

Dry Farming Vegetables

Vancouver and Gulf Islands

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Photo credit: Naomi Roberts, KPU

What is dry farming?

Dry farming is crop production with no, or little, applications of supplemental water (irrigation) using soil moisture conservation practices and careful site selection.

Why dry farming ?

Dry farming reduces inputs including irrigation water, labour, and fertilizer. Where sites are suitable, dry farming can support those seeking to:

- expand production with limited irrigation access
- make water allocation decisions with limited water
- enter farming while minimizing expenses

Dry farming vs dryland farming

Dry farming is often used to describe unirrigated crop production in regions where annual precipitation is relatively high compared to annual water loss from the field, but where most precipitation falls outside of the growing season.

In contrast, dryland farming refers to unirrigated crop production in semiarid areas where annual precipitation is generally less than 50% of the potential water loss.



Figure 1. Dry farmed squash and soil moisture sensor, Yellow Boot Farm, Black Creek, June 2025.
Photo Credit: Naomi Robert

Dry farming site suitability

The soil's capacity to store water and the climate are both important factors in identifying a site for dry farming. Importantly, soil health also influences the amount of plant-available water stored in the soil. Table 1 provides an overview of available dry farming site suitability guidelines in the Pacific Northwest.

Soil properties and soil health

Available water holding capacity (AWHC), or the amount of plant-available water stored in the soil, is the primary consideration for dry farming site suitability. Available water holding capacity is impacted by several physical soil properties, many of which relate to soil health. Healthy soils, such as those with higher levels of organic matter and lower bulk densities (compaction), can generally store more plant-available water. For more information on assessing soil health, see the [BC Ministry of Agriculture Soil Health Assessment Protocol \(SHAP\)](#).

Several soil properties impact available water holding capacity:

- Soil texture: Silty and loamy soils with some clay content (e.g., loam, silt loam, clay loam) will hold more plant-available water relative to coarser textured soil (e.g., sandy loam)
- Stoniness: Stones reduce the soil's capacity to store water
- Soil depth: Deeper soils will have a larger potential reservoir for water storage relative to shallow soils
- Dense or impermeable layers (e.g., hardpan): Dense layers restrict both root growth and the soil's capacity to store plant-available water.
- Soil organic matter and soil structure: organic matter improves soil water storage and soil structure. Improved soil structure better resists compaction and erosion, promotes root penetration, and facilitates water infiltration.

Climate

The climate of a given region will impact dry farming site suitability as hotter, dryer climates increase plant water requirements. Annual precipitation, evapotranspiration, and frost-free days are all site suitability considerations.



Figure 2. Examples of dry-farmed vegetables

How to estimate available water holding capacity

- Take a 5 ft. soil core with a soil auger, or dig a hole deep enough to get a sense of what soil properties the plant roots are experiencing
- Identify the different soil horizons present and their depth (Fig. 3).
- Take a soil sample from each horizon and determine its texture. See the Jar Test for approximating soil texture in the [Dry Farming Extension Guide, Vancouver and Gulf Islands](#)
- Input the soil horizon depths and soil textures into the Available Water Holding Capacity Estimator in the [Dry Farming Extension Guide, Vancouver and Gulf Islands](#)



Figure 3. Soil horizons identified in 5 ft soil core, Sandown Centre for Regenerative Agriculture, North Saanich B.C.

Table 1. Dry Farming Site Suitability Summary

Site Characteristic	Preferred Conditions for Dry Farming
Soil Physical Properties	
Soil texture	Silty and loamy soils with some clay content
Stoniness	Low
Restricting or impermeable layers	None
Bulk density ¹ (compaction)	Max 1.10 g/cm ³ – 1.60 g/cm ³
Soil organic matter	Higher levels increase available water holding capacity, especially in coarser textured soils
Estimated Available Water Holding Capacity	Min 8 inches of water in the top 5ft or soil// 20 cm in the top 150cm
Climate	
Annual precipitation	Min 510 mm
Annual evapotranspiration	Max 1270 mm
Annual frost-free days	Min 100 days

¹ Bulk density thresholds that restrict root growth vary with soil texture. See USDA Natural Resources Conservation Centre Soil Bulk Density/Moisture/Aeration, Soil Health Guides for Educators. <https://www.nrcs.usda.gov/sites/default/files/2022-10/Soil%20Bulk%20Density%20Moisture%20Aeration.pdf>

For climate data see Government of Canada Climate Normals 1981-2010 station data (https://climate.weather.gc.ca/climate_normals/index_e.html) and BC AgriWeather (<https://dashboard.bcagriweather.ca/>).

Crop and variety selection

Table 2 provides a partial list of crops for which dry farming suitability has been explored in the Pacific Northwest by Oregon State University (OSU) Dry Farming Program, the Dry Farming Institute, and Kwantlen Polytechnic University (KPU).

Table 2. Dry farmed vegetable crops and varieties in the Pacific Northwest.

Crop	# of Varieties (Trial Years) <i>OSU Dry Farming Program and Dry Farming Institute</i>	Examples of Successful Varieties
Tomato	54+ (2020, 2021, 2022)	Big Beef
Squash	16 (2016, 2017, 2020)	Tetsukabuto
Bean	22 (2019, 2020)	Anasazi
Melon	41 (2022)	Eel River Green Nutmeg Moon and Stars
Potato	28 (2019-2021)	Caribe German Butterball

See Dry Farming Collaborative, Oregon State University Research Project Reports (below) for more information.

Dry farming management practices

The following management practices support dry farming:

- Careful site assessment and selection to prioritize sites with high available water holding capacity
- Addition of organic matter as part of bed preparation and building soil organic matter over time (e.g., cover crops, compost etc.)
- Drought tolerant, deep rooting, and early-maturing crop and variety selection
- Minimizing soil disturbance
- Diligent weed management through mulches and cultivation
- Low plant densities to reduce competition for soil water
- Planting early to ensure sufficient soil moisture to support germination and seedling development
- If available, water in transplants to improve establishment success



Figure 4. Straw (top) and paper (bottom) mulch weed control strategies to conserve soil moisture in vegetable production systems.

Find more information:

Dry Farming Extension Guide:

Vancouver & Gulf Islands, Institute for Sustainable Food Systems, KPU

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Dry Farming Accelerator Program:

Dry Farming Program, Oregon State University

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Pacific Coastal Dry Farming Collaborative Newsletter

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