Northland Horticulturalist Resilience Study Summary

Project brief

"Towards Resilient Farm Businesses in Northland" is funded by MAF's Sustainable Farming Fund (SFF). The project sought to establish a better understanding of how landowners perceive risks around adverse weather events and to identify the factors that influence their actions and decision making in relation to such events.

The aim of this study was not to statistically analyse levels of resilience in Northland agriculture but to build a picture of factors that were influencing farmer/horticulturalists resilience and to use this knowledge in following years to assist farmers/horticulturalists and organisations involved in aiding rural recovery from adverse.

What we did

Three focus groups were held with the three main sectors that make up Northland agriculture: beef/sheep; dairy; and horticulture (avocados). A focus group sought to identify initial participants' experiences and responses to adverse weather events. The information collected was then used to inform the following grower interviews that sought a greater depth of understanding of the issue. Ten semi-structured interviews were undertaken in each of the three sectors across Northland. Farmers were asked questions based around five main themes: farm demographics; historic storm experience; impact of the 2007 storms; response to the 2007 storms; information sources that were useful. This summary reports on the horticultural sector of the study. The group was predominantly avocado growers affected by the 2007 storms. This group was selected to work with because there was a need to focus the study rather than trying to spread the interviews across a very diverse industry.

What we found

During the workshop and interviews growers were asked to identify the bigger adverse weather events that had impacted them. The storm events of 2007 and 2008 featured heavily with earlier events such as cyclones (particularly Bola in 1989) - some large frost events were also mentioned. Highlighted was the easy remembrance of recent events compared to more historic events. Often there existed an element of 'story telling' in the recalling of past events. That is, participants often referred to parents or another orchardist's recollection of a historic weather event. This build-up of social memory passed either through a family or community combined with orchardists own experiences provided orchardists wtih a foundation for comparing recent or upcoming adverse weather events and their potential impacts. As such, they are an important locally based information source that contributes to orchardists risk assessment and decision making.

All orchardists advised that adverse weather events were random in nature and did not follow any identifiable pattern. Many did however identify regular annual or biannual weather events including storms, frosts, dry summers that did follow a pattern but that were not as severe in nature as the larger events mentioned above. This suggests that participants were addressing the dynamics of weather events on a regular basis.

It was evident after discussions with orchardists that they take a relatively pragmatic view of weather events and their ability to survive them. Quotes such *as "you just get hardened to them"* or *"changing weather patterns don't matter really. It either happens or it doesn't"* were not uncommon as participants discussed storms. This likely arises from their own experiences of past recovery, and importantly their ability to survive adverse

weather events and maintain the existence of their orcharding businesses – this shows a build up of resilience in the individuals themselves. Orchardists interviewed were clear that they were unable to change or control the weather, and knew that they just had to deal with the consequences.

The ability of orchardists to change the impact level of adverse weather events to orchards lay in their ability to understand the dynamic social, economic and physical limitations and opportunities that their orchards presented – in short, their ability to evaluate the risk posed and put in place adaption strategies and practices to address these.

Adaptation strategies to adverse weather events

A focus for this study was growers' preparedness for and decision making around adverse weather events. Discussions from both the workshop and interviews highlighted that droughts were not considered problematic due to current in-built resilience. In particular, having irrigation installed on orchards and access to water sources either bores or community irrigation schemes.

Storm events were considered to be the most problematic in terms of impact for horticulturalists. Events consisting of rain and wind were likely to cause damage to crops (fruit), crop trees, infrastructure, shelter and soils. Financial losses due to these impacts for orchards based on experiences with the storms of 2007 were potentially considerable.

Horticulturalists are constrained in their ability to adapt their environment due to the static nature of orchards. Once an shelter and crops are established, there is little chance of them being shifted as the offset of loosing production opportunities is likely. Any changes to build resilience must fit within these boundaries. Orchardists discussed a range of strategic (long term) and tactical (shorter term) options to deal with the effects of storm damage (Table 1).

Table 1: Some options identified for preparing for or dealing with storm damage

	Strategic	**Tactical**
Crop and tree damage	Reduce avocado tree height.	Decide if there is a need to remove fallen fruit from under trees.
	Pruning maintenance to allow more space in the middle of tree.	
	Try to create a strategy whereby fruit were ready to pick earlier.	
Structures	Decide to stop growing crops in particular areas .	Clear laneways.
	Reduce avocado tree height.	Re-balanced/stabilise/stake trees; OR Wait and see what the trees will do – let trees settle.
	Investment in plant structures.	Spray for Phytothera – usually trunk spraying.
	Trunk spraying for Phytothera incorporated in regular crop spraying program.	Use a regular copper application or other fungicide prior to storm.
	Use rootstocks that have some Phytothera resistance.	Cut away parts of trees with Phytothera infection.
Shelter	Plant shelter belt strategically to block prevailing wind.	Clean up fallen trees and replant.
	Increase shelterbelt height –	

	don't trim.	
	Consider using different shelter species.	
Soil damage	Drainage built into orchard design or added later.	Drainage cleared and maintained regularly.
	On sloping orchards use simple diverts to divert main water away from trees.	Don't use machinery and vehicles on heavily saturated soils.

To counter the ups and downs in financial fluctuations in horticulture and to maintain their lifestyle choices, most growers had built resilience by diversifying their income streams. Aside from growing avocados, these orchardists either grew other crops as well; or worked off orchard in local towns or in industry related contract work. This inbuilt resilience means that although the financial impact of storms could be considerable, most participating orchardists were able to survive. Other strategies for reducing the impact of storm damage included utilising existing financial resources or increased debt levels to manage the risk around the financial impacts of weather. No participating orchardists had crop insurance, as they considered the cost too high.

Most horticultural households felt they were prepared for adverse weather events that may leave them potentially isolated and without power. Thus, as a household, resilience has been build through preparedness with heat, water, food etc. Orchardists also reflected on the increased sense of community as *"people keep a look out for each other"* during and after storm events. This is important as the realisation of storm damage to the orchard physically and financially sinks in for growers.

External resources
Resilience was also evident from assistance sourced off orchard. Two key players were evident: the avocado industry; and Taskforce Green. The avocado industries proactive and supportive role was very important to a coordinated approach to identifying what level of damage existed after the 2007 storm and what actions were required. The local representative was a key driver, but this group also includes other local avocado industry members and the national organisations response.

Although different opinions were held about Taskforce Green, their value lay in enabling orchards to become operational again. They did work in shorter time spans than orchardists on their own could have done.

Findings Summary: Challenges to building resilience

One of the biggest challenges to orchardists is the difficulty of changing an orchard around once established. Participants highlight how critical it is to orientate the orchard well for both production and for protection from the environment from the onset of orchard design and setup. Growers are often limited in their ability to avoid storm damage by the static nature of their orchards. They also realise that they are working with natural systems and sooner or later an adverse weather event will strike.

Working well for orchardists is that many of the best management practices encouraged by the industry are also those highlighted to assist with avoiding or managing damage from adverse weather events. In this way, activities undertaken for plant maintenance or to manage picking or spraying activities such as cutting down tree sizes or pruning will also decrease the impact of wind and rain.