

Climate Change and Tree Fruit Production in British Columbia

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by

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Climate Change - What does it mean for the tree fruit sector?

Climate change has been defined as increasing average temperatures. Global warming was and is a topic of hot debate, though science points to long term increases in average global temperature. As air warms, it holds more moisture and more energy. Now, climate change is being defined as 'increased variability, and increased chance of extreme weather events'.

In tree fruit, the extreme events that can harm tree fruit are, seasonally:

- Flooding as the snowpack at higher elevations melt.
- Disease spread due to high humidity from Spring flooding.
- Frequent periods of rain, especially during June-August, when cherries ripen.
- Wind damage to fruit.
- Sunburn on fruit.
- Smaller fruit due to heat stress and drought.

Fortunately, tree fruit does not suffer from forest fires or the smoke from forest fires.

Climate change is leading to weather events that are

- a) Getting more extreme
- b) Getting more frequent

Where Okanagan Tree Fruit Production is Located, and Its Biogeoclimatic Zone

The Okanagan Valley is located in the interior of British Columbia, about 220 kilometers due East of Vancouver. The valley runs North-South, is relatively narrow and 150 km long. Associated with the Okanagan tree fruit growing areas are the Similkameen Valley, Shuswap, and the Creston Valley.

In the Okanagan, the valley bottom is about 1,100 feet in elevation, surrounded by a plateau about 4,000 feet elevation. The mountains located on this plateau have the finest skiing in the world, and the plateau naturally stores water in the form of snowpack, until it melts in late Spring

until June. As the melt occurs, creeks become raging torrents that can flood. The most serious floods in memory occurred in the Spring of 2017.

Another feature of the Okanagan Valley is its low summer rainfall. Average annual precipitation is 387 mm, or 15.2 inches. The Okanagan is semi-arid.

The Okanagan climate approaches the ideal for tree fruit production. Its winters are cold , but not too cold. Cold winters encourage fruit set, kill some of the overwintering pests, and also assist by thinning fruit as a small percentage of buds suffer winter damage. Rarely, winters will have extreme cold and cause extensive damage to fruit buds, or blossoms may be frozen in the Spring due to a sudden cold snap. Tree damage and tree mortality can occur in very extreme cases, but this appears to be once every 50 to 100 years. Cold snaps can be especially damaging if severe cold occurs before trees are dormant in the late Fall.

Summers in the Okanagan are hot and dry. Fruit trees become stressed at temperatures over 30 degrees celsius, and fruit growth above 35 degrees celsius plant growth is stopped. Growers observe that there are more extreme hot summers than in the past, and this is impacting the need for irrigation (due to evapotranspiration and cooling needs).

Local Government and Industry - Adapting to Climate Change

The regional governments in the Okanagan have been very active in adapting to climate change, through water use planning. The province has improved monitoring of snowpacks and drought. An important element of these new activities is reporting to all of the agencies, including agriculture associations, as shown in the following example.

“Between June and August, Kelowna broke its record for LEAST SUMMER RAINFALL, with only 7.3 mm accumulated. Penticton and Vernon are poised to break their own records for summer dryness. Kelowna also broke records for HOTTEST July and August.

This follows a record-breaking spring for MOST PRECIPITATION from March to May for Vernon (2nd highest ever recorded), Kelowna (4th highest) and Penticton (ranked number 1 for precipitation), out of 100 years of records.”

*Okanagan Drought Bulletin #2, September 1, 2017,
Okanagan Basin Water Board*



Spring Flooding in Cawston, BC, June 1, 2017. Photo by Glen Lucas.

Of note, there are several initiatives in the tree fruit sector to adapting to climate extremes,

- The tree fruit sector has moved from hand move sprinklers to more efficient microjet and drip irrigation.
- A climate action initiative has
 - developed an irrigation planning tool.
 - adopted a Decision Aid System that uses two week weather projections to help growers understand pest development and plan treatments ahead of time.
 - Mapped future climate, to determine the expansion of tree fruit growing areas in British Columbia.
- The AAFC Summerland Research Station has been a leader in modeling and mapping climate change.

The government and industry has been innovative, but there are some risks that are increasing, and for which we have not prepared.

Improving How The Tree Fruit Industry, and Agriculture as a Whole, Adapts to Climate Change

There are several notable program lapses that need to be addressed:

- **Preparing for Multiple Year Drought**, through Water Storage and Water Conservation. We recommend that priority be given to increasing water storage - for agriculture and for cities. In particular, we strongly recommend that the Prairie Farm Rehabilitation Agency be re-established, as it was unfortunately cut by the previous government at a very critical time of increasing risks in climate change. The PFRA was respected, effective, professional and efficient. It was the Canadian equivalent of the US Army Corp of Engineers and should be re-instituted.
- **Increasing Water Supply for Agriculture.** We recommend that increased water storage be eligible for infrastructure funding on a priority basis. Due to expensive upgrades for water quality, in the Okanagan and Creston area, agriculture systems are at risk of being orphaned. We recommend that federal funding provided for the twinning of water supplies (separating agricultural and residential water supplies) should require parallel investment in the agricultural water systems to ensure they remain viable.
- **Dealing with Extremes in a Proactive Basis in the Production Insurance Program,** for example, extreme wind damage was new to tree fruit in 2015, and was not a peril covered in the quality portion of the provincial Production Insurance program, but subsequently was added to the list of perils covered - little comfort to those who suffered damage in 2015 and were not covered. We recommend that Climate Change funding be utilized to study future impacts of climate change and adapt Production Insurance to look at perils and provision of coverage before risks impact growers.
- Use Agriflex to enhance other programs, reinforcing protection from climate change. AgriFlex is not working for localized weather disasters, such as extreme hail storms that cause damage beyond what is conceived in Production Insurance. We recommend that AgriFlex be used to enhance Production Insurance for unspecified perils, and for risks not adequately covered in existing crop insurance.



Apple growers south of Oliver suffered significant damage when a 2015 wind storm blew down trees and knocked the fruit to the ground. Photo by Pinder Dhaliwal

Summary

“The weather - everyone talks about it but no one does anything about it,” to paraphrase Mark Twain. We encourage the Senate Committee on Agriculture and Forestry to take the lead in adjusting agricultural programs, re-introducing the Prairie Farm Rehabilitation Agency, and seeking new programs and funds for climate change.