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INSIDE

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JUST ADD WATER

FEATURE ARTICLE: INVESTIGATING THE RETURNS FROM IRRIGATION

Huge attention needs to be paid to deriving cash value from water storage and new irrigation projects. Our research shows average per hectare returns for the various land uses under irrigation of: $2,380/ha for dairying; $2,000/ha for arable and processed crops; $700-$900/ha for sheep, beef and dairy support; and a wide range for horticulture depending on crop, variety and location. There is no "one size fits all" solution, and anyone considering investing in irrigation should get good advice to work out the viable options for their particular situation.

THE MONTH IN REVIEW

Apart from a few ups and downs most farmers have had a phenomenal run of weather and pasture growth since May. More recently, as spring has started to arrive, high pressure systems have been replaced by wet fronts. This has helped fully recharge water tables heading into the seasonal peak for pasture growth and demand. This has set up most for a great start to the 2013-14 season.

RURAL PROPERTY MARKET

Expectations are building that the coming spring/summer sales period could see rural property prices start to turn red hot. Turnover indicators and prices during the winter period were strong and have reinforced a noticeable lift in underlying price trends that started at the beginning of the 2012-13 season. Lack of supply is being reported and is likely to continue.

KEY COMMODITIES AND FINANCIAL MARKET VARIABLES

In-market prices for NZ's soft commodity basket have stabilised at near-record levels in recent months, largely due to dairying. The larger exposure of NZ's primary sectors to China seems to be helping buffer against lower soft commodity prices in other Northern Hemisphere markets.

ECONOMIC BACKDROP

The economy is firmly into an economic expansion: that's a step up from recovery. The drivers are not hard to identify: global dairy prices are sky-high, the Canterbury rebuild is gaining pace, and the Auckland housing market is responding predictably to near-record low mortgage rates and housing shortages.

BORROWING STRATEGY

Indicative rural fixed lending rates have continued moving higher, led by the long end. As a consequence of the "steeper" lending curve, it now costs significantly more to fix for longer terms than it has at any time since interest rates started to rise earlier this year. We expect interest rates to continue moving higher as we move closer to the first OCR increase, and as global monetary policy normalises.

EDUCATION CORNER: AQUACULTURE

Global aquaculture production has grown 12-fold since 1980, which has made it the fastest-growing protein sector. With the volume of capture fisheries having plateaued, further lifts in demand will need to be filled by aquaculture. For NZ this offers us another opportunity to unleash the potential of our renewable capital. In NZ the aquaculture sector has grown to a $400 million business with the majority of activity centered around three main species: Pacific oysters, Greenshell™ mussels, and King Salmon. The sector has growth aspirations to reach $1 billion in revenue by 2025. Recent regulatory reforms now provide the sector with the opportunity to reach this goal, provided it can execute on the other parts of its strategy.

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SUMMARY

The potential ability to export embodied water and better manage the volatility of Mother Nature means huge attention needs to be paid to deriving cash value from water storage and new irrigation projects. Our research shows average per hectare returns for the various land uses under irrigation of: $2,380/ha for dairying; $2,000/ha for arable and processed crops; $700-$900/ha for sheep, beef and dairy support; and a wide range for horticulture depending on crop, variety and location. However, around these averages there are wide ranges depending on a number of factors.

Top farm management performance, moderate-to-average existing debt levels, and reasonable prices are often required to make a switch to irrigation work for an existing land owner. A change to irrigation and new farm policy also requires developing a business plan, project plan, and budget, as well as completing the changeover on time, to specification and within budget. Vulnerability is at its highest in the first few years of a changeover, so successful execution is a critical component of success.

For a farmer/grower considering irrigation and a change of land use or farm policy there are many factors that need to be weighed up. There is no "one size fits all" solution, and anyone considering investing in irrigation should get good advice to work out the viable options for their particular situation. Get the execution right though, and what our analysis has shown is that – in most cases – investment in irrigation can be made to work in today's business environment despite the many challenges and the higher cost of accessing water.

INTRODUCTION

New Zealand is a nation rich in renewable resources. In fact we rank number 1 for renewable resources (on a per capita basis) according to the World Bank's *Wealth of Nations* report. We have plenty of land and water whereas a host of other counties are a bit short. **How New Zealand unlocks these resource endowments is strategically important for the country's long-term success.** In many ways our renewable resources are New Zealand's winning lottery ticket if GDP per capita aspirations are to be achieved.

A key component is irrigation. As we highlighted back in June, over the last five years there has been a 17 percent increase in the land area in New Zealand under irrigation to 721,700 hectares, as well as a shift to more efficient irrigation systems. Additionally there are currently plans in place for 16 new water storage and irrigation schemes around the country. If completed, these have the potential to nearly double the total irrigable land to 1.38 million hectares, or 12 percent of New Zealand's total agricultural land.

Building the 16 proposed schemes is not expected to be cheap, with a total projected cost of between $4 and $5 billion, or $6,100 to $7,600 per hectare. Coming up with this sizeable amount of capital requires innovative financing solutions. **The key issue for funding the development of irrigation schemes is not so much the availability of funding per se, so much as it is the certainty of cash flow. In most cases this is largely determined by farmer uptake of irrigation.** A high uptake from day one by farmers creates more cash flow certainty and therefore more certainty for investors.

There are many factors that will influence a farmer's decision to invest in irrigation or not. In most cases financial returns and the starting point for equity within a farm will probably be the two most important factors. **Obviously returns are influenced by a myriad of factors, but a change of land use, or at least farm policy, will be required when converting to irrigation.**

The physical and environmental aspects of a piece of land will determine the potential opportunities for land use change to a different enterprise. These include factors such as soil type, topography, rainfall, climate, and aspect. An individual's appetite to adopt a particular farm policy, or change to an alternative enterprise, will be influenced by their attitude to risk, existing debt levels, availability and sources of capital, age, experience in different fields, and family circumstances.

When capital is a limiting factor, the farm system may move toward the highest return on total assets rather than the highest return on new capital employed. For example, a farmer with high existing debt levels may move to intensive finishing and dairy support rather than dairy conversion, as the step-up in capital requirements with the latter would be large. Influences outside the farm-gate also need to be considered. These include things such as environmental regulation, farm-gate prices and other budget parameter expectations, surrounding industry infrastructure, and the fine print (cost, reliability and terms and conditions) of the irrigation scheme, or water take.

Our analysis explicitly avoids looking into the impacts of environmental constraints on the economics and feasibility of investing in irrigation and a change of land use. At the moment a number of unknowns in this area is one of the greatest uncertainties holding farmers back from

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investing in irrigation. **Environmental constraints are highly relevant for the risks around the productive capacity and cost assessments of the different land uses under irrigation.** However, it is an area that applies equally to both existing dry land and irrigated farms. Therefore to avoid this extra complexity – and because it is not solely an irrigated area issue – we have not spent time on it. Previous *Agri Focus* editions have touched on the topic of nutrient limits and other regulatory change occurring in the water space; interested readers should refer to this for more detail.

When all the mentioned factors are put into the mix it is often difficult for a farmer to decide on what their realistic options are under irrigation, and which option best suits their circumstances. The complexity also makes for a difficult job in coming up with a coherent financial assessment of the options and the risks around each. Therefore, we thought it would be topical to look at the average returns from different land uses under irrigation and the key sensitivities. Our disclaimer for those reading on from here is that anyone considering converting to irrigation, or capital upgrades to existing irrigation infrastructure, should do their own due diligence and use local expertise to make the assessment relevant to their situation, because as mentioned above there are many factors to consider.

The complexity of the issue also makes even generalised analysis no simple task. Firstly, getting robust and standardised data across a good range of different land uses proved challenging. This was mainly due to the many factors that need to considered, as well as limited data availability. Another limitation was the large range of accounting practices and analytical frameworks used in the financial assessments of the different irrigation schemes. Nevertheless, despite these limitations, we think the analysis contained in this article adds some value to the debate around the different returns from land uses under irrigation.

We would like to acknowledge all the parties that contributed data, information and time to this research. These included Dairy NZ, Beef + Lamb NZ, Baker and Associates, Roy Evans Ltd, Macfarlane Rural Business Ltd, the Ministry for Primary Industries, and the six proposed schemes analysed. These six schemes included the Canterbury Central Plains Water, Ruataniwha Water Storage Project, North Otago/Waitaki district development, Hurunui Water Project, Flaxbourne Community irrigation scheme, and Waimea Water Augmentation community dam.

First, we have gathered together all the publicly available information from irrigation schemes where some financial analysis has been completed within the last couple of years. In total we managed to gather together datasets and analysis from 10 different sources (six proposed schemes and four other datasets of existing land under irrigation), but often there have been multiple models, or variations produced to highlight different options. Where possible we have grouped the different options under common land uses and then analysed and standardised key assumptions to produce an Income and Expenditure assessment for different land use options. Where grouping has proved to be too difficult we picked out a couple of stand-alone models related to a particular irrigation scheme to highlight the possibilities.

DAIRY

Dairying seems to dominate irrigation conversions these days, making up the majority of land use change that occurs when water becomes available. Over the page is an Income and Production Statement we've produced as a 'central' scenario for dairying under irrigation. **Key assumptions are a milk price of $6.10 per kg and dividend of $0.35 per share.** This is a little higher than we use for long-term dairy budgets, but the irrigation schemes analysed seemed to be in consensus on this assumption, with the vast majority using this level of pricing to analyse dairying returns. In our view, banks have historically been a little conservative in their assessment of the long-term milk price for a variety of reasons.

On the production side of things we have used 1,500 kgs MS/ha. This was one area where there was quite a wide range of assumptions used, ranging from 1,288 to 1,637 kgs MS/ha. In the discussion on production potential the various assessments noted that an even larger range of 1,000 up to 2,000 kgs MS/ha was currently being achieved by dairy farms under irrigation. The result was often linked to management ability and skill in utilising the irrigation and extra pasture grown to maximise production. Soil type was also mentioned as being influential.

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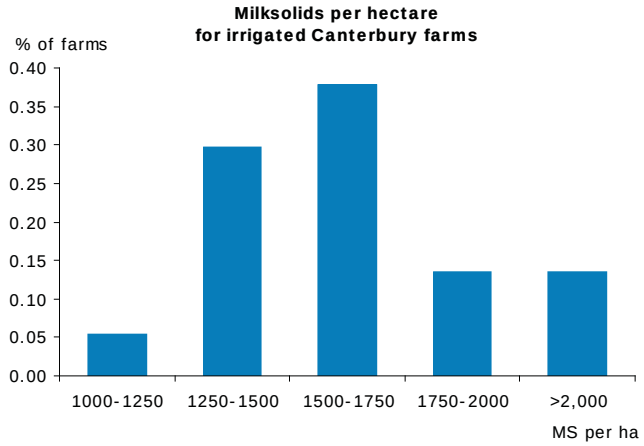
INCOME AND PRODUCTION STATEMENT FOR DAIRY				
Physical characteristics:	**Per farm**	**Per cow**	**Per hectare**	
Effective area (ha)	300			
Peak cows milked	1,000			
Milksolids sold (kg)	450,000	450	1,500	
	$ per farm	**$ per cow**	**$ per effective hectare**	**$ per Kg milksolids sold**
Dairy cash income:				
Milk sales (net of dairy levies)	2,871,900	2,872	9,573	6.42
Net livestock sales (sales – purchases)	103,500	104	345	0.23
Other dairy cash income	18,000	18	60	0.04
Net dairy cash income	2,993,400	2,993	9,978	6.69
Cash farm working expenses:				
Wages	283,500	284	945	0.63
Animal health	99,000	99	330	0.22
Breeding & herd improvement	58,500	59	195	0.13
Farm dairy	31,500	32	105	0.07
Electricity	103,500	104	345	0.23
Net feed made, purchased, cropped	472,500	473	1575	1.05
Stock grazing	184,500	185	615	0.41
Support block lease	40,500	41	135	0.09
Fertiliser (incl nitrogen)	157,500	158	525	0.35
Irrigation	225,000	225	750	0.50
Regrassing	22,500	23	75	0.05
Weed & pest	13,500	14	45	0.03
Vehicles & fuel	67,500	68	225	0.15
Repairs & maintenance	112,500	113	375	0.25
Freight & general	22,500	23	75	0.05
Administration	22,500	23	75	0.05
Insurance	27,000	27	90	0.06
ACC	27,000	27	90	0.06
Rates	45,000	45	150	0.10
Farm working expenses	**2,016,000**	**2,016**	**6,720**	**4.48**
Cash op surplus	**977,400**	**977**	**3,258**	**2.206**
Adjustments:				
Value of change in dairy livestock	0	0	0	0
less Labour adjustment	149,850	150	500	0.333
plus Feed inventory adjustment	0	0	0	0
less Owned support block adjustment	0	0	0	0
less Depreciation	112,500	113	375	0.25
Net adjustments	-262,350	-262	-875	-0.583
Operating cash & non-cash:				
Dairy Gross Farm Revenue	2,993,400	2,993	9,978	6.686
Dairy Expenses	2,278,350	2,278	7,595	5.063
Dairy operating profit	**715,050**	**715**	**2,384**	**1.623**
Other expenses				
Rent	45,000	45	150	0.1
Interest	460,440	460	1535	1.00
Tax	99,000	99	330	0.22
Plus Net Non-dairy cash income	4,500	5	15	0.01
Total other expenses	**599,940**	**609**	**2,030**	**1.33**

Dairy NZ also kindly provided some data on the physical and financial performance for the 2011-12 season for existing dairy farms under irrigation in the Canterbury region (Dairy NZ irrigated farms were defined as having greater than 30 percent of the milking platform under irrigation). **The data showed higher average production levels of around 1,600 to 1,700 kgs MS/ha and a slightly larger range. The low side was similar at 1,000 kgs MS/ha, but 14 percent of the farms surveyed achieved above 2,000 kg MS/ha in 2011-12.**



Sources: ANZ, Dairy NZ

On the cost side we did a bottom-up exercise and came up with farm working expenditure of $4.5 per kg MS, or $6,720/ha (cost of irrigation included). Obviously, irrigation costs vary substantially across the difference schemes depending on how they are funded and the amount of water that needs to be used, which will be influenced by the physical and environmental aspects of a property.

Some schemes have a high capital cost to sign up and lower annual charge, with farmers' capital used to help finance the off-farm infrastructure. In this case, the annual water charge, plus the annual cash cost for the off-farm capital via an interest cost if debt funded (or opportunity cost if equity funded), are the main impacts on cash flow. Some schemes on the other hand only have a direct charge for the amount of water used and no off-farm capital requirements. For the purposes of this analysis, we have used a direct annual charge of $750/ha, or $0.50 per kg MS. Nevertheless, we would note the annual cash cost varied from $0.12 to $0.60 per kg MS depending on the split.

The other main areas of analysis sensitivity were:

1. Net feed made, purchased, or cropped, which seemed largely to depend on the pasture and feed assumptions used.

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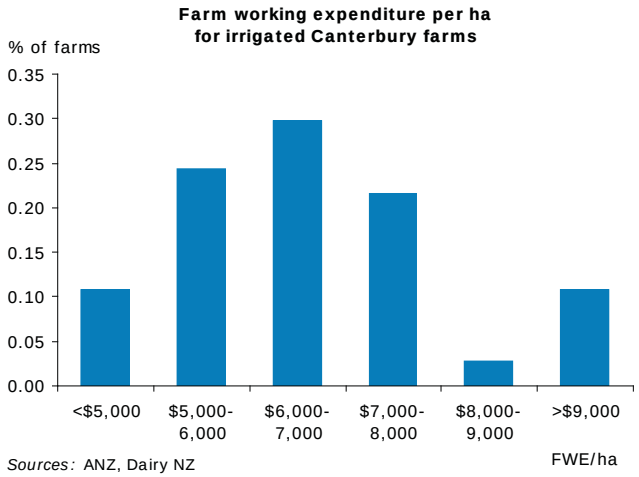
2. Electricity charges, which depended on how the water is delivered (piped, pressure etc) to the farm-gate, and other on-farm specifics, such as the type of irrigation infrastructure employed.

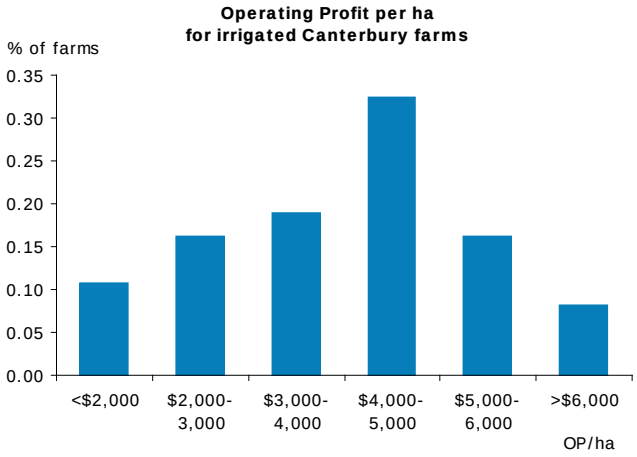
For the other areas of farm working expenditure there was little variation. The result of $6,720/ha was surprisingly close to the average result from the Dairy NZ survey farms for 2011-12 of $6,770/ha. The range of farm working expenditure from the Dairy NZ figures was very large though, with 10 percent of farms having costs below $5,000/ha and 10 percent above $9,000/ha. Even adjusting our assumed irrigation costs by the variation across the schemes only provides for a variation of -$600 to +$150/ha. Some of the variation could be attributed to the stage of development (higher costs earlier on) and perhaps the proportion of the property that is being irrigated, but the degree of variation also suggests there is some flexibility in cost structures and a wide range of systems being used under irrigation in Canterbury.



Sources: ANZ, Dairy NZ

All up, our 'central' scenario gives a cash operating surplus of $3,260/ha. When a labour adjustment (which could be considered drawings for an owner-operator) and depreciation is removed, an underlying profit of $2,380/ha (before interest and tax) is derived.

As we have used a milk payout that is very close to the 2011-12 actual ($0.05 per MS difference for 100 percent shared backed farmer) a comparison can be made with the operating surplus from the Dairy NZ data for irrigated farms in Canterbury. **These results showed an average above our assessment, at $4,095/ha. This was largely due to higher production levels than our assumed 1,500 kgs MS/ha.** The range of results – 8 percent of farmers achieving below $2,000/ha, as well as 8 percent above $6,000/ha –highlights the variation though, due to all the factors mentioned earlier.



Sources: ANZ, Dairy NZ

DAIRY SENSITIVITY ANALYSIS

Sensitivity analysis is always important to understand the range of outcomes possible under different circumstances. For a dairy farmer it is relatively straightforward, with milk price, production, and expenditure the key areas to understand.

The below table shows the different underlying profit scenarios per hectare for the milk price against production and farm working expenditure. This analysis holds the different expenditure categories per MS the same under each scenario. In reality some of these aspects would also change depending on the situation. Production and expenditure tend to be directly under the control of farmers, whereas the milk payout is outside a farmer's direct control. If there is reasonable confidence around expenditure and production then the sensitivity analysis of operating profit to the milk payout is the largest factor that determines a farmer's ability to invest or not (i.e. borrow, or source additional capital to convert).

SENSITIVITY ANALYSIS FOR DAIRYING TO KEY PARAMETERS						
Returns per ha		Milk payout $ per MS for 100% share backed				
		$5.13	$5.77	$6.42	$7.06	$7.70
Production MS per ha	1,000	306	947	1,589	2,231	2,872
	1,250	382	1,184	1,986	2,788	3,590
	1,500	459	1,421	2,384	3,346	4,308
	1,750	535	1,658	2,781	3,904	5,026
	2,000	612	1,895	3,178	4,461	5,744
Farm working expenditure $ per ha	5,000	2,179	3,141	4,104	5,066	6,028
	6,000	1,179	2,141	3,104	4,066	5,028
	7,000	179	1,141	2,104	3,066	4,028
	8,000	-821	141	1,104	2,066	3,028
	9,000	-1,821	-859	104	1,066	2,028

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In our budget we have also adjusted the interest cost to a level that provides an interest cover ratio of 1.25 under the central scenario at an assumed fixed tax rate. Generally this is the minimum interest cover ratio level banks are looking for when providing finance. Under this scenario it indicates an interest cost of $1.00 per MS, or $1,504/ha, is sustainable. At a long-term interest rate of say 7 percent, this implies there is potential to borrow nearly $21,540/ha, or $14.40 per MS. This might sound like a lot, but analysing recent conversion costs in Canterbury indicates that farmers looking to convert from dry land arable, or meat and fibre operations to irrigated dairy would need to have plenty of equity to start with.

According to our analysis in the table below, recent conversion costs in Canterbury have averaged $9,400/ha. Add to this buying dairy cows, and if a farmer were to supply Fonterra (as assumed with the dividend included in the milk payout), shares of $10,500/ha would be needed at today's price of $7 per share (assuming production of 1,500 kgs MS/ha). **This skyrockets the conversion cost to a shade over $26,000 per hectare.**

Fonterra's new capital structure provides more flexibility around shareholdings and the time over which to become fully shared, helping to alleviate the upfront cash requirements. **Still, it implies anyone looking to convert from an arable or meat and fibre farm to dairying would need to have at the very least 80 percent equity (if not more) to be able to entirely debt fund the change these days.**

RECENT DAIRY CONVERSION COSTS IN CANTERBURY		
	Whole farm	$ per ha
Physical Data		
Effective Milking Area	257	
Cows	845	
Conversion Costs		
Shed	$845,889	$3,287
Lanes	$135,708	$527
Water for paddocks	$71,089	$276
Regrassing	$79,689	$310
Capital Fertiliser	$89,300	$347
Fencing	$46,750	$182
Housing/Accommodation	$259,167	$1,007
Underpass	$19,167	$74
Irrigation	$582,883	$2,265
Other	$196,050	$762
Consultant Fees	$95,000	$369
Conversion Costs	**$2,420,692**	**$9,406**
Share Purchase		$10,500
Dairy Cows		$6,365
Total conversion cost including shares	**$6,761,087**	**$26,271**

Most of the irrigation schemes had assumed similar conversion costs to these, but one area of variation was on-farm irrigation costs. Our analysis has pegged these at $2,300 per hectare, where many of the schemes analysed had higher costs of $3,000 to $6,000 per hectare. This probably reflects the type of on-farm irrigation infrastructure employed, shape of block to be irrigated, and proportion of property that is under irrigation. **This suggests conversion costs could be up to $4,000/ha higher than our $26,300/ha assumption, depending on these specific factors.**

DAIRY DEBT CARRYING CAPACITY PER HECTARE						
		Milk payout $ per MS for 100% share backed				
		$5.13	$5.77	$6.42	$7.06	$7.70
Production MS per ha	1,000	-48	7,285	14,617	21,950	29,282
	1,250	-60	9,106	18,271	27,437	36,603
	1,500	-72	10,927	21,926	32,925	43,923
	1,750	-84	12,748	25,580	38,412	51,244
	2,000	-96	14,569	29,234	43,899	58,565

In an attempt to draw out some of the sensitivities, the above table shows debt loadings per hectare with an assumed interest rate of 7 percent and interest cover ratio of 1.25. **What it clearly shows is that given today's conversion costs, both a reasonable milk payout (milk price and dividend) above $6.50 per MS, and high productivity – at least above 1,500 kgs MS/ha, are required to make it work when going off one of the banks' key criteria to assess the ability to repay a loan.**

HORTICULTURE

In the horticultural space there was a limited amount of analysis on the different options for the schemes we examined. Nonetheless, with irrigation many horticultural crops become a possibility in previous dry land areas. **Generally many of the main horticultural enterprises in New Zealand are adaptable to a range of soil types. But climate variables such as the prevailing wind, the risk of frost, growing degree days, and rainfall during certain times of the year are often the more important factors for whether a particular crop or variety may be suitable for a specific area and the expected returns.** As such, trying to generalise the returns, or producing a standardised model for returns from a particular crop, is difficult. Nevertheless the table over the page provides a summary of the Ministry for Primary Industries orchard models for the main horticultural crops to give an idea of what can be achieved. But we stress these would need to be adapted to a particular site and variety to see how

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viable a change of land use might be. See appendix pages 12 and 13 for more details on these models.

Key Parameters $ per ha	1: Marl. Viticulture	2: Hawkes Bay Viticulture	3: Hawkes Bay Pipfruit	4: BoP Kiwifruit
Total gross revenue	**21,473**	**15,040**	**49,464**	**43,076**
Orchard Cash Working Expenditure				
Labour expenses	4,027	2,432	12,709	15,426
Other working expenses	2,943	3,344	26,475	10,290
Overhead expenses	1,220	1,288	2,370	3,840
Total Working Expenditure	**8,190**	**7,064**	**41,555**	**29,556**
Managerial Salaries	2,000	3,456	2,273	10,880
Depreciation	1,090	1,128	1,205	1,730
Orchard Profit before tax	**10,193**	**3,392**	**4,431**	**910**
Interest @ 1.25 interest cover and 7% interest rate	5,550	2,075	2,270	1,140

SHEEP, BEEF AND DAIRY SUPPORT

Trying to standardise the assumptions and returns across the different schemes for sheep, beef and dairy support, as well as arable/ processed vegetable operations, proved to be too difficult. This was due to a much wider range of possible livestock and cropping rotation policy options that could be employed. **Many scenarios also analysed part irrigation of a farm's flat area. Under this situation the return to the irrigated part of the farm cannot be looked at in isolation, as it affects the whole farm system. There are benefits to the non-irrigated part of the farm too**, particularly where the irrigated part is of sufficient scale to provide more flexibility in the farming operation to respond to market signals, as well as to maximise total farm output. For example, depending on the weather and relevant prices, lambs and calves can be finished instead of being sold, and store and breeding stock can be fed better at key times of the year to improve lambing and calving percentages.

We have pulled out a couple of the different scenarios from the schemes we looked into to show some of the possibilities. The three modelled options we have chosen and their key production and price assumptions are below. The full Income and Production Statements are included in the appendix on page 14.

1. **A 50 percent irrigated 400ha farm with arable and livestock under the Central Plains Water Limited scheme.** Key production assumptions are 4,454 stock units wintered at 15.4su/ha grazing area with 2,100 ewes lambing 150 percent, 475 hoggets lambing 100 percent, grazing 200 dairy calves for 15 weeks and 475 dairy heifers for 12 months. Crops include 72ha wheat and barley (at $380/t at 9t/ha and $440/t at 8.5t/ha respectively), 28ha lucerne and 44ha winter brassica. Price assumptions are $6 and $6.5/kg (shoulder of season) for prime lambs, $2.7/kg for store lambs, $4/kg for wool, $4.25/kg for prime beef, $6/wk for dairy calves and $10/wk for dairy heifers.
2. **A fully-irrigated 300ha farm with livestock finishing under the Hawke's Bay Ruataniwha water storage scheme.** The operation comprises bull and lamb finishing, along with the production of spring barley. Running 18 su/ha, 13 tDM/ ha gross pasture production, supplemented with brassica feeding in early winter and 25 ha feed barley at 7 t/ha. Livestock are 5,500 lambs finished to 18.2 kg average carcass at a $32.60 margin and 450 weaner bulls purchased at 100kg live weight and finished to 310 kg carcass with a $915 margin. No dairy support. Price assumptions the same as model 1.
3. **A 900ha livestock finishing farm with 200ha irrigated and 700ha non-irrigated under the Hawke's Bay Ruataniwha water storage scheme.** Key production assumptions: 700ha dryland pasture production 8tDM/ha gross with a lift from additional pasture renewal and better grazing management. 200ha irrigated high quality pasture producing 13tDM/ha gross. In total 5,400 ewes lambing at 147 percent, 1600 hoggets lambing 68 percent, 3,250 trading lambs finished to 19.5 kgs, 450 yearling bulls finished as two-year olds at 320kg carcass. Dryland pasture renewal through brassica and pasja. No dairy support. Price assumptions the same as model 1.

Key financial parameters that fall out of these models are in the table over the page. We have also added the 2011-12 results from irrigated farms in Beef + Lamb New Zealand's survey of Class 6 South Island finishing breeding farms. These are generally extensive finishing farms, encompassing some irrigation units and frequently with some cash cropping. Carrying capacity ranges from 6 to 11 su/ ha on dryland farms and over 12 su/ha on irrigated units. Mainly in Canterbury and Otago we have picked out the ones where some irrigation is being undertaken.

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Key Parameters $ per ha	1: CPW part irrigated	2: Hawkes Bay fully irrigated	3: Hawkes Bay part irrigated	4: B+LNZ Class 6 South Island
Total gross revenue	**2,504**	**2,242**	**1,595**	**1,319**
Farm Cash Working Expenditure				
Wages	32	73	99	61
Fertiliser & lime	243	168	152	109
Irrigation charges	643	1,008	182	79
Total Working Expenditure	**1,358**	**1,743**	**704**	**664**
Managerial Salaries	110	267	100	125
Total Standing Charges	163	320	123	214
Farm Profit before tax	**903**	**96**	**695**	**341**
Interest @ 1.25 interest cover and 7% interest rate	578	57	507	224

As the above table shows there's quite a range in the bottom-line results: from $1,013 to $363 per hectare, before tax, interest and any managerial salaries are paid out. There was a large range of assumed managerial salaries, which dropped the returns further when they were deducted. While it is very difficult to draw comparisons across the different results, some general observations from here and other material examined were:

1. **Part irrigation of a larger livestock farm that improves farm policy flexibility and helps mitigate against dry conditions generally lowers risk and provides higher per hectare returns compared with a fully irrigated property.**
2. **Over time, as skills and confidence grow, the irrigated area on a livestock property tends to gravitate toward the most profitable enterprise depending on market conditions** i.e. lamb finishing versus specialist cropping. This highlights the improved flexibility irrigation provides farmers and the ability to set up a farm to maximise production and profit every year, instead of trying to mitigate dry conditions.
3. **Solely dedicated livestock finishing operations didn't tend to fare well**, with the model we chose (2: Fully-irrigated in the Hawke's Bay) being the poorest performing even when adjustments are made for different managerial salary assumptions. One of the main reasons for the poor returns across a number of finishing models was high water requirements, which increased irrigation charges.
4. **In some cases the rates of return for individual livestock farm policies were lower than without irrigation.** This highlighted the productivity boost in a normal year wasn't always sufficient to compensate for increased costs and additional capital invested.
5. **Farmer productivity around production parameters was key to making a success of a new irrigation scheme.** For the three models we chose, top management results were assumed in all. Reducing farm production to average levels often cut the return on marginal capital invested to convert to irrigation to a level below the cost of capital i.e. rural term loan rates.

We also took a look at the returns of irrigated and non-irrigated Class 6 farms in 2011-12 from the Beef + Lamb NZ survey to assess differences in farm performance (see appendix, page 15 for the detailed Income and Production statements). The prices received for prime stock where very similar to those assumed in model 1, with the only material difference being a wool price of $4.30/kg. It is important to note the farms are only identified as having irrigation, not the area irrigated. But as 20 percent of the area on these farms are identified as being flat, it would probably be safe to assume somewhere around this proportion of the area is irrigated.

Interestingly, comparing the bottom lines for the averages showed a difference of only 6 percent, or $19 per hectare. Gross revenue is 30 percent higher on the irrigated farms, which is largely driven by more cropping and dairy grazing. While net meat production is also 15 percent higher at 175 kg/ha, compared with 152 kg/ha on non-irrigated properties, this doesn't show up in extra revenue. We suspect this was due to the unsustainably high store stock prices during this season, which probably reduced margins for this particular year. A more favourable year for finishing margins would likely boost revenue with this higher production.

On the cost side, the irrigated farms have higher costs per ha for most categories. Overall total farm working expenditure is 36 percent, or $175/ha higher. Nearly half of the difference is irrigation charges at $79/ha, but other areas of higher expenditure include higher direct cash crop expenses of $40/ha and depreciation of $53/ha with a larger area cropped. **Remember – these are averages and the numbers we presented above were for top performance, which added $50 to $150 per ha in extra profit assuming other things remained the same.**

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ARABLE AND PROCESSED CROPS

For arable returns we followed a similar exercise to sheep, beef and dairy support by pulling out a couple of the different scenarios from the schemes we looked into, to show some of the possibilities. **Like livestock farming, there are many different crops that can be grown depending on market signals, expertise, and the physical and environmental aspects of a property.** The two modelled options we have chosen and their key production and price assumptions are below. See appendix, page 16 for the detailed Income and Production statements.

1. **A fully irrigated 400ha farm with arable and processed crops under the Central Plains Water scheme.** A six-year crop rotation cycle, with some intensive lamb finishing at a margin of $20/head. Produce grown includes milling wheat (9 t/ha, $440/t), feed wheat (12 t/ha, $380/t), potatoes (68 t/ha, $186/t), peas (7.0 t/ha, $300/t), grass seed (1.8 t/ha, $2,200/t) and clover seed (0.7 t/ha, $6,000/t).
2. **A 90 percent irrigated 300ha farm with arable and processed vegetables under the Hawke's Bay Ruataniwha water storage scheme.** A five-year crop rotation cycle and 30 ha of dry lucerne. Produce grown includes wheat (10 t/ha, $470/t), squash (15 t/ha, $700/t), potatoes (65 t/ha, $220/tonne), peas (8.5 t/ha, $400/t), beans (12 tonne/ha, $430/t), maize grain (12.5 t/ha, $450/t), and ryegrass seed (2 t/ha, $1,700/t). Ryegrass straw and Lucerne balage is sold. The system also includes intensive lamb finishing, with irrigated pasture production of 12.9 t/DMha gross.

Key Parameters $ per ha	1: CPW arable and processed crops	2: Hawkes Bay arable and processed vegetables	3: B+LNZ Class 8 South Island
Total gross revenue	**5,566**	**7,355**	**3,447**
Farm Cash Working Expenditure			
Wages	105	193	170
Weed & Pest Control	377	689	255
Fertiliser & lime	898	707	384
Seeds	515	722	64
Irrigation charges	366	612	146
Cartage	276	327	86
Total Working Expenditure	**3,112**	**4,531**	**2,014**
Managerial Salaries	105	267	100
Total Standing Charges	158	363	246
Farm Profit before tax	**2,091**	**2,053**	**851**
Interest @ 1.25 interest cover and 7% interest rate	1,250	1,230	261

Again while drawing conclusions across the different models and other analysis examined is difficult, there was consistency shown in the fact that fully irrigated arable and processed crop farms returned a net farm profit around the $1,500 to $2,000/ha mark.

The main benefit arable farms receive from irrigation is that reliable water enables farmers to move from commodity crops to specialist, higher risk, but higher EBIT crops. To highlight some of the many opportunities we have included a table in the appendix on page 17 of the gross returns from a wide range of different crops, many of which require reliable water to be able to be grown. These figures are from Roy Evans Limited who pull together an annual update of these gross margins and the cost of production for each based on their observations. It's important to note the crop gross margins are a guide to comparative direct crop variable income, and variable expenditure and total farm profitability cannot be determined from the gross margins. Consideration must also been given to other factors such as relative risk of alternative crops, crop rotations, irrigation requirements, labour and machinery availability, soil type storage requirements, and management skill.

As with our livestock comparison we also thought it might be worthwhile looking at the returns of irrigated and non-irrigated Class 8 farms in 2011-12 from the Beef + Lamb NZ survey to see what the differences are in farm performance. The detailed Income and Production statements are included in the appendix on page 18. Again it is important to note the farms are only identified as having irrigation, not the area irrigated.

Unlike the earlier comparison between Class 6 farms there is quite a large gap in the bottom-lines of $264/ha, or 45 percent. Higher gross revenue across all categories was the big driver. **The largest $/ha variation was for the cropping account, with a difference between the two of $619/ha.** Interestingly, a slightly smaller proportion (60 percent of effective area) of the farms that were irrigated were cropped compared with non-irrigated properties (69 percent of effective area). **However, the large difference in the revenue generated per hectare between the two indicates more specialised high-value crops were able to be grown on the irrigated farms because of more reliable water.**

As would be expected, farm working expenditure was higher on irrigated farms. The main differences were high cash crop costs from more specialist crops being planted, irrigation

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charges, and feed and grazing. The higher feed and grazing costs looks to have been a result of more dairy grazing, with higher per hectare dairy grazing revenue on irrigated properties. Making comparisons between these results and the models examined is difficult. However, the per hectare results from the Class 8 irrigated properties were less than half those of the models we examined. The difference seems to be largely due to the proportion of the farm used to grow crops, crop rotation, slightly higher crop price assumptions, and top performance.

Trying to carry out sensitivity analysis on the price, production and cost parameters of the livestock and arable models would be rather pointless in our view. This is due to the ability to substitute between different enterprises and change policy as returns alter. However, one interesting aspect we examined was the assumed conversion costs for the different models from dry land to their new state, as well as the ability to debt fund this through the requirement of an interest cover ratio of 1.25 and interest rate of 7 percent.

The table below provides a summary of the results. Dry land conversion to livestock operations were generally assessed to cost $5,500/ha on average.

LIVESTOCK				
Model Number	**1**	**2**	**3**	**4**
Conversion costs	$5,969/ha from dry land	$3,795/ha from dry land	$5,509/ha from dry land, but only part irrigation of 200ha. Over total area $1,224/ha	$19,460/ha current total assets of irrigated Class 6 farms
Debt service capacity @ 1.25 interest cover ratio and 7% interest rate	$8,257/ha	$807/ha	$7,243/ha	$1,404/ha total current liabilities for irrigated. $1,111/ha for non-irrigated farms.

ARABLE AND PROCESSED CROPS			
Model Number	**1**	**2**	**3**
Conversion costs	$11,800/ha from dry land	$6,167/ha from part irrigation of 50 hectares already.	$29,943/ha current total assets of irrigated Class 8 farms
Debt service capacity @ 1.25 interest cover ratio and 7% interest rate	$17,857/ha	$17,571/ha	$7,824/ha total current liabilities for irrigated farms. $5,842/ha for non-irrigated farms.

Where a proportion of a farm was irrigated, this lowered the overall per hectare cost, with the extent depending on the split between the irrigated and non-irrigated area. Arable and processed crops were slightly higher, usually in the $10,000-$12,000 range for dry land conversions. **Looking at the average existing debt loadings on non-irrigated Class 6 and 8 farms and the debt-servicing capacity of the returns when converted to either livestock or arable, it suggests most dry land operations with moderate-to-average debt could convert.** Obviously once converted, the assumed physical and financial performance of the models would need to be achieved.

PARTING REMARKS

The benefits of irrigation have been known for a very long time, but despite this, New Zealand still only irrigates about 5 percent of its pastoral land. Part of the issue is the diminishing quantity of available water for irrigation. Around 41 percent of water used for irrigation is extracted relatively easily from groundwater sources stored naturally in aquifers. Access to this water is regulated by local government and was historically issued on a first-in first-served basis. Over time the race to access water has meant that in some regions water has been fully allocated, or over-allocated. Furthermore, with water conservation becoming increasingly important, extraction from run of river is no longer a viable means for long-term water security. **With the realisation that water is a finite resource, there's additional motivation for investment to capture water in order to make use of it at the right time, the right place, and in the right amount.**

The development of more water storage and enhancements to existing irrigation schemes are key to primary sectors unlocking offshore opportunities. The potential ability to export embodied water and better manage the volatility of Mother Nature means huge attention needs to be given to deriving cash value from storage.

The table over the page provides a summary of our findings on the potential earnings of different land uses under irrigation. **As we have highlighted, there are many factors a farmer/grower needs to weigh up when looking at the returns of different land uses under irrigation.**

There is no "one size fits all" solution. For any farmer considering their own particular situation it pays to invest in good advice to work out the viable options. Many new schemes have shown a high turnover in business ownership (and usually, but not always, associated land

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ownership) of around 70 percent within five years of a scheme's commissioning. Associated with this change has usually been the introduction of some new expertise and additional equity, so that not all the marginal capital required to install irrigation and change land use or farm policy is debt funded.

SUMMARY OF RETURNS OF DIFFERENT LAND USES UNDER IRRIGATION		
Dairy	Average	$2,380/ha
	Range	$2,000-$6,000/ha
Sheep, Beef & Dairy Support	Average	$700-$900/ha
	Range	$100-1,000/ha
Arable and Processed Crops	Average	$2,000/ha
	Range	$1,000-$2,500/ha
Viticulture	Average	Depends on region & variety.
	Range	$4,000-$10,000/ha
Kiwifruit	Average	Depends on variety split but $900/ha
	Range	Wide range
Pipfruit	Average	$4,400/ha
	Range	Depends on variety split.

Most of our analysis has shown top farm management performance, moderate-to-average existing debt levels, and reasonable prices are often required to make new irrigation work for an existing land owner. Additionally, to make money from irrigation, a farm needs to be set up to maximise production and revenue every year, rather than just aiming to mitigate the risks of drought.

Productivity of new farms taking up irrigation will often be at the top end of the range because of:

- **Younger farmers taking over management** through family succession, or change of ownership;
- **Top performers buying more land and expanding;**
- **High debt levels sharpening performance;**
- **Leveraging new technology** eg. new centre pivots compared to older technology such as gun irrigators, or even flood irrigation, helps mitigate poor management;
- **Reliability and increased confidence allows the system to be run to its maximum** and avoids conservatism being applied in the farming operation;
- **In many cases partial irrigation lifts the productivity of the non-irrigated part of the farm** and is likely to provide the best return for those short on capital to invest.

Even some of the high-productivity assumptions used in certain models could be conservative in 20 years' time for three reasons:

- New innovation;
- Macro-economic drivers and improving real terms of trade for the primary sectors;
- New irrigation technology.

One needs only to look at the amount of innovation and changes in farming practice that have occurred in the last 20 years to get a sense of what is possible. The three factors above should boost real returns over time, which improves the rate of return on sunk capital.

Depending on the property market the additional capital expenditure to convert to irrigation is usually also capitalised into the value of the enterprise. Historically there have been steep initial capital gain opportunities associated with irrigation investment, and the associated change of land use. **What seems more likely at this point in time though is a more gradual accrual of value at a slightly faster rate than non-irrigated land.** In many cases where new irrigation is planned, land values are already quite high, farm-gate returns remain volatile, and new irrigation developments are generally higher cost than has historically been the case.

Another area we have not covered is the execution side of implementing new irrigation and a change of land use or farm policy. The first few years of a new investment and change of land use is when vulnerability is at its highest. **Developing a business plan, project plan, and budget, as well as completing the changeover on time, to specification and within budget, are critical components for any new investment.** Not getting this right often leads to a business being tripped up and not succeeding. Get the execution right, and what our analysis has shown is that – in most cases – investment in irrigation can be made to work in today's business environment despite the many challenges and the higher cost of accessing water.

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INCOME AND PRODUCTION STATEMENT						
	Marlborough Viticulture			Hawkes Bay Viticulture		
Orchard size	30			12.5		
Tonnes of production	370			107		
	$ per orchard	$ per effective ha	$ per tonne	$ per orchard	$ per effective ha	$ per tonne
Total Cash Revenue						
Income from fruit sales	644,200	21,473	1,741	188,000	15,040	1,760
Other income	0	0	0	0	0	0
Total Gross Revenue	**644,200**	**21,473**	**1,741**	**188,000**	**15,040**	**1,760**
Vineyard Working Expenditure						
Hand harvesting	2,900	97	8	300	24	3
Pruning (and tying down)	64,200	2,140	173	14,800	1,184	139
Canopy/Crop management	22,600	753	61	12,500	1,000	117
Other wages	30,100	1,003	81	2,300	184	22
ACC – employees	1,000	33	3	500	40	5
Total labour expenses	**120,800**	**4,027**	**326**	**30,400**	**2,432**	**285**
Weed & pest control	22,600	753	61	9,400	752	88
Fertiliser & lime	6,100	203	16	3,100	248	29
Electricity	4,200	140	11	1,900	152	18
Vehicle	4,400	147	12	2,400	192	23
Fuel	8,500	283	23	5,200	416	49
Repairs & maintenance	10,800	360	29	4,100	328	38
General	3,900	130	11	900	72	8
Frost protection	2,700	90	7	1,300	104	12
Contract machinery work	6,600	220	18	2,900	232	27
Machine harvesting	18,500	617	50	10,600	848	99
Total other working expenses	**88,300**	**2,943**	**239**	**41,800**	**3,344**	**392**
Rates	9,800	327	26	3,800	304	36
Water rates	2,200	73	6	200	16	2
General insurance	4,100	137	11	3,600	288	34
Crop insurance	0	0	0	0	0	0
ACC – owners	6,100	203	16	1,700	136	16
Communication	2,000	67	5	1,300	104	12
Accountancy	3,100	103	8	2,200	176	21
Legal & consultancy	2,000	67	5	800	64	8
Levies & subscriptions	5,800	193	16	1,700	136	16
Other administration	1,500	50	4	800	64	8
Total overhead expenses	**36,600**	**1,220**	**99**	**16,100**	**1,288**	**151**
Total vineyard working expenses	**245,700**	**8,190**	**664**	**88,300**	**7,064**	**829**
Managerial salary/drawings	60,000	2,000	162	43,200	3,456	405
Depreciation	32,700	1,090	88	14,100	1,128	132
Total vineyard expenditure	**338,400**	**11,280**	**914**	**145,600**	**11,648**	**1,366**
Vineyard profit before tax	**305,800**	**10,193**	**827**	**42,400**	**3,392**	**394**
Rent &/or leases	8,200	273	22			
Interest	166,500	5,550	450	25,938	2,075	243
Tax	122,800	4,093	332	11,900	952	112
Net non-fruit cash income	32,700	1,090	88	2,000	160	19
Total other expenses	**330,200**	**11,006**	**892**	**39,838**	**3,187**	**374**

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INCOME AND PRODUCTION STATEMENT FOR HAWKE'S BAY PIPFRUIT			
Orchard size	22		
Number of trays	67,339		
	$ per orchard	$ per planted ha	Gross $ per tray
Total Cash Revenue			
Income from fruit sales	1,072,200	48,736	15.92
Other income	16,000	727	0.24
Total Gross Revenue	**1,088,200**	**49,464**	**16.16**
Orchard Working Expenditure			
Hand harvesting	139,400	6,336	2.07
Pruning	41,800	1,900	0.62
Thinning	54,200	2,464	0.80
Other wages	40,000	1,818	0.59
ACC – employees	4,200	191	0.06
Total labour expenses	**279,600**	**12,709**	**4.15**
Packing	188,500	8,568	2.80
Packaging	180,500	8,205	2.68
Cool storage	83,700	3,805	1.24
Freight	14,800	673	0.22
Total post harvest expenses	**467,500**	**21,250**	**6.94**
Weed and pest control	59,400	2,700	0.88
Pollination	1,450	66	0.02
Fertiliser and lime	2,000	91	0.03
Electricity	3,300	150	0.05
Vehicle	10,000	455	0.15
Fuel	14,300	650	0.21
Repairs & maintenance	15,000	682	0.22
General	7,300	332	0.11
Contract machine work	2,200	100	0.03
Total other working expenses	**114,950**	**5,225**	**1.71**
Rates	5,500	250	0.08
Water & related charges	500	23	0.01
General insurance	5,000	227	0.07
Crop insurance	14,400	655	0.21
ACC – owners	2,200	100	0.03
Communication	2,600	118	0.04
Accounting	3,800	173	0.06
Legal and consultancy	3,400	155	0.05
Levies and subscriptions	12,500	568	0.19
Other administration	2,250	102	0.03
Total overhead expenses	**52,150**	**2,370**	**0.77**
Total orchard working expenses	**914,200**	**41,555**	**13.57**
Managerial salary/drawings	50,000	2,273	0.74
Depreciation	26,500	1,205	0.39
Total orchard expenditure	**990,700**	**45,033**	**14.70**
Profit before tax	**97,500**	**4,431**	**1.46**
Rent &/or leases	24,500	1,114	0.36
Interest	49,940	2,270	0.74
Tax	11,000	500	0.16
Net non-fruit cash income	230	23	0.01
Total other expenses	**85,670**	**3,907**	**1.27**

INCOME AND PRODUCTION STATEMENT FOR BAY OF PLENTY KIWIFRUIT			
Orchard size	5		
Number of trays	41,984		
	$ per orchard	$ per planted ha	Gross $ per tray
Total Cash Revenue			
Green – OGR progress	122,840	30,710	3.70
Green – previous crop final	10,730	2,683	0.29
Gold – OGR progress	76,560	76,560	8.70
Gold – previous crop final	2,904	2,904	0.24
Other orchard income	2,350	470	0.06
Total Gross Revenue	**215,380**	**43,076**	**5.13**
Orchard Working Expenditure			
Pruning wages	43,200	8,640	1.03
Thinning wages	8,000	1,600	0.19
Picking wages	16,020	3,204	0.38
Other wages	9,910	1,982	0.24
ACC – employees	0	0	0.00
Total labour expenses	**77,130**	**15,426**	**1.84**
Weed and pest control	9,000	1,800	0.21
Psa management	5,000	1,000	0.12
Pollination	6,300	1,260	0.15
Fertiliser and lime	7,000	1,400	0.17
Electricity	1,200	240	0.03
Vehicle (including fuel)	8,500	1,700	0.20
Repairs and maintenance	8,000	1,600	0.19
General	3,100	620	0.07
Frost protection	0	0	0.00
Freight to packhouse	3,000	600	0.07
Contract machine work	350	70	0.01
Total other working expenses	**51,450**	**10,290**	**1.23**
Rates	4,500	900	0.11
Insurance	3,000	600	0.07
ACC – owners	2,750	550	0.07
Communication	2,000	400	0.05
Accountancy	3,700	740	0.09
Legal and consultancy	1,350	270	0.03
Levies and subscriptions	700	140	0.02
Other administration	1,200	240	0.03
Total overhead expenses	**19,200**	**3,840**	**0.46**
Total orchard working expenses	**147,780**	**29,556**	**3.52**
Managerial salary/drawings	54,400	10,880	1.30
Depreciation	8,650	1,730	0.21
Total orchard expenditure	**210,830**	**42,166**	**5.03**
Profit before tax	**4,550**	**910**	**0.10**
Rent &/or leases	0	0	0.00
Interest	5,700	1,140	0.14
Tax	5,600	1,120	0.13
Net non-fruit cash income	8,160	6,672	0.80
Total other expenses	**19,460**	**8,932**	**1.07**

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	1: Central Plains Water part irrigated arable and livestock		2: Hawkes Bay Ruataniwha water storage full irrigation livestock finishing		3: Hawkes Bay Ruataniwha water storage part irrigated livestock breeding & finishing	
Physical characteristics:	**Per farm**	**Per hectare**	**Per farm**	**Per hectare**	**Per farm**	**Per hectare**
Effective area (ha)	400		300		900	
Total Sheep & Beef Stock units	4,454		2,727		6,737	
Total SU per ha	15.4 (wintered)		18		10	
	$ per farm	**$ per effective hectare**	**$ per farm**	**$ per effective hectare**	**$ per farm**	**$ per effective hectare**
Total Cash Revenue						
Wool	57,200	143	4,800	16	149,940	167
Sheep	378,000	945	179,250	598	1,033,020	1,148
Cattle	–	–	411,630	1,372	252,270	280
Dairy Grazing	–	–	–	–	–	–
Deer + Velvet	–	–	–	–	–	–
Goat + Fibre	–	–	–	–	–	–
Cash Crop	259,920	650	77,010	257	–	–
Other (includes dairy grazing)	306,400	766	–	–	–	–
Total Gross Revenue	**1,001,520**	**2,504**	**672,690**	**2,242**	**1,435,230**	**1,595**
Cash Farm Working Expenditure						
Wages	12,600	32	22,000	73	89,000	99
Animal Health	13,880	35	11,384	38	32,820	36
Weed & Pest Control	32,800	82	6,500	22	8,250	9
Shearing Expenses	18,090	45	2,400	8	62,520	69
Fertiliser	97,280	243	50,481	168	136,521	152
Lime	–	–	–	–	–	–
Seeds	17,720	44	8,750	29	11,250	13
Vehicle Expenses	21,520	54	16,000	53	32,000	36
Fuel	–	–	–	–	–	–
Electricity	2,040	5	27,200	91	21,800	24
Feed & Grazing	1,240	3	–	–	–	–
Irrigation Charges	257,200	643	302,400	1,008	163,840	182
Cultivation & Sowing	–	–	30,000	100	22,500	25
Cash Crop Expenses	13,360	33	24,750	83	–	–
Repairs & Maintenance	24,120	60	10,000	33	27,000	30
Cartage	15,840	40	8,000	27	16,000	18
Administration Expenses	15,400	39	3,000	10	10,000	11
Total Working Expenses	**543,090**	**1,358**	**522,865**	**1,743**	**633,501**	**704**
Insurance	10,000	25	8,000	27	9,000	10
ACC Levies	3,000	8	–	–	–	–
Rates	8,250	21	8,000	27	12,000	13
Managerial Salaries	44,000	110	80,004	267	90,000	100
Interest	–	–	–	–	–	–
Rent	–	–	–	–	–	–
Total Standing Charges	65,250	163	96,004	320	111,000	123
Total Cash Expenditure	608,340	1,521	618,869	2,063	744,501	827
Depreciation	31,800	80	24,900	83	64,800	72
Total Farm Expenditure	**640,140**	**1,600**	**643,769**	**2,146**	**809,301**	**899**
Farm Profit before Tax	**361,380**	**903**	**28,921**	**96**	**625,929**	**695**

FEATURE ARTICLE: INVESTIGATING THE RETURNS FROM IRRIGATION

	Beef + Lamb NZ Irrigated Class 6 South Island finishing/breeding		Beef + Lamb NZ Non-irrigated Class 6 South Island finishing/breeding		
Physical characteristics:	**Per farm**	**Per hectare**	**Per farm**	**Per hectare**	
Effective area (ha)	345		523		
Total Sheep & Beef Stock units	2,657		3,975		
Total SU per ha	7.7		7.6		
	$ per farm	**$ per effective hectare**	**$ per farm**	**$ per effective hectare**	**% difference**
Total Cash Revenue					
Wool	34,559	100	61,756	118	-15%
Sheep	211,012	612	321,002	614	0%
Cattle	91,339	265	89,564	171	55%
Dairy Grazing	24,899	72	17,416	33	117%
Deer + Velvet	10,364	30	6,140	12	156%
Goat + Fibre	–		110	0	-100%
Cash Crop	45,568	132	17,714	34	290%
Other (includes dairy grazing)	37,312	108	18,049	35	213%
Total Gross Revenue	**455,052**	**1,319**	**531,750**	**1,017**	**30%**
Cash Farm Working Expenditure					
Wages	20,979	61	21,689	41	47%
Animal Health	11,927	35	18,336	35	-1%
Weed & Pest Control	10,033	29	12,348	24	23%
Shearing Expenses	9,553	28	19,613	38	-26%
Fertiliser	37,605	109	55,260	106	3%
Lime	3,678	11	10,256	20	-46%
Seeds	8,456	25	8,180	16	57%
Vehicle Expenses	12,310	36	14,199	27	31%
Fuel	17,250	50	15,136	29	73%
Electricity	4,337	13	2,505	5	162%
Feed & Grazing	14,148	41	–	–	-18%
Irrigation Charges	27,390	79	26,208	50	
Cultivation & Sowing	7,569	22	4,744	9	142%
Cash Crop Expenses	3,253	9	1,051	2	369%
Repairs & Maintenance	22,722	66	30,198	58	14%
Cartage	6,703	19	4,691	9	117%
Administration Expenses	11,337	33	11,673	22	47%
Total Working Expenses	**229,249**	**664**	**256,087**	**490**	**36%**
Insurance	8,466	25	6,919	13	85%
ACC Levies	3,968	12	4,670	9	29%
Rates	11,495	33	9,456	18	84%
Managerial Salaries[1]	34,500	100	52,300	100	25%
Interest	–	–	–	–	
Rent	6,786	20	9,017	17	14%
Total Standing Charges	73,840	214	82,362	157	36%
Total Cash Expenditure	303,089	879	338,449	647	36%
Depreciation	34,438	100	24,743	47	111%
Total Farm Expenditure	**337,527**	**978**	**363,192**	**694**	**41%**
Farm Profit before Tax	**117,524**	**341**	**168,558**	**322**	**6%**

[1] Have assumed a $125/ha and $100/ha Managerial Salaries

FEATURE ARTICLE: INVESTIGATING THE RETURNS FROM IRRIGATION

	1: CPW arable & processed crops		2: Hawkes Bay Ruataniwha water storage arable & processed vegetables	
Physical characteristics:	**Per farm**	**Per hectare**	**Per farm**	**Per hectare**
Effective area (ha)	400		300	
	$ per farm	**$ per effective hectare**	**$ per farm**	**$ per effective hectare**
Total Cash Revenue				
Wool	21,320	53	18,300	61
Sheep	130,040	325	163,200	544
Cattle	–	–	–	–
Dairy Grazing	–	–	–	–
Deer + Velvet	–	–	–	–
Goat + Fibre	–	–	–	–
Cash Crop	2,075,200	5,188	2,025,000	6,750
Other	–	–	–	–
Total Gross Revenue	**2,226,560**	**5,566**	**2,206,500**	**7,355**
Cash Farm Working Expenditure				
Wages	42,000	105	58,000	193
Animal Health	7,000	18	12,846	43
Weed & Pest Control	150,800	377	206,621	689
Shearing Expenses	11,200	28	13,650	46
Fertiliser	359,125	898	212,217	707
Lime	–	–	–	–
Seeds	206,100	515	216,471	722
Vehicle Expenses	54,250	136	52,500	175
Fuel	–	–	–	–
Electricity	2,000	5	22,560	75
Feed & Grazing	1,200	3	45,533	152
Irrigation Charges	146,400	366	183,600	612
Cultivation & Sowing	82,225	206	176,702	589
Cash Crop Expenses	–	–	–	–
Repairs & Maintenance	52,000	130	45,500	152
Cartage	110,520	276	98,223	327
Administration Expenses	20,000	50	15,000	50
Total Working Expenses	**1,244,820**	**3,112**	**1,359,423**	**4,531**
Insurance	10,000	25	11,000	37
ACC Levies	3,000	8	5,000	17
Rates	8,250	21	13,000	43
Managerial Salaries	42,000	105	80,004	267
Interest	–	–	–	–
Rent	–	–	–	–
Total Standing Charges	**63,250**	**158**	**109,004**	**363**
Total Cash Expenditure	**1,308,070**	**3,270**	**1,468,427**	**4,895**
Depreciation	82,000	205	122,120	407
Total Farm Expenditure	**1,390,070**	**3,475**	**1,590,547**	**5,302**
Farm Profit before Tax	**836,490**	**2,091**	**615,953**	**2,053**

FEATURE ARTICLE: INVESTIGATING THE RETURNS FROM IRRIGATION

Arable and processed crops gross margins per hectare			
	Base price	Medium yield	High yield
Barley feed	$380	$1,103	$2,035
Barley malting	$420	$1,264	$2,380
Borage	$10.00	$669	$2,418
Buck wheat	$2,000	$1,657	$2,553
Carrot seed hybrid	$40.00	$4,491	$8,782
Carrot seed open pollinated	$16.00	$526	$4,503
Chinese cabbage	$2.50	$2,069	$3,141
Chinese kale	$3.10	$2,394	$3,571
Grass seed cocksfoot	$4.35	$2,138	$3,448
Grass seed prairie grass	$1.65	$1,775	$3,053
Grass seed ryegrass forage common	$1.80	$1,494	$2,558
Grass seed ryegrass forage propriety	$2.40	$1,207	$3,672
Grass seed ryegrass turf	$2.40	$1,542	$3,126
Grass seed tall fescue	$5.00	$2,377	$5,343
Kale seed	$3.85	$1,725	$3,234
Lentils	$1,300	$1,615	$2,434
Linseed	$925	$897	$1,689
Mustard Chinese	$2.60	$1,372	$3,449
Oats	$440	$1,207	$2,012
Peas blue	$600	$908	$1,713
Peas garden	$950	$1,096	$2,182
Peas maple sprouting	$1,000	$2,000	$3,543
Peas marrowfat	$750	$1,042	$2,086
Peas white	$500	$840	$1,628
Peas vining	$415	$1,386	$2,614
Phacellia	$7.00	$427	$1,644
Potatoes	$350	$6,331	$9,060
Radish hybrid	$25.00	$2,191	$5,191
Radish open pollenated	$3.00	$1,492	$3,186
Radish sprouting	$3.50	$1,825	$4,001
Red beet open pollinated	$4.00	$1,243	$4,132
Ryecorn	$455	$1,290	$1,554
Silage maize	$0.23	$861	$1,780
Silage/graze pasture	$0.08	$652	$1,074
Silage wheat	$0.23	$1,905	$2,770
Triticale	$350	$999	$1,611
Wheat feed	$380	$1,499	$1,958
Wheat spring milling	$410	$1,107	$1,456
Wheat winter milling	$410	$1,320	$1,909
White clover huia	$4.50	$715	$1,675
White clover specialist	$5.75	$879	$1,973
Winter stock feed – kale	$0.23	$1,554	$2,432
Winter stock feed – fodder beet	$0.23	$743	$2,416

FEATURE ARTICLE: INVESTIGATING THE RETURNS FROM IRRIGATION

	Beef + Lamb NZ Irrigated Class 8 South Island mixed finishing		Beef + Lamb NZ Non-irrigated Class 8 South Island mixed finishing		
Physical characteristics:	**Per farm**	**Per hectare**	**Per farm**	**Per hectare**	
Effective area (ha)	430		346		
Total Sheep & Beef Stock units	3870		1384		
Total SU per ha	9.0		4.0		
	$ per farm	**$ per effective hectare**	**$ per farm**	**$ per effective hectare**	**% difference**
Total Cash Revenue					
Wool	40,850	95	23,151	67	42%
Sheep	250,651	583	145,593	421	39%
Cattle	89,788	209	13,446	39	437%
Dairy Grazing	44,621	104	11,176	32	221%
Deer + Velvet	16,297	38	–		
Goat + Fibre	–		–		
Cash Crop	958,285	2,229	556,880	1,609	38%
Other	81,717	190	51,544	149	28%
Total Gross Revenue	**1,482,210**	**3,447**	**801,789**	**2,317**	**49%**
Cash Farm Working Expenditure					
Wages	73,122	170	57,350	166	3%
Animal Health	11,653	27	6,415	19	46%
Weed & Pest Control	109,706	255	86,659	250	2%
Shearing Expenses	16,194	38	4,553	13	186%
Fertiliser	165,056	384	92,908	269	43%
Lime	6,097	14	5,557	16	–12%
Seeds	27,520	64	15,390	44	44%
Vehicle Expenses	31,261	73	35,901	104	–30%
Fuel	56,524	131	34,503	100	32%
Electricity	4,141	10	4,488	13	–26%
Feed & Grazing	77,026	179	15,224	44	307%
Irrigation Charges	62,728	146	–		
Cultivation & Sowing	12,083	28	12,653	37	–23%
Cash Crop Expenses	90,107	210	34,520	100	110%
Repairs & Maintenance	60,239	140	32,780	95	48%
Cartage	37,075	86	12,698	37	135%
Administration Expenses	25,576	59	15,958	46	29%
Total Working Expenses	**866,106**	**2,014**	**467,557**	**1,351**	**49%**
Insurance	20,924	49	8,394	24	101%
ACC Levies	7,061	16	3,187	9	78%
Rates	16,164	38	12,722	37	2%
Managerial Salaries[1]	43,000	100	34,600	100	0%
Interest	–	–	–	–	
Rent	18,808	44	19,497	56	–22%
Total Standing Charges	105,956	246	78,400	227	9%
Total Cash Expenditure	972,062	2,261	545,957	1,578	43%
Depreciation	144,136	335	52,679	152	120%
Total Farm Expenditure	**1,116,198**	**2,596**	**598,635**	**1,730**	**50%**
Farm Profit before Tax	**366,012**	**851**	**203,154**	**587**	**45%**

[1] Have assumed a managerial salary of $100

THE MONTH IN REVIEW

SUMMARY

Apart from a few ups and downs most farmers have had a phenomenal run of weather and pasture growth since May. Many regions experienced mild winter conditions, which combined with the normal seasonal increase in moisture meant pasture covers recovered quickly from the summer/autumn drought and growth was barely checked thereafter. More recently, as spring has started to arrive, high pressure systems have been replaced by wet fronts. This has helped fully recharge water tables heading into the seasonal peak of pasture growth and demand. Combined with lower stocking rates, this has set up pasture covers and animal condition for a great start to the 2013-14 season.

DAIRY

Where do we start on the dairy sector's recent events? **The positive story is that the 2013-14 season is shaping up as a perfect storm, and is set to deliver record bottom lines for many.** This is being fuelled by a better-than-expected recovery from the drought, prospects of a record payout, and good pasture covers, cow condition, and calving in most regions. Many have described calving as the "best ever" with low metabolic issues, compact calving spread, and good pasture cover/cow condition.

This has led to a strong start to the season for milk intakes, with Fonterra reporting year-to-date milk flows up 3.4 percent at the end of August. With the increase the same for both Islands, it highlights the present uniformity in conditions up and down the country. The fast start has been impressive given the culling of nearly 200,000 extra cows (+28 percent y/y) during the drought, and that the comparison is against a good start last year. Many analysts have recently revised their production forecasts up, with Fonterra moving to a forecast increase of 5 percent for 2013-14. **As previously stated, we think a gain of 3 to 6 percent is possible depending on how the seasonal conditions play out. At this stage we would be at the top of this band.**

While a further year-on-year increase in milk production of 5-6 percent is expected to have occurred in September, milk production was extremely strong during the October to January period last year. So with total cow numbers little changed it will take a good season again this year to match, let alone exceed, last year's milk intakes during the October to January period. **The main gains will come later in the season if Mother Nature plays nicely.**

The negative of course was the food safety scares and product recalls suffered by the industry during August. The direct hit at the farm-gate looks like it will be minimal as the "tens of millions" to Fonterra for the product recall only equates to 1-2 cents per kg MS at the farm-gate. The reputational hit and any customer compensation remain larger areas of concern though. While some regulatory and company changes have already been implemented to strengthen systems and processes, it will be important any recommendations from the multiple inquiries underway are acted on. **Reassuring key customers and trading partners of NZ's commitment to high food safety standards is paramount if the industry is to maintain momentum.**

With international dairy prices shrugging off the August incidents, the milk price forecast continuing to rise, and the good start to the season, the stars have aligned and this is leading to a rapid rise in confidence. For many this will put debt repayment, land acquisition, off-farm investment, or plant replacement back on the table in the coming months.

MEAT AND FIBRE

The meat sector seems to be cautiously optimistic on the year ahead, but many unsolved challenges remain. Lambing is estimated to be 85 percent completed in the North Island and halfway through in the South Island. Of those ewes that have lambed, most regions are reporting higher-than-average lamb survival, which is going some way to compensate for lower scanning rates.

Beef + Lamb NZ's survey of stock numbers pointed toward a 1 percent reduction in the number of breeding ewes to 20.2m head at the start of 2013-14. Considering the 700,000 head (+21 percent y/y) lift in the mutton slaughter in 2012-13 the result was better than expected. The North Island regions that were hit by the drought declined by 2.7 percent, but the South Island managed to register a small 0.5 percent increase. Combined with a lower lambing percentage, Beef + Lamb NZ are anticipating a 7.7 percent drop in the 2013 lamb crop to 24.4m head. Lower stocking rates and a good season will lead many to add more weight to maximise earnings. It will also create more procurement pressure for processors, but with weaker balance sheets and still slim margins in 2012-13, farmers shouldn't get their hopes too high.

Surprisingly, the survey showed only a 0.5 percent drop in the number of breeding cows, suggesting the entire increase in the cull cow slaughter in 2013-14 was dairy-related. A drop of 2.1 percent was recorded in the North Island, which was partly offset by a 2.4 percent lift in the South Island. Calving results are expected to be similar to last year as feed conditions are currently good and were also good when mating took place last spring.

RURAL PROPERTY MARKET

SUMMARY

Expectations are building that the coming spring/ summer sales period could see rural property prices start to turn red hot. Turnover indicators and prices during the winter period were strong and have reinforced a noticeable lift in underlying price trends that started at the beginning of the 2012-13 season. All types of rural property apart from horticulture-aligned blocks have received a lift. Lack of supply is being reported and is likely to continue. Anecdotal feedback has been that the high turnover this winter has seen many second and third-tier properties sold that had been on the market for some time due to unrealistic price expectations. Combined with vendors sitting tight and enjoying the higher cash returns on offer in many sectors, supply of quality properties could be even tighter than expected this year.

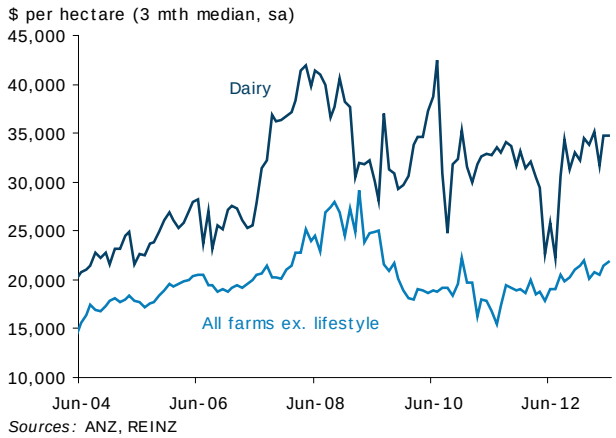
Not too much has changed since our last update on the property market. While recent activity data points to a strengthening trend in prices, the acid test is likely to come this spring/summer, showing where the true balance of power lies between sellers and buyers. The reported shortage of quality properties could get worse if vendors sit tight and enjoy the higher cash returns on offer in many sectors, while awaiting higher property prices before listing. But as has been witnessed previously, there could be a danger of missing the boat, with volatility in farm-gate returns expected to continue for the foreseeable future.

Total farm sales turnover during the winter has run at nearly 90 percent of the 10-year average over July and August, which has been a step up from the 2012-13 average of 80 percent. **While there are very limited measures on the supply of farms for sale, the anecdotal feedback has been that the high turnover this winter has seen many second and third-tier properties sold that had been on the market for some time due to unrealistic price expectations. This suggests supply may be even tighter than many expect heading into the peak sales period.**

FARM SALES BY FARM TYPE

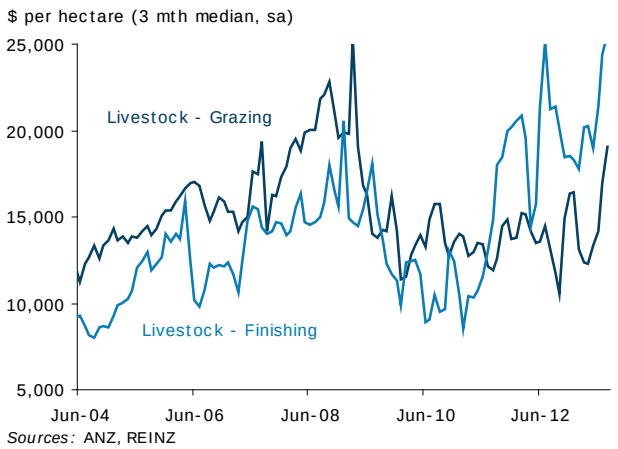
3-Month Seasonally Adjusted		Current Period	Previous Period	Last Year	10-Year Average	Chg. P/P	Chg. Y/Y	Chg. P/10yr
Dairy	Number of Sales	60	55	36	73	↑	↑	↓
	Median Price ($ per ha)	34,700	34,700	25,900	29,500	↔	↑	↑
Livestock – Finishing	Number of Sales	97	89	58	64	↑	↑	↑
	Median Price ($ per ha)	25,600	24,400	21,200	13,800	↑	↑	↑
Livestock – Grazing	Number of Sales	175	179	172	230	↓	↑	↓
	Median Price ($ per ha)	19,000	16,900	13,000	15,000	↑	↑	↑
Horticulture	Number of Sales	40	39	45	49	↑	↓	↓
	Median Price ($ per ha)	128,600	103,800	133,900	146,500	↑	↓	↓
Arable	Number of Sales	17	18	19	19	↓	↓	↓
	Median Price ($ per ha)	27,500	29,900	25,000	25,800	↓	↑	↑
All Farms ex. Lifestyle	Number of Sales	419	413	359	469	↑	↑	↓
	Median Price ($ per ha)	24,400	22,600	20,500	19,800	↑	↑	↑
Lifestyle	Number of Sales	1,665	1,666	1,363	1,599	↓	↑	↑
	Median Price	495,000	485,000	463,000	413,000	↑	↑	↑

Farm Sales, Median Price



Sources: ANZ, REINZ

Farm Sales, Median Price



Sources: ANZ, REINZ

RURAL PROPERTY MARKET

If a continued shortage persists then higher prices will be needed to attract additional properties to the market. Add in still historically low interest rates, investor fund interest, rising confidence, and a competitive lending environment, and things could really start to heat up as summer arrives.

That said, there are still some challenges that may limit how high prices can lift. Some pockets of the agri sector still need to repay term debt, as well as higher working overdrafts from the drought. The anticipated higher returns for many farmers this year offer the perfect opportunity. There are also plenty of other areas on the farm that are currently being focused on by farmers instead of purchasing more land: more capital expenditure on meeting increasing environmental compliance standards, building more resilience into businesses to manage cost risks and cope with volatile farm-gate returns, and other delayed capital expenditure from 2012-13.

A key issue going forward will be the possible re-emergence of any pre-2008 "bubble" behaviours. On some levels we're starting to see precisely that. Pricing (risk-wise) is aggressive. Returns on an outright basis for some of the second and third-tier properties sold at high prices look questionable. Some of this we can put down to liquidity looking for a home, but on other levels we're starting to wonder (and implicitly worry). A leveraged balanced sheet, concerns over the possibility of an asset price bubble forming, and evidence of pre-2008 style behaviour were all reasons the RBNZ instigated loan-to-value ratio restrictions in the housing space. Casting our minds back to the sources of inflationary pressure (asset prices and general costs) during the last economic cycle the rural sector was at the forefront. While the housing market is getting all the attention, the RBNZ has the tools to deliver a prudential policy response aimed at the rural sector too.

Examining the backward-looking indicators for the rural property market on page 20 shows **this winter has seen a noticeable step-up in rural property prices following the drought.** This has reinforced a noticeable strengthening trend in our average all-farm price indicator that extends back to the start of the 2012-13 season – with only a slight breather taken during the drought. **In fact, average prices for the 2013 calendar year so far have averaged $21,700/ha, which is 11 percent up on the post-GFC average.** While this is still 16 percent below the 2008-09 peak of $25,900/ha, it suggests prices have almost recovered half their losses since then.

The strengthening trend has been led by finishing and arable properties. Finishing properties have averaged $20,900/ha and arable $29,400/ha since the start of 2013. This level of pricing has meant finishing properties have averaged 33 percent above their post-GFC average and arable 11 percent above. The gains have been more modest for grazing properties and existing dairy farms over the same period, with prices averaging 6 and 5 percent respectively above their post-GFC averages. Just like the housing market, lifestyle property prices have also been very buoyant, averaging $497,500 since the start of 2013. They are now sitting 12 percent above their pre-GFC average. While interest has picked up for the main horticultural enterprises, average prices are still nearly 20 percent below the pre-GFC average.

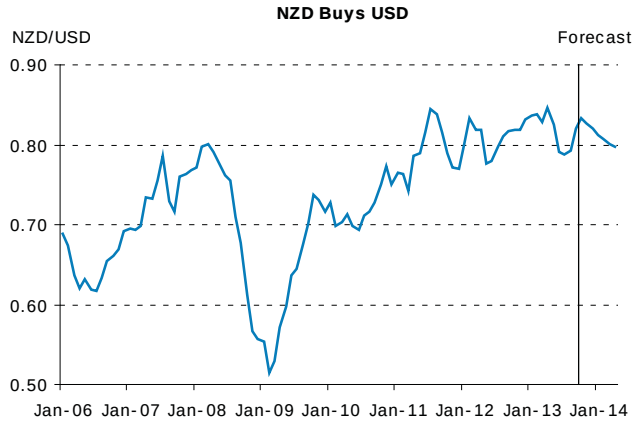
Dairy property turnover was solid in July and August at around 80 percent of the 10-year average. **In the month of July, 10 dairy farms were sold at an average sale value of $35,720/ha, or $41 per kg MS.** The average farm size was 149 hectares and the average production/ha was 861kgs of MS. In the month of August, eight dairy farms were sold with an average sale price of $31,755/ha, or $44 per kg MS. **The average farm size was 130 hectares and the average production/ha was 725kgs of MS.**

Finishing land prices broke outside our $18,000-$20,000/ha range, moving aggressively up to average $25,000/ha over July and August. Activity levels were very strong in dairying-aligned regions. Canterbury, Southland and Taranaki led the way and accounted for just over 50 percent of the sales for the three month period ended August. Total turnover was the strongest of all the farm types, at levels nearly 50 percent above the 10-year average. **The number of sales of both grazing and arable land was steadier over the same period, at 77 and 100 percent of their respective 10-year turnover rates.** Average arable prices slipped below the $30,000/ha mark, which had set the pace since earlier in 2013. Grazing property prices spiked higher, driven by what looks like a higher proportion of sales occurring outside traditional meat and fibre farming areas.

In the horticultural scene, while average prices achieved have not strengthened to the same degree as other enterprises, rising confidence continues to stimulate interest in the big three of pipfruit, kiwifruit and viticulture. This is highlighted by turnover having remained robust in recent months at nearly 80 percent of the 10-year average. With Psa less prevalent over the last year, G3 grafting showing reasonable tolerance to Psa, and record orchard-gate prices anticipated, this has lifted confidence and demand for kiwifruit orchards. In the viticulture space there has been a spike in mergers and acquisitions, with large wine companies looking to secure supply and strategic purchases of brands to complement existing business. This activity has seen a number of land sales over 2013 transacted in the $150,000-$200,000/ha range.

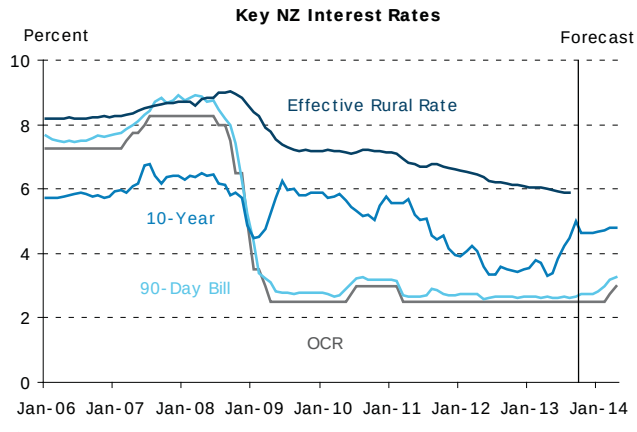
ECONOMIC INDICATORS

EXCHANGE RATES					
	Current Month	Last Month	Last Year	Chg. M/M	Chg. Y/Y
NZD/USD	0.82	0.79	0.82	↑	↑
NZD/EUR	0.61	0.60	0.64	↑	↓
NZD/GBP	0.55	0.51	0.51	↑	↑
NZD/AUD	0.90	0.86	0.79	↑	↑
NZD/JPY	88.2	77.7	63.9	↑	↑
NZD/TWI	77.0	75.3	73.9	↑	↑



Sources: ANZ, Bloomberg

NZ INTEREST RATES					
	Current Month	Last Month	Last Year	Chg. M/M	Chg. Y/Y
Official Cash Rate	2.50	2.50	2.50	↔	↔
90 Day Bill Rate	2.66	2.64	2.64	↑	↑
1 yr	2.92	2.99	2.53	↓	↑
2 yr	3.47	3.09	2.55	↑	↑
3 yr	3.92	3.38	2.61	↑	↑
5 yr	4.46	3.89	2.90	↑	↑
10 yr	5.02	4.47	3.51	↑	↑
Effective Rural Rate	5.88	5.94	6.20	↓	↓
Agricultural Debt ($b)	50.93	50.62	48.47	↑	↑



Sources: ANZ, RBNZ

The NZD has rebounded strongly over the past month. The lift in the RBNZ's interest rate projections provided the initial catalyst, and the US Federal Reserve's refrain from tapering their quantitative easing (QE) program was the "clincher" that saw it move back above 84 US cents. While this reaction has been intuitive, ironically, the higher the NZD goes, the less urgency there is for the RBNZ to raise rates.

We're pencilling in the NZD/USD sitting around 0.82 at year end. Domestic factors and a still weak USD argue for elevation. However, there are two other areas of which to remain mindful. Firstly, it's something of a stretch to expect the USD to be on the back foot forever. The US economy is improving and with that QE (a huge USD negative) will eventually come to an end. Markets are forward looking. Second, we've now seen the lows for global interest rates, and this is turning attention belatedly to nations who have borrowed excessively over the past few years. That's the emerging market darlings, including China. Diversification (flows from the core such as the USD to the periphery) are being replaced by reversification (from the periphery to the core). This thematic has a way to play out and opens up NZD downside.

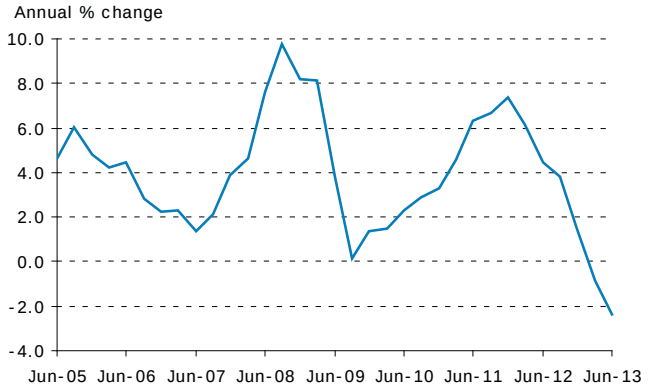
Interest rates continue to move higher, led by the long end. While there has been some correction lower in term rates in the wake of the Fed's "refrain", global long-term rates will continue to drift gradually higher in coming years as the global recovery broadens. We're not talking a steady upward trend, more like a glacial rise. US 10-year interest rates remain well below rates of nominal GDP growth, supported by QE. This unnatural situation cannot be sustained, and we view any falls in term interest rates as offering "one last bite at the cherry" for borrowers, as we discuss in our borrowing strategy. Short-end rates remain anchored by an on-hold RBNZ OCR for now, but they will start to rise gradually in 2014. An elevated NZD will temper how quickly the OCR moves up.

The RBNZ recently released its annual breakdown of the agri sector's off- and on-farm debt. In 2012-13 total on-farm debt grew 5.4 percent to $49.3 billion. The dairy sector accounted for the lion's share (66 percent) with this growing 5 percent in 2012-13 to $32.4 billion. The meat & fibre sector at $11.9 billion (24 percent of total debt) and viticulture at $1.29 billion (2.6 percent of total debt) had the next two largest shares. Meat & fibre debt grew at 6.4 percent y/y, suggesting the drought and lower returns took a toll, rather than expansion. Viticulture debt actually shrank by 1.4 percent y/y, suggesting recent investment activity by larger players is yet to spill over into the broader sector. Another area of interest was a 6.6 percent drop in kiwifruit debt, probably reflecting reduced investment and write-offs from Psa.

ECONOMIC INDICATORS

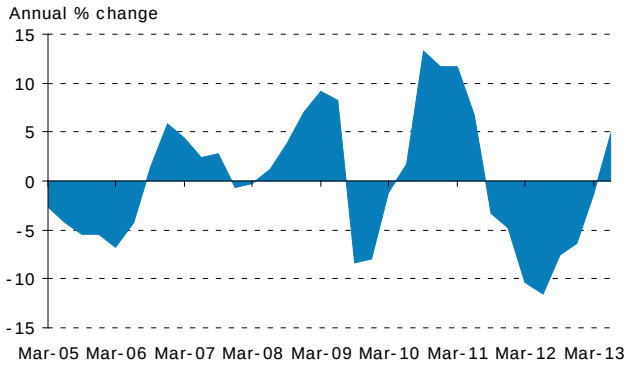
INFLATION GAUGES					
Annual % change	Current Qtr	Last Qtr	Last Year	Chg. Q/Q	Chg. Y/Y
Consumer Price Index	0.7	0.9	1.0	↓	↓
Farm Input	-2.4	-0.8	4.5	↓	↓
Net Imp. Margins PPI	4.8	-1.4	-11.5	↑	↑

Farm Input Inflation Gauge



Sources: ANZ, Statistics NZ

Net Implied Margins PPI
Ag/Forestry/Fishing (Outputs - Inputs)



Sources: ANZ, Statistics NZ

On-farm inflation pressures continued to ease in the June quarter, with the first annual decline in the Statistics NZ measure of the cost of farm inputs in 10 years. More broadly, headline inflation was at a 14-year low in Q2, at just 0.7 percent y/y. The NZD continues to exert downward pressure on the tradable sector, global inflation remains well contained, and domestically there is still some spare capacity to respond to the pick-up in the economy's momentum. However, as mentioned previously, we seem to be at an inflexion point for on-farm inflation, with real risks around the next 12-18 months.

As the dairy payout and confidence continue to lift, this is raising the prospect of pricing pressures emerging for a number of key productive inputs. Recently livestock, land values, and feed prices have begun to show some signs of life, potentially bellwethers of things to come. While these are focused on the productive side of the business, how price pressures evolve for the other fixed costs within dairying businesses will be crucial to bottom lines in 2013-14 and beyond.

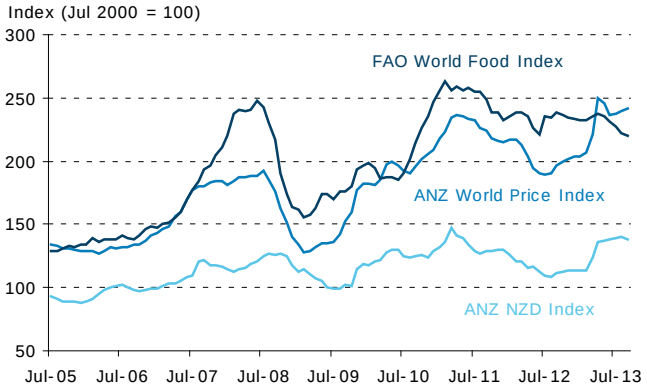
In past years a higher dairy payout has seen greater cost pressures, reducing margins. The two other years with a dairy payout above $7 per kg MS have led to pricing pressure above 5 percent for total farm inputs. This pressure also flowed into the following season, even when the payouts were lower. While a certain component of farm expenditure is flexible, upward adjustments have occurred quickly and subsequently have not been easily unwound. These dynamics, combined with an expected lift in general inflation pressures, present a danger of a similar situation emerging over the next 12-18 months. For other primary sectors there is a real danger that the cost pressures from the dairying sector and the boarder economy will spill over into their sectors. Generally the different sectors' costs of input move in tandem.

Annual PPI margins hit positive territory for the first time in two years in the June quarter, improving by 4.8 percent. The annual increase was driven by dairying (+8.5 percent), poultry and other livestock farming (+6.9 percent) and forestry (+6.7 percent). The seafood sector experienced a decline of nearly 4 percent and the other sectors were little changed. **While better output prices accounted for half the headline increase, lower input prices accounted for the other half.** Annual input prices dropped by 2.4 percent in the June quarter, with the recent declines being the first in nine years. The largest declines were for cropping and sheep/beef farming, which were back 5.5 and 7.0 percent y/y respectively. The forestry and seafood sectors both experienced small annual input increases. On the outputs side both dairy (+7.9 percent) and forestry (+7.6 percent) lifted the most.

KEY COMMODITIES: OVERALL INDEX AND DAIRY

SOFT COMMODITY PRICE INDICES					
	Current Month	Last Month	Last Year	Chg. M/M	Chg. Y/Y
ANZ NZ Index	138	139	112	↓	↑
ANZ World Index	242	238	197	↑	↑
FAO World Food Index	220	227	238	↓	↓

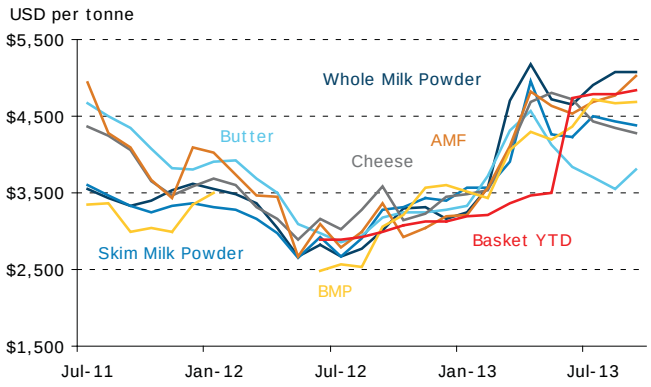
Soft Commodity Price Indices



Sources: ANZ, FAO

OCEANIA DAIRY PRICE INDICATORS					
USD per tonne	Current Month	3 Mth Trend	Last Year	Chg. M/3M	Chg. Y/Y
Milk Price YTD ($ per MS)	8.35	8.20	5.10	↑	↑
Milk Price Forecast ($ per MS)	8.30	7.00	NA	↑	
Whole Milk Powder	5,077	4,879	3,007	↑	↑
Skim Milk Powder	4,375	4,389	3,275	↓	↑
Butter	3,810	3,697	3,175	↑	↑
Anhydrous Milk Fat	5,025	4,666	3,364	↑	↑
Butter Milk Powder	4,686	4,582	3,060	↑	↑
Cheese	4,276	4,506	3,591	↓	↑
Basket YTD	4,837	4,769	2,990	↑	↑

Dairy Products - NZ Export Market Prices



Sources: ANZ, GlobalDairyTrade, USDA

In-market prices for NZ's soft commodity basket have stabilised at near-record levels in recent months. Dairy prices have been the driver, with a 57 percent lift since the trough in June 2012. The non-dairy component of the index has managed only a 8 percent lift though since it bottomed in August 2012. **Interestingly, NZ's soft commodity prices have run counter to the FAO world food price index, which has slipped** by 7.6 percent since April and is now 16 percent below its peak in February 2011.

The larger exposure of NZ's primary sectors to China seems to be helping buffer against lower soft commodity prices in other Northern Hemisphere markets, which have generally had a better growing season, boosting supplies of key produce. In contrast, food inflation in China has lifted to nearly 5 percent y/y in recent months from a low of 1.8 percent y/y in late 2012. The drivers seem to be a mix of adverse weather conditions, disease issues, and accelerating policy-driven structural change in the food supply chain from retail to the farm. Combined, these factors have lowered Chinese domestic production in a number of key sectors.

NZ's main dairy products seem to have shrugged off the product recalls that occurred in August. Tight global supplies for powders certainly look to have helped, but the general feeling we have got from the market post the initial confusion seems to be that NZ's transparency only reinforced our reputation for high food safety standards. That said, it will be important that any recommendations from the inquiries underway are acted on to reassure key customers and maintain access to markets that would like to slow milk imports to support domestic producers.

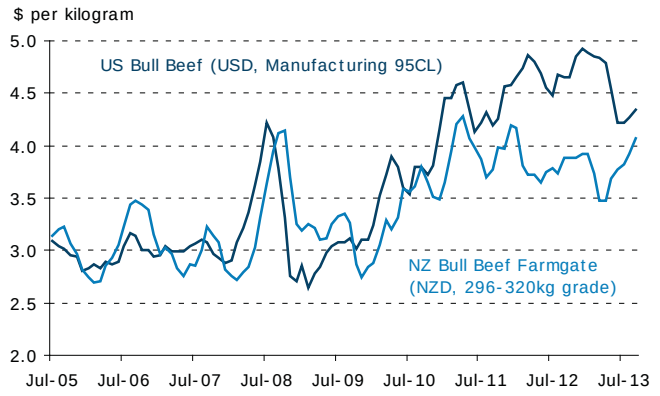
More broadly, while lower milk production in key exporting countries has helped, **China has also experienced lower production.** Several reports are indicating raw milk production in China was down 6 percent y/y over the first half of 2013. This has been attributed mainly to smaller farms exiting faster than larger and more efficient farms are growing supply. Policy changes across the manufacturing and social areas to boost supply chain efficiencies and food safety are part of the reason, but temporary factors that seem to have sped up consolidation have been threefold: higher beef prices encouraging early exit, unfavourable weather in certain regions, and some disease issues. NZ seems to have been the main beneficiary of this slower milk production, with a lift in milk powder exports to China of 13 percent y/y in 2013 so far, and higher market share. **We have revised up our milk price forecast to $8 per kg MS for 2013-14. Fonterra's announced $8.30 per kg MS looks to have fully priced in the high international prices and we still expected a supply response to build, leading to prices correcting lower in 2014.**

KEY COMMODITIES: BEEF AND LAMB

BEEF PRICE INDICATORS					
$ per kg	Current Month	3 Mth Trend	Last Year	Chg. M/3M	Chg. Y/Y
NZ Bull Beef[1]	4.07	3.84	3.89	↑	↑
NZ Steer[1]	4.33	3.99	4.01	↑	↑
NZ Heifer[1]	3.75	3.42	3.43	↑	↑
NZ Cow[1]	2.95	2.77	3.03	↑	↓
US Bull Beef[2]	4.34	4.23	4.66	↑	↓
US Manu Cow[3]	4.12	3.95	4.34	↑	↓
Steer Primal Cuts	7.21	6.68	6.52	↑	↑
Hides[4]	70.00	66.69	53.37	↑	↑
By-Products[4]	48.76	46.61	46.06	↑	↑

[1] (NZD, 296-320kg Grade Bull & Steer), (NZD, 195-220kg Grade Heifer) (NZD, 160-195kg Grade Cow)
[2] USD, Manufacturing 95 CL [3] USD Manufacturing 90 CL [4] USD$ per Hide

Beef Indicator Prices

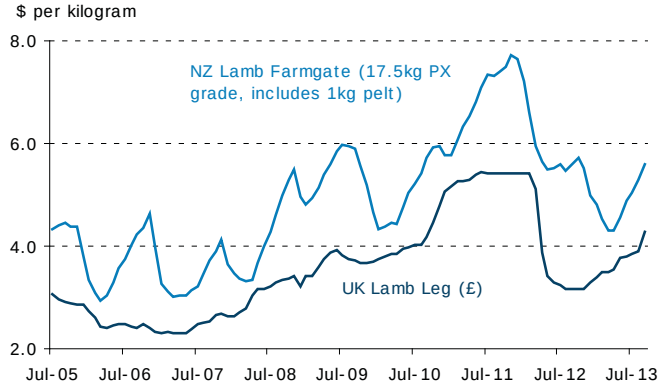


Sources: ANZ, Agrifax

LAMB PRICE INDICATORS					
$ per kg	Current Month	3 Mth Trend	Last Year	Chg. M/3M	Chg. Y/Y
NZ Lamb[1] (NZD)	5.59	5.07	5.59	↑	↑
UK Lamb Leg (£)	4.27	3.85	3.15	↑	↑
Rack US (USD)	15.61	15.38	21.29	↑	↓
Flaps (USD)	5.04	4.86	4.32	↑	↑
Skins[2]	6.16	7.97	2.74	↓	↑

[1] 17.5kg PX grade, including 1kg pelt [2] USD per skin

Lamb Indicator Prices



Sources: ANZ, Agrifax

Key market indicators look positive for beef prices as we head into the normal seasonal pick-up in prime cattle slaughter. The only possible dampener might be the recent dramatic increase in the NZD, which is expected to remain elevated.

In the US, cow slaughter has finally started falling behind both year-ago and 5-year average levels, driven entirely by declines in beef cow processing. Prime cattle supply also looks set to tighten up with the number of cattle on feed running below both year-ago and 5-year average levels since July. These indicators are one of the clearest signals seen in the past few years that US beef producers are starting to retain more cows to rebuild herds. **This suggests US cow meat supplies could be tight in the 4th quarter of 2013**, which bodes well for NZ returns during this period.

Elsewhere, growth in non-traditional markets is expected to soak up extra tradable product. In Indonesia the government recently announced changes to import quotas, which is expected to support imports. Exports to Indonesia soared during 2009-10, which saw it become NZ's second-biggest beef market during that season. However, tight import quotas then resulted in trade slowing to only about 30 percent of its peak. The new system reportedly sees quotas replaced by a price-based import trigger. This means that when domestic beef prices rise above a certain level, the Indonesian Government will release import permits until supply catches up with demand and prices fall to affordable levels. Current prices are about 25 percent higher than the desired level, so a release of permits is expected and exporters are already reporting an increase in enquires. At the same time, beef trade with China continues to grow, also helping soak up product.

In-market prices for the main lamb cuts continue to slowly improve as both retail and foodservice demand recovers. The European market has seen a significant improvement in prices recently as importers look to secure supply. However, many remain wary of pushing prices too high again and burning off consumer demand, as happened in 2011-12. In the foodservice sector, getting back on the menu is a slow process, but a slight improvement in the price of some higher value cuts, such as racks, suggests the corner has been turned.

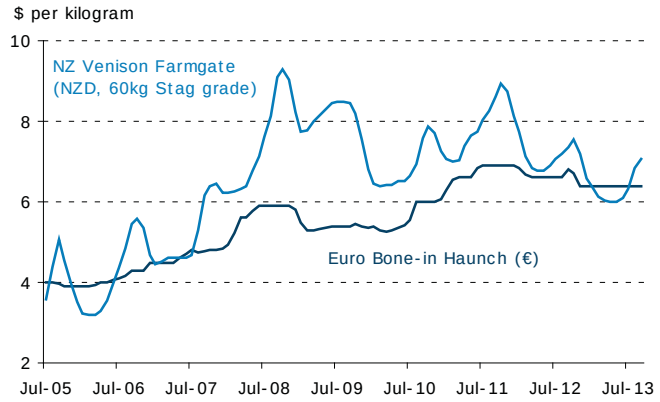
Examining year-to-date slaughter numbers (+6 percent) and exports (+24 percent) suggests there isn't a lot of excess stock in storage at present. **Combined with an anticipated smaller lamb crop this is expected to support chilled prices for the Christmas trade, boosting farm-gate prices further.** However, farmers shouldn't expect new records as processor margins were still slim in 2012-13 and balance sheets are weaker than in 2011-12.

KEY COMMODITIES: VENISON AND WOOL

VENISON PRICE INDICATORS					
$ per kg	Current Month	3 Mth Trend	Last Year	Chg. M/3M	Chg. Y/Y
NZ Stag[1]	7.06	6.42	7.35	↑	↓
NZ Hind[1]	6.95	6.32	7.25	↑	↓
Euro Bone-in Haunch (€)	6.40	6.40	6.80	↔	↓
Boneless Shoulder (€)	4.69	4.70	5.83	↓	↓
Loin (€)	13.99	14.00	16.87	↓	↓

[1] (60kg Stag AP grade), (50kg Hind AP grade)

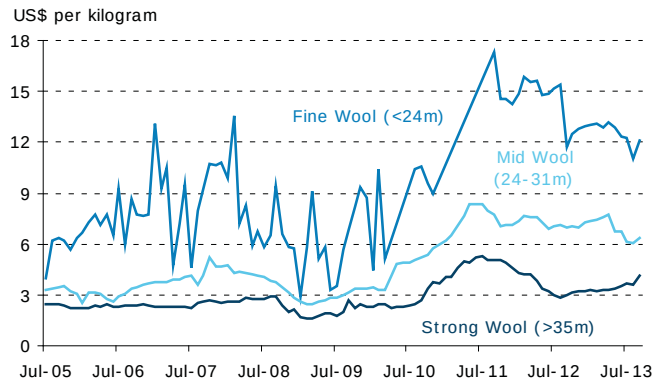
Venison Indicator Prices



Sources: ANZ, Agrifax

CLEAN WOOL INDICATOR PRICES					
$ per kg	Current Month	3 Mth Trend	Last Year	Chg. M/3M	Chg. Y/Y
NZ Fine Wool (>24m)	14.72	15.04	14.36	↓	↑
NZ Mid Wool (24-31m)	7.73	7.98	8.55	↓	↓
NZ Strong Wool (>32m)	5.08	4.55	3.67	↑	↑
USD Fine Wool (>24m)	12.07	11.89	11.73	↑	↑
USD Mid Wool (24-31m)	6.34	6.31	6.99	↑	↓
USD Strong Wool (>32m)	4.17	3.60	3.00	↑	↑

Wool Indicator Prices (Clean)



Sources: ANZ, Beef + Lamb NZ, Wool Services International

Relatively stable venison prices over the last four years have given way to lower returns. Schedules seem to have peaked at around the $7.20 per kg mark as the lower NZD/EUR since June seems to have been absorbed by importers putting downward pressure on prices, rather than NZ exporters keeping the gains. Chilled prices remain flat, but on lower volumes. Frozen pricing is down 10-15 percent depending on cut and volume. Stronger competition from other European game producers who have increased both quality and volumes has eaten into the premium that NZ venison can command on the European market.

In-market strong wool prices have shown a lot more life than expected recently, and combined with a lower NZD, this has seen auction prices hit the early $5 per kg mark in September. The main driver seems to be expectations of tighter supply from NZ, and Europe has led the main importers to restock. Underlying end-demand is still soft in many markets, but as many importers have been living hand-to-mouth in recent years, when supply of certain types of wool is set to become short they restock in anticipation (and vice-versa). This is also one of the reasons why there has been so much variability in the prices between different wool types over the past two years.

How much could NZ wool production drop this coming season? For starters, it looks like the 2012-13 mutton slaughter will finish around 700,000 head (+21 percent) higher than the year before, driven by the widespread dry conditions and ongoing dairy expansion. This implies the sheep flock shrank by 3.4 percent over the course of 2012-13. However, Beef + Lamb NZ's stock survey suggested total breeding ewe numbers were down only 1 percent to 20.2 million head at 30 June 2013. It seems farmers turned off lower performing and older ewes instead of younger breeding stock during the drought, leading to a larger proportion of two-tooths in the flock at the start of 2013-14.

Estimates of per head wool production vary, but lower stock numbers, fewer lambs, and current good pasture conditions suggest fleece weights shouldn't be down. Using average per head wool production from the last three years implies total shorn wool production could be back only 1.5 percent y/y, which is probably a smaller fall than current expectations. That said, the forecast 8 percent drop in the mutton and lamb slaughter means slipe wool is expected to be back by a similar amount. **Combined, this leads to a 2.3 percent drop in total greasy wool production to 164,400 tonnes.**

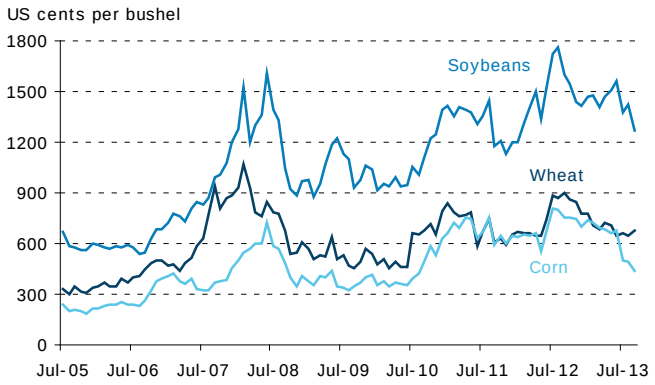
Despite production perhaps not being as tight as expected, support for strong wool prices (clean) in the $4.50-$5.50 per kg range seems likely to continue with stable substitute fibre prices and a pick-up in US and Chinese demand offsetting weakness elsewhere.

KEY COMMODITIES: GRAINS

GRAIN & OILSEED PRICE INDICATORS					
	Current Month	3 Mth Trend	Last Year	Chg. M/3M	Chg. Y/Y
NZ Milling Wheat[1]	418	415	433	↑	↓
NZ Feed Wheat[1]	397	384	376	↑	↑
NZ Feed Barley[1]	400	378	375	↑	↑
Palm Kernel Expeller[1]	315	312	330	↑	↓
US Wheat[2]	6.8	6.5	9.0	↑	↓
US Soybeans[2]	12.7	14.5	16.0	↓	↓
US Corn[2]	4.4	5.6	7.6	↓	↓
Australian Hard Wheat[1]	401	434	472	↓	↓

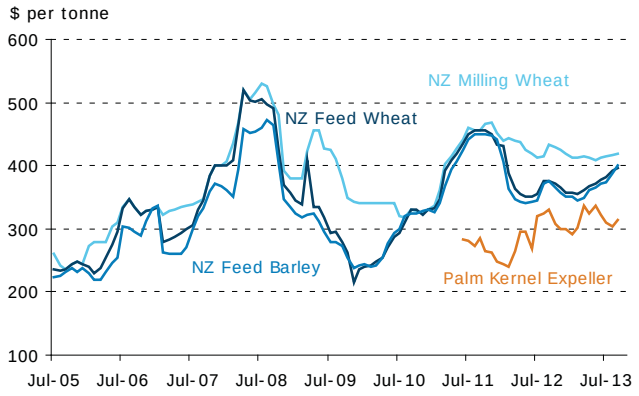
[1] NZD per tonne
[2] USD per bushel

CBOT Future Grain & Oilseed Indicator Prices



Sources: ANZ, Bloomberg

Key NZ Grain Prices



Sources: ANZ, Agrifax

International grain prices have fallen since our last update, but domestic grain prices have continued to rise. The key question is how long it can last. Domestic feed grain prices have climbed toward $400 per tonne in recent months and are now at a 20-month high. This has largely been driven by anticipation of improved demand from the dairy sector as the milk price forecast continues to be raised, making it more profitable to feed extra supplements to boost milk production.

How much has actually been sold at the higher prices is difficult to ascertain. While the AIMI grain grower survey of 1 July pointed toward medium-to-high tonnages of feed grain unsold and sitting in silos, there were also very high stocks of forward sold grain in silos. With very favourable winter and early spring growing conditions for pasture, a lot of this grain is still reported to be sitting in silos waiting use later in the season. The growth conditions have been so good that grass silage has even been cut very early in many places, especially in the North Island, as many look to manage pasture quality. Therefore, it seems the short-term needs of most dairy farmers should be covered. Other reports have also indicated most other buyers (feedmillers and other industries such as pork and poultry) have their short-term needs covered. **So combined with softer international prices, it seems the market could take a breather and wait direction from the 2014 harvest.**

The AIMI survey suggested there could be an approximate 6 percent lift in the feed barley and wheat area harvested when the areas planted in the autumn are combined with spring planting intentions. **While the size of the 2014 harvest will be determined by how the weather and pasture conditions evolve, current spring planting conditions look good and the winter had excellent growing conditions. Therefore at this stage a larger 2014 harvest should be expected.**

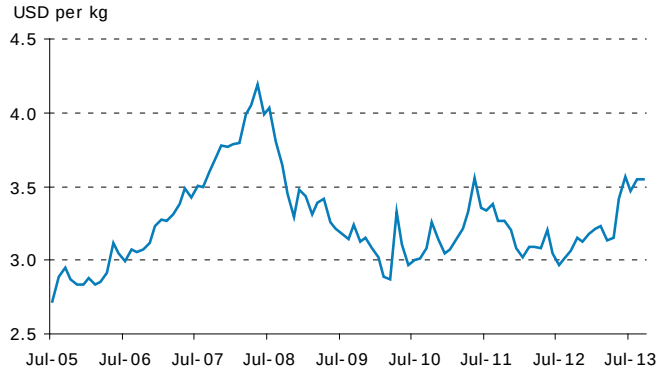
Globally, grain prices have continued to move lower, as the key development phase for Northern Hemisphere corn and wheat has passed with only minor weather concerns. This has removed the last of the risk premium for production uncertainty. While most of the downward price adjustment is now in place, prices are yet to make their seasonal low, which will likely occur only in the coming months. **With the major window for production risk largely past, attention is now shifting to the demand outlook.** In this regard there is some nervousness over domestic US livestock and ethanol demand, which could further weigh on prices. However, lower-than-expected crop outputs in China and continued strong imports from the Middle East are likely to support trade activity and provide some support for prices.

KEY COMMODITIES: HORTICULTURE

HORTICULTURE PRICE INDICATORS					
	Current Month	3 Mth Trend	Last Year	Chg. M/3M	Chg. Y/Y
Kiwifruit (USD per kg)	3.5	3.5	3.1	↑	↑
Apples (Weighted Index)	269	266	244	↑	↑
Average Wine Price[1]	7.1	5.9	5.3	↑	↑
Packaged White Wine[1]	6.5	6.3	6.4	↑	↑
Packaged Red Wine[1]	10.1	9.4	9.6	↑	↑
Bulk wine[1]	3.2	3.3	2.8	↓	↑

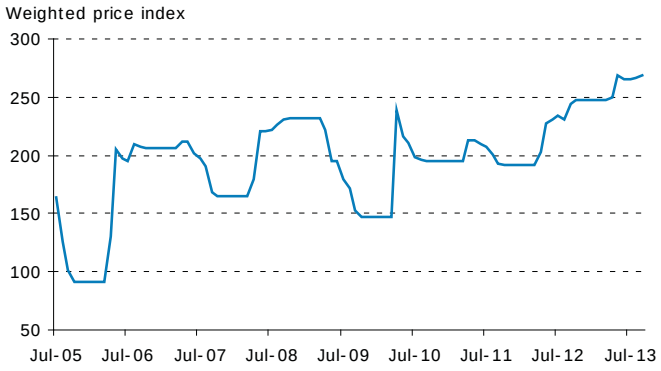
[1] USD per litre

Kiwifruit Indicator Price



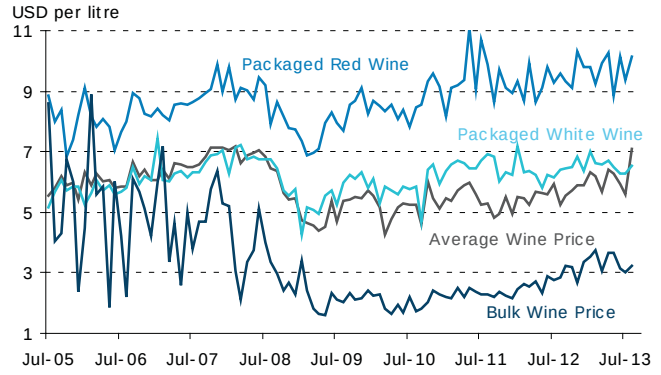
Sources: ANZ, Zentrale Markt- und Preisberichtstelle

Apple Indicator Price Index



Sources: ANZ, Zentrale Markt- und Preisberichtstelle

Wine Indicator Prices



Sources: ANZ, NZ Winegrowers

NZ Wine Growers recently released its annual report, which includes key statistics on the 2012-13 season. **Despite product shortages, packaged exports grew by 4 percent** to over 120 million litres, valued in excess of $1 billion. **By contrast, bulk shipments fell 22 percent to account for a shade under 30 percent of total shipments**, indicating that despite lower supply, bulk wine now has a substantial foothold in the industry.

Further development of the North American markets has been a major area of focus. Shipments to the US increased 13 percent to $284 million, making it the 2nd largest market for NZ wines (behind Australia). Exports to Canada also lifted 10 percent to $78 million, consolidating its position as NZ's 4th largest export market. This suggests there has been some success in this strategy. By contrast, sales to both Australia and the UK slipped by 2 percent by value, and volume reductions were significantly greater, back 7 percent and 17 percent respectively. A bounce-back for these markets is anticipated to shift the substantially larger 2013 harvest. Despite the top 4 markets making up 84 percent of export earnings, a slow shift to second-tier destinations continues. This is most evident for Northern Europe and Asia, which combined accounted for just under $200 million of exports. **Meanwhile, domestic sales of NZ wine fell 19 percent to 52 million litres**, with the fall accompanied by a corresponding 50 percent increase in wine imports to 41 million litres. **This was a result of the smaller 2012 vintage, with wineries prioritising hard-won export markets over domestic sales.**

Pipfruit sales and prices were reported as very strong across all the main markets in the early and middle stages of the selling season, but some softening occurred over the last quarter. There have been positive reports on European sales being supported by low domestic stocks and a cool spring, which saw consumers eating pipfruit for longer than usual. In the UK prices were strong in the first half, but the hot summer and greater selection of summer fruit options saw this taper off in the second half. In North America there was a strong season for domestic produce in the US, because of reduced supply. This allowed southern hemisphere imports to piggy-back off the high domestic prices when product first hit the shelf. Asia performed well throughout with strong demand for larger fruit with high colour and exceptional taste. For many varieties the strong early and mid season prices are raising the prospects that orchard-gate returns will be up $2+per TCE on last year. **Depending on size and grade early indications are for Braeburn returns in the $22-25 per TCE range, Royal Gala $24-27 per TCE, Fuji $24-26 per TCE and Jazz $24-26 per TCE.**

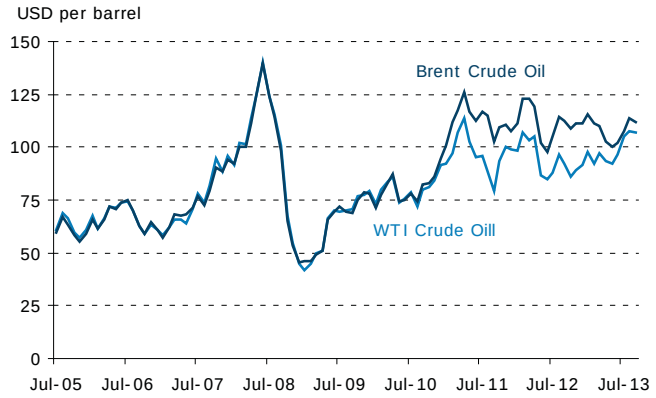
KEY COMMODITIES: OIL, FREIGHT AND FERTILISER

OTHER COST INDICATORS					
	Current Month	3 Mth Trend	Last Year	Chg. M/3M	Chg. Y/Y
WTI Oil[1]	107	103	92	↑	↑
Brent Oil[1]	112	108	112	↑	↓
Ocean Freight[2]	2,020	1,122	766	↑	↑

[1] USD per barrel, grade WTI

[2] Baltic Dry Index

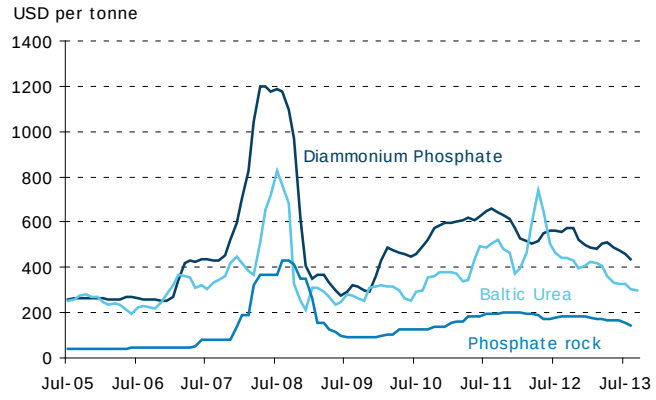
Crude Oil Indicator Prices



Sources: ANZ, Bloomberg

FERTILISER PRICE INDICATORS					
USD per tonne	Current Month	3 Mth Trend	Last Year	Chg. M/3M	Chg. Y/Y
DAP (USD)	438	458	559	↓	↓
Urea (USD)	298	319	441	↓	↓
Phosphate Rock (USD)	145	156	185	↓	↓
Farm-gate DAP (NZD)	856	877	NA	↓	NA
Farm-gate Urea (NZD)	645	663	NA	↓	NA
Farm-gate Super phosphate (NZD)	337	341	NA	↓	NA

Indicative International Fertiliser Prices



Sources: ANZ, Bloomberg

Oil prices are expected to remain elevated through the remainder of 2013, though some near-term weakness is expected due to a seasonal slowdown in refinery operations over October.

Oil prices have retraced their geopolitical premium as the threat of military intervention in Syria has receded and the market becomes less uncomfortable around Middle East/North Africa (MENA) supply disruptions. However, the continued tensions in some countries mean prices will probably remain volatile, with any flare-up in tensions adding upside risk. While the immediate "headline risk" emanating out of MENA has receded, supplies from key producers are forecast to remain lacklustre. In Libya, production in Q4 2013 is forecast at just 0.6mmb/d, down from a rate of 1.3mmb/d in the first half of 2013. Output from Iran is also unlikely to lift substantially, and much will depend on negotiations with the US regarding lifting trade sanctions. In any case, it is likely to be a slow process.

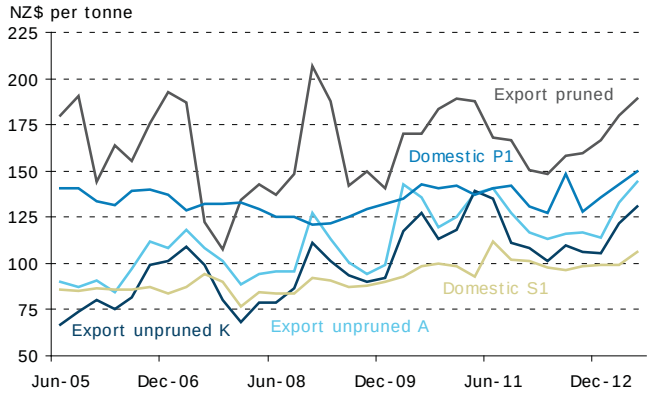
The macro environment should remain positive for oil, with the US Federal Reserve delaying the tapering of their asset purchase QE program and developed economy central banks set to keep monetary policy settings über accommodative for some time to come. Seasonal demand is set to remain soft in October as the usual period for refinery maintenance takes place. This could put some near-term pressure on prices as demand falls for near-term deliveries. But this is set to reverse through Q4 as refinery run-rates pick up and commercial crude oil stocks (US, Europe and Japan), fall to below 720m barrels, the second-lowest level in 5 years. These factors should work to support prices in Q4.

Farm-gate prices for the main fertiliser types remain unchanged since our last update. However, international prices continue to move lower. Urea prices are currently 31 percent below the same time last year. A boost in supply has been the main driver, with new sources of supply coming from the Middle East and North African region. Combined with higher Chinese exports during their low-export tax window, which finishes in mid October, this has boosted available tradable product. **Global phosphate prices are 20-25 percent below last year.** Increased export availability from China has met lower activity from Indian importers due to the rapid depreciation in their currency. **Combined with the high NZD this implies there might be some scope for farm-gate prices to move lower.**

KEY COMMODITIES: FORESTRY

OTHER COST INDICATORS					
	Current Month	3 Period Trend	Last Year	Chg. P/3P	Chg. Y/Y
Export: (NZ$ per JAS m3 f.o.b.)					
Pruned	189	169	159	↑	↑
Unpruned A Grade	145	121	116	↑	↑
Unpruned K Grade	131	111	110	↑	↑
Pulp	116	101	98	↑	↑
Domestic: (NZ$ per tonne delivered at mill)					
P1	150	135	149	↑	↑
P2	127	119	117	↑	↑
S1	107	99	97	↑	↑
S2	103	94	93	↑	↑
Pulp	48.5	48.8	48.5	↓	↔

NZ Forestry Indicator Prices



Sources: ANZ, MPI

Export log prices have moved back up slightly during September, after the typical summer slowdown in China looks to have run its course without too much pressure on prices. While on port stocks in China built up slightly during the winter, in mid-September they had fallen to about six weeks of supply. This means it is likely that imports will need to continue at a decent clip until the New Year to meet the normal seasonal lift in demand.

An acceleration in monthly US housing starts from 694,000 at the start of 2012 to a peak of nearly 1 million in March this year drove increased demand, soaking up domestic North American supplies. However, while the US housing market continues to improve, new housing starts have slowed to around 900,000 a month since March as financial conditions have tightened with talk of the US Reserve Bank to start the gradual process of normalising monetary policy. As a result, a drop in US timber prices has seen more US and Canadian exports to China.

All up, while competition in the Chinese market has increased from North America, reasonable levels of new housing starts should support US domestic demand and limit large increases in exports. **Export prices are therefore expected to at least hold steady on the back of the normal seasonal uptick in China. Additionally there has been a reported lift in demand in export markets for lumber and finished products.**

Domestically the focus has been on policy initiatives to boost the supply of housing for Auckland and the Canterbury rebuild. With activity picking up on both fronts there has been an acceleration in building consents issued during the winter. This should lead to increased activity during the summer and higher demand for timber and finished products.

While most commentators agree there is plenty of volume to meet this increasing demand, retail prices for timber have definitely started to increase. It seems mills are currently holding on to the recent improvements in retail prices to try to restore margins, but eventually some of these increases are expected to start to flow back to domestic log prices.

ECONOMIC BACKDROP

SUMMARY

The economy is firmly into an economic expansion: that's a step up from recovery. The drivers are not hard to identify: global dairy prices are sky-high, the Canterbury rebuild is gaining pace, and the Auckland housing market is responding predictably to near-record low mortgage rates and housing shortages. Under the bonnet, small microeconomic initiatives are adding lustre to the picture. After years of restraint and cost-cutting, NZ firms and households are raring to go. But risks and vulnerabilities remain. The national balance sheet is still weak and one of the economy's biggest challenges over the coming years will be expanding its supply-side capacity so resource constraints don't bite too early.

OVERVIEW

There are still a large number of major offsetting influences affecting the economy. Our nationwide balance sheet is weak, with a large debt overhang. Fiscal austerity is crimping growth. The currency is overvalued. Working against this is a large (and not fully tapped) resource endowment, with the NZ economy currently the beneficiary of a once-in-a-generation terms of trade boost. Financial conditions – in the form of low interest rates – are loose, supporting domestic demand. The Auckland property market is on fire, requiring 30,000 more houses. Throw in the $40bn Canterbury rebuild and signs of strengthening construction sector activity filtering through into the wider economy, and the scene is set. Economic indicators are becoming increasingly in agreement that **NZ's economic momentum is lifting and the expansion is broadening.**

While we can look at the obvious drivers, small nuances cannot be overlooked. Businesses have made substantial progress in the past few years driving efficiencies: they're now raring to go. The Government is doing the basics well. We've seen fiscal prudence – the books are getting back into good health, welfare reform, a plan attacking housing affordability, asset sales et al. It's not defining in itself, but gives the impression NZ is on the right path. It all adds to that feel-good factor.

This growth is being led by the pro-cyclical parts of the economy, which are recovering from multi-year lows. Investment activity is picking up, and prospects for the construction sector and manufacturing are looking a whole lot brighter. Even the sluggish labour market is finally showing some signs of life, benefiting both the services sector and consumer spending. A mild winter has set the scene for some of the growth lost from the early 2013 drought to be made up, but this is more dairy-centric.

Export commodity prices are at historically high levels, with dairy incomes set to lift by nearly $5bn from the previous season – hardly small change. Tell-tale signs of the improving mood are widespread. Business and consumer confidence is high, with sentiment for most major sectors strengthening.

What could possibly go wrong? A few things, is the answer.

- **The NZD is still overvalued**, and is threatening to choke off a burgeoning export sector recovery.
- **Our commodity prices are not invulnerable.** Global supplies of dairy products are currently tight, but there will be a supply response. In addition, 'eyeball econometrics' suggests that global prices for NZ's commodities benefited from the three rounds of US quantitative easing (QE), and it would be optimistic to assume no downdraft once QE 'tapering' begins.
- **Borrow and spend behaviours of old could re-emerge.** That would boost growth in the near term but we'd pay for it down the track. The Reserve Bank of NZ has some concerns about recent developments with regard to financial stability: they've slapped on loan-to-value ratio lending restrictions as a reminder to settle down. We'll be watching the agri space closely. The historical experience has been that lifts in dairy prices find their way into land values (and inflation). The RBNZ won't want a bar of that. **NZ is still deeply indebted from a borrowing binge last decade.** While the Government has a credible plan to return to surplus promptly and reduce debt, the same cannot be said of the private sector. This leaves NZ vulnerable to adverse turns in global financial markets as well as being under the RBNZ's microscope.
- **The inflation genie could be let out of the bottle**, necessitating a monetary policy response. With the demand side of the picture looking very solid, one of NZ's greatest challenges over the coming year will be expanding its supply-side capacity. A failure to do so would mean resource constraints will bite earlier.

There are always going to be challenges, but stepping beyond these, the outlook is pretty good. We simply need to recognise that maintaining an economic expansion is not just about generating sufficient demand. It's also about creating sufficient supply-side capacity to meet the demand as recoveries broaden, such as now. This is where attention needs to be turning more rapidly.

BORROWING STRATEGY

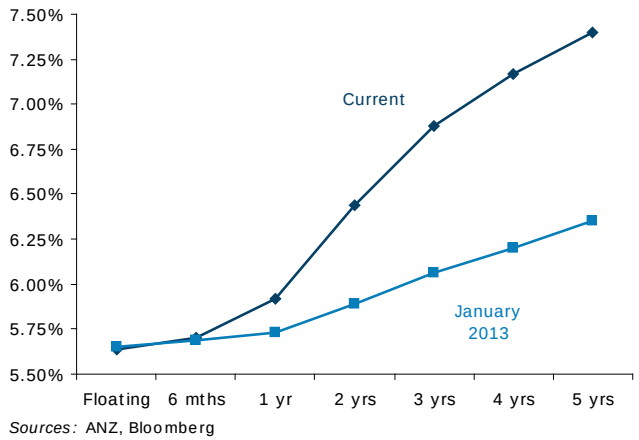
SUMMARY

Indicative rural fixed lending rates have continued moving higher, led by the long end. As a consequence of the "steeper" lending curve, it now costs significantly more to fix for longer term than it has at any time since interest rates started to rise earlier this year. We expect interest rates to continue moving higher as we move closer to the first OCR increase, and as global monetary policy normalises. We are thus confident we have seen the lows in interest rates this cycle. But with the expectation of higher interest rates built into the term structure, caution is required. Fixing provides certainty, but from a pure cost perspective is now very much a line call. We thus favour targeting dips to add to cover.

OUR VIEW

Indicative fixed lending rates have ratcheted even higher in since our last edition, taking 4 and 5 year rates over 7 percent for the first time in 2 years. But with the floating rate unchanged thanks to a steady RBNZ Official Cash Rate, as the chart below shows, this has led to a significant "steepening" of the rural lending yield curve since January. Whereas there was just a 0.7 percent difference between floating and the 5 year in January, that spread has now widened to almost 1.7 percent. As a consequence, **borrowers ought to be cautious when deciding whether to fix at the moment. Not only are the immediate cost implications significant, it is also debatable whether fixing now will even shield borrowers from the lift in floating rates that we believe lies ahead.** An expectation of rising rates is now already built into the term structure of interest rates.

Indicative Rural Lending Rates



Sources: ANZ, Bloomberg

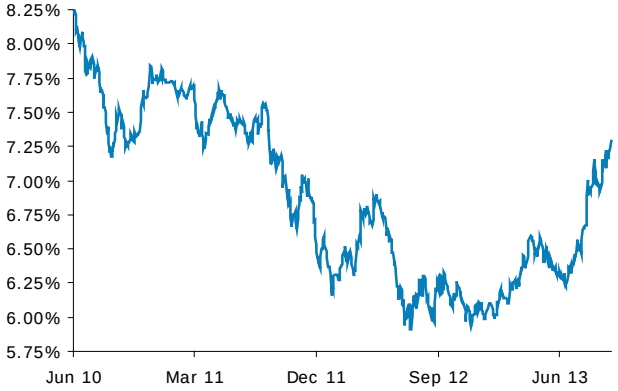
Breakevens provide a useful gauge of what's "priced in" to the term structure of interest rates. As the next table shows, the term structure of interest rates needs to lift by between 0.3 and 0.5 percent in the next 6 months, and by between 0.6 and 1.0 percent over the next 12 months. Breakevens 2 years ahead show that 6-month – 2 year rates need to rise by between 1.4 and 1.8 percent. **The term structure is thus "pricing in" a rising profile into the future, and only offer value if the actual path of interest rates moves up more quickly than our breakevens show.** Given our forecast that the OCR remains on hold till early next year, and then rises by around 0.75 percent per annum after that, **our view remains the same as it was last month: the decision between fixed and floating is something of a line call.**

Some readers may find it difficult to reconcile the idea of standing pat with our assertion that the lows in rates for this cycle are now in. If rates are heading higher, surely the case for fixing is a good one. **What our breakevens demonstrate is that term fixed rates are now so high that one needs to see a significant lift in floating rates for fixing to be cheaper in the long run.** Caution is thus warranted. Of course, not everyone that fixes will be doing so simply to save money. For some, the certainty that comes with being fixed is of significant value. All we wish to stress is that certainty comes at a cost.

Rural Lending Rates (incl. typical margin)		Breakeven rates			
Term	Current	in 6mths	in 1yr	in 2 yrs	in 3 yrs
Floating	5.68%				
6 months	5.71%	6.07%	6.67%	7.48%	7.82%
1 year	5.89%	6.37%	6.92%	7.69%	7.96%
2 years	6.41%	6.85%	7.31%	7.82%	8.09%
3 years	6.84%	7.19%	7.52%	7.96%	
4 years	7.12%	7.42%	7.70%		
5 years	7.34%				

It is not just our sense that the market is fully priced that lies behind our caution. **We are also mindful that interest rates have potentially overshot in the short term.** As the chart below shows, the 5 year lending rate has moved sharply higher since June. It is unusual for rates to rise so quickly with only one brief correction. Now that we are at the year's highs, it thus makes sense to target a corrective dip to add to cover.

Indicative 5 Year Rural Rate



Sources: ANZ, Bloomberg

EDUCATION CORNER: AQUACULTURE

SUMMARY

Global aquaculture production has grown 12-fold since 1980, which has made it the fastest growing protein sector. Annual global production now stands at nearly 60 million tonnes, and earnings at an estimated US$119 billion. Expansion is expected to continue, driven by population growth, increasing emerging market demand – many have strong cultural preferences for seafood, and consumers continuing to search for healthy protein options. With the volume of capture fisheries having plateaued over the last seven years and further expansion not anticipated, the gap is expected to be filled by aquaculture.

For New Zealand this offers another opportunity to unleash the potential of our renewable capital. Often the focus of unlocking our natural resource endowment is on accessing non-renewable resources i.e. oil, or better using our land. But with our total exclusive economic zone being the 5th largest of all countries there is also plenty of sea frontage to utilise.

In New Zealand the aquaculture sector has grown to a $400 million business with the majority of activity centred around three main species: Pacific oysters, Greenshell™ mussels, and King Salmon. The sector has aspirations to reach $1 billion in turnover by 2025. Recently the Government implemented long-overdue regulatory reforms including the removal of designated Aquaculture Management Areas (opening up more area for development), and developed its own five-year plan to assist the sector. Looking forward it will be critical councils "read from the same book". An improved regulatory environment is helpful but ultimately it will be over to the industry itself to execute its strategy if it is to succeed in reaching its $1 billion goal by 2025.

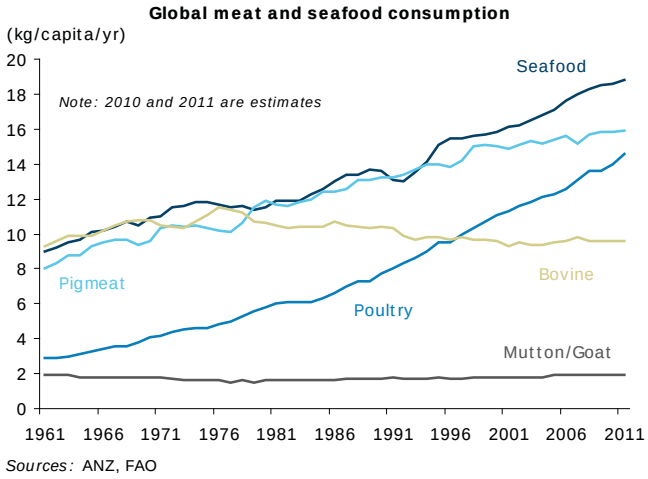
INTRODUCTION

In this month's *Education Corner* we focus our attention on aquaculture and show how the global aquaculture sector will be an important part of meeting the rising demand for protein. We also take a look at the specifics of the New Zealand aquaculture sector and how it is becoming an increasingly important part of the wider New Zealand seafood sector.

When thinking about the seafood sector it is easy to just think about the basic fish species, mussels and a few other delicacies, such as crayfish and Bluff oysters, which we occasionally get to dine out on in New Zealand. **However, the reality is much wider than this, with the New Zealand seafood sector actually made up of roughly 100 different species.**

However, this pales in comparison with the global seafood sector, which comprises over 1,500 capture species and over 500 aquaculture species (some aquaculture species are also be capture species). This means seafood protein makes up a substantial component of diets around the globe. In many cultures it is a more regular feature on menus than other popular meat proteins, such as pork, beef and poultry. Many cultures view it as one of the healthiest meat protein options, and rich in a number of other key nutrients that are essential parts of a balanced diet and healthy lifestyle.

While seafood has always been an important part of diets in many countries, the general lift in food consumption, along with a push towards healthier choices, has seen per capita seafood consumption double over the last 50 years. This sees global per capita consumption now sitting just shy of 19kg per annum, outstripping poultry, pork, beef, and mutton/goat.



Sources: ANZ, FAO

The growth rate in per capita seafood consumption is impressive in itself, but given that during the same 50 years the human population has more than doubled, this has resulted in an even larger increase in aggregate demand. In fact the annual global seafood market for direct human consumption is now 131 million tonnes, with a total value of US$190 billion. Population growth has accounted for about a third of the growth, and the lift in per capita consumption the remaining two-thirds.

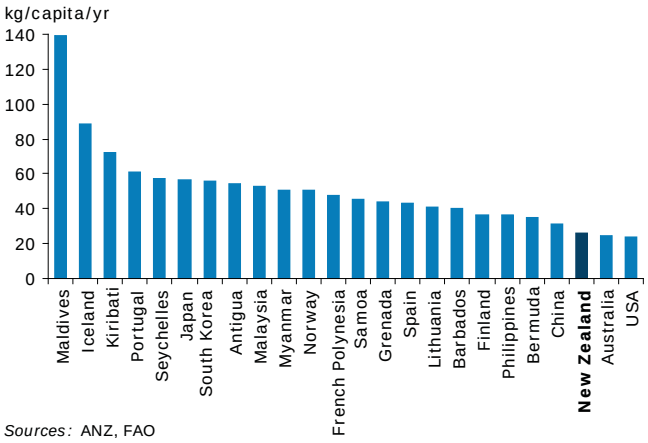
With the world's population expected to rise by another 2.4 billion people by 2050 and per capita consumption in emerging countries expected to lift a further 29 percent, a further increase in aggregate demand can be expected *(source: www.un.org)*. Even if per capita consumption rates don't increase, an additional 23 million tonnes (+17 percent) of seafood

EDUCATION CORNER: AQUACULTURE

will be needed to satisfy the extra demand from population growth by 2020. **On the supply side, with the volume of capture fisheries expected to remain static, because of many fishing stocks being either fully exploited or over-exploited, the gap will need to be filled by aquaculture.**

If we look at New Zealand's top seafood trading partners we can see they have an even larger appetite for seafood than the global average. Japan and South Korea (where seafood is a central part of their national food culture) top the list with annual seafood consumption of 60kg per capita. Although these consumption rates are high by international standards they pale into insignificance compared to the Maldivians, who top the global list, devouring almost 140 kg per person per year.

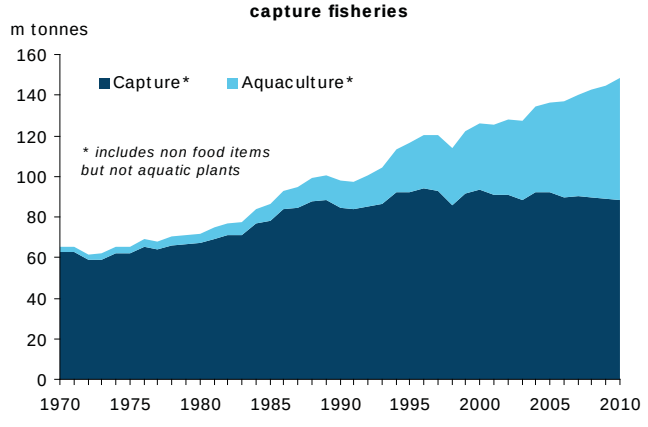
Seafood consumption in key countries



Sources: ANZ, FAO

Given its rapid growth over the last 20 years, aquaculture already plays an important part in the global seafood sector. **Since 1980 total global aquaculture production has grown 12-fold to nearly 60 million tonnes, which has made it the fastest-growing protein sector.** This phenomenal growth has meant that today aquaculture production is on par with global beef production. Further to this, global aquaculture is set to overtake the wider seafood sector on a volume basis in the not-too-distant future, with total captured volumes having remained relatively static over the past seven years at approximately 90 million tonnes (includes non-food items, but not aquatic plants). In 2010 aquaculture was estimated to have generated revenues of US$119 billion, which means on a per tonnage basis it was more valuable than captured volumes. This can be largely attributed to the mix of farmed species being higher value than captured volumes.

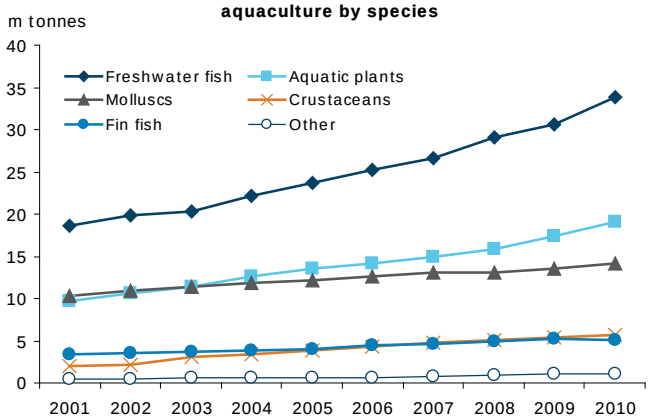
Increasing volumes of aquaculture vs. capture fisheries



Sources: ANZ, FAO

The vast majority (89 percent) of global aquaculture production occurs in the Asia–Pacific region, with China accounting for a massive 67 percent of global production. NZ represents around 0.17 percent of global aquaculture production, but 0.3 percent of total sales. The divergence between volumes and value is testament to the superior attributes (taste, quality etc) of NZ's products, as well as it being pitched and marketed to buyers who are willing to pay a premium for these superior attributes. While most New Zealanders associate aquaculture with mussels, oysters and salmon, **global aquaculture is dominated by freshwater fish, aquatic plants (mainly seaweed), and molluscs (shellfish).** Freshwater fish are by far the highest-produced aquaculture product with close to 34 million tonnes of fish (mainly carp and tilapia) produced each year. Aquatic plants, which are not only used as a food source, but also in the production of agar and carrageenan products (food additives), are harvested at the rate of about 19 million tonnes per year[1]. Production of molluscs, which include shellfish such as cockles, scallops, mussels, oysters and abalone, equates to about 14 million tonnes per year.

Global production volumes of aquaculture by species



Sources: ANZ, FAO

[1] Only some of this is included in our total aquaculture figures.

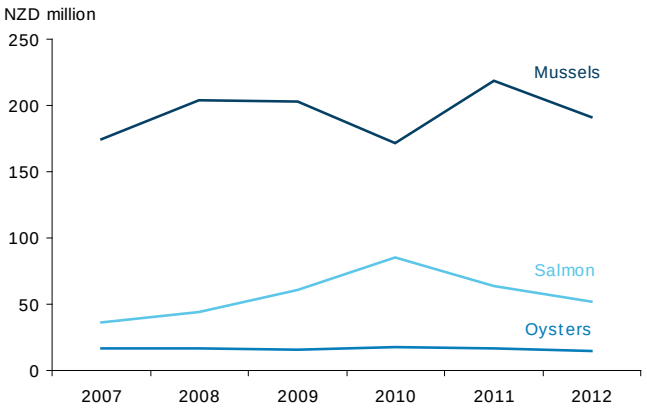
EDUCATION CORNER: AQUACULTURE

NEW ZEALAND AQUACULTURE SECTOR

Commercial aquaculture in New Zealand has grown to a $400 million business since its inception 40 years ago. Of this, about $260 million worth heads offshore as exports to over 70 countries.

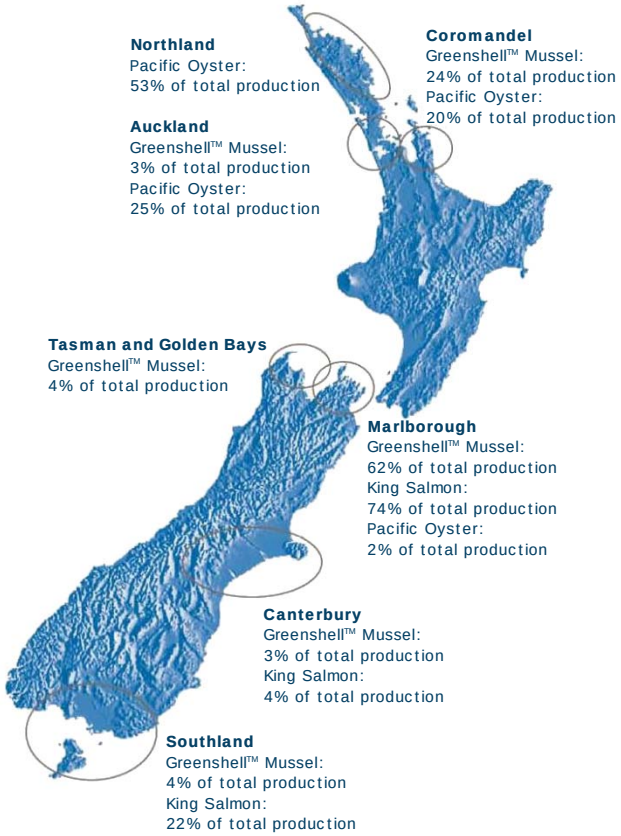
The success of the sector has centered around three main species: Pacific oysters *(Crassostrea gigas)*, Greenshell™ mussels *(Perna canaliculus)*, and King Salmon *(Oncorhynchus tshawytscha)*. However, it **has not been a one-way bet: growth since 2007 has been flat** due to space constraints, as well as weather and disease issues affecting production during various periods.

New Zealand exports of Mussels, Oysters and Salmon



Sources: ANZ, Statistics NZ

Major aquaculture areas in New Zealand



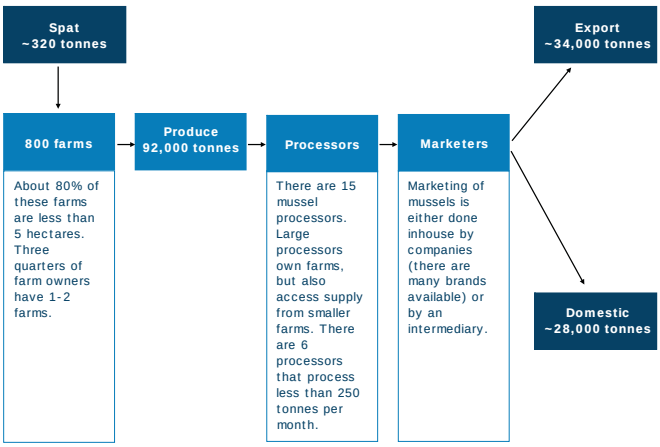
Sources: ANZ, Aquaculture New Zealand Levy Production 2010

Currently, aquaculture occurs in discrete pockets around New Zealand depending on the species being farmed. Water quality, currents, and weather exposures are important factors that limit farms to specific areas. **According to the Ministry of Primary Industries there are 23,279 hectares of allocated water space for marine-based aquaculture in New Zealand, which accounts for only 0.005 percent of our ocean area.** Of the area that is currently being utilised, nearly 60 percent is near shore and the remainder is considered open-ocean. There are also land-based farms dotted around the country that utilise either rivers (or irrigation canals in the case of freshwater species), or in the case of marine species are fully-contained systems that re-circulate water.

Mussels

Greenshell™ mussels *(Perna canaliculus)* are native to New Zealand and today are firmly established as one of New Zealand's largest seafood export earners and our top aquaculture earner. Mussel farming takes place in Northland, Auckland, Waikato, Tasman, Marlborough, Canterbury, West Coast and Southland.

MUSSEL SUPPLY CHAIN



EDUCATION CORNER: AQUACULTURE

Growing mussels suitable for market takes 12-18 months. Juveniles, known as spat, are usually harvested from the wild from bits of flotsam such as seaweed, and attached to long-line ropes. About 320 tonnes of spat are collected each year for the sector. Attaching spat involves stuffing spat and the flotsam into a cotton mesh stocking, which is then hung out on a mussel farm. As the seaweed and cotton mesh rot, the spat "hopefully" attach themselves to the culture rope. We use the expression "hopefully" as spat attachment and retention is a major problem for the NZ mussel industry. Losses of up to 100 percent can occur and NIWA has reported that losses of more than 70 percent are commonplace. Reasons for these losses include predation, natural mortality, and/or secondary settlement, with the spat deciding to drift off to a more favourable environment.

Becoming New Zealand's top aquaculture exporter has been no mean feat considering some of the challenges Mother Nature has thrown up. Besides spat attachment, the sector has also had to deal with barnacles settling on shells (making processing difficult), blue mussels settling on lines (competing with Greenshell™ mussels), algal blooms, and more recently invasive pests such as the seaweed *Undaria* and the clubbed *tunicate Styela clava*. Considerable research efforts continue to be expended looking at ways of dealing with these issues.

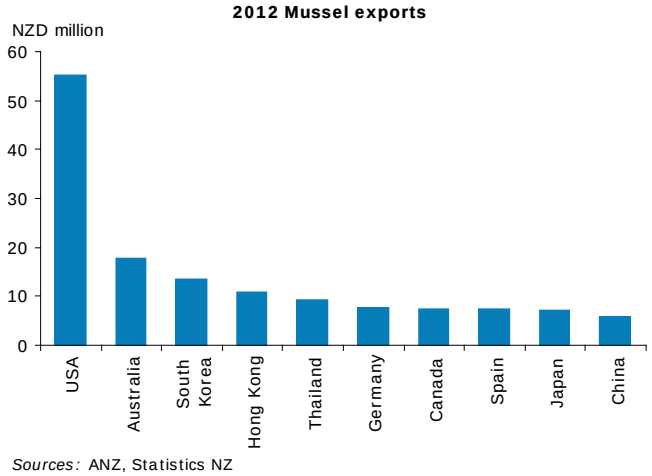
Further research has examined how productivity can be increased through selective breeding programs, while other research has looked at the viability of development of commercial hatcheries. Increasing mussel productivity through research will go a long way towards making the sector's goal of being a $1 billion industry by 2025 achievable.

King Salmon

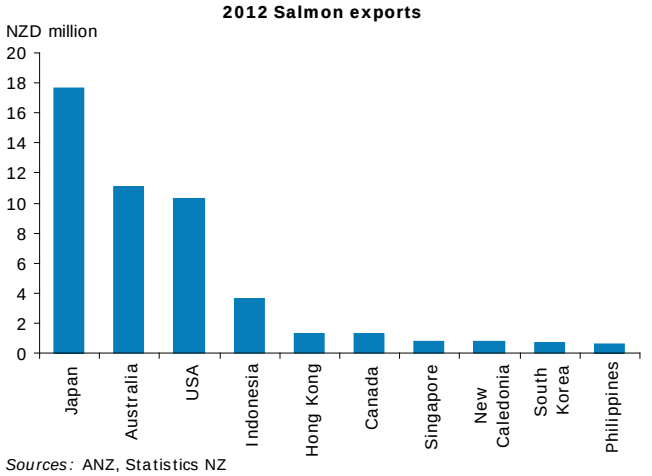
Globally, salmon aquaculture is dominated by the Atlantic salmon (approximately 1.6 million tonnes is produced annually). Yet although New Zealand has a few feral populations of Atlantic salmon, **our salmon sector is built around King Salmon** (aka Chinook, or Quinnat). Historically a freshwater game fish, King Salmon were first farmed in 1976 in Waikoropupu Springs, Golden Bay. The original farm was set up as an ocean-ranching venture (i.e. fish are raised in freshwater to about 25cm and released into the sea in the hope that some will return as adults… many didn't). Other similar ocean-ranch ventures were set up in the Clutha and Rakaia rivers, but it was the introduction of the first sea-cage salmon farm in Stewart Island in the early 1980s that set the foundation for NZ salmon farming as it is known today.

Today, sea-cage farming is the main method for farming salmon. That said, there are some ventures in the South Island that are entirely freshwater based, but they now also rely on cages to ensure full control of the lifecycle. **From small beginnings the New Zealand salmon industry now accounts for around half of the 15,000 tonnes of King Salmon produced in aquaculture globally.** The only other significant producer of King Salmon is Chile, although this species is also part of a capture fishery in North America, Russia and Japan. The main competitors that produce Atlantic Salmon are Norway, Australia, Chile, UK, Russia, and Canada.

New Zealand's King Salmon is considered the "wagyu" of the salmon world and is sought after around the globe. Roughly half of our salmon is consumed domestically with the rest heading off to export markets such as Japan, Australia, and the US, where it achieves a price premium over Atlantic



Sources: ANZ, Statistics NZ



Sources: ANZ, Statistics NZ

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salmon. Taste, colour, and texture are important attributes when it comes to selling food and NZ salmon rates highly on all these attributes. However, it has additional benefits over competing products. It has a higher oil content than Atlantic salmon, and New Zealand farms do not use antibiotics, pesticides, growth promoters, or vaccines. All these attributes contribute to its premium position and mean it is a highly sought-after product by many top-end retailers and restaurants.

Oysters

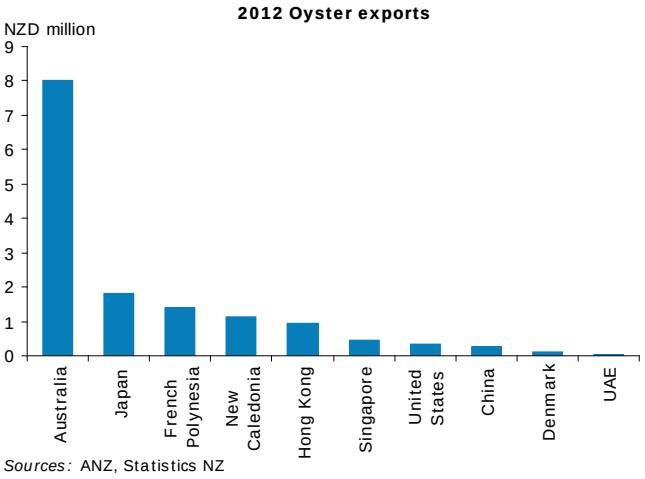
Aquaculture in New Zealand started with oysters in the 1960s. Originally the native rock oyster was farmed, but this was soon replaced by the faster-growing invasive Pacific oyster, which was unintentionally introduced in the early 1950s. Aquaculture farmers at the time noticed that the Pacific oyster outcompeted the native species due to its superior growth rate. The fast growth made this species ideal for aquaculture and by the 1970s it was the mainstay of the oyster industry.

The oyster-growing process involves either collecting spat in the wild by placing timber sticks in the water during spawning (January to March), or producing spat in a hatchery. The spat-covered sticks are then placed on intertidal racks, or for spat produced in a hatchery, they are in baskets, mesh trays or bags. The oysters are then left to grow and are harvested 12-18 months later.

Oysters are grown mainly in estuaries in Auckland and Northland, with key cultivation areas in the Whangaroa, Mahurangi, and Kaipara Harbours, as well as the Coromandel and the Bay of Islands. Future expansion can really only occur in the northern part of New Zealand as the Pacific oyster requires water temperatures between 15-18°C for optimal growth.

The oyster sector has faced some serious issues recently, including the discovery of a herpes virus in 2010 that devastated many North Island farms. Since then the Cawthron Institute has been working on developing oysters resistant to the virus, and recent indications suggest that positive progress has been made.

Besides the virus outbreak, oyster farmers also face potential issues with water quality. For example, in the Bay of Islands the industry was shut down for a number of years due to high levels of norovirus present in samples. Investigations suggested a number of possible sources for the virus, including leaking septic tanks, sewage discharges from boats, or the local sewage treatment plant.



Sources: ANZ, Statistics NZ

While mussels, salmon and oysters make up the bulk of aquaculture sector there are also other species that are farmed commercially, albeit at a smaller scale. Paua are farmed at 12 sites around the country, mainly on land-based farms that have re-circulating tank systems. Paua are generally produced for their meat, but more recently some entrepreneurial types have succeeded in growing pearls from their shells. Other species farmed on a commercial scale include koura (freshwater crayfish), flat oysters and prawns.

THE WAY FORWARD

In 2006 the aquaculture industry (along with other participants of the seafood sector industry) developed a plan to turn the sector into a $1 billion dollar earner by 2025. As such, the industry formed a strategy which set out a blueprint to achieve this goal. The strategy was divided into three phases:

1. Phase I – Pathway to 2011 (2006-2010). The main goals for the first phase were to set up a new sector organisation, and develop a strong partnership with government to address aquaculture legislation and the Maori aquaculture settlement.
2. Phase II – Dynamic change (2011-2015). The second phase looks to build on the work done in the first phase and focuses on increasing investment and developing production. Innovation and education are also outlined as important parts of this phase.
3. Phase III – Enhanced value (2016- 2025). The final phase continues the momentum built up from the first two phases and focuses on ensuring continued investment is attracted to the sector. This will be achieved by having sector-led market innovation and R&D programmes, as well as strong partnerships with stakeholders.

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In their entirety the three phases look to achieve the following 10 outcomes:

1. Establish a new national sector organisation;
2. Strengthen the partnership with government;
3. Strengthen other stakeholder partnerships;
4. Secure and promote investment in aquaculture;
5. Improve public understanding of and support for aquaculture;
6. Promote Maori success in aquaculture;
7. Develop the market for New Zealand aquaculture products;
8. Maximise opportunities for innovation;
9. Promote environmental sustainability and integrity of aquaculture; and
10. Invest in training, education and workforce promotion.

Already a number of initiatives have been undertaken. **Most notable was the formation of Aquaculture New Zealand in 2007, which was set up to promote the sector, strengthen partnerships, and drive the growth of the sector.** Part of the strategy has involved working more closely with the Government, who also saw the potential of aquaculture to unlock our natural resource endowment. **The Government subsequently developed its own five-year plan in 2012 to assist the aquaculture industry achieve its billion dollar goal by 2025.**

As part of its attempts to assist the sector, the Government introduced long-overdue legislative reforms to support the aquaculture sector and its growth aspirations. Previously, demand for space in the 1990s was so great that it clogged the consenting system. By 2002 a moratorium was put in place, which essentially stopped all growth in the sector. The more recent reforms were a welcome relief as they looked to reduce costs and delays in the consenting process, thereby promoting more investment certainty.

The main change to the relevant legislation was the removal of the Aquaculture Management Areas (AMA) (areas designated within the Regional Coastal Plan where aquaculture was permitted). The removal of AMAs meant that a resource consent for an aquaculture project could be applied for across all coastal areas. Other changes included a "tweak" to the Tasman and Waikato Regional Coastal Plans to allow farming of a wider range of species, and the ability for the consent process to head to the Environmental Protection Authority for a decision; potentially a quicker, though more expensive process.

So while there are still environmental protections in place to ensure any development is sustainable and has minimal impact on the environment these changes also assist the growth ambitions of the sector.

Yet despite the legislative changes there are still some issues regarding the interpretation of the law by regional councils. This can result in variation between regions, meaning that what is allowed in one region may or may not be allowed in another. And of course gaining consent still requires consultation with all stakeholders who "share the water-space". This can create some tension when the various stakeholders often have very different views on how the water space should be used. It must be noted that the amended legislation allows for ministerial intervention if necessary also. There are naturally teething issues and consenting can still be a very costly process. However, on the whole the changes have provided more investment certainty for the sector.

Providing space can be obtained it will be up to the mussel, salmon and oyster sectors to achieve the lion's share of growth. These three sectors have already done the hard yards by developing systems and technology to farm their respective species. But also, more importantly, they have developed their markets and understand what their customers want. Furthermore, the respective industries, as well as the Government, have invested significantly into research and development to improve productivity and yields, as well as deal with the unforeseen issues that have occurred, such as the herpes virus in the oyster sector. Increasing productivity gains from these three species, as well as opening up new markets, would be akin to "picking the low-hanging fruit" for the sector and Government.

While the success of the sector is largely reliant on these three main species, other species also offer opportunities. However, finding suitable species for aquaculture takes an enormous amount of research, which is both costly and time consuming. While some capture species may be in demand from consumers, they may not be suitable for aquaculture, and it is only through methodical research that this can be determined.

That said, New Zealand researchers have made some positive steps towards identifying a list of potential winners. For example, finfish species such as hapuka and the yellow tail kingfish look

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promising, with hatchery trials already showing some success. Eels are another possibility, with wild glass (juvenile) eels being caught and raised in captivity. Flat oysters are also on the agenda, with a small amount already being farmed. And let's not forget to mention the obscure geo duck (pronounced gooey duck), which is considered a delicacy in Asia and can fetch around $40 per kg. Seahorses have also been examined, as dried seahorse is highly sought after in Asia for medicinal purposes. The list of other potential candidates includes a range of seaweeds as well the Asian delicacy, sea cucumbers.

It would also be remiss of us not to mention the potential of trout. The rainbow trout, which was introduced to New Zealand in the late 1800s, is a close relative of the King Salmon and highly regarded worldwide as both a sport fish and aquaculture species. Some 770,000 tonnes are produced annually around the world worth approximately US$3.8 billion, but given it is currently prohibited to farm (due to politics) this species in New Zealand it may be premature to suggest this species could help achieve the sector's $1 billion goal.

The environment can still deal a few blows to even the best-laid plans; probably more so when dealing with aquatic environments. Good water quality is a crucial factor, with run-off from streams and rivers having important consequences for aquaculturalists. This is especially so for mussels and oysters, which are filter feeders and can accumulate "nasties" associated with run-off. After periods of heavy rainfall, harvesting may be halted to allow the shellfish to flush their digestive systems. Any delays in harvesting can result in shellfish losing condition and therefore impact on the price the farmer receives. These types of events illustrate the potential impacts that long-term water degradation could have on the sector.

A lapse in biosecurity is another issue that could derail expansion plans. Already we have seen the impact of the herpes virus on the oyster sector. And although the mussel and salmon sectors are free of any major diseases, the introduction of a new disease could have dire consequences.

Besides disease, there are a number of pests that are already having an impact on the aquaculture sector. For example, the seaweed *Undaria*, which entered the country in the late 1980s, has an affinity with mussel farms and requires continual removal. Ironically, this species, commonly referred to as wakame, is also a common aquaculture species in Asia, with approximately 1.8 million tonnes grown annually. Another species *(Styela clava)* turned up in New Zealand in the mid-2000s, and like *Undaria*, quickly became an unwelcome sight on mussel farms. While both these species have little impact on yields, they increase costs, as they need to be continually removed. **Of course keeping pests and diseases out of the marine environment is no easy task, but it is clear that in order to protect and grow the aquaculture sector very high levels of biosecurity will be needed.**

The achievements the industry has made so far have laid a solid foundation for the sector to embark on the next two phases of its strategy. Now that the legislative environment has improved, the sector needs to build on this and execute its strategy for growth.

Key to this will be:

1. Ensuring councils across the country "read from the same book". This will likely require the Government to provide more prescriptive information for councils on how to manage aquaculture activities;
2. Continued research and development to further boost productivity and better manage pest and disease risks;
3. The introduction of new species into the mix;
4. Creating and investing in new and existing markets;
5. Educating the public on the benefits of aquaculture and the minimal impacts that well-managed farms have on the environment.

We have no doubt the aquaculture industry has the potential to reach its goal with some further hard work and Government assistance. Given rapidly diminishing wild fish stocks, there is no question the sector has an important role to play in feeding an increasingly protein-hungry world and become a more significant part of the New Zealand economy.

With contribution and thanks to:

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KEY TABLES AND FORECASTS

FX RATES	ACTUAL			FORECAST (END MONTH)						
	Aug-13	Sep-13	4-Oct	Sep-13	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14	Mar-15
NZD/USD	0.773	0.830	0.829	0.84	0.82	0.80	0.79	0.78	0.78	0.78
NZD/AUD	0.868	0.891	0.882	0.90	0.91	0.91	0.91	0.91	0.92	0.92
NZD/EUR	0.584	0.614	0.609	0.63	0.61	0.58	0.56	0.56	0.56	0.56
NZD/JPY	75.86	81.56	80.61	88.2	86.1	84.0	83.0	81.9	81.9	81.9
NZD/GBP	0.498	0.513	0.513	0.55	0.54	0.53	0.52	0.51	0.50	0.50
NZ TWI	73.1	77.1	76.8	79.2	77.8	75.9	74.7	73.9	74.0	74.0

INTEREST RATES	ACTUAL			FORECAST (END MONTH)						
	Aug-13	Sep-13	4-Oct	Sep-13	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14	Mar-15
NZ OCR	2.50	2.50	2.50	2.50	2.50	2.75	3.00	3.00	3.25	3.25
NZ 90 day bill	2.65	2.74	2.66	2.70	2.80	3.20	3.30	3.30	3.70	3.70
NZ 10-yr bond	4.55	4.35	4.58	4.70	4.70	4.80	4.80	4.90	4.90	4.90
US Fed Funds	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
US 3-mth	0.26	0.25	0.24	0.26	0.40	0.40	0.40	0.40	0.50	0.50
AU Cash Rate	2.50	2.50	2.50	2.50	2.25	2.25	2.25	2.25	2.25	2.25
AU 3-mth	2.58	2.60	2.56	2.60	2.40	2.40	2.40	2.40	2.40	2.40

ECONOMIC INDICATORS	Jun-13	Sep-13	Dec-13	Mar-14	Jun-14	Sep-14	Dec-14	Mar-15	Jun-15	Sep-15
GDP (% q/q)	0.2	**0.9**	**0.9**	**0.8**	**0.8**	**0.7**	**0.6**	**0.6**	**0.5**	**0.5**
GDP (% y/y)	2.5	**3.1**	**2.4**	**2.8**	**3.5**	**3.3**	**3.0**	**2.8**	**2.5**	**2.3**
CPI (% q/q)	0.2	**0.8**	**0.1**	**0.5**	**0.5**	**0.7**	**0.4**	**0.8**	**0.7**	**0.8**
CPI (% y/y)	0.7	**1.2**	**1.5**	**1.5**	**1.9**	**1.9**	**2.1**	**2.3**	**2.5**	**2.6**
Employment (% q/q)	0.4	**0.3**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Employment (% y/y)	0.7	**1.5**	**2.9**	**1.5**	**1.5**	**1.5**	**1.4**	**1.3**	**1.2**	**1.1**
Unemployment Rate (% sa)	6.4	**6.3**	**6.1**	**5.9**	**5.8**	**5.7**	**5.7**	**5.7**	**5.7**	**5.6**
Current Account (% GDP)	–4.3	**–4.1**	**–4.1**	**–4.2**	**–4.3**	**–4.4**	**–4.3**	**–4.4**	**–4.6**	**–4.8**
Terms of Trade (% q/q)	4.9	**1.9**	**1.2**	**0.3**	**–0.1**	**–0.2**	**–0.5**	**–0.7**	**–0.8**	**–1.1**
Terms of Trade (% y/y)	4.6	**10.1**	**12.7**	**8.5**	**3.3**	**1.2**	**–0.5**	**–1.5**	**–2.2**	**–3.1**

Figures in bold are forecasts. q/q: Quarter-on-Quarter, y/y: Year-on-Year

NEW ZEALAND'S 20 LARGEST EXPORT MARKETS

NZ'S TOP EXPORT MARKETS FOR THE 12 MONTHS ENDED AUGUST 2013 (NZ$M)

	Global Total	Australia	China	USA	Japan	Korea	UK	Germany	Singapore	Hong Kong	Malaysia	Indonesia	Taiwan	India	Saudi Arabia	Philippines	Thailand	UAE	Nether-lands	Canada	Algeria
Sheepmeat	2,695	5	595	215	46	4	533	232	13	31	40	1	39		81	1	4	9	138	90	6
Beef	2,102	13	188	916	187	110	26	10	35	34	30	32	123		21	33	12	22	28	82	
Other Meat	452	46	21	23	37	28	28	62	5	29	6	2	3		11	4	2		20	5	
Milk Powder	6,758	56	2,346	15	39	11			230	149	328	282	183		215	219	204	356	4	7	299
Butter	1,927	70	177	105	5	13	2		35	17	47	59	51	1	91	63	31	42	13	13	42
Cheese	1,434	217	101	44	312	129	14		10	17	29	59	35	1	64	55	14	16	25		26
Whey/Casein	1,811	48	270	636	207	48	3	135	60	1	22	44	12	7	28	21	6	1	8	30	1
Kiwifruit	870	60	82	20	246	38		179	9	25	12	9	57	4		2	7	4		4	
Apples	502		22	72	6		56	53	15	20	13	6	14	21		1	45	28	52	13	
Other Fruit/Vege	819	351	14	32	159	22	14	8	12	8	33	8	17	2	2	1	13	2	17	3	2
Wine	1,219	368	24	292	13	2	281	11	17	19	3	1	1			1	2	5	28	79	
Wool	757	42	391	18	19	2	45	40		7	6	1	7	31			7		1	3	
Skins/Hides	579	22	204	2	6	24	2	1		29		6	4	17			9				
Logs	2,116		1,448		154	309							11	185			4				
Sawn Timber	1,101	319	173	164	69	57	1	1	5	1	16	19	45	3	19	39	30	7	15	1	
Fibreboard/Plywood	341	43	26	12	196	1					5	20	4	5		10	1			1	
Wood Pulp	595	68	166		59	64			2		17	106	23	13		3	18				
Fish/Seafood	1,430	278	399	132	111	31	12	23	28	56	9	4	7		2	13	28	6	6	12	
Crude Oil	1,775	1,638							113												
Aluminium	997	79	33	38	450	148	54	2	2	11	1	4	3	16			2		67	2	
Remainder	15,250	5,582	1,246	1,350	515	560	326	181	323	351	251	190	193	449	64	196	191	66	184	212	1
TOTAL	**45,529**	**9,306**	**7,924**	**4,086**	**2,838**	**1,598**	**1,399**	**938**	**915**	**806**	**867**	**854**	**832**	**754**	**599**	**664**	**631**	**565**	**608**	**557**	**378**

NZ MERCHANDISE EXPORTS ANNUAL CHANGE BETWEEN THE 12 MONTHS ENDED AUGUST 2013 AND A 12 MONTH SPAN A YEAR EARLIER (NZ$M)

	Global Total	Australia	China	USA	Japan	Korea	UK	Germany	Singapore	Hong Kong	Malaysia	Indonesia	Taiwan	India	Saudi Arabia	Philippines	Thailand	UAE	Nether-lands	Canada	Algeria
Sheepmeat	74	-2	330	-33	-3		-1	-38	2	-5	-7		-14		-13		2	-2	-19	-4	-8
Beef	59	-5	163	60	-14	-12	-3	-9	-16	-10	5	-36	-15		15	-9	3	-1	-4	-20	
Other Meat	-5	11	5	1	-4		1	-4	-1	6	-2	-8			-1	1			-7	1	
Milk Powder	-365	-9	466	1	16	-1			10	57	-9	11	18	-32	-32	-31	-29	-78	-5	7	-25
Butter	-306	-31	-32	-17	-15	-9	2		-9	-1	-12	3	-4	-29	-12	-5	-17	1	3	-5	-14
Cheese	24	-13	15	33	-4	11	-24		1			4	7	1	-3	-4		-2	2		10
Whey/Casein	-160	-15	24	-151	-1	-4	-2	-9	-4	-4	-9	7		3	2	-11	4		1	-6	1
Kiwifruit	-210	-5	-31	-7	-67	-33		-25	-1	-6	-1		-39	1			1	1	-1	1	
Apples	133		19	26			8	12	3	-3	2		-5	-3		1	14	9	20	7	
Other Fruit/Vege	-64	-57	4	-7	-31	-4	6	1	1	1	11	2	1		1	-1	-2		5	1	
Wine	31	-16	-5	43			-6	4	2		1						1	-2	3	6	
Wool	-106	-22	-14	-8	-2	-1	-11	-1		3	-3	1	-4	-5			-2	-1			
Skins/Hides	8	6	-15		-4	2	-5			-8		-4	2	5			-2				
Logs	560		510		-19	61							1	10			-1				
Sawn Timber	-16	-12	28	5	-24	5		-1	-2		1	-4	13		-8	-15	-2	-4	9		
Fibreboard/Plywood	-66	-25			-28						-5	-3	1	1	-1	4					
Wood Pulp	-25	8	-26		-35	-16			-5		-5	26				-2	-8				
Fish/Seafood	-64	7	108	-8	-32	-16		5	-12	-106		2	-1			8	4	1		-3	
Crude Oil	-388	-393			-33				65			-24									
Aluminium	-106	-10	1	-24	-99	22	3		1	-6	-1		1	1			1		-9	-2	
Remainder	-381	-379	26	53	-148	39	14	38	30	-2	-26	53	26	-51	-8	-11	-31	-13	35		-1
TOTAL	**-1,373**	**-963**	**1,575**	**-33**	**-547**	**45**	**-18**	**-28**	**65**	**-88**	**-60**	**30**	**-12**	**-99**	**-59**	**-76**	**-63**	**-90**	**32**	**-18**	**-36**

NZ MERCHANDISE EXPORTS ANNUAL CHANGE BETWEEN THE 3 MONTHS ENDED AUGUST 2013 AND A 3 MONTH SPAN A YEAR EARLIER (NZ$M)

	Global Total	Australia	China	USA	Japan	Korea	UK	Germany	Singapore	Hong Kong	Malaysia	Indonesia	Taiwan	India	Saudi Arabia	Philippines	Thailand	UAE	Nether-lands	Canada	Algeria
Sheepmeat	45	-2	91	5	1		-5	-5		5	-2		-7		-17	1	1	-1	-3	1	-9
Beef	-59		31	-36	-10	-5	-3	-7	-9	-2	3	-2	-9		5	-6			1	-1	
Other Meat	11	3	3		-4	-2		5	-2	2	-1	-1	1		-1					1	
Milk Powder	-298				1	2			23	-9	33	7	17		-31	-6	5	-47	-2	7	-58
Butter	29	-4	7	-13	-6		2		1	1	2	12	-3		-7			2	2	-5	-3
Cheese	-11	8	-3	-7	-1	-2					2	-6	1	1	-13	-2	-1	-1	-4		-1
Whey/Casein	-98	-1	-5	-68	-5	-5		-7	-5		-2	-4			-3	-4	3	-1		-4	
Kiwifruit	-120	-9	-23	-2	-36	-13		-2		-4			-30	1				1			
Apples	45		7	13	-2		1	1	1	1	1	-2	2	1			4	-1	7	3	
Other Fruit/Vege	3	1		1	-2	-1			-1		4						-2			1	
Wine	19		-5	11			8	1		-1									4	-1	
Wool	8	-4	11	-2			1	-1		2	-1		-2	-1							
Skins/Hides	8	1	5		-1	-1						-2		2			-2				
Logs	226		170		-4	27								33							
Sawn Timber	13	1	4	4	-1	1			-1			1	3		-4	-6		1	3		
Fibreboard/Plywood	-18	-7	-2	2	-7						-1										
Wood Pulp	17	2	2		-11	2						10	2	2		-1	-4				
Fish/Seafood	-34	-2	10	-2	-13	-9	1		3	-10			-1				-3	2		-1	
Crude Oil	-177	-160			-33				16												
Aluminium	52	-2	-3	-8	21	45	-2			-3		1		1					-7	1	
Remainder	-9	-102	8	36	-64	-35	20	19	5	-2	3		7	-4	-5	11	-2	3	7	7	
TOTAL	**-349**	**-276**	**309**	**-67**	**-176**	**5**	**22**	**3**	**33**	**-18**	**40**	**15**	**-17**	**35**	**-75**	**-12**		**-43**	**8**	**9**	**-70**

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