



4 Use Verticality

Maximize sunlight capture by growing at multiple heights. Some creative ideas for doing this inside a high tunnel include:

- Growing thick-stalked plants like sunflowers in the tunnels to become next year's rooted-in-the-ground, vertical stakes
- Raised beds and large pots in high tunnels help maintain pathways, provide vertical support and make it easy to plant at different layers in the canopy.
- Horizontal roofing struts extend along the length of the high tunnel above the doorways. The struts make it easy to support heavy, vertical growth of crops like tomatoes, beans, cucumbers.

5 Watering for Success

It is important to keep the soil well watered and evenly moist in the summer within a high tunnel, and water sparingly in the winter. Danny hand waters with a hose laid across the mulched ground to fully saturate the soil, then he moves the hose periodically. He uses this time watering to multitask, also harvesting, pruning, and keeping a lookout for "Triple Bonus Moments" where a new planting opportunity might arise.

- **Summer:** hand water for 1/2 hour each day per high tunnel.
- **Fall:** As temperatures get cooler, taper off watering to reduce moisture in tunnels in preparation for winter.
- **Winter:** Minimal or no watering. Do not be tempted to water for a brief, unexpected warm spell in the dead of winter as it can wake the plants up and make them vulnerable to the next deep freeze.
- **Spring:** Begin increasing water slowly as temperatures increase.



A Permaculture Approach to Winter Growing: 5 Strategies for Success



Danny Botkin of **Laughing Dog Farm** has a small, permaculture inspired farm in Gill, MA. He uses several techniques for "farming on the fringe" to improve land health, and continually increase the overall resilience on the farm in a time of increasing climate uncertainty. Although maximizing production for a market is not his central goal, he enjoys surprisingly abundant crop yields by nimbly leaning into the variations that naturally and circumstantially occur from year to year.

1 Pushing the Envelope

Danny has two permanent unheated **high tunnels** for year round growing, and many easy-to-construct, semi-permanent **low tunnels** around his farm made from 3/4" steel conduit bent onsite with a homemade jig. Danny saves seeds of many of his crops and re-sows creative mixes of these seeds widely and periodically throughout the season to encourage the "hardy potential" of his crops. High and low tunnels allow Danny to:

- **Extend the growing season for summer crops:** tomatoes, peppers, eggplant, annual flowers.
- **Grow specialty crops not usually grown in New England:** turmeric, ginger, figs, tender perennial flowers.
- **Grow crops with hardy potential to be harvested through the winter:** kale, tatsoi, leeks, lettuce, Asian greens, alliums, and various other brassicas.

2 Embrace Creative Mulching

Mulching is a mainstay technique for Laughing Dog Farm. Walking through Danny's high tunnels is like walking on a carpet of soft mulch. Danny seeks to always keep the soil covered with generous amounts of mulch in order to suppress weeds, provide a healthy carbon source for soil microbes, and retain moisture. It's not enough just to apply mulch once: you must keep adding it. Some creative mulch ideas include:



- **Animal bedding** that has aged (Danny uses the composted bedding from his goats) can be laid the thick layers "like plaster" around crops to suppress weeds.
- **Mulch "burrito"** created by rolling up crop residues, weeds, etc., with the leftover mulch for in-the-field composting piles. These can be laid down along pathways, between rows, or bermed around the base of a tree.
- **Aged straw bales.** While the mulch hay ages (aging lets weed seeds germinate and die off before use), use the whole bales on contour as terraces or to frame gardening beds.

• **Dust mulch** from old hay or crushed dried leaves can be effectively used to cover the soil and protect delicate, slow-germinating seedlings like carrots and onions.

• **Old carpet and rugs** or other non-degradable material can be used in a pinch to suppress weeds to maintain pathways. As more mulch materials become available, they can be removed and replaced.

3 Take Advantage of 'Triple Bonus Moments'

Danny strives to mimic nature and is always seeking out windfalls, gifts and unexpected opportunities or niches in which to grow green food. These windows of opportunity, or "Triple Bonus Moments" as Danny calls them, might involve taking risks within the typical season or in between moments, where more traditional growers might slow down or stop planting. In contrast, Danny leans into these moments by:



- Having transplants waiting "in the wings" to be planted in response to an unexpected warm spell or abrupt seasonal shift.
- Sowing a wide variety of seeds abundantly and often no matter the odds against them.
- Transplanting in clumps by sowing a variety of seeds and then transplanting "a small part of an ecosystem" into the ground.
- Inter-cropping and under-cropping seeds or seedlings under existing plants to keep the ground covered and be one step ahead for the next crop. Ex: winter or fall greens planted beneath summer tomatoes.