USDA-NRCS
High Tunnel
Opportunities

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What is a High Tunnel?

• Protection for crops grown outside of the normal growing season to meet a particular food need of a family or of a community

• Protection of crops to meet a particular commercial production market
What is a High Tunnel?

Maine

Kansas
Crops Typically Grown

• **Tomatoes**
• Strawberries, blackberries, raspberries
• Cucumbers
• Greens – lettuce, spinach, kale, etc.
• Peppers
• Cut flowers
• Other high value crops
High Tunnels

- **Advantages**
  - Return on investment
    - More production per unit of land
    - Year-round production?
      - Winter – salad greens, lettuce, spinach, etc.
      - Extend warm season crops – tomato, peppers, cucumbers, etc.
    - Low investment cost
  - Protection from critters (rabbits, deer, etc)

- **Disadvantages**
  - Weather issues
    - Hail, winds, heavy snow or rain
  - Added labor & management
    - Controlling temperature
    - Irrigation
Tomatoes
Strawberries
Cucumbers
Multiple greens
What is a NRCS High Tunnel?

- Manufactured kit assembled to manufacturer’s written instructions – must follow manufacturer’s recommendation
- Minimum 6 mil plastic film cover, UV-resistant polyethylene
- Ventilation – Cross ventilation is very important
- Ends installed
- Crops are to be grown in the natural soil profile. Soils can be amended with compost, peat, manure, etc.
- Runoff must be controlled as to not cause additional erosion
- All disturbed areas must be seeded
HIGH TUNNEL SYSTEM Code 325 (ft$^2$)

**DEFINITION**
An enclosed polyethylene, polycarbonate, plastic, or fabric covered structure that is used to cover and protect crops from wind, excessive rainfall, or cold, to extend the growing season in an environmentally safe manner.

**PURPOSE**
Improve plant health and vigor.

**CONDITIONS WHERE PRACTICE APPLIES**
This practice applies to land capable of producing crops. This practice applies where wind intensity may damage crops, or where an extension of the growing season is needed due to climatic conditions. The practice does not apply to crops which are not grown in the natural soil profile (i.e. tables/benches, portable pots, hydroponically, etc.).

**CRITERIA**
Plan supportive conservation practices to address all environmental concerns associated with the installation and use of the high tunnel systems such as erosion, irrigation, and runoff. Crops must be grown in the natural soil profile. Raised beds may be installed to improve soil condition, fertility, and access. Raised beds are a maximum of 12 inches in height. The practice does not include greenhouses or low tunnel systems. The practice cannot be used to provide shelter or housing for any livestock, or to store supplies or equipment. Locate structures to avoid buried public utilities. Locate the structure near a viable water source for irrigation. Locate the structure outside of the 100 year floodplain. Locate the high tunnel conveniently for ingress/egress of plant materials, equipment, and other operation and maintenance activities.
High Tunnel System 325

• Approved Land
  – Land has to currently be capable of producing crops at time of application.
High Tunnel System (325)

• Things to remember:
  – Participants can install heating and ventilation equipment at their own cost.
  – Practice has a life-span of 5 years
  – May not use the high tunnel as a storage shed as it is not an intended purpose of the practice. This avoids causing compaction and/or contamination.
High Tunnel System (325)

• Things to remember:
  – High Tunnel cannot be certified until all of the installation is complete
  – All materials (including plastic) must be installed according to manufacturer’s instructions before payment is authorized.
KY Example
Before You Build!
Layout and Location

• Choose a location with a moderately well-drained or well-drained soil
• Maximize exposure to sunlight
• Plan the high tunnel for convenient ingress/egress of plant materials, equipment, and other operation and maintenance activities
• Locate them near a viable water source for irrigation
• Locate the practice to avoid public utilities
• Place outside of the 100 year floodplain
Selecting a High Tunnel
Bought or Built or Both?

- NRCS Structure? **Must** be bought from a manufacturer
- End walls and doors can be constructed on sight
Shape?

- Gothic - Better for Snow Load. The straight sidewalls also provide more room.

- Quonset - Better for Wind
Gothic style
Quonset style
Size and number needed?

• Home garden or commercial production?

• How many crops?

• How many seasons will you grow in?

• Can be mobile – on rails, wheels, or skids
Example of a mobile high tunnel
Strength?

- Bracing
- Truss kit
- Tubing diameter
- Snow load required
- Wind strength required
Optional Truss Kit
Optional Brace Kit
Optional? Choose Your Kit Wisely
Covering?

• One layer or two (insulating value vs light)

• Minimum 6 mil “greenhouse grade” clear polycarbonate material
Water Source?

- City Water—easy to manage but costly
- Pond—water quality?
- Spring—water quality, development costs
- Cistern/Tank with Gutters—Cost of installing
- Can it be pressure or gravity fed or do I need a pump?
Water Distribution

- Plumbing
- Pump (what kind, electric or solar?)
- Storage
- Roof Runoff Management
- Micro-irrigation
Roof Runoff Management and Water Recycling
Micro-irrigation and Fertigation
Micro-irrigation under plastic
What is EQIP?

• A financial assistance and technical assistance program that addresses natural resources by applying vegetative and structural practices.

• Nationally, a billion dollar program, funded annually

• Kentucky usually receives 10 to 13 million dollars for EQIP assistance

• New program year will begin October 1st
General Eligibility

• Participants must meet all Program eligibility requirements.
  – Adjusted Gross Income (AGI)
    • $900,00 limitation of non-farm income in the 2014 Farm Bill
    • This will likely change with the approval of a new Farm Bill
  – Highly Erodible Land (HEL) and Wetland Conservation (WC) provisions must be met
  – Land must have a Farm Number and Tract Number registered with the Farm Service Agency (FSA)
  – All Program eligibility forms can be filled out at your local FSA office
High Tunnels and EQIP

- Participants are only eligible for $10,000 per contract per year in Kentucky. For Historically Underserved participants, the limit is $11,500.

- This can be multiple smaller high tunnels or one large one.
High Tunnel Payment Rates

EQIP payment rate for a high tunnel is set nationally. FY2019 rates:

• $3.24/sq. ft. for Gothic Style – Maximum size: 3,086 sq. ft. (example: 30’ X 102’)

• $2.70/sq. ft. for Quonset Style – Maximum size: 3,703 sq. ft. (example: 30’ X 123’)

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High Tunnel Payment Rates

Historically Underserved Rates (FY2019):

• $3.89/sq. ft. on Gothic Style for Historically Underserved participants. Maximum size: 2,956 sq. ft. (example: 30’ X 98’)

• $3.24/sq. ft. on Quonset Style for Historically Underserved participants. Maximum size: 3,086 sq. ft. (example: 30’ X 102’)

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Historically Underserved?

Beginning Farmers

– Farmed less than 10 years
– For FY2018: Provide at least one IRS Form 1040 from the past 10 years (2007 – 2016)
Historically Underserved?

Limited Resource Producers (must meet both requirements)

– Direct or indirect gross farm sales of not more than $174,600 (for FY2018) in each of the previous 2 years

– Total household income at or below the national poverty level for a family of four (Ranges from low to mid $20K for most Kentucky counties)

Self determination tool is available at: http://www.lrftool.sc.egov.usda.gov/
Historically Underserved?

Socially Disadvantaged

–American Indians, Alaskan Natives, Asians, Black or African Americans, Native Hawaiians and other Pacific Islanders, Hispanics
NRCS High Tunnel Summary

- Must be constructed according to manufacturer’s kit
- Consider high tunnel design, materials and bracing
- Does not include greenhouses or low tunnel systems that may cover single crop rows
- Crops must be grown in the soil profile
- No tables/benches, portable pots, hanging baskets, etc.
You can find local NRCS Field Office contact information at:

http://offices.sc.egov.usda.gov/locator/app

Kentucky NRCS program can be found at:

www.ky.nrcs.gov

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