

SUBMISSION TO THE BOARD OF AGRESEARCH LTD – ON BEHALF OF THE PEOPLE OF OTAGO/SOUTHLAND – BY THE DUNEDIN CITY COUNCIL

Executive Summary

This proposal has generated substantial regional dismay, much more than one might expect from the loss of 85 jobs from the area. We view it as a serious strategic error for New Zealand, both for primary production industry and for science.

Our submission is the first of what we hope can be an on-going communication, on paper and face to face.

At the heart of our submission is a wish to retain an existing hub of animal genetics/genomics/breeding in Dunedin where it has been, and grown, for about 30 years. In that time this hub has identified the genetic basis for what has been a doubling of productivity in the lamb industry and much besides.

Our submission describes this hub, with Invermay at its centre. It has no name or identity. It just is.

We note that at the heart of AgResearch proposal is a wish to create hubs that may drive primary production productivity, and therefore GDP, sustainably. Yet an existing hub which has been doing that for decades will be dismantled in the process.

We also offer comment on other matters including the company's history in restructuring initiatives, campus assets, staff retention, and the University of Otago.

We conclude by expressing the hope that the chance may present for us to talk about a still more positive future for Invermay, because we have been thinking about that as well.

1. Introduction

This submission is a first step in the engagement that AgResearch is offering pursuant to its announced proposals to significantly concentrate its research at two campuses. We hope to engage on an on-going basis, as AgResearch proposals become firmer plans and as new ideas and initiatives emerge. We note that no relocations are scheduled before 2016 and therefore anticipate that this might be the first communication of many.

We are aware that our submission might be viewed as parochial, so we would like to deal with parochial arguments from the outset.

The view around the lower South Island is one of dismay. Invermay is not being closed but the proposal is that it be reduced by 74% so the effect is nearly the same. Invermay has been around in some form or other longer than almost everyone associated with this response, so feelings are visceral. Many staff will, despite the company's severance package, have their lives significantly affected, and we feel for them. We do not make these comments lightly. That is where our parochial comment finishes. Henceforth this submission will argue in the national interest, and we expect our arguments to be judged against the national interest by the Board.

2. The Context

Following the recent public announcement that AgResearch proposed to relocate most of its existing Invermay staff to Lincoln, the Dunedin City Council [DCC] hosted a summit, held on Wednesday 14th August at the Municipal Chambers in Dunedin. Many relevant stakeholders were invited at very short notice. There was a strong response. Over 50 community leaders, tertiary education leaders, farmer leaders, union leaders, tangata whenua, business leaders, past science managers and politicians from across the political spectrum gathered and put in a day's work. Local AgResearch staff were invited but politely declined.

As you might expect those gathered were of the view that shifting most of the staff from Invermay was wrong. However the meeting also engendered some a good deal of positive thinking on how to better exploit the campus and its research. This submission, and another to the Minister of Economic Development, are drawn in part from the workshop findings of that day. The DCC has retained additional expertise to assist.

3. What do we think is AgResearch position?

3.1 A good submission will try to clearly understand the other point of view, and then respect it.

We have no trouble respecting AgResearch's position; the company is known by us to be well managed and well governed and we are sure this announcement will have been arrived at thoughtfully.

So respect comes easily. However a clear understanding has been harder to fathom.

Accordingly in this section we outline what our understanding of AgResearch's position might be. This has been reached by reading what is in the public arena, and by drawing on the knowledge of others.

3.2 We have seen a number of very broad statements from AgResearch, from some primary sector leaders and some politicians that argue for the proposal on the less than specific notion that the creation of new centres or hubs or innovation hubs might well lead to improved productivity and to improved GDP. Such statements are easily made. A cynic might retort that history is littered with them.

However our response, later in this submission, describes an existing hub that has a proven and remarkable track record in improving productivity and GDP. The current proposal will see that hub dismantled.

3.3 We assume the Board has examined a set of cost /benefit analyses or econometrics which point to gains of some sort. We have not seen these. We would offer the obvious remark that they will be as good as their author's assumptions. We also assume the Board is familiar with earlier efforts to restructure the company. We make generic remarks on restructuring in section 4, and some specific remarks on Wallaceville in later sections.

3.4 The company's announcement highlighted capital investment of \$100m. This has been helpful for us. We think asset management and renewal is a one driver for the company. We do not wish to argue for or against the fate of Ruakura but we do acknowledge the age of those physical assets, the uncertainty over future ground rent, urban encroachment and

perhaps even the influence of the proposed SH1 bypass. These are longstanding issues. We have assumed that they seize the board today to a greater extent than in the past. Accordingly our response includes our views on Invermay as a capital asset.

3.5 However we think the key driver of the announcement is the simple idea of intensifying agricultural research in two centres around Massey University and Lincoln University. The company seems to value the new synergies that they expect to emerge with co-location. Our response therefore looks at this issue in some detail including the existing Dunedin hub and its likely fate.

We also think that the idea of a Lincoln Hub, announced by the Government last April, will have influenced the Board's view as to what an appropriate South Island configuration might look like. Put another way we think it entirely possible that the board would have reached a different South Island configuration in the absence of that idea. We have some remarks to offer on what AgResearch is contemplating walking away from; and to.

3.6 We hope we have captured the essence of the thinking behind the proposal. We do not have the range of information that will be available to the Board, so we hope we have made an intelligent guess.

4. Recent AgResearch History

4.1 AgResearch is 21 years old. The company has made a large difference. The primacy of primary production in the New Zealand economy is not debatable. The role of AgResearch as the main primary production research provider to the nation is also not debateable.

There are major gains in productivity that can be traced in particular animal breeding, before and after the advent of genomics, undertaken in large part by AgResearch. The company has also been at the forefront of sustainability in agriculture, mostly through its water, soil, pest, weed, animal health etc. science but also social science, animal welfare and the like.

4.2 AgResearch has a history of restructuring.

Ten years ago AgResearch was attempting to be a global bioscience company, at one point actively contemplating a significant offshore presence. The NASDAQ was high, the word was that this was the biotechnology century and AgResearch wanted to be part of it. That may still partly come to pass of course. But meantime the company found itself at a distance from its key stakeholders, and there was a costly and noisy dip in the quality of key relationships.

Several years ago AgResearch decided to close Wallaceville. The logic was that staff involved in animal health and reproduction could relocate to the Hopkirk centre and Invermay respectively. That change, though comparatively hasty, was rather small compared to the current proposal. The Board will presumably agree it was not particularly successful.

More recently still AgResearch sought an amalgamation with Lincoln University which foundered. Perhaps it was because it was unclear under which statute such a product might ever exist.

4.3 The point we wish to make is that in its short history AgResearch has unarguably contributed world class science to a world class industry. However restructuring was not a key reason for success.

More pointedly, it would be hard to point to any instance where restructuring *per se*, has delivered proven benefits. Rather, we have listed three instances where it has been a disappointment or a distraction.

That is not to argue against restructuring; rather it is to argue that consulting the company's history shows the promised rewards have not yet eventuated.

4.4 We draw our **first conclusion** accordingly; restructuring is always attended by delay, cost, loss of morale and unintended consequences. Therefore any exercise in restructuring ought to try to quantify those downsides with the same vigour that attends the inevitable highlighting of the upsides.

We ask the Board if they are satisfied that this has occurred.

5. Campus Issues and Invermay

5.1 The Board will be well aware that Invermay's main buildings are less than 30 years old, are designed to be used flexibly and are somewhat underutilized. In addition the Christie building, costing about \$17m, is not quite 5 years old and is regarded as state-of-the-art. The campus at Invermay is either the most modern, or almost the most modern, that the company has.

5.2 As mentioned above the Ruakura campus faces longstanding issues of age, ground rent uncertainty, and urban or infrastructure encroachment. We have no wish or remit to comment on these issues except to point out that Invermay faces none of them.

5.3 Should this proposal proceed, Invermay will house 30 or so staff in a facility capable of housing over 160 staff, an occupancy rate below 20%. We think it inevitable that the campus will close, probably within a few years. Indeed it would be illogically costly to keep it open.

However the assets are rather specific. That means they are likely to be undervalued in the absence of a buyer with similar needs. In Dunedin that means the University of Otago but its long-term asset plan does not include expansion on to the Taieri. Asset stranding is a real risk. That is bad for your company and bad for our city.

5.4 We draw our **second conclusion**; that it is inevitable that in due course the Invermay campus would be closed entirely, at a loss, to stem the company's poor asset utilization.

[We attach a one pager from Dr George Davis, a retired Invermay scientist who was incidentally awarded the sheep scientist of the year by the industry last month, entitled 'Ten Reasons Why AgResearch Invermay Campus Should be Expanded']

6. Science Wins, and a Warning

6.1 We think that the key idea, of focusing AgResearch's staff around New Zealand's two primary production focused universities, has merit. The logic becomes stronger when one takes in to account other CRIs at both campuses, Fonterra Research, Hopkirk, Riddet etc. at the Massey campus and the promise of Dairy NZ at Lincoln.

Further, we note a degree of Government enthusiasm for the hub at Lincoln though we don't know if that is accompanied by taxpayer investment that could somehow benefit AgResearch. We also see the logic in focusing more behind the farm gate at Lincoln and beyond the farm gate at Massey though such distinctions are useful only to a point. So science wins might be expected from such a configuration, especially over time. They will be hard to predict, quantitatively and qualitatively, but the idea of hubbing is intuitively attractive.

6.2 There is also a direct benefit to Lincoln University in having the proposed location of many AgResearch scientists just over the road. Lincoln would have access to teachers and to post-grad supervisors of a high calibre. We offer further comment on that theme later, but put simply Lincoln University has a good deal more to gain from this proposal than does AgResearch.

6.2 We sound a warning; whenever an innovation system is examined in retrospect one of the few reliable findings is that physical co-location matters less than do cultural and personal factors. Restructuring *per se* doesn't work. The soft wiring is far more important. Further, the strongest hubs or clusters or ecosystems are those that have evolved of their own accord, perhaps assisted or facilitated once started, and not those that have been designed or mandated. These observations are not made in a cavalier manner; they are supported by empirical research [for example that of Prof Michael Porter with whom the board will have familiarity]

6.3 So having listed the benefits as we see them and having sounded a warning against assuming success, we spend much of the remainder of our submission examining the losses, starting with the most profound one.

7. Genetics [or genomics, or animal breeding]

7.1 We view the proposed relocation of the animal genetics team as a very grave mistake, for many reasons.

The team is undoubtedly world class as measured by the normal criteria [citations, paid conference invites etc]. It has built up over about 30 years. Including bioinformatics staff, and including the dozen or so staff at Genomnz, we think the team numbers a little over 40 people.

7.2 Just over thirty years ago all of New Zealand's animal genetics was done at Ruakura. It drifted to Invermay from the late seventies, but especially after about 1985, for one reason; the establishment of the molecular biology unit at Otago University [by Prof George Peterson]. The link between Otago University and Invermay in the field of genetics became very strong and very productive. It is as strong today as it has ever been. It involves many academics in many departments, mostly in the school of medical sciences - Anatomy, Biochemistry, Micro/Immunology etc but also in Mathematics/Statistics etc.

7.3 Many Invermay genomics scientists are trained at Otago. This is unsurprising because Otago produces more senior genetics students than any other New Zealand university, easily. Invermay scientists can take their pick because they help teach them and because they supervise some of them over summer. We understand that AgResearch funds chosen students through doctoral studies, again supervised by Invermay staff.

Lincoln University does not have the strongest genomics capability in New Zealand. That is an awkward statement, but it can be refined by examining publicly available data, or the Board can ask its own staff.

7.4 Genetics matters. Animal genetics has lifted primary production productivity more over recent decades than any other area of research. Almost all that research is undertaken in Dunedin.*

7.5 The research has been very successful. It has been undertaken by an ever expanding cluster or hub of Dunedin based players, at the centre of which is the team at Invermay. The results of this 25+ years of work, and application by industry, is a story well known to the Board. It is the story about how New Zealand's lamb exports are as least as valuable today as they were 30 years ago despite the flock halving. It is a story of productivity doubling.

[*Dairy has had a different history from sheep, beef and deer because of AI and the LIC, but also because of historic differences in attitude regarding the role of AgResearch, IP ownership and so on. This is mentioned in passing for the sake of completion. However it is also the case that Invermay scientists and AgResearch management played a role in the global precursor work on the cow genome, and therefore helped focus the global effort on that species ahead of pig].

7.6 The 'hub' or 'cluster' that is responsible for this remarkable result has many players. But tellingly it has no name. That is probably our fault as much as anyone's. If it was centred elsewhere in the world, and possibly elsewhere in New Zealand, it would have a name, a story line and therefore an identity. But it doesn't. It just is.

7.7 It includes many staff from many departments at Otago University, 32 mainly quantitative genetics staff at Abacus Bio*, Ovita [renamed Beef and Lamb genetics for the next round of funding], Pfizer [trading now as Zoetis] and a number of smaller players. Though it is difficult to quantify, we estimate this hub to comprise somewhat over 100 FTEs. The players variously compete, contract or [mostly] collaborate with one another, and it works. Abacus Bio in particular is currently growing quickly because its services are critical to good information uptake by the industry.

[* Abacus Bio is a little over 10 years old and began because senior management in AgResearch believed quantitative genetics would have little value to offer. The founders, all Invermay scientists, saw the future differently and left to establish their start-up. Time happens to have proved them right. Quantitative genetics is the intersection of genetics and maths/statistics. In essence it is how an animal's genetic score is determined.]

7.8 Genetics research still has a long way to go. It has been slower to deliver than was first hoped when molecular biology got underway but large and inexorable improvements in productivity have accrued year by year. More such reliable, incremental gain is certain as the volume of information accretes, and is made accessible to farmers.

Genetics/genomics/animal breeding is nowhere near maturity as a scientific frontier. Apart from production characteristics such as fecundity, food conversion efficiency etc [themselves still steadily improving] it also has contributions to make to environmental outcomes, animal health, animal welfare and so on.

7.9 This cluster or hub will be dismantled if the genomics team leaves Invermay. We think that will occur in two stages. An initial quick stage occasioned by the failure of some scientists to relocate [see later], followed by a slower deterioration in collaboration as staff turnover sees more and more people in key positions who simply don't know one another well. It is proposed that a world class team is to be cleaved from its academic wellspring of thirty years, from the best private sector quantitative genetics capacity in the country, and from assorted service providers, facilitators and a funder. It is proposed that they instead collocate with a relatively weak academic capacity which happens to include no academic quantitative geneticists.

Our **third conclusion, especially strongly held**, is that the costs of shifting the genetics team to Lincoln far exceed any benefits.

8. Reproduction Science

8.1 There is a group of reproduction scientists at Invermay. This discipline was until recently a central component of the animal breeding story. The group undertook a body of mostly basic science work when it operated out of Wallaceville, which underpinned the work being forged in Dunedin. It too was at that time regarded as world class using the normal criteria. Reduced by the decision to relocate the team to Invermay around 2008, and further diminished by redundancies since, the team is now very small and will become smaller should this proposal proceed.

8.2 However the two disciplines, animal genetics and reproduction science, were the dual beneficiaries of the decision to house [in the Christie building] the new Centre for Reproduction and Genomics five years ago, with the express involvement of the University of Otago, particularly the Anatomy Department..

8.3 We are unable to offer a view as to whether this team should be merely retained, or rebuilt. Some say it should be rebuilt but others suggest that the science is maturing. We simply **do not** have the expertise to **come to any conclusion**.

9. 'omics'

9.1 The company speaks publicly of its 'omics' platform. We are not sure what that means but think that it is perhaps part of the logic for shifting the genomics group north because there is some proteomics capacity at Lincoln including mass spectroscopy. We make two points.

9.2 It is not possible to have only one 'omics' platform in AgResearch because we don't anticipate all of the metabolomics [and NMR] plus plant genetics shifting out of Grasslands. In other words shrinking the 'omics' platform from three sites to two is as good as it is going to get.

9.3 The cost of shifting the genomics team to Lincoln includes the cost of losing access to 'kit'. Otago and Invermay have a long history of commercial and non-commercial access to one another's kit and Otago University is about to invest over \$1m this financial year in further 'state of the art' mass spectrometry capability. This reduces one of AgResearch's logical relocation arguments.

9.4 Our **fourth conclusion**, posed as a question, is to ask if the Board is satisfied that the value of an 'omics platform' has not been overstated in the proposal.

10. Deer Science

10.1 About two-thirds of the national deer herd is raised south of Timaru; deer capture was originally centred in Otago and Southland. Over the ensuing 30 years Invermay has accrued assets unique to New Zealand [including a small and a larger farm], access to some privately owned herds, again mostly South of Timaru, and a range of expertise.

10.2 Forest dwelling animals were vulnerable to a range of production diseases once they were held on pasture and that is why the company, and its predecessor, has held contracts with Otago University's Disease Research Laboratory since 1985. The Board will be familiar with resultant progress on parasites, mycobacterial diseases etc. Some have voiced to us their concerns that the relationship with Otago University is too narrowly based. Our advice is that succession planning in this regard is well advanced.

10.3 The future of animal health, in deer and in general, will increasingly deploy genetics, including quantitative genetics, as resistance to disease is progressively identified and quantified.

10.4 If the deer scientists and staff shift North then that proven long-term collaboration will, as with the genetics hub, be weakened, probably in the same two-phase manner. Indeed the role of genetics in animal health means that it is all part of the same thing.

11. Will People Shift?

11.1 In researching this submission we have received off the cuff estimates of how many people are likely to shift ranging from 10% to 70%. We are aware of a somewhat informed guess that suggests 15%-25% will agree to shift. But we prefer harder evidence either from offshore or in New Zealand.

11.2 We have been fortunate to make contact with Dr Allan Crawford, a retired AgResearch scientist who was asked by AgResearch to review the Wallaceville decision in a paper to the company. He provided the following paragraph to us:

The closure of Wallaceville and the relocation of the Wallaceville reproduction team to Invermay has been a failure. Despite the prospect of a new building and co-location with the Invermay team, their long term collaborators, only 7 of 25 staff chose to relocate. Ken McNatty the leader choosing to take a chair at Victoria University rather than move south. Since that time the team has been much diminished by redundancy, resignation and retirement such that the combined group that numbered approximately 33 staff prior to the relocation will reduce to just 3 scientists and 4 technicians after the current round of redundancies is complete.

So there is some hard evidence; 7 out of 25, or 28%. We do not know whether the figure surprises the Board or not. If does not then we feel obliged to ask why the Board could be relaxed about such a loss of human capital. If it does cause surprise then we are pleased to have brought it to your attention.

11.3 Of course the argument could be raised that 'this time it will be different', presumably because it is happening much more slowly. It is true that this proposal, should it proceed, will not be until 2016. But we are unaware of any evidence suggesting that more notice results in lots more compliance, other than 'progress' made by attrition.

11.4 This leads us to our **fourth conclusion** which we also present as a question. Has the Board sought advice regarding international data on attrition rates, for example from CSIRO, resulting from relocation?

12 University of Otago

12.1 There are three main research engines in the New Zealand economy, all of them in the public sector. They are Auckland, Otago and AgResearch. The fourth largest provider – perhaps Plant and Food or Massey or NIWA – is a good deal smaller, and the smallest are Lincoln, AUT, and ESR etc.

There are two main post graduate universities, Auckland and Otago [in that order]. At any one time about 1% of the population of Dunedin is undertaking a doctorate. No other population centre in Australasia would approximate that research intensity.

There are three universities that are always at or near the top of the [PBRF] research quality rankings; Otago, Auckland and Canterbury. Those always at or near the bottom are AUT and Lincoln.

These remarks, though they may be perceived as provocative or even elitist, are being made because we have a problem in Dunedin. It is that Otago University has been hiding its light under a bushel somewhat, not in marketing its teaching to students, but in highlighting the quality and quantity of its research. That is being better addressed these days and we are keen to help.

We wish to ensure that the Board knows what it is proposing to work away from [and to].

12.2 We suspect the University would want to be rather measured in the way it expresses a view at losing its Invermay research partners, mainly because it respects the right of AgResearch to make decisions but also because it thinks long term and across its multiple campuses. Otago also has protocols about criticising another institution.

12.3 AgResearch and Otago University undertook a collaboration in the Centre for Reproduction and Genomics which, after several years of moderate success, has changed its nature. No doubt many factors were at play over those years and the impact of the original decision of the research leader not to relocate from Wellington is well understood.

But our view is that 'engineered', collaborations have a lesser chance of success than 'organic' ones. In this case reproduction science was engineered and genetics was, and still is, organic. This is not to argue against engineered collaborations; it is simply to reiterate that they can be difficult to pull off.

12.4 Otago has, straightforwardly, more kit and science infrastructure than either Massey or Lincoln. Accessing it from Christchurch would be that bit harder. Otago has, straightforwardly, a far greater capacity than Lincoln [or Massey] to produce postgraduate skills needed by the company.

12.5 Some collaborations will persist with Invermay, especially in soil ecology, fresh water science etc and many existing collaborations between Otago and AgResearch's campuses will also persist, including many that do not involve Invermay.

We sought summary data on the University's contracts with AgResearch [except commercially sensitive data].

There have been 112 contracts over 10 years to 2012, 95 awarded to the University and 17 awarded by it. The average value is \$75,000. A total of 22 departments have been involved, though the biggest players have been anatomy, micro and immunology, pharmacy, biochemistry, oral sciences and physiology.

12.6 There are future collaborations in store too, especially in new aspects of animal health, infectious disease and disease control, alternative or indigenous agro ecology, resource monitoring systems for fresh water, answering environmental science questions that AgResearch will surely receive from the farming community and so on.

12.7 To conclude on a determinedly positive note, not only are two of New Zealand's large research engines collaborating at multiple levels, such collaboration can in some areas readily increase.

Conclusion

We said near the beginning that the summit that was called recently was well attended at short notice. We judge that this proposal has engaged more local leaders more strongly than has any other episode of lost jobs or lost companies in recent times. We think that is because the proposal as it affects Invermay is strategically damaging.

We hope we have laid out clearly the extraordinary strategic damage that would be done to New Zealand's animal genetics/genomics/breeding future should this proposal come to pass. We hope also that no-one on the Board is in any doubt about the remarkable achievements [especially in lamb production] this hub has made to date.

We also described the summit as generating a good deal of positive thinking on the future. This thinking is of course predicated on Invermay not being largely dismantled. It would therefore be presumptuous to start to talk about that positive thinking now. But the Board should be aware that we have given a range of alternative ideas some thought, because we hope it can be where our discussions go next.

Please don't fix Invermay; it isn't broken.