



ADAPTING TO A CHANGING CLIMATE: CASE STUDY 11

CENTRAL OTAGO ORCHARD

Maintaining a competitive advantage

THE ORCHARD

- A mixed crop orchard at Alexandra, Central Otago.
- Microclimates and topography varies from the cold Earnsclough flats to north-facing and south-facing hills.



Harry Roberts' new orchard development on the lower slopes of his Central Otago block.

THE ORCHARDIST

- Harry Roberts (senior).
- Became an orchardist when he left school In 1965.
- Has built a vertically integrated operation from growing through to packing and cool storage.



Nevis apricots are ready to pick in about mid-February – two weeks later than the main season varieties.

A Central Otago fruit producer is adapting his business to take advantage of expected climatic changes and maintain a late season market niche.

Harry Roberts has built a vertically integrated operation to fulfil his vision of creating a viable, long-term family business. Ongoing development has been necessary to make sure that the business stays viable, capitalises on new industry developments, and continues to benefit from economies of scale.

CLIMATE PROJECTIONS AND CENTRAL OTAGO

Most Central Otago fruit growers regard changing climatic conditions as positive for their industry.

TEMPERATURE

There is a gradation in temperatures across Central Otago's fruit growing areas. Cromwell is warmest, Alexandra is about 1°C cooler, and the area around Roxburgh and Ettrick is another degree cooler.

In the next 20 to 40 years, mean temperatures in Central Otago are expected to rise by about 1°C. This will bring temperatures to the Cromwell basin similar to North Canterbury today. Likewise, Alexandra will become similar to Cromwell and the Roxburgh/Ettrick area similar to Alexandra.

Average temperatures are expected to rise by about 2°C between 2080 and 2100. This means that temperatures at Cromwell will become similar to those experienced by Marlborough or Hawke's Bay regions today, while Alexandra will become similar to North Canterbury or Marlborough, and the southern part of Central Otago like Cromwell.

The changing climate will bring forward Central Otago's summer fruit harvest season but because other fruit growing regions will be similarly affected, the harvest sequence from region to region is likely to stay the same.

“My philosophy is to try to match the plant material I am growing to the sites on the orchard best suited to it. Thus, later flowering, more frost hardy fruit types...will remain on the flats, while production of earlier flowering species will eventually be moved to warmer sites where frost protection will be easier.” Harry Roberts

Key points

- 1 Central Otago can expect warmer temperatures, more rainfall, milder winters and less severe frosts.
- 2 Climatic conditions expected would benefit summer fruit production.
- 3 Fruit producer Harry Roberts maintains his late season market niche and the viability of his business by adapting his orchard to future conditions and staying alert to new industry developments.
- 4 Apricot plantings are being relocated to a hill block, which has characteristics that suit frost-sensitive and later ripening fruit.
- 5 Fruit growers can maintain a late season market niche by growing late harvest varieties, and using their property's topography, microclimates and altitudes to extend the harvest season.

RAINFALL

Rainfall is expected to increase between 10 and 15 percent in winter, while an increase of between 2.5 and 7.5 percent is likely to occur in spring.

If the additional rainfall can be collected and used for irrigation, this increase can be seen as positive. However, more rain in spring – the critical flowering and fruit set period – could increase disease prevalence and lead to more fungicide use.

Summer and autumn rainfall is expected to increase by just 2.5 percent, so weather conditions during harvest will stay much the same.

WORKING WITH MICROCLIMATES AND SITES

Most of Harry's orchard was originally located on the Earnsclough flats, where seasonal frosts create a major problem for early flowering species, such as apricots.

To make frost protection easier and meet his goal to produce late season fruit, Harry has started to relocate the apricots northwards to about 60 to 80 hectares of adjacent southern-facing slopes.

Here, an area of about 36 hectares has potential to become high quality apricot-growing land because of three important characteristics:

- Temperatures on frosty nights are up to 7.5°C warmer on the slopes compared to the flats.
- Apricots grown on south-facing slopes ripen 10 days after the north-facing slopes on the other side of the valley.
- Higher areas on the hill block reach 300m above sea level (Altitude contributes to later ripening).

Harry has already developed and planted about 14 hectares at the base of the hill block. Most of this has been planted with apricots, including some of the late harvest cultivars from the Nevis breeding programme.

Irrigation will be the main challenge for the orchards at higher altitudes.

THIS IS ONE IN A SERIES OF CASE STUDIES CALLED ADAPTING TO A CHANGING CLIMATE

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AN INTERNATIONAL ADVANTAGE

Central Otago shares its late harvest niche with two other Southern Hemisphere fruit growing regions: Tasmania in Australia and an isolated area of southern Chile to the east of the Andes.

Tasmania has the mildest winters of the three and is able to grow apricots and cherries with less frost injury and risk of bacterial disease.

The milder winters expected in Central Otago could provide a similar production advantage.

As climate conditions have changed, it has become possible to produce later ripening varieties of some fruit types. This is because changing conditions have extended the length of the growing season and created better ripening conditions for late varieties later in the season.

As Harry has done, Central Otago fruit growers can adapt their systems to maintain a late-harvest marketing niche:

- Plant later ripening cultivars, such as Nevis series apricots, and later ripening varieties of nectarines, cherries, peaches and plums.
- Make the most of microclimates, slope aspect and altitude.

FOR MORE INFORMATION

- Check the expected climate conditions for your region from the National Climate Centre: www.niwa.co.nz
- Find out how horticulture is likely to be affected by changing climatic conditions at www.maf.govt.nz