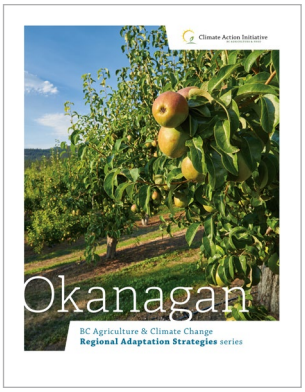
Climate & Agriculture Initiative BC

Okanagan

Regional Adaptation Program | **AGRICULTURAL IMPACTS** | as assessed in 2016



The changes in climate projected for the Okanagan region will have a range of impacts on agricultural production. Potential agricultural impacts are summarized the table below.

This table is extracted from the *Okanagan Adaptation Strategies* full report, published in 2016 by the Climate & Agriculture Initiative BC. To read the full report, visit: *www.ClimateAgricultureBC.ca*

Projected Climate Changes	Projected Effects	Potential Agricultural Impacts
↗ Increase in average temperatures ↘ Decrease in summer precipitation ↗ Increase in number of warm and extremely hot days ↘ Reduction in snowfall (and associated snowpack)	***Warmer & drier summers:*** ▪ More frequent and extended dry periods in summer ▪ Lower summer stream flow levels (more rapid and earlier spring melt)	– Reduction in water supply availability – Increase in irrigation demand and draw down of water storage – Impacts to crop yields and quality (particularly non-irrigated crops) – Increase in plant stress/damage – Impacts to livestock health/productivity – Changes to timing and use of rangelands for grazing cattle – Increase in costs associated with water (e.g., water supply infrastructure)
↗ Increase in precipitation in winter ↗ Increase in frequency, intensity and magnitude of extreme rainfall	***Extreme precipitation events:*** ▪ Increase in runoff ▪ Potential for more rain-driven flood events ▪ Increase in excess moisture	– Increase in risk of soil erosion and landslides – Damage to riparian areas (e.g., erosion, washouts, silting) – Damage to infrastructure (e.g., dams) – Increase in site-specific flood risk and drainage issues – Reduced windows for crop development and seasonal tasks (pollination, planting, germination and harvesting) – Negative impact on crop productivity and quality – Increase in crop damage and losses (e.g., hail storms)

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Projected Climate Changes	Projected Effects	Potential Agricultural Impacts
↗ Increase in average temperatures ↗ Increase in growing degree days ↗ Increase in frost free days ↗ Increase in minimum winter temperatures	***Changing crop suitability ranges:*** ▪ Changing seasonal conditions ▪ Changing production windows	– Increase in suitability of late maturing varieties and decrease in suitability of early maturing varieties – Expansion or relocation of some operations northward and to higher elevations – Changes to irrigation needs and possible land use competition – Inconsistent yield and quality of previously suitable crops – Difficulty in identifying suitable varieties for crops with long time horizons as change continues (e.g., tree fruit) ***Potential opportunities:*** + Increase in suitability for new varieties and new crops + Opportunity for season extension and additional harvest of certain crops
↗ Increase in annual temperatures ↗ Increase in winter minimum temperatures ~ Shifting precipitation patterns ↗ Drier summer conditions	***Changes in pests, diseases & invasive species:*** ▪ Increasing winter survival rates ▪ Increasing number of cycles in a year ▪ Introduction of new pests and diseases ▪ Changing range/distribution of pests, diseases and invasive species	– More frequent and increased damage to crops – Impacts to livestock health due to pests/diseases – Reduction in forage quality – Increase in costs for management of pests, diseases, invasive species – Less effective pest models (i.e., pest models calibrated for past climate)
↗ Increase in average and seasonal temperatures ↗ Increase in extreme weather events	***Increase in extreme heat events:*** ▪ Increasing number (and frequency) of consecutive warm and hot days	– Increase in irrigation demand – Reduction in productivity, size and quality of some crops – Increase in crop damage and loss – Increase in some pest and disease damage – Pressure on cooling and storage technologies/infrastructure (particularly at harvest) – Impacts to livestock health and productivity
↗ Increase in variability of conditions	***Increasing variability:*** ▪ Fluctuating and unpredictable seasonal conditions ▪ Increased uncertainty of frost risk timing (spring/fall)	– Damage to crops and increase in susceptibility to disease – Reduction in productivity and quality – Earlier season for all agricultural activities – Changing labour needs (timing/volume)

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Projected Climate Changes	Projected Effects	Potential Agricultural Impacts
↗ Increase in average temperatures and extreme heat events ↘ Decrease in summer precipitation (longer, warmer and drier summers)	***Increasing wildfire risk:*** ▪ More frequent and intensive wildfire events	– Damage and losses to agricultural assets and infrastructure – Loss of production and decrease in quality (e.g., due to smoke) – Impacts on livestock health – Reduction in agri-tourism – Increasing costs associated with preparing for, managing and responding to wildfire – Impacts on agricultural water supply (competing use for fighting fires)
↗ Increase in average temperature ↗ Increase in average precipitation	***Changing ecosystems & wildlife populations/distribution***	– Increase in pressure on agricultural lands from distribution of deer, elk, wild sheep and other species – Impacts to grazing areas in northern Okanagan from wolf populations – Increasing challenge with maintaining environmental flows (and potential impacts on agricultural water)