mix of owned and leased.

Crops grown: fresh vegetables; including iceberg lettuce, broccoli baby leaf salad crops.

Important requirements to be able to continue production:

- Ability to rotate land to avoid soil borne disease.
- Recognition of business growth in the past 10 years.
- Recognition that commercial vegetable production occurs in multiple water zone and sub regions and enabling movement for CVP between these.
- Reliable access to water.

Impacts of PC7:

Plan Change 7 will have a significant effect on our business, as during the base years we operated in the Selwyn Waihora Zone and have now moved to the Hurunui and Kaikoura Zones.

Canterbury is an area of limited coastal micro-climates. Historically the people of Canterbury have relied on produce being trucked in from other regions during the winter months. However, in the last five years growers such as ourselves have moved our operations into area with micro-climates to produce year-round. This is a reality of domestic food security.

Limiting our ability to freely move between sub-regions does not allow us to continue to operate without going through a risky and expensive process.

Despite moving to an area with significantly less nitrate loading, we are not able to use our 2009 – 13 baseline years, something that will have a detrimental effect both on the environment, the people who work within our business and for security of locally grown fresh vegetables in Canterbury.

Ben Scott

Owner, Scottfresh

APPENDIX 2 – CASE STUDY 2: HEWSON FARMS (NZ) LTD

Name: Hewson Farms (NZ) LTD

Years in operation: 40 years farming & 21 years at current location

Location: Numerous sites throughout mid Canterbury including;

- Chertsey
- Newlands
- Rokeby
- Dromore
- Barrhill
- Lauriston
- Tinwald

Water Zone: Currently Chertsey / Barrhill & Pendarves Newlands

Area (ha): 1780ha owned 200ha leased

Ownership (owned, leased or shared): Owned / leased

Crops Grown: Potatoes, carrot seed, onions, beetroot, wheat, grass seed, white clover, hemp, peas, lentils, barley, triticale, kale seed, rape seed, oats, chicory, plantain, spinach, phacelia, turnips, radish, linseed, cabbage, broccoli, beans, red clover.

Important requirements to be able to continue production:

To continue production, our operation needs the following to be considered in the PC7 commercial vegetable growing operation rules:

- Recognition of the direct and significant economic benefits to the grower to utilise fertiliser and irrigation as efficiently as possible.
- Acknowledgement of the inefficiencies of requiring commercial vegetable production to obtain consent for an activity already permitted through the irrigation scheme and/or individual farming consents.
- Ability to rotate land to enable healthy crop areas are available annually to avoid soil borne disease and pests and provide the healthiest medium to grow our crops.
- Recognition of sustainable business growth in the past 7 years.
- Recognition that commercial vegetable production occurs in multiple water zones and sub regions and enabling movement between these.
- Reliable access to water.
- Recognition that best practice and beyond is an ongoing science. Plant breeding, genetic development and mechanical advancement will improve environmental effects from farming activities

Impacts of PC7:

Plan Change 7 will have a significant effect on our business. Limiting our ability to freely move between sub-regions and leases will reduce the land available and likely reduce our ability to maintain quality or introduce significant annual costs. Water quality and soil testing we have completed over the past 20 years shows we are reducing inputs into the environment, despite significant growth in production.

Canterbury is an area of varied coastal micro-climates. Mid Canterbury has an excellent Mediterranean climate for growing our vegetable crops, with sunshine, heat and rainfall all contributing to this. Access to irrigation along with the local soils are crucial to meeting our customers' quality and yield requirements.

Our ability to have a varied cropping rotation, integrated with livestock grazing is unique and sets us apart from the rest of the world. We typically have a crop rotation designed to optimise nutrients, protect the soil and minimise the need for agrichemical sprays. For example, potatoes and onions are typically followed by oats to mop up residual nitrogen, followed by wheat. Low residual nitrogen is essential to maximise the control we have over the quality of our product.

The importance of a good cropping rotation cannot be understated and estimated. Some benefits include;

- Risk management;
- Better utilization of soil nitrogen;
- Improved soil structure/organic matter and biology;
- Ability to use different a large of chemical groups with different modes action, which helps avoid chemical resistance and overuse;
- Enables us to produce good quality products;
- Short rotation increases soil borne diseases/pests which in turn reduces quality along with yields and opportunity; and
- Use of Mulching crop residues to enhance organic matter and biodiversity in our soils

The "Quality" component is mostly derived from understanding crop/plant nutritional requirements which requires us to measure what is available in the soil profile, then meeting these plant demands for nutrition as required during those critical periods of the plant growth cycle, deficiencies or over supply mean quality & shelf life is compromised and our products are unsuitable to enter the food chain.

Through GlobalGAP and BCI FEP Audits, Hewson Farms has consistently demonstrated implementation of Good Management Practice or better by achieving "A" grades.

Hewson Farms uses a range of technology to aid us growing crops. We are often early adopters of technology where we can see a benefit to making our business more efficient in some cases. We are often working alongside the people developing the technology and helping them with development of what we require to achieve the best result.

As an example, we partnered with Crop and Food in 2001 to assist with the development of the Potato Calculator, a tool developed to effectively match fertiliser and water requirements to minimise loss and maximise yield. They found that excessive fertiliser and irrigation can reduce potato yields and decrease shelf life⁹, so we invest in technology to manage these inputs as best as we can.

Some of the technology we use includes:

- Field net control for irrigation. Ability to remotely, precisely monitor & control irrigation, (i.e. stop them when significant rain arrives), alerts us of any issues.
- Yield maps produced from combine harvester and potato harvesters which assist with agronomy decisions.
- GPS technology on fertilizer spreader so unable to spread wrong area/paddock/crop. Minimize overlaps.
- Trimble Farmer Pro record keeping which keeps everyone involved in business including agronomists up to date in real time, while providing accurate record keeping of all tasks such as fertilizer, spraying, irrigation, cultivation, harvesting.
- Soil moisture monitoring that is web based & able to view on mobile devices to make sound informed irrigation decisions
- Weekly Satellite images through Trimble and Reason which we can use to assess crop health, and any areas paddocks that may be under/over watered or fertilized.
- Soil nitrogen testing before we start nitrogen applications to determine what is available in ground before we apply any seasonal nitrogen requirements for a crop. We then calculate requirements for each individual crop using this information.
- Low ground pressure tracks on cultivation tractors/harvesters to assist with compaction and look after soil structure, a vital requirement for the healthy passage of water and nutrients to move freely through the soil profile.
- Crop Leaf tissue testing in season for monitoring the level of nutrition within the plant meets known plant demand curve, this helps to minimize deficiencies or excesses.

⁹ Jamieson, P.D., Zyskowski, R.F., Sinton, S.M., "The Potato Calculator in Canterbury", Crop and Food Research Report No. 1443 (July 2005)

Implementation of these technologies means we can produce more crop using less inputs and deliver on the quality expectations of our customers.

Despite moving to an area with light soils in 2000, our requirement under GlobalGAP to test our water supplies annually reveals a small decrease for nitrates over 20 years (4.2 mg/l - 2.26 mg/l) against NZ drinking water standards of 11.3mg/l.

We believe Overseer simply does not accurately represent our wide range of crops grown or represent the nitrogen losses from our system into the environment.

Often these crops are not able to be entered into overseer and a substitute is picked instead. We have noted that our nitrogen loss over the years has fluctuated as overseer versions have changed and seems to significantly overestimate losses from process crops, such as potatoes and onions.

Overseer has onions leaching more nitrogen than we apply, this is not supported by soil tests post-harvest (see above) as we usually have to apply nitrogen to produce an oat crop that is planted and explicitly designed to mop up any surplus nitrogen from the field.

Over the last 30 years we have seen and recorded major changes and advancements for crop performance eg wheat, ryegrass and potato crops have all recorded significant changes in crop monitoring agronomy, timing, application rate of nitrogen and yield.

Ryegrass used to receive nitrogen application rate of 250 – 350kg N/ha with average yields of 1100-1500kg/ha, today N rates are 150 – 180kg N/ha with average yields of 2500- 2900kg/ha. Wheat is similar but with application rates of N being similar at 200 – 300kg/ha, but a better understanding of agronomic monitoring of crop demand and timing has seen average yields lift from 5-6t/ha to 12-13t/ha and even higher as we have seen this year (Figure 1).

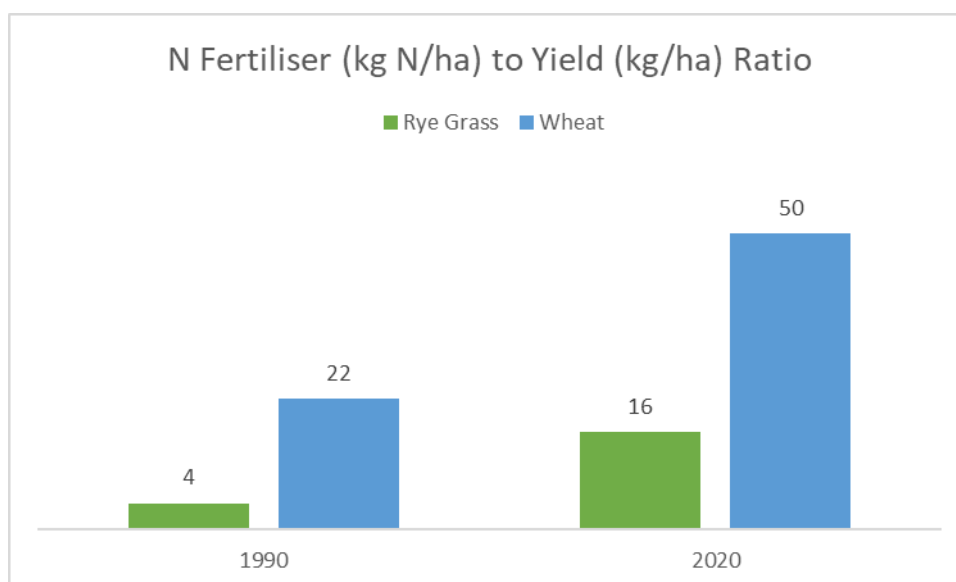


Figure 1: Nitrogen Fertiliser to Yield ratios 1990-2020

Similar performance of effective use of nutrients especially nitrogen have been recorded in our potato crops. The use of Deep N testing for residual nitrogen postharvest and using well proven crop demand requirements to grow our crops has not only improved crop performance and yields but led to consistently lower residual nitrogen in our fields often requiring nitrogen to be added to aid crop mulch residue breakdown.

As a shareholder of BCI, we are required to complete Overseer nutrient budgets annually. These cost us approximately \$10,000 each year and the variability we have seen in the model means we are not confident to adjust our management practices based on the outputs. For example, the year end 2017 nutrient losses were 32kg N/ha on version 6.2.3. Then year end 2018 went to 65kg N/ha on version 6.3.3, while essentially having same farm practice/rotation. Within the block, Overseer estimated N losses on the individual properties within the rotation to be between 15 kg N/ha and 67 kg N/ha.

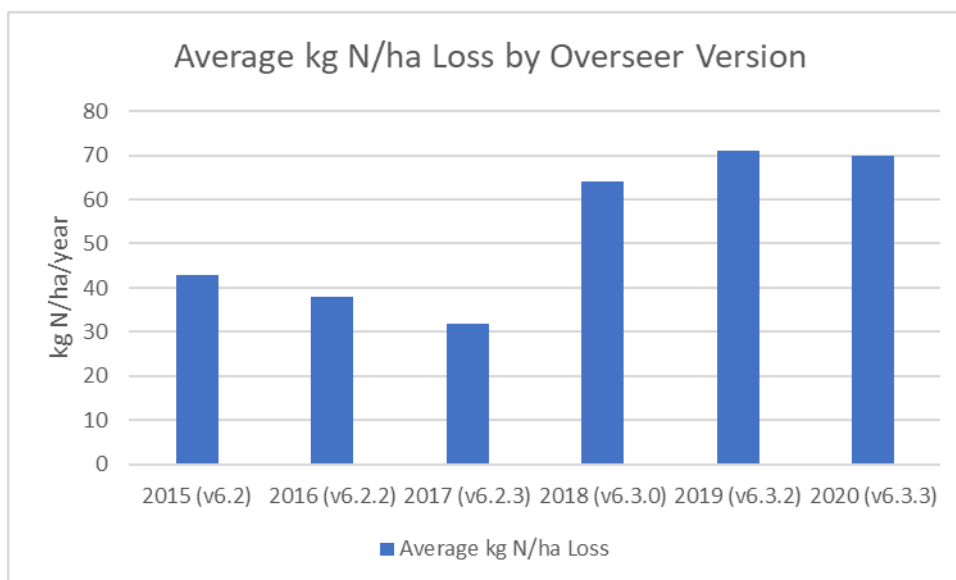


Figure 2: Overseer Nitrogen Loss Calculations 2015-2020

The time and costs required to prepare an Overseer nutrient budget on new lease blocks is prohibitive, and we are not confident this information will result in improvements in water quality.

We do know, however, that best practise for growing crops can meet environmental expectations. We need the PC7 rules framework to allow our business to operate viably, which is vitally important for security of locally grown fresh vegetables in Canterbury along with NZ exports that secure and sustain food and employment for people in our communities and cities to live.

Ross Stewart Hewson

Farm Owner

Hewson farms (NZ) LTD

APPENDIX 3 – CASE STUDY 3: LOVETT FAMILY FARMS LTD

Name: Lovett Family Farms Ltd

Years in operation: 40 Plus

Location: Numerous sites throughout Canterbury including;

We operate (own and lease) between the Ashburton River and the Rakaia River. We also operate in the area from the ocean to Methven. But we may have to go over the rivers in the future to get access to available land for our business. We have always operated in that zone, but we have increased our operations size over the last 40 years.

Water Zone: All water zones applicable to the above area.

Area (ha): 1200 ha

Ownership (owned, leased or shared): We own 1000ha's and lease 200ha's.

Crops grown: Potatoes, onions, carrots, beetroot, blackcurrants, wheat, barley, grass seed, clover, radish seed, spinach seed, maize, grass silage, peas, lucerne, hemp, broccoli, linseed, pasture for stock and up to 10 other crops depending on market demand and contracts secured.

Important requirements to be able to continue production:

- Acknowledgement of the inefficiency in requiring commercial vegetable producers (**CVP**) to apply for consent when commercial vegetable production is already consented as a farming activity.
- Enabling CVPs to rotate land to avoid soil borne disease.
- Recognition of business growth in the past 40 years.
- Recognition that commercial vegetable production occurs in multiple water zones and sub regions and enabling movement for CVPs between these.
- Providing for reliable access to water.
- Recognition that commercial vegetable production growth is sustainably managed through the GlobalGAP certification programme.

Impacts of PC7:

We are continuously moving our production area around. This is a factor of consumer demand, weather, soil borne diseases, and farmers willing to lease land. We cannot do everything want we want to do on our own land as we need a large rotation to be able give the soil a break and not destroy its natural properties.

The excess use of nitrogen in horticultural practises is self-regulating as if you ask anyone trying to store vegetables they will not want to have excess nitrogen in the plant as it will decay in store or transit very fast. For instance, we are wanting to see our onion leaf turn yellow in the centre of the row so we know that the plant has used all the nitrogen up and there is no excess left in the soil.

We are soil and plant testing the crop every 7-10 days to monitor the crop health. If we get it wrong it will cost us up to \$20,000/ha in lost revenue let alone the cost of dumping or returning the crop if they arrive in poor condition on the other side of the world.

We are already going through an annual two day audit (GlobalGAP) which is a stringent ISO-accredited process done independently and audited globally. The market has demanded we need this certification or else we do not have access to the customer. There is no point in doubling up on clip boards.

The Global Gab looks at our business from the outside. It is a worldwide regulatory system that is tackling more than just nitrogen and water use. It looks at how our chemicals are stored, whether all of our farms and lease land is accredited, fuel and oil storage, health and safety across the farm and pack house, residue tests and results on produce, vermin trapping, stock health and welfare, staff training, staff welfare, consents, record keeping, etc.

Daniel Lovett

Joint Owner of Lovett Family Farms Ltd

APPENDIX 4 – CASE STUDY 4: PYE PRODUCE LTD

Name: Pye Produce Ltd - Berry Farm, Te Ra, Whenua, Malcoms, Ironsides

Years in operation: 20

Location: Numerous sites throughout Canterbury including;

- Dorie
- Pendarves

Water Zone: Ashburton District

Area (ha): 1500 hectares

Ownership (owned, leased or shared): Owned

Crops grown: Potatoes, Onions, Cereals (wheat, barley & rye), Grass Seed, Small Seeds, vegetable seeds, lamb finishing

Important requirements to be able to continue production:

- Acknowledgement of existing consents in inefficiency in requiring commercial vegetable consent for activity that is already consented as a farming activity.
- Ability to rotate land to avoid soil borne disease.
- Recognition of business growth in the past 5 years.
- Recognition that commercial vegetable production occurs in multiple water zone and sub regions and enabling movement for CVP between these.
- Reliable access to water.
- Where Canterbury arable production has come from is actually a good news story
- Cropping rotation is the key to the historical success of arable systems and is essential for the system to continue at a high level
- Rigid non-flexible categorization is not workable nor reflect the complexity of the system

Impacts of PC7:

The Canterbury arable farming system is based around a cropping rotation that is the envy of many overseas systems. It is not a monoculture but a system based on inputs and outcomes overlapping as they interact with each other. Locking in crops as blocks does not suit the flexibility that a complex arable – grazing system requires and the farm also needs the ability to adapt to future opportunities and changes. This is one reason why Overseer has failed in being outcome based in a blockchain methodology when it is a multifaceted dynamic system.

There is also significant progress being made in crop production, even without overreaching legislation being imposed on growers. One of many advances in production example of this is that Pye Produce supply McCain Foods with potatoes for processing into Food products. The backstay of McCain supply 20 years ago was the potato variety Russet Burbank originating from the USA. The table below is stylised example showing the potential gains with potentially changing varieties, and the direct effect this has to improving outcomes for the grower but also better environmental footprint.

VARIETY	YIELD (MT PER HA)	NITROGEN (KG PER HA N APPLIED)	STATUS
RUSSET BURBANK	60	350	Declining in area
INNOVATOR	65	300	Maintaining
CROP60 (NZ VARIETY)	70	200	Increasing potential
UNKNOWN	75	150	Being developed*

*it is assumed breeders will continue to make new genetic discoveries

This is a great example of getting more food production, off less area with genetics and better crop management and importantly having flexibility in crop rotation. This direction is being pursued by global companies such as McCain, McDonalds and Pepsico to name a few all that have their own global environmental/sustainability goals and projects to ensure that they are being responsible global companies.

At a crop production Pye Produce uses soil testing before all crops, and with potatoes take in-season Petiole testing to manage nutrient input into the potato crop. There is the use of soil nitrogen testing when the status of the soil nitrogen levels cannot be accurately estimated, this greatly assists the management of cereal and grass seed production.

There has also been advancement and changes in production have been achieved in Onion production, ryegrass for seed production and wheat growing where cropping input and management have significantly changed in 20 years.

Dean Pye

Farm Owner

Pye Produce Limited

APPENDIX 5 – CASE STUDY 5: PEELVIEW

Name: Peelview Orchard

Years in operation: Peelview Orchard was established as a commercial orchard in the late 1920s. The 2020 crop was the current owners' twenty-fifth crop.

Location: 20 Bennett Road, Geraldine

Water Zone: OTOP Zone

Area (ha): 8.79 hectares

Ownership: Owned in partnership by DA and SE Payne trading as Peelview Orchard.

Crops grown: Apple and Pears, and occasionally small-scale vegetables/arable (e.g. radish seed or other crops as opportunities present).

Important requirements to be able to continue production:

- Recognition of low impact of fruit growing.
- Higher permitted activity threshold for CVP.
- Maintain consented water allocation.

Impacts of PC7:

Part A

1. Fruit growing is quite different from other farming activities. There must be a clear distinction, within the Canterbury Land and Water Plan, between fruit growing, where excess vegetative growth is undesirable, and other farming activities which are trying to maximise the amount of grass or other crop grown. These crops of-course require higher inputs of fertiliser and water.

Fruit growing has a low environmental risk and should be provided for as a low intensity farming activity (such as proposed in the Waikato) and be enabled to operate and expand without excessive limitations.

2. The minimum property size of 0.5 hectares as a permitted activity under Rule 5.42CA of PC7 is a nonsense. For a property of our size it would prevent us considering other crops to assist with the economic viability of our operation which is at all times marginal.

One year we grew 1.5 hectares of high-value hybrid radish for seed. Being required to get a consent for this would make this less economic and with only two of us the time required could be better spent. A

business of our size does not have the economic capacity to out-source work such as this to consultants.

In addition, I note that as we don't have a 'baseline commercial vegetable growing area', if we can't prove our nitrogen loss rate it would be a prohibited activity for us to grow more than 0.5 hectares of vegetables. The minimum property size requirement (as the associated rule framework stipulates) does not promote the protection of land for vegetable growing.

Part B – Allocation and Water Quality Limits

In general terms, fruit growing is a limited user of water. However, its use at some stages in the crop's life-cycle is critical. In high-rainfall years fruit growers may not use any water at all. In drier seasons, which climate change models suggest will be more frequent on the East Coast, under established best-practice we operate a deficit irrigation strategy. This requires that we deliver a managed amount of water, via drip irrigators to the root zone of each established tree to maintain the tree above wilt point. Without this the tree and its fruit carrying capacity will suffer distress.

Under the framework proposed within this plan change as it relates to OTOP, we are concerned that our lack of use of water in high-rainfall years could be seen as an opportunity to reduce our already minimal water allocation, causing us problems in dry years.

This would be inequitable as other users would probably have earned about 80% of their annual income when seasonal restrictions are likely to be applied. In comparison, we fruit growers would have earned nothing and would need water to carry our crop to harvest in the period starting late February and ending in mid-May.

Conclusion:

Our property is subject to Timaru District Council rules on subdivision. By these district council rules we can't subdivide. By the proposed regional council rules, we can't grow vegetables. So, we are forced to keep growing fruit, which isn't getting any easier for those of us who are small, owner-operated businesses, not large corporate or syndicated operations which are generally export focussed and have the economies of scale to do so.

On a property of our size we need to be constantly re-inventing ourselves to stay viable and the on-going imposition of new rules will make it less likely that owners of small blocks will stay productive.

We need to be able to grow fruit and vegetables to feed people healthy food. When supply does not meet demand, prices will rise and

the most vulnerable people in our communities will be the first to miss out.

It is important that small growers like us have the flexibility to grow crops to meet local demands.

DA Payne

Partner

Peelview Orchard