

Verbal Submission to the Canterbury Regional Council,

Hinds Plains, Variation 2, Canterbury Land and Water Plan.

By David Clark, on behalf of the Hinds Land and Water Partnership.

1. My name is David Clark, along with my wife and parents I own and operate a 463ha mixed arable and livestock farming business at Valetta.
2. I have recently finished 6 years as the Grain and Seed Section Chairman of Mid Canterbury Federated Farmers and 7 years on the Grain and Seed National Executive of Federated Farmers including 4 as Vice Chairman.
3. Our farming business grows 380ha of summer harvested arable crops and 150ha of green feed crops; our livestock enterprise carries 1,000 breeding ewes, 300 replacement hoggets and this year will fatten 8,000 lambs.
4. The arable rotation is a dynamic farming model that must be agile in responding to the vagaries of domestic and international markets in order to remain economically viable. While every year our business operations remain within the scope of previous years, the makeup of that rotation may change due to in availability of particular crops or seed multiplication opportunities; or climatic changes increasing or decreasing the amount of winter feed available for grazing, whether that be winter or summer grazing for finishing of lambs or running other livestock types. Without that flexibility, our business would be locked into growing the crops that happen to be sought after in the market at this particular point in time.
5. In operating our farming business we fully understand that we have a responsibility to minimise our environmental footprint and as we are an intergenerational family business we are keenly aware that to achieve our long term family succession goals we must ensure that our natural resources are in better order for future generations than they are today, whilst of course maintaining present day profitability. We cannot meet any future aspirations of any type if we do not operate a profitable business.
6. Some of the steps that we have taken to improve the stewardship of our property include the planting of shelter trees along each boundary, laneway and around the perimeter of each pivot; incorporating all crop residues other than ryegrass straw which is baled and feed to stock, so to increase our soil organic matter levels; no stubble burning, so to reduce nutrient loss; the use of a modern fertiliser spreader with a very accurate boundary spread limiting system; use of GPS Auto steer for all in-field operations with a repeatable accuracy of 2cm; soil testing of 1/3 of the farm every year and tailored fertiliser applications; yield mapping on the combine harvester so that we can analyse yield variances; the planning of a balanced crop rotation to ensure a balance of depletive and restorative crops. In my opinion we are investing significant times, resources and planning to improve our environmental performance.
7. During 2010 and 2011 our farm underwent significant irrigation redevelopment. We had realised that the Rotorainers that we had installed in 1998, 1999 and 2002 were not as efficient in either resources or production capacity as Centre Pivots. This re-development cost us in the order of \$1 million and has resulted in a 30% increase in farm production with ^{but} increasing total water usage or nitrogen applications. We were able to undertake this development and realise these environmental gains because we operated a profitable business *and* because it was profitable to do so.
8. Working within an inflexible regulatory regime may have precluded these environmental and economic gains. Indeed, we may well yet be penalised for this work because our development came into production during the latter two of our *Baseline* years of 2009-2013, so we will be locked into an average of these years, whereas had we built a cowshed as part of this irrigation re-development we would have been able to choose the highest of those years as our *Baseline*.

Overseer for Valetta Farms Ltd & Valetta Holdings Ltd.

9. In May 2014 we completed an Overseer Nutrient Budget for both the 2014 year and also established our Baseline for the 2009-2013 years.
10. For the purposes of Overseer Baseline and the LWRP our property consists of
 - 2 Separate Nutrient Zones – Hinds Plains and Ashburton River
 - 9 Soil types
 - 19 different crop types
 - Irrigated and Dryland pasture
 - 3 different types of irrigation
 - 3 Classes of livestock - Grazed on-farm and on up to 3 other properties on a casual basis.
 - 40 individual fields bunched into 29 Overseer “blocks”.
11. This farming business is typical of many in our district and is not unusual in either its size or complexity.
12. We hold very comprehensive data for the Baseline years of 2009-2013 including exact timings and quantities of all fertiliser applications, total water usage, stock numbers including grazing on and off farm dates, inward and outward livestock weights and exact weights of every arable crop produced over this time period. This was a significant quantity of accurate data.
13. During the process of inputting the data I was clearly advised that Overseer could not process this level of detail. The process we then followed was to make some generalisations as to what constituted a typical rotation and then make broad assumptions as to what were normal or average inputs into each particular crop. For production data, long term average crop yields were used for calculations along with average, typical stock purchase and sale weights and days “on-farm” for each calendar month. Long term average weather data and standardised irrigation volumes were automatically included.
14. I was very surprised how we had taken very detailed records and made sweeping assumptions and averaging to provide a data set that may have given an indication as to the potential Nutrient Loss for our farming operation, but it certainly did not reflect that particular production year.
15. For our baseline we did not model each of the four years individually, rather assumed that the model itself represented an average of the four years.
16. I understand that the inputs had to be modified four times to get a data set that was stable enough for Overseer to produce a calculated result. I do not believe the inputted data could have been reconciled against my fertiliser purchases or stock sales and crop production had the model been audited.
17. The file of our Overseer model run for one year is 137 pages.
18. As I have detailed, we made broad assumptions as to the inputs and outputs of our farming business, however the model produced a very specific numerical result. 36kg of Nitrogen leached per hectare. A very specific number that then takes great importance in a Regulatory Regime that does not allow for flexibility or seasonal variation.
19. That result of 36kg/ha was the weighted average of individual paddocks ranging from 10kg/ha to 141kg/ha, which in turn are the result of an averaged data set.
20. The intent of Overseer may well be very good as a management tool, but in my opinion, it is a bit like a sausage machine, the finished product doesn't bear much resemblance to the individual ingredients.

Seasonal Variation of Winterfeed and the practical application of Overseer.

21. Our business has to react to the seasonal vagaries of the weather. In 2014 we were badly affected by wet harvesting conditions resulting in delay harvest and planting of following winter feed crops. As an example we sowed 26ha of green feed oats in one particular field. This is 5.6% of our total farmed area. The yield was approximately 2,000kgDM/ha resulting in 1,333 lamb grazing days based on a feeding level of 1.5kgDM/head/day.
22. This year we had perfect harvesting conditions and were able to plant our green feed crops 3 weeks earlier. A similar 26ha field, a neighbouring quarter under the same centre pivot was planted in green feed oats. The same quantity of fertiliser was applied and timely autumn rains meant the no irrigation was required just as was the case for the 2014 crop. This field yielded approximately 5,000kgDM/ha, achieving a feeding result of 3,333 lamb grazing days based on the same feed intake.
23. There was no difference in inputs across these two years, but vastly different production outcomes. This was repeated across 80ha of Oats on our property this season.

Dynamics of markets affecting crop rotation.

24. A third 26ha field under the same centre pivot was planned to have a crop of autumn sown Feed Barley planted following the harvesting of a winter sown Milling Wheat crop. During the April 2015 the market prospects for Feed Barley has diminished with the reducing profitability of Dairying. Whereas the fall in the Euro/NZD exchange rate has increased the contract price indications for Borage, a seed crop exported to the Netherlands. Dry conditions had also increased the demand for winter feed so a decision was made to abandon the Feed Barley crop and instead plant a green feed Oat crop for feeding in September to be followed by a Borage crop to be planted into a stale seed bed in November.
25. That is the dynamics of our markets that require flexibility in the arable farm system.

How do those dynamics and seasonal variability's interact with Overseer and the LWRP?

26. Let's say our farming business is operating at its Baseline discharge levels across a four year rolling average.
27. How do I as a farmer working a dynamic, evolving farming system reconcile these variations with my obligations under the LWRP? Would I be able to feed the green feed Oat to its full yield potential and capitalise of the potential of two and a half times as many grazing days that were a result of extra heat unit days due to earlier planting and achieved with no additional fertiliser or irrigation inputs? Or would we have to spray off and cultivate in that additional dry matter production? Arguably the higher yield crop was more resource efficient.
28. If the Nutrient Discharge assumed by Overseer was 25kgN/ha higher over those 80ha of Oats, our total farm discharge may have increased by 4kgN/ha. On a four year rolling average, already operating at our ceiling of 36kgN/ha, our four year average would have increased by 1kgN/ha thus leaving us in breach of the LWRP.
29. Could I as a farmer react to market signals and make a subtle change of deciding not to grow Feed Barley that will struggle to find a market and instead growing green feed Oats and Borage that will find a ready purchaser, or would I be constrained by the assumptions of the Algorithms of a computer model?
30. In a practical sense, do I run an Overseer model of my business at the end of every season to assess my historic discharges, or am I required to use Overseer to assess my discharge levels of my intended farm program at the beginning of each farming year and then validate every farming decision with a complete re-run of Overseer numerous times throughout the season to ensure that any decision taken will not result in my Overseer result breaching the LWRP?
31. In short, am I better to ask permission, or seek forgiveness?

Overseer Modelling for the Arable Farm System

32. The Foundation for Arable Research (FAR) have publicly expressed a view that Overseer is a useful model for estimating potential nutrient losses for individual arable crops but hold real concerns about the severe limitations of using Overseer for “whole farm” arable systems.
33. Every arable farm puts their individual crop rotations and stocking policies together in their own unique combination reflecting their view on their farm’s capability, markets, risk profile and personal preferences. The application of a pastoral nutrient loss model across this type of farming enterprise is not necessary appropriate or accurate at this stage in the development of the model.
34. As we genuinely wish to comply with the Regulations that are in place, an exercise we are currently doing on farm is to look to whether we can rightly meet our obligations under the LWRP with our current farming system, or whether we would more likely meet our regulatory responsibilities if we converted our property to dairying which is a far simpler system to plan, manage and model.

Conclusion

35. As I farm in an area designated as an “Orange Zone” my farming business will require a Resource Consent from 2016 as this plan is proposed. I cannot stand here today and provide any guarantee of the accuracy of such a Resource Consent Application based on the assessment tools available to me today.
36. We need time for modelling tools to evolve and mature in their accuracy and ability to model the arable system and we need time to develop technologies for mitigate our environmental footprint. Any planning regime implemented must incorporate a degree of flexibility that is reflective of the dynamic, evolving nature of farming in a living environment.
37. My view is that there is some mitigation available now that could assist in meeting the Environmental aspirations of our community, such as Targeted Stream Augmentation as is being trialled by the Eiffelton Irrigation Scheme. Personally I believe we need to have a more genuine discussion around how livestock can be more efficiently wintered in Canterbury and what locations are appropriate for additional livestock intensification.
38. In my opinion, worrying about whether or not Valetta Farm will be growing Borage or Barley in 2016 will not achieve your / our desired environmental aspirations, but rather bog our farming business and the Canterbury Regional Council down in an un-workable, inaccurate bureaucracy.
39. I operate a complex dynamic farming system that must react to market and climatic variations to remain viable. My business is very similar to my fellow farmers. I understand the intent of the LWRP in addressing Environmental concerns in the Hinds Plains area. However, in my opinion as a working farmer, Overseer is not yet ready to be used on Arable farming systems and be applied to a regulatory regime that looks to rigid numbers to establish its thresholds for consent.

David Clark,

On behalf of the Hinds Plains Water Partnership.

17th July 2015.