



Photo Source: Harnois.com

What is a Seasonal High Tunnel?

A seasonal polyethylene covered structure with no electrical, heating, and/or mechanical ventilation systems that is used to cover crops to extend the growing season in an environmentally safe manner. A seasonal high tunnel modifies the climate to create more favorable growing conditions for vegetable and other specialty crops grown in the natural soil beneath it.

The purposes for using seasonal high tunnel cropping systems are:

1. Extending the crop growing season.
2. Improving plant quality.
3. Improving soil quality.
4. Reducing nutrient and pesticide transport.

How does a High Tunnel Structure extend the growing season?

High Tunnel Structures can extend the growing season by allowing a producer to plant and harvest a crop earlier and/or later in the growing season. Typically a High Tunnel Structure will allow a producer to plant a crop up to 30 to 45 days prior to the last frost free day in the spring of the year. Typically a High Tunnel Structure can also allow a producer to harvest a crop on average 30 to 45 days past the first frost of the year in the fall. The average length of time extended will vary depending on the type of crop that is being planted inside the High Tunnel Structure. The management of both daytime and nighttime temperatures is critical in order to maintain the crops that will be grown.

What are the advantages and disadvantages

Advantages Using High Tunnels

- Improved crop quality.
- Extended growing season on average 4-6 weeks.
- Allows management of crops during inclement weather.
- Frost protection.
- Insect protection.
- Reduces some moisture-related plant diseases.
- Compatible with many production aids/techniques, row cover, micro irrigation, etc.
- Irrigation needs of crops are easily managed.

Disadvantages Using High Tunnels

- Requires fairly regular attention to control internal temperatures, especially early season.
- Disposal cost of plastic covering after lifespan of plastic has expired.
- Moderate high cost per square foot of production area.

What crops are eligible?

Vegetables, Ornamentals, Fruit Trees

What is it constructed of?

Many commercially available High Tunnels are on the market in numerous widths and lengths. High Tunnels are Quonset hut or Gothic arch shaped. Ventilation is achieved by means of a combination of roll-up side vents; end vents; and, occasionally, roof vents. They are constructed of metal or durable plastic bows that are connected to metal posts that are driven into the ground. One layer of greenhouse grade, 6-mil polyethylene covers the structure. Generally, the end walls are framed-in to create door and ventilation areas.

What are the design criteria?

Financial assistance will be limited to tunnels covering up to 5% of one acre (2,178 square feet) per farming operation. NRCS has established that no support will be given to producers for coverage of more than 2,178 square feet per agricultural operation with a seasonal high tunnel. This is equivalent to a structure the size of 30 ft x 72 ft. NRCS in Mississippi will only approve High Tunnels with a minimum side height of 6 feet. This practice will be limited to manufactured systems commercially available and the technical criteria will require installation in accordance with guidelines from the manufacture. Producer fabrication of the system will not be permissible. The vendor must agree to provide a warranty for the structure for at least 4 years.

What is the payment rate?

The payment rates are: base \$1.90 sq. ft.; organic \$2.70 sq. ft.; and HU \$3.30 sq. ft.

What are the Eligibility requirements?

To receive cost sharing through EQIP you must be actively participating in agricultural crop production at the time you apply for the program. There must be an annual minimum of 1,000 of agricultural products being produced. Each participant must obtain a farm and tract number from USDA/FSA and meet compliance and AGI eligibility requirements. The land must be cultivable land, and you must own or have control of the land for the life of the contract.

The Conservation Systems Approach?

Water runoff from the high tunnels can cause ponding and runoff issues that will require the application of other supporting practices such as underground outlets, grassed waterways, and critical area plantings. The following core conservation practices must be planned in conjunction with the High Tunnels: nutrient management 590, pest management 595, and irrigation water management 449. If additional practices are needed, they will need to be planned and installed as part of a conservation plan as a condition for the installation of a high tunnel. If a producer receives funding for a high tunnel, they must agree to carry out the associated practices. The crops grown within the high tunnel must be planted directly into the soil covered by the house. The use of pots, growing racks or hydroponics is not eligible.

What are the additional criteria?

For all vegetable and ornamental crops, the Crop rotations 328 and Cover Crops 340 conservation practices must be adopted. The 6-mil polyethylene cover must be removed every two years and a cover crop planted during the summer months to reduce potential problems with nutrients and pests. In High Tunnel Structures where fruit trees are grown, compost, mulch or a cover crop should be used to add organic matter to the soil. A positive soil condition index in RUSLE2 is required for all crop production systems.

Annual Reporting Requirements?

The interim standard will be to serve as a mechanism for field testing the new technology to address resource concerns. The state will prepare annual reports to discuss the strengths, weaknesses, and recommendations to develop into a national standard or to discontinue the use of the interim standard. A final report is required at the end of the 3-year pilot. Annual and final reports will be submitted to the National Conservation Practice Subcommittee Chair.

The following items shall be evaluated on an annual basis:

1. First year only, the size and cost of the season high tunnel system.
2. Annual maintenance cost and requirements for the season high tunnel system.
3. What are the conservation resources concerns being addressed with the interim seasonal high tunnel system?
4. Sheet and rill erosion before and after the seasonal high tunnel using RUSLE2.
5. Drainage and erosion around the seasonal high tunnel structure:
 - What additional drainage or erosion features were installed to address the structure?
 - If additional features were installed, how effective were the drainage features?
6. How long did the seasonal high tunnel structure extend the growing season?
7. Did the seasonal high tunnel increase production, if so how much?
8. What rates of nutrients (nitrogen, phosphorus, and potash) were applied before and after the seasonal high tunnel system was installed.
9. What rates of pesticides (product and rate) were applied before and after the seasonal high tunnel systems were installed.
10. Other observations and evaluation.