



Cornell University
Cooperative Extension

BEST MANAGEMENT PRACTICES

IN HIGH TUNNEL PRODUCTION

Site Selection

You've decided to add a high tunnel to your farm. Deciding where to put the structure comes next, and it is a step that requires careful consideration. After all, behind the type of structure you choose, location is the hardest thing to change about your high tunnel production system. A good site will set you up for success by avoiding potential problems. A poor site may work for a season or two, but inconvenient access, excessive water, poor soil, high winds, or low light levels will eventually decrease profitability or lead to property loss.

Convenience

High tunnels can be an asset, but only if they are well managed. Good management requires frequent monitoring, particularly during the colder months.

It is most beneficial to choose a site that provides the following conveniences:

- Proximity to a farm house or main building
- Year round access to entire structure
- Good water and electricity nearby
- Close to cooling/packing facilities

Remember-out of sight is too often out of mind.

This publication was supported by the Specialty Crop Block Grant Program at the U.S. Department of Agriculture through a grant from the New York State Department of Agriculture and Markets. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA or NYS DAM.



Topography and Surface Water

Infiltrating water may begin as a nuisance in a high tunnel, but easily becomes a yield limitation. Water flowing over land or pooling from tunnel run-off can cause muddy conditions, favor disease, drown plants, and cause erosion. It also leads to uneven soil moisture, which frustrates irrigation efforts and can cause fruit to crack.

To avoid saturation problems, look for a level site on high ground. A very slight pitch down the length of the tunnel is desirable. The soil level in the tunnel should be slightly higher than the surrounding field. If such a site is not available, keep the tunnel out of the path of surface water flow by:

- Intercepting and diverting water away from tunnel with shallow ditches or furrows along the outside perimeter
- Improving drainage in surrounding areas with tile drainage where feasible
- Ensuring adequate water removal or percolation along the inside sidewalls

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Soils

High tunnel production is intensive and demanding of soils. Tunnel soil does not benefit from leaching like a field, may become compacted, and is at higher risk for loss of both structure and organic matter.

Good high tunnel soil:

- Has good physical structure, drainage, pH, and organic matter
- Is not compacted
- Is free of soil-borne diseases

Maintaining soil health requires adding organic matter, avoiding over-fertilization and rotating crops. The details of sustaining tunnel soil health are the subject of another Best Management Practice bulletin.

Light, Wind, and Orientation

Choose a site that receives full sun and is free from shadows for the entire length of your growing season. For best winter production, orient the tunnel east to west to maximize light capture and distribution throughout the low sun-angle months. Summer row crops may benefit from a north to south orientation, although orientation this time of year is not as critical as winter.

The site should be protected from strong winds while allowing sufficient airflow through the house during the growing season. A sheltered site, combined with structural design and management will prevent the house from taking flight during windstorms. If possible, orient tunnels perpendicular to the prevalent wind direction to protect the weak endwall from exposure.

- Study wind patterns at potential sites. Consider direction and strength in severe weather for all seasons, with particular attention to April-October
- Do not site the tunnel in a wind tunnel!
- Make use of natural windbreaks, while avoiding their shadows
- Orient the tunnel to accommodate both wind direction and light needs

In windy location use plenty of ground anchors and diagonal bracing, and fortify the end walls.

Tax, Building code, and Zoning Considerations

Growers are encouraged to contact local code or zoning enforcement officers to discuss local ordinances. In New York, high tunnels are generally considered agricultural equipment and not real property, thus they are exempted from property tax and New York State building codes.

Growers may apply for a permanent real property tax exemption provided no washing, packaging, or other post-harvest processing of produce occurs within the tunnel. The one-time application form, NY State tax form RP-483c, is available online at http://www.tax.ny.gov/pubs_and_bulls/orpts/farmbld.htm

Although building permits are not required, growers may have to obtain a zoning permit. Other important legal documents concerning high tunnels can be found here:

- http://www.agriculture.ny.gov/AP/agsservices/GD_FP%20and%20Ag%20Districts%20FINALJPC.pdf
- <http://www.dos.ny.gov/DCEA/pdf/TBtempgreenhouse07.pdf>

Finally, note that regulations and local interpretation of enforcement change over time and geography.

Websites:

Cornell High Tunnels:

<http://www.hort.cornell.edu/hightunnel>

High Tunnels Manual – by Ted Blomgren, Tracy

Frisch: <http://www.uvm.edu/sustainableagriculture/hightunnels.html>

Team High Tunnel Website:

http://cvp.cce.cornell.edu/greenhouse_tunnels.php

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May 2014