

A long, covered high tunnel structure in a field at sunset. The sky is a mix of orange, yellow, and blue, and the tunnel is covered in a translucent material. The structure is supported by a series of vertical posts and has a peaked roof.

HIGH TUNNELS FOR WINTER GROWING: TECHNIQUES AND TIPS FROM FARMERS

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HIGH TUNNEL FUNDAMENTALS

- Location and orientation
 - Accessible year round
 - Quality soil
 - Level ground
 - Oriented east/west (best for season extension)
 - Access to irrigation
 - Site prep for water management
- Cost-share opportunities with NRCS
 - Must have crop history; can't locate on new ground
 - Could cover ~75% of cost
 - High Tunnel vendors: CT Greenhouse Co., Rimol, Ledgewood, Harnois, Griffin, Farmtek

SITE SELECTION AND MATERIAL PROCUREMENT



EXCAVATION: WATER LINES & DRAINAGE SYSTEM



FRENCH DRAINS: DIVERTING WATER AWAY FROM TUNNEL



PLANNING FOR THE FUTURE



SITE PREPARED TO SHED WATER



SITE WORK COMPLETE — READY TO BUILD!



GROUND POSTS & BOW INSTALLATION



PURLINS & PLASTIC



INSTALL YOURSELF OR HIRE OUT?



PREPARE FOR RAIN AND SNOW

- Prep site to shed water
- Trusses at each hoop or every other hoop
- Wind braces
- Raised beds
- Plan for snow removal around tunnel

WINTER MANAGEMENT: SHOVELING OR PLOWING SNOW



POTENTIAL FOR DAMAGE FROM WEATHER EVENTS



HIGH TUNNEL ADVANTAGES

- You can stand up and work easily inside
- Accommodates tall fruiting crops
 - Easy to trellis
- Potential to harvest in any month of the year
- Soil temperature warms earlier in the season, allows for earlier sowing or transplanting
- Disease prevention – large physical barrier to keep fungal spores off plant foliage
 - Proteknet for pest barrier

HIGH TUNNELS AT MASSARO

- 30'x48' tunnel used as a multipurpose house
 - In spring 1/3 for seedlings, 2/3 in carrots or greens
 - Mid June planting of cucurbit, solanum or greens
 - Fall/Winter greens
- Five 30'x96' tunnels
 - Two planted in tomatoes
 - One planted in early cukes
 - Rotate tomatoes and cukes with spring greens, carrots
 - Successions of winter greens plantings
 - Cover crops rotated in when possible

RAISED BEDS IN TUNNEL



MULTI-USE IN SPRING



MINI HOOPS INSIDE HIGH TUNNEL IN WINTER



WHAT TO GROW IN YOUR TUNNELS?

- Anything is possible, so it depends on you and your operation
- What is your market?
 - Farmers' Markets (advantages to have the “first” of a given crop)
 - Wholesale (advantages to producing in the summer *and* winter)
 - Schools (advantages to producing when school is in session)
- How can you optimize your tunnel investment?

CROPS WE HAVE GROWN IN HIGH TUNNELS

- Tomatoes
- Peppers
- Eggplants
- Cucumbers
- Lettuce, Salad Mix
(many varieties of greens)
- Spinach
- Carrots
- Beets, Radishes, Turnips
- Chard
- Onions
- Strawberries

BED SPACING & LAYOUT

- Massaro: originally 6 beds, each ~42" wide
 - 7 paths, each 10" wide
 - More space dedicated to beds, less space occupied by paths
- Current layout/spacing is 7-8 beds per tunnel, each 30" wide
 - 9 paths; 18" paths on ends and in center, 11" paths between
 - Many tools are designed to fit this system
- Direct Sown Greens/Roots – 5-6 rows per bed
- Transplanted Greens/Roots – 4-5 rows per bed
- Fruiting Crops – 1 row per bed; (*target 8 beds per tunnel*)
 - Might add a companion plant (basil with tomatoes, radishes with cucumbers)
 - Usually grown in plastic (landscape fabric)

SINGLE ROWS: TOMATOES AND CUCUMBER



DETERMINATE TOMATOES WITH BASIL INTERPLANTED



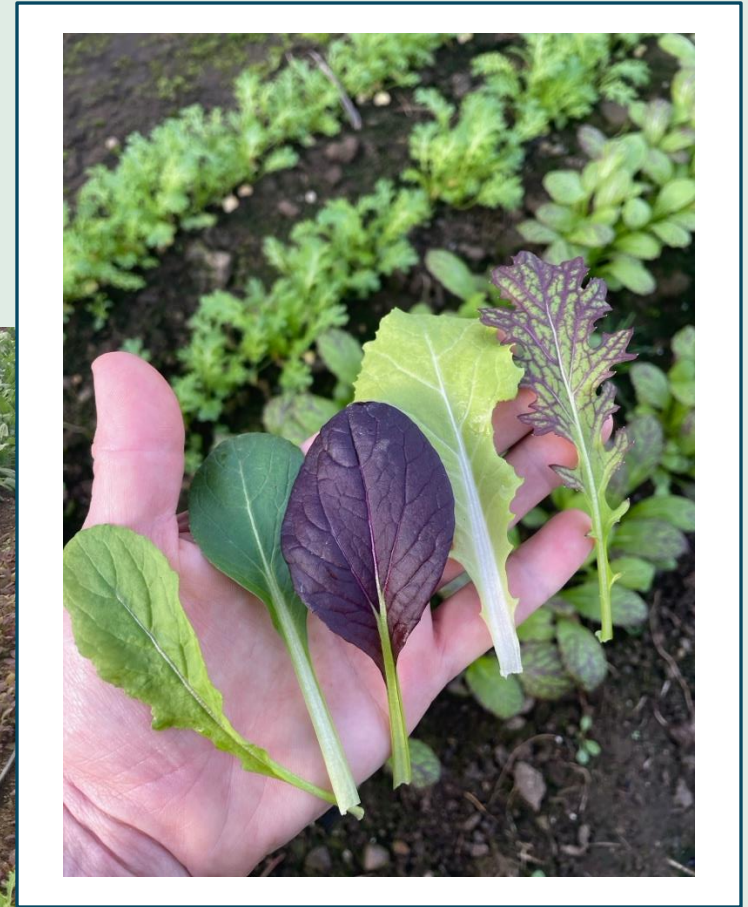
GRAFTED TOMATOES WITH BASIL INTERPLANTED



CARROTS: 5-6 ROWS/BED



SPINACH & SALAD MIX: 6 ROWS/BED



INTERPLANTED KALE, CHOY & LETTUCE (NOVEMBER)

4-5 ROWS/BED



KALE (NOVEMBER)



PLANTING/SOWING DATE

CROP	TP/DS	HARVEST
Tomato	Late April	Summer
Tomato	Mid June	Late Summer/Fall
Greens	March	Spring
Greens	Late Sept/Early October	Winter
Cucumber	Late April	Summer
Cucumber	Early July	Fall
Carrots	March/April	Early Summer
Carrots	August	Fall/Winter
Carrots	Dec-Feb	Spring

WHY EXTEND THE SEASON?

Advantages

- Start earlier, end later, grow year round?
- Continued customer contact
- Keep farm staff employed
- Cash flow
- More production

Challenges

- Start earlier, end later... never stop?
- Habitat for pest and disease
- Weather conditions
- Infrastructure – washing and storage
- Cost analysis; is it profitable?

A long, covered high tunnel structure, likely used for winter growing, is shown in a field. The structure is covered with a translucent material and supported by a metal frame. The background features a vibrant sunset sky with shades of orange, yellow, and red, and silhouettes of trees on the horizon.

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