**Chapter 6: Growing your first high tunnel crop— an introduction to commercial high tunnel crop production in Kentucky.**

High tunnel crop management begins with soil sampling, selecting a suitable crop variety, planning the layout of beds, and preparing the tunnel for planting. Consider if you will direct seed or transplant the crop into the tunnel. The pre-planting process should also include setting up the irrigation system.

Irrigation, layout, and fertilization should all be customized based on recommendations for each planned crop.

After planting, using best practices for irrigation, fertility, and integrated pest management (IPM) will result in the highest possible yields for your high tunnel crop.

Check out the resources below for recommendations on high-tunnel crop management:

1. **An overview**
	1. *Top 5 Common Mistakes Made in a High Tunnel (Resource ###)*
* A 2-minute video from Iowa State University Extension and Outreach on common pitfalls in high tunnels management.
* https://www.youtube.com/watch?v=8qpGegSyNAI
1. **Soil sampling and testing**

*More resources on managing high tunnel soil fertility can be found in Chapter 7 of this toolkit, ‘High Tunnel Soil Health*’

1. *Soil Testing: What It Is and What It Does, AGR-57 (Resource ###)*
* A two-page explanation from the University of Kentucky Cooperative Extension Service on soil testing and its purpose.
* <https://publications.ca.uky.edu/sites/publications.ca.uky.edu/files/agr57.pdf>
1. *Soil Testing—Commercial Horticulture Submittal Form* *(Resource ###)*
* Kentucky Residents can submit soil samples through their county Extension office. Samples will be sent to the University of Kentucky Division of Regulatory Services for testing and results will be returned to the grower.
* Your county Extension agent can assist with interpreting the results and go over management recommendations with you.
* Growers with more than one high tunnel should submit a separate sample for each high tunnel.
* <https://www.rs.uky.edu/soil/forms/HorticultureSubmittal.pdf>
1. *Collecting Soil Samples for Testing (Resource ###)*
* University of Kentucky Cooperative Extension Service guide for taking soil samples and preparing samples for submission to a diagnostic laboratory
* <https://publications.ca.uky.edu/files/agr16.pdf>
1. *High Tunnel Best Management Practices: Long Term Soil Health and Fertility (Resource ###)*
* This two-page publication discusses four best practices of soil management identified for high tunnel production systems identified by Cornell Cooperative Extension
* Recommendations include an annual soil test.
* <https://rvpadmin.cce.cornell.edu/uploads/doc_652.pdf>
1. **Crop planning**

Selecting a crop

* *Crop Profiles*
	+ A collection of Crop Profile publications from the University of Kentucky Center for Crop Diversification (CCD) overviewing commercial production and market outlook for various horticultural crops in Kentucky
	+ Information is organized by crop-specific and system-specific resources.
	+ <https://ccd.uky.edu/resources/crops/vegetables>
* *Vegetable Production Guide for Commercial Growers, ID-36 (Resource ###)*
	+ This is a comprehensive guidebook for growing vegetables on a commercial scale in Kentucky. Although not specifically geared towards high tunnel production, much of the information is still relevant.
	+ Crop-specific recommendations including suggested cultivars are organized by crop in alphabetical order.
	+ This resource also includes information on crop-specific fertility, insect, weed, and disease management for each crop.
	+ <http://www2.ca.uky.edu/agc/pubs/ID/ID36/ID36.pdf>
* *Community Supported Agriculture (CSA) Production Manual of the Organic Farming Unit at the University of Kentucky, HO 127 (Resource ###)*
	+ This manual explains the production plan for the University of Kentucky Certified Organic CSA farm, standard operating procedures, and provides crop management guidelines.
	+ It includes a crop handbook with crop profiles to assist with planning and management.
	+ https://publications.ca.uky.edu/files/HO127.pdf

Timing of planting

* *High Tunnel Planting Calendars and Use Guide (Resource ###)*
* A two-page guide on the principles of High Tunnel Production for season extension and instructions on how to use high-tunnel planting calendars for this purpose.
* <https://ccd.uky.edu/sites/default/files/2025-01/ccd-fs-09-high-tunnel-planting-calendar.pdf>
* *High Tunnel Planting Calendar (Region 1—Western KY) - CCD (Resource ###)*
	+ A planting calendar for high tunnels in Western and far eastern Kentucky
	+ <https://ccd.uky.edu/sites/default/files/2025-01/ccd-ig-01_ht-region-1.pdf>
* *High Tunnel Planting Calendar (Region 2—Central KY) (Resource ###)*
	+ A planting Calendar for high tunnels in Central and Eastern KY
	+ <https://ccd.uky.edu/sites/default/files/2025-01/ccd-ig-02_ht-region-2.pdf>
* *High Tunnel Planting Calendar (Region 3—Eastern KY) (Resource ###)*
	+ A planting calendar for high tunnels in Eastern Kentucky
	+ <https://ccd.uky.edu/sites/default/files/2025-01/ccd-ig-03_ht-region-3.pdf>

*Equipment Considerations for Vegetable Production (Resource ###)*

* During this recorded webinar, the University of Kentucky Extension Vegetable Specialist walks you through useful tools and equipment for vegetable equipment for different crop management tasks.
* This includes considerations before purchasing equipment, characteristics of useful equipment, and shows examples of some useful equipment and tools.
* This 38-minute video has timestamps for each equipment category (soil preparation, weed management, etc.) for easy navigation and reference.
* <https://www.youtube.com/watch?v=jyec2NLrWvw>
1. **Customizing irrigation for your crop**
2. *Basic Irrigation for Vegetable Production (Resource ###)*
	* A recorded 30-minute presentation from the University of Kentucky Extension Vegetable Specialist explaining drip irrigation for a beginning commercial vegetable system with example diagrams and photographs.
	* Topics covered include components of an irrigation system, water sources, managing water pressure, irrigation zones, and determining crop water needs.
	* <https://www.youtube.com/watch?v=6QOcdiPNrzU>
3. *Irrigation Methods and Systems (Resource ###)*
* This is a chapter excerpt from Purdue University’s publication *Water Management for Vegetable Crops on Small Farms.*  It discusses using low-flow overhead and drip irrigation in vegetable production on pages 14-16. Table 1 on page 7 describes the most critical periods for irrigating specific vegetable crops.
* <https://edustore.purdue.edu/ho-341-w.html>
1. *Drip Irrigation* Video Series *(Resource ###)*
	* This is a 4-part video series from Grow Appalachia introducing drip irrigation systems for first-time installations.
	* Part 1: Drip Irrigation Introduction highlights some considerations/regulations to keep in mind for irrigation systems funded by NRCS grants.
	* *Part 1—Drip Irrigation Introduction*: <https://www.youtube.com/watch?v=XmJzycL9GFI>
	* *Part 2—Drip Irrigation Filter Assembly and Installation*: <https://www.youtube.com/watch?v=loJvyD0rjaw>
	* *Part 3—Drip Irrigation Header Line: Installation*https://www.youtube.com/watch?v=Yjyvp-Kkw-I
	* *Part 4—Drip Irrigation Drip Tape Installation:* <https://www.youtube.com/watch?v=OQiuvgB8GeM>
2. *Go with the Flow: Simple Calculations for Small Drip Irrigation Systems, HO-122 (Resource ###)*
	* A 5-page extension resource from the University of Kentucky introducing the calculations and concepts used to create a small drip irrigation system.
	* <https://publications.ca.uky.edu/ho-122>
3. *Off the Grid: Ultra-low Pressure Drip Irrigation and Rainwater Catchment, HO-120 (Resource ###)*
	* This is an 11-page publication discussing using ultra-low pressure and catching rainwater for irrigation systems.
	* Includes many helpful images of components and example irrigation set-ups.
	* https://publications.ca.uky.edu/sites/publications.ca.uky.edu/files/HO120.pdf
	* *Rainfed Drip Irrigation* is a 24-minute video that compliments the Off the Grid written resource for growers who are more visual learners:
	* <https://www.youtube.com/watch?v=qpoxxjNYhrU>
4. *Water, Soil, and Fertility Management in Organic High Tunnels (Resource ###)*
	* A 10-page publication from Michigan State University that covers water and irrigation management on pages 2-4.
	* Topics include water quality, water testing, when to irrigate, calculating water amounts, and irrigation methods.
	* This resource also includes information on soil testing and fertility in high tunnels.
	* https://www.canr.msu.edu/hrt/uploads/535/78622/hightunnelwatersoilfertility2013-10pgs.pdf
5. *Rainwater Catchment from a High Tunnel for Irrigation Use (Resource ###)*
	* This 7-page guide with diagrams on installing a rainwater catchment system and integrating it with a drip irrigation system was published by Iowa State University Extension and Outreach.
	* Information on drip irrigation systems can be found on page 6.
	* Includes recommendations for summer and winter maintenance of the catchment system.
	* https://store.extension.iastate.edu/product/Rainwater-Catchment-from-a-High-Tunnel-for-Irrigation-Use
6. **Layout, bed formation, and crop spacing**

*‘Interior Tunnel Layout’ from High Tunnels: Using Low-Cost Technology to Increase Yields, Improve Quality, and Extend the Season (Resource ###)*

* This manual by the University of Vermont Center for Sustainable Agriculture was written for high tunnel growers in the Northeastern USA. The information on spacing can be applied to a Kentucky high tunnel.
* See pages 57-58 of this manual for suggestions on planning the layout of your beds to maximize your growing space and accessibility.
* <https://www.sare.org/resources/high-tunnels/>

*Indiana High Tunnel Handbook (Resource ###)*

* This 36-page publication from Purdue University gives an overview of High Tunnel Production in Indiana. Much of the information can be applied to the Kentucky high tunnel system. Keep in mind the differences in climate between Kentucky and Northern Indiana that will affect planting dates.
* Pages 23 and 24 discuss the arrangement and spacing of rows in a high tunnel system.
* https://www.extension.purdue.edu/extmedia/ho/ho-296.pdf
1. **Planting**

*Steps for Successful Transplanting (Resource ###)*

* A 7-minute video from University of Kentucky Extension Vegetable Specialist on how to tell if seedlings are ready to transplant and how to transplant into beds for optimum plant health.
* <https://www.youtube.com/watch?v=zhNc-5_sGBI>

*Setting Your Transplants Up for Success (Resource ###)*

* An article by Purdue University highlighting 10 best practices for transplanting vegetable crops.
* <https://vegcropshotline.org/article/setting-your-transplants-up-for-success/>

*Direct seed versus transplant*

1. **Crop management**
2. *Vegetable Production Guide for Commercial Growers, ID-36 (Resource ###)*
* This is a comprehensive guidebook for growing vegetables on a commercial scale in Kentucky. Although not specifically geared towards high tunnel production, much of the information is still relevant.
* Crop-specific recommendations including suggested cultivars are organized by crop in alphabetical order.
* This resource also includes information on crop-specific fertility, insect, weed, and disease management for each crop.
* <http://www2.ca.uky.edu/agc/pubs/ID/ID36/ID36.pdf>
1. *High Tunnel Tomato Production (Resource ###)*
* A 50-minute webinar-style video breaking down high-tunnel tomato production in Kentucky.
* Includes:
* Managing soil fertility
* Suggested cultivars
* Production recommendations and tips
* Post-harvest considerations
* <https://youtu.be/JDZXwz9RokY?si=eV1xkEjDl60VNSS8>
1. *Trellising Techniques for High Tunnel Tomatoes (Resource ###)*
* A 3.5-minute video from Grow Appalachia on how to trellis tomatoes from lines suspended from the high tunnel structure.
* <https://www.youtube.com/watch?v=Gx18ELOwIcU>
1. *Florida Weave (Resource ###)*
* A 4.5-minute video from the University of Kentucky Extension Vegetable Specialist demonstrating how to use the Florida weave method to trellis tomato plants.
* <https://www.youtube.com/watch?v=uHEAvs-ICh8>
1. Crop Rotation
* **See IPM Chapter 8—'Integrated Pest Management in High Tunnels’
* *High Tunnel Crop Rotation (Resource ###)*

This resource is a one-hour webinar on how to practice crop rotation in high tunnels featuring the University of Tennessee Extension Vegetable Specialist.

<https://www.youtube.com/watch?v=0_3QOV55LUI>

* *Introduction to High Tunnel Crop Rotation to Extend the Production Season (Resource ###)*
	+ This is a five-minute video of the University of Kentucky Extension Vegetable Specialist introducing research on rotating high tunnel tomatoes with cut flowers.

<https://www.youtube.com/watch?v=3uLYI4ygIZ0>

* Crop Rotation Overview
	+ A recorded presentation by the University of Kentucky Extension Vegetable Specialist on crop rotation in high-tunnels.
1. **High Tunnel Climate Management**

*Season Extension: Introduction and Basic Principles (Resource ###)*

* An article from North Carolina Cooperative Extension overviewing reasons and ways to extend your growing season.
* It includes a useful reference of damaging temperature thresholds for common vegetable crops.
* <https://growingsmallfarms.ces.ncsu.edu/growingsmallfarms-seasonextension2012/>

*How to Manage Temperatures in a High Tunnel (Resource ###)*

* This 6-minute video from Iowa State University Extension and Outreach shows some options for managing temperature extremes in a high tunnel.
* <https://www.youtube.com/watch?v=Zj9wam0-uhw>

*Preparing for Spring with a High Tunnel (Resource ###)*

* This 28-minute video presented by the University of Kentucky Extension Vegetable Specialist discusses the principles of season extension and various methods and tools that can be utilized in the early spring months.
* <https://youtu.be/MwhXXiCFl4w>

*High and Low Tunnel Options for Season Extension (Resource ###)*

* A 7-minute video discussing the benefits of season extension for Kentucky growers and the use of high tunnel technology for this purpose.
* <https://www.youtube.com/watch?v=oZj35CFZV1c>

*Assessing Climate in a High Tunnel for Disease Management (Resource ###)*

* University of Kentucky Extension Plant Pathologist discusses the impact of high tunnel climate on disease management.
* <https://www.youtube.com/watch?v=L-2P1X3-aDY>

*Kentucky Mesonet*

* As part of the Kentucky Climate Center, weather stations across the state capture climate data. County-specific summaries, tables, graphs, and maps of the recorded measurements are available on this website. This is a great resource for county-specific weather information such as winds, temperature, and relative humidity.
* <https://www.kymesonet.org/about.html>