Adaptation to a changing climate

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"The whole climate is getting a bit later. The winter season has shifted and the harvest season is warmer than in the past with fruit growth continuing later in the season than it used to."

THE ISSUE OF CLIMATE CHANGE

What does climate change mean to you and your kiwifruit business? Do you immediately think of issues like food miles and carbon trading? If your export markets think these things are important, as they certainly do in Europe, then you have to deal with them. Similarly, the passing of the emissions trading scheme legislation means that carbon budgeting will be mandatory over time. These things cannot be ignored. But is this all there is to climate change? What about the weather? Climate change as a market and regulatory issue has, at present, a lot to do with carbon. Climate change as a production issue has everything to do with the weather.

We can be increasingly confident that climate change is happening. However, we can't be certain as to the amount of temperature increase and exactly what changes in rainfall we'll experience. At present New Zealand temperatures are increasing at the rate of about 0.1°C per decade. The latest information from NIWA (National Institute of Water and Asmospheric Research, New Zealand) indicates that the rate of increase will accelerate over coming decades. Average temperatures in all kiwifruit growing regions could be at least 1°C higher by the 2040's and 2°C higher by the 2080's. Over the same timeframe, there could be a trend to drier winter and spring conditions in Northland and eastern North Island growing regions. Slightly wetter summer and autumn conditions could prevail. A warmer atmosphere will hold more moisture. Over time, this could lead to more extreme rainfall events. There will also be the possibility of increased westerly winds in winter and spring. Increased temperatures will reduce the total number of frosts, which is already a trend throughout New Zealand. However, the occurrence of damaging late frosts in recent years is evidence that average trends need to be put together with local experience.

Such changes may not be as dramatic as melting glaciers and the melting of sea ice in the Arctic. However, changes such as the trend towards more frequent warmer winters are a concern for the kiwifruit industry. Warmer winters might be of even greater concern if the recent EU ban on production and use of Hydrogen Cynamide in Europe is upheld.

CLIMATE CHANGE AND ADAPTATION

What does it all mean for kiwifruit growers? Any discussion about this issue must be considered in context. New Zealand has ideal climates and soils for kiwifruit production. However, as an island nation in the southern ocean, we have the reality of a predictably unpredictable climate. The big challenge for all growers is to consistently produce a high quality, well-sized, crop from one year to the next. To even come close to achieving such consistency requires considerable skill.

Early research on climate change and kiwifruit suggested that the Hayward variety would become uneconomic in Northland and subsequently the Bay of Plenty. In the past this led to suggestions of a southward relocation of growing regions and industry infrastructure. While such a dramatic change is unlikely there will undoubtedly be a need for adaptation over time. Climate change may not be the main driver for adaptation in the short term but could become of greater importance in coming decades.

Adaptation to change has been a necessity in the past. Probably the best example for the kiwifruit industry is the introduction of the KiwiGreen programme. With climate change, adaptation is a necessity for the present and future. As a grower there are some things that you just have to deal with. There are, however, plenty of things that you still have control over. How you manage your orchard and deal with a changing climate is very much in your hands. This is what adaptation to a changing climate is

about. Focusing on issues that matter now and for the future and looking at practical actions you can take to deal with them.

Recently a number of growers shared their views on what climate change might mean and what adaptations could be required.

GROWER PERSPECTIVES

"Previously we were thinking about [dealing with the effects of climate change], but bogged down with all of the negatives that the sky is falling and the whole focus and emphasis on managing carbon. We need the motivation to focus on adaptation."

In the early part of the 2008 harvest season, from 17 March to 18 April, interviews were completed with 19 Bay of Plenty growers. This work was funded as part of the MAF climate change programme. The growers were spread from Katikati through to Opotiki, and included a mix of GREEN and GOLD, and growing systems (conventional, organic and biological). They were asked about: current climate challenges, things they're already doing to climate proof their orchards, what concerns and opportunities they see for the future and what adaptations are likely to be needed over time.

The consensus is that there have been some notable changes in the climate over the last five years. Observed changes include a shift towards warmer winters, less reliable spring conditions with increased frost risk and warmer autumns. Growers have invested in overhead sprinklers and wind machines to fight frost. There is a lot of experimentation with sub-canopy shelter and a growing interest in above-canopy shelter. In most regions, water is also becoming an issue, particularly on shallower soils and in areas where there is pressure from urban expansion. In general, there is a lot of know-how, innovation and available technology to deal with recent changes in the climate. What of the future?

Big concerns for the future relate to the potential for more extreme weather events, the effects of warmer winters and autumns, availability of water and changes to pests and diseases. Warmer spring and summer conditions will probably be beneficial to fruit quality. The results of the 2008/09 season suggest that hotter, drier conditions may be beneficial overall. Dealing with a more variable climate, with more extreme weather and the effects of warmer winters are the biggest concerns. On-going pressures from markets for a high quality, residue and blemish-free product, adds to the challenges.

The banning of Hydrogen Cynamide in Europe, if upheld, may accelerate a focus on alternative products and new kiwifruit varieties. The most realistic, longer-term solution is to develop varieties that require less winter chilling. In the short-term, growers will need to look more closely at those who are doing well. Organic growers provide a valuable benchmark. There is also emergent interest in biological systems and other innovative approaches such as biennial cropping. Growing more GOLD Kiwifruit is another option. With limits on the amount of crop that can be grown, it isn't a long-term solution for everyone. More extreme weather events could lead to a greater emphasis on overhead canopy shelter and other technologies. Some growers are more philosophical about climate changes, present or future. They hold to "farming pretty much to what we're given" or "if you're in the business of growing you're very reliant on the weather. You have to farm with the weather, not

"It is not going to come on us in one day. It's going to come on slowly. We need to do more investigating about alternatives and keep a very open mind to it getting warmer. What are we going to do? It's not going to be tomorrow that it's all changed. The industry needs to be proactive rather than reactive."

against it. We will get extreme weather events and suffer crop losses".

Issues relating to increased urban demand for water and the allocation of water for the present and future, need to be addressed. Regional Councils are giving a lot more attention to this. While there has been a lot of attention paid to carbon, access to water is already a major issue throughout the world. It will undoubtedly become a greater issue in the future.

WHAT YOU MIGHT DO

The old saying "forewarned is forearmed" is very relevant to climate change. You might feel saturated with hearing about it, but there are some important things to be aware of. You will undoubtedly have to pay attention to carbon, but also be proactive in thinking about future proofing your orchard. Be prepared to deal with the worst effects that might arise and take advantage of new opportunities. If you want to read the MAF report which contains more detail on what growers shared through interviews, contact ZESPRI or NZKGI to request an electronic copy. It is hoped to produce a summary sheet in coming months to hand-out to growers. There have also been discussions about the possibility of field days that have a practical focus on adaptation, perhaps with a broader emphasis on future proofing. ■