



Adapting to Extreme Temperatures in the Islands Region

Field Vegetables

Vegetable farm © Ted McGrath, [CC BY-NC-SA 2.0](#)

HEAT MANAGEMENT

Rising temperatures can disrupt the development of vegetable crops, leading to variable yields and increased vulnerability to extreme weather events.^{1,2} To build resilience, vegetable growers must adopt proactive strategies that mitigate heat stress, conserve soil moisture, and improve crop hardiness.

Pre-season Planning

Adjust planting days – Start tolerant crops earlier in the season to avoid heat stress during key growth stages and use succession planting to distribute risk and improve harvest timing.

Optimize planting density – Reduce competition for water by spacing plants appropriately. Thinning overcrowded plants early can improve air circulation and root development.³

Select efficient irrigation equipment – Use high efficiency irrigation equipment, invest in drip irrigation or other efficient systems.⁵ Inspect drip irrigation systems annually and prior to forecasted heat events. Identify and repair leaks or blockages.

Improve soil health and moisture retention – Apply organic mulch (straw, wood chips) to maintain soil moisture and regulate temperature.⁴ Increase organic matter with compost or cover crops to enhance soil water-holding capacity. Utilize minimal tillage practices to retain soil structure and reduce moisture loss.



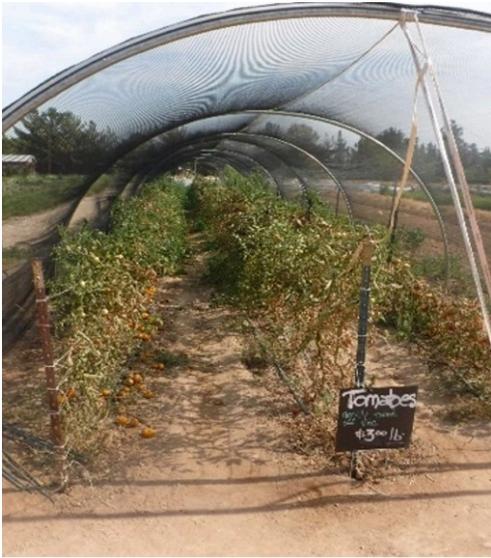
Drip irrigation © [CC BY-NC 2.0](#)

Select heat-tolerant varieties – Choose crop varieties bred for heat and drought tolerance. Search for data on locally adapted cultivars by reaching out to local seed companies, Regional Agrologists, and/or consultants.

- ➔ The open-source platform [SeedLinked.com](#) contains data from collaborative variety trials

In-season Actions

Heat stress mitigation – Monitor plants for early signs of heat stress (dropping leaves, wilting, sun damage to ripe fruits) and increase irrigation frequency if needed. Apply kaolin clay spray or use shade covers (20-40% opacity) to reduce sunburn on fruits and leaves.^{6,7} Use windbreaks to reduce moisture loss due to hot, dry winds.



Tomatoes under shade cloth © CC BY-NC 2.0

Use efficient irrigation practices – Use drip irrigation to deliver water directly to the root zone and reduce evaporation. Continue inspecting drip irrigation systems before forecasted heat events to identify and repair leaks or blockages. Water early in the morning or late in the evening to maximize absorption and minimize water loss.

- Use the [Irrigation Scheduling Calculator](#) to optimize water application based on weather conditions.

Support pollinators in heat events – Place shallow trays of water with pebbles in fields for pollinators. Plant flowering cover crops and hedgerows or interplant flowers to provide shelter for beneficial insects.



Bee visiting an elderberry bush © CC BY-NC 2.0

Post-Extreme Heat Event Recovery

Protect harvested produce – Use shade structures or tarps to protect harvested crops from sun damage. Store produce in well-ventilated, cool areas to maintain quality.⁸

Monitor and adjust irrigation – Assess soil moisture levels and increase irrigation as needed to help plants recover. Use moisture sensors to avoid overwatering, which can stress weakened plants.

Maintain canopy cover – Do not remove heat-damaged leaves immediately, as they provide shade to recovering plant tissue. Prune selectively to promote new growth while maintaining plant integrity.

COLD MANAGEMENT

Based on the mild winter climate, there is added potential for an extended growing season and winter harvest in the Islands Region.¹ However, even tolerant crops can be subjected to extreme cold spells or late spring frosts. During reproductive phases, a cold spell can weaken fruit set and in extreme cases lead to death of tissue as ice crystals form inside the plant cells.^{9,10}

Pre-season Planning

Site selection and planting strategies – Avoid planting in low-lying spots where frost is more likely to occur.¹¹ Use windbreaks to reduce cold exposure and prevent cold damage. Diversify crop selection to include both sensitive and hardy varieties. Space out the timing of planting to spread frost risk over multiple plantings and harden off seedlings.

In-season Actions

Use frost protection measures – Use plastic or floating row covers to insulate crops during cold spells.¹¹



Floating row covers. Source: [Michigan State University](#).

Monitor forecast and adjust irrigation – Use on-site weather stations to anticipate frost events. Water plants before anticipated frost to trap heat in soil and protect roots.



[Solar powered weather station](#). Source: USDA.

Post Frost Recovery

Assess damage – Assess damage 2-3 days after cold exposure to determine if plants will recover and to evaluate resistance and hardiness of different varieties for future planting.



[Frost damaged peppers](#) © Washington State Department of Agriculture, CC BY-NC 2.0

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/industry/agriculture-seafood/agriservice-bc/agriservice-connect>
1-888-221-7141



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



BC Agriculture Water Calculator
<https://bcwatercalculator.ca/agriculture/welcome>



Vegetable Production Guide: Planting
https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agriservicebc/product-ion-guides/vegetables/planting_bc_vegetable_production_guide.pdf



Climate Change Adaptation Program IPM Guides
https://www.bcclimatechangeadaptation.ca/library/?_resource_library_search=ipm



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/>



An Overview of the BC Field Vegetable Industry
[https://www.saanich.ca/assets/Community/Documents/field veg_profile.pdf](https://www.saanich.ca/assets/Community/Documents/field_veg_profile.pdf)



AgSafeBC
<https://agsafebc.ca/>



FireSmart BC

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



Extreme Heat: Community Care Facilities Factsheet

<https://www.islandhealth.ca/sites/default/files/environment/documents/Factsheet-Long-Term-Care-Heat.pdf>



Heat Stress Information Sheet

<https://agsafebc.ca/download/heat-stress-information-sheet/>

References

1. [Vancouver Island Adaptation Strategies](#)
2. [Response and Defence Mechanisms of Vegetable Crops against Drought, Heat and Salinity Stress](#)
3. [Adaptation Resources for Agriculture: Responding to Climate Variability and Change in the Midwest and Northeast](#)
4. [Heat Stress in Vegetables: Impacts and Management Strategies - A Review](#)
5. [Irrigation Tips to Conserve Water on The Farm](#)
6. [Using Shade for Fruit and Vegetable Production](#)
7. [Kaolin, an emerging tool to alleviate the effects of abiotic stresses on crop performance](#)
8. [Small-Scale Postharvest Handling Practices: A Manual for Horticultural Crops \(5th Edition\)](#)
9. [Alleviation of cold stress in vegetable crops](#)
10. [Potential impacts of climate change on vegetable production and product quality – A review](#)
11. [Frost Protection](#)

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