



# Adapting to Extreme Temperatures in the Islands Region

## Berry Crops

*Berry farm* © Allagash Brewing, [CC BY 2.0](#)

### HEAT MANAGEMENT

Yield loss from heat damage and insufficient water for cooling and irrigation can be costly to farms on Vancouver Island, the Gulf Islands, and the Sunshine Coast.<sup>1</sup> Heat stressed berry plants can result in shriveled or smaller, poor-quality fruits. It is important to monitor weather forecasts and measure on-farm temperatures. This information, along with the plant's development stage and the beneficial management practices listed in this fact sheet, will improve berry crop resilience.

#### Pre-season Planning

**Plant multiple varieties** – This will stagger fruit ripening to minimize risk of an extreme heat event damaging the entire crop.

**Establish inter-row cover crops** – This will increase humidity and reduce potential for sunscald damage.

**Increase soil cover** – Apply low-density, organic mulch to provide a thermal barrier to the soil and retain moisture.

**Invest in backup water storage** – Increase available irrigation water with dugouts or cisterns on the farm.<sup>2</sup>

➔ Learn how to plan for a [dugout](#)

**Inspect irrigation systems** – Inspect annually and prior to forecasted heat events to identify and repair issues.

**Select efficient irrigation equipment** – Invest in drip irrigation or increase efficiency of existing systems.<sup>3</sup>

➔ Monitor crop water requirements with the [Irrigation Scheduling Calculator](#)

➔ Learn about cover crop, irrigation, and fertilization strategies for raspberries in this [BC FoodWeb Research Brief](#)

The [BC Government Production Guides](#) contain more resources and guidance on berry variety selection and other management needs.

#### In-season Actions

**Maintain soil moisture** – Use soil moisture sensors (tensiometers or volumetric sensors) to measure soil moisture during heat events.<sup>3</sup> Irrigate prior to a heatwave, at night or early in the morning, and frequently for shallow-rooted crops such as blueberries. This is particularly important where the soils are well-drained, or where sawdust mulch is in place. Use pulsed irrigation (short, infrequent irrigation cycles) to reduce runoff and leaching.

**Use evaporative cooling** – Apply pulse cooling in 20-min cycles using sprinklers or microsprinklers.<sup>4</sup> Potable water should be used once fruit is present to reduce safety concerns.

For blueberries, evaporative cooling should be used at the following critical air temperatures: 32°C (green stage) and 35°C (ripening).<sup>1,7</sup>

**Use shade cloths** – These can decrease sun damage to fruits while cooling the surrounding air and retaining soil moisture. Choose the type and placement of shade cloths carefully (see article on [GrowOrganic](#)).

**Use slip-on covers or tarps** – Keep harvested produce shaded with reflective white tarps to protect fruit integrity and reduce berry weight loss.<sup>5</sup>



*Custom reflective tarp on hand lugs. For more information visit [Reflective Tarps Maintain Fruit Quality](#) factsheet.*

## Post Heat Recovery

**Assess heat damage** – Evaluate crop damage and yield losses 1-3 days after the heat event. Examine the fruits for softening, shriveling, spotting, or damage.<sup>1</sup> Remove damaged fruit from plants or sort prior to packing.

## COLD MANAGEMENT

The unpredictability of extreme cold events in the Islands Region increases the risk of damage to perennial berry crops. Cold damage typically occurs in the fall or late winter, when plants are entering (or coming out of) dormancy. Periods of warm weather followed by cold weather in the late winter can increase susceptibility to cold damage. The following management strategies can help minimize impacts:

## Pre-season Planning

**Select cultivars carefully** – Include those that have cold tolerance and chilling hour requirements suited to the region.

**Install hedgerows or windbreaks** – These will reduce risk of damage due to desiccation during extreme cold events.

## In-season Actions

**Prepare for cold damage** – Monitor weather forecasts, weather station data, and plant growth to prepare for weather events that may cause cold damage. Cover plants with row covers or tunnels to reduce cold damage.<sup>6</sup>

**Use sprinklers** – Apply overhead irrigation on non-windy days when temperatures are just above 0°C and are about to dip below freezing. Critical temperatures of berry flowers range from -7°C (blueberry bud swell) to 0°C (raspberries).<sup>7,8</sup>

## Post Frost Recovery

**Assess damage** – Evaluate cold damage of different varieties 2-3 days after cold exposure for future planning.

**Document impacts** – Extreme cold events tend to impact varieties differently year to year depending on the timing of the cold event and the plant stage. Take notes regarding impacts on the varieties along with details of the cold events in order to help with yield estimates and future planning.



*Damaged blueberry flowers from a freeze event, Gary Gao*

## Additional Resources



### **A Guide to On-Farm Demonstration Research**

<https://www.bcclimatechangeadaptation.ca/app/uploads/FI03-On-Farm-Demonstration-Research-Guide.pdf>



### **AgriService BC**

<https://www2.gov.bc.ca/gov/content/home>  
1-888-221-7141



### **BC AgriWeather**

<https://dashboard.bcagriweather.ca/>



### **BC Agriculture Water Calculator**

<https://bcwatercalculator.ca/agriculture/welcome>



### **Berry Farm Practice Guide**

[https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/strengthening-farming/farm-practices/870218-6\\_berry.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/strengthening-farming/farm-practices/870218-6_berry.pdf)



### **AgSafeBC**

<https://agsafebc.ca/>



### **FireSmart BC**

<https://firesmartbc.ca/farm-and-ranch-wildfire-preparedness/>



### **BC Irrigation Management Guide**

<https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/agricultural-land-and-environment/water/irrigation/irrigation-management-guide>



### **Farm Irrigation Fact sheets: Scheduling basics**

<https://www.bcclimatechangeadaptation.ca/app/uploads/OK11-Farm-Irrigation-Fact-Sheets-Set5-Scheduling-Basics-2023.pdf>



### **Beneficial Management Practices Program**

<https://iafbc.ca/beneficial-management-practices/>



### **Production Insurance for Berries**

<https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs/agriculture-insurance-and-income-protection-programs>

## References

1. [BC Government Production Guides](#)
2. [Water storage options on the farm](#)
3. [Irrigation tips to conserve water on the farm](#)
4. [Reducing cranberry heat stress and midday depression with evaporative cooling](#)
5. [Fraser Valley - Managing Extreme Heat with Reflective Tarps in the Blueberry Industry: Project Report](#)
6. [Freeze protection methods for crops](#)
7. [Frost and freeze damage on berry crops](#)
8. [Susceptibility of blackberry flowers to freezing temperatures](#)

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