

# Seasonal High Tunnel System for Crops

## **Interim Conservation Practice 798**

### **Frequently Asked Questions**



Photos: Danny McBride, NRCS Utah

#### **What is a Seasonal High Tunnel System for Crops?**

A seasonal tunnel system is a polyethylene (plastic) covered structure that is used to cover crops to extend the growing season. They are also known as high tunnels or cold tunnels. They are used to extend the growing season for crops by approximately two to three weeks on each end of the season by increasing the temperature surrounding the crop and minimizing the heat loss during the night. The standard has been modified slightly to allow producers to install electrical, heating, and ventilation systems at their own cost.

#### **Are Seasonal High Tunnel Systems the same as Greenhouses?**

No. The seasonal high tunnel system depends on the plastic covering to raise temperatures within the structure. Temperatures during the growing season are controlled by using manual roll-up side vents and by opening end doors to provide ventilation. Unlike greenhouses, seasonal high tunnel systems as indicated by their name are seasonal and are considered temporary structures.

#### **How are crops grown in the Seasonal High Tunnel System?**

Crops can be grown by either using conventional tillage in the natural soil profile or by installing permanent raised beds under the tunnel. Seasonal high tunnel systems installed under the Environmental Quality Incentives Program (EQIP) are not designed for crops grown on tables/benches or in portable pots.

#### **Are row covers and/or low tunnels considered a Seasonal High Tunnel System eligible for EQIP?**

No. In order to qualify as a seasonal high tunnel system under EQIP the tunnel system must be 6 feet in height; therefore, row covers and/or low tunnels do not qualify under EQIP.

#### **How can the EQIP help me install a Seasonal High Tunnel System?**

Persons interested in participating in the EQIP should contact their local NRCS office. EQIP participation requires the applicant to meet specific eligibility requirements. A potential participant will need to submit an application and to show proof of ownership (deed) or control (lease lasting throughout the contract period) of the land on which the system will be installed. The land submitted for the program must be currently in cultivation or presently capable of being planted to a crop (i.e. land in a fallow condition) on which they wish to place their seasonal high tunnel system. Land presently in permanent cover such as hayland, pastureland or forestland will not qualify.

Applicants will work with NRCS to finalize the details of the application before the application is submitted for ranking and funding consideration. Applications selected for funding will proceed into the contracting phase. Program contracts will be developed that outline practices to be installed, payment rates, schedule for installation and operation and maintenance requirements. EQIP payments cannot be received for practices installed prior to contract approval. The local NRCS office can provide detailed program and contracting requirements for the EQIP program as this fact sheet is general in nature.

### ***What are the structure requirements for a Seasonal High Tunnel System under EQIP?***

Under EQIP the seasonal high tunnel system must be obtained as a pre-fabricated kit directly from the manufacturer or from a supplier. The frame shall be constructed of metal, wood, or durable plastic and be at least 6 feet in height. The plastic cover must be, at a minimum, a 6-mil greenhouse-grade, UV resistant polyethylene. Individuals must work closely with their manufacturer or supplier to plan, design and construct the structure in accordance with the manufacturer's specific recommendations.

When selecting a kit individuals should consider factors such as structure design strength for snow and wind loads, the type of anchoring system required, the strength and thickness of the polyethylene cover provided with the kit, venting method (roll-up or drop-down sides) and warranties provided on the frame or covering. Reputable manufacturers and suppliers should be able to provide this information for the seasonal high tunnel systems that they sell. Individuals should look for manufacturers that offer kits providing warranties of 4 years for the plastic covering and 10 years for the frame structure. Information regarding snow and wind zones can be obtained from your NRCS office.

### ***How do I find a manufacturer or supplier of Seasonal High Tunnel Systems?***

Start local. Many local farm, building or greenhouse suppliers may sell kits.

Use the internet. One of the easiest ways to find a manufacturer or supplier of seasonal high tunnel systems is to use an internet search engine by searching on the key words: High Tunnel and following the links returned. Another good place to find links to manufacturers or suppliers is to visit high tunnel information websites such as <http://www.hightunnels.org/> and follow their links to find manufacturers or suppliers. Look for manufacturers that specifically design high tunnels for use in western states that have snow and wind loads similar to those found in Idaho.

### ***What size Seasonal High Tunnel Systems are available?***

Systems are available as "kits" in all sizes and dimensions. Under EQIP, contract payments can be made on Seasonal high tunnel systems installed on cropped areas of up to 5% of one acre or 2,178 square feet. EQIP program regulations allow for contract payments to be made on one or more structures up to the contract maximum of 2,178 square feet. Structures can be larger; however, contract payment is limited to 2,178 square feet per producer.

### ***What usually comes in a Seasonal High Tunnel kit?***

Basic kits usually include the frame structure and assembly hardware; polyethylene cover with roll-up or drop-down side assemblies and heavy duty ground posts. Optional items include manufactured end panels and/or door assemblies as well as top and bottom baseboard kits. Most kits will require the use of locally purchased lumber to construct baseboards and door frames and some additional anchoring equipment.

***Can I build my own Seasonal High Tunnel System under the EQIP?***

No. NRCS standards currently allow only for the installation of pre-fabricated seasonal high tunnel system kits.

***What factors should I consider when deciding where to place my Seasonal High Tunnel System?***

Seasonal high tunnel systems should be placed perpendicular to prevailing winds (except in high wind areas) to insure proper ventilation and if possible, with the long axis oriented in a north-south direction to provide more uniform sun exposure to plants and minimize plant shading. Keep in mind that in high wind areas wind damage is more likely when the structure placed perpendicular to the prevailing wind direction. If the structure must be orientated perpendicular to the prevailing wind, consider cross bracing at least every third rafter, concrete anchors at the corners, and/or 4" by 4" end frames that will help strengthen the ends. Systems should not be located in areas prone to shade. Look for sites with topography that allows for adequate drainage of roof runoff away from structure. Many kits can be modified for installation on areas with a 1-2 percent grade along one axis (generally the length side) but most cannot be installed on areas with two directional slopes. Consult your manufacturer or supplier for specific guidelines. At sites where roof runoff away from the structure is problematic, a stable outlet shall be installed to prevent erosion and/or ponding of water. Systems should also be located in areas that allow for convenient ingress/egress of plant materials and equipment. Water supply location for irrigation should also be considered when deciding where to place the system.

***Is my Seasonal High Tunnel System moveable?***

Many systems are movable and can be rotated to different locations depending on the anchoring system used. Please note that while the system can be moved that sometimes moving the structure can negate the manufacturer's warranty on the system. Make sure to check with your manufacturer or supplier if you plan to rotate your high tunnel to a different location.

***What requirements are there for maintaining and operating my Seasonal High Tunnel System?***

EQIP regulations require that the system be functional for a minimum of 4 years. Due to this requirement participants should utilize caution in selecting the seasonal high tunnel system kit that they purchase to make sure it will remain functional throughout the contract period. Maintenance and repair of the system is the sole responsibility of the contract holder. If damage occurs, contract holders should be prepared to bear the costs of making repairs or replacing the polyethylene cover during the contract period. The EQIP does not provide any additional payment to aid in the repair of structures. In climate conditions where snow loads may damage the structure, the tunnel cover shall be removed or rolled up at the end of the growing season unless the structure is designed to withstand expected snow loads. Polyethylene life depends on the quality of installation, operation and weather factors. Several ways to help increase the lifespan of the polyethylene covering is to place the rafters' close enough to minimize flapping in the wind, cross brace the structure to prevent vibration in the wind, sand the rafters smooth prior to installing polyethylene or wrapping rafters with plastic, installing cover on a warm day to get plastic tight, keeping farm implements and people off the polyethylene and making sure structure is well anchored. Contact your specific manufacturer for additional suggestions.

***What other conservation practices would be good to use with my Seasonal High Tunnel System?***

Additional conservation practices could include nutrient management, pest management, irrigation water management, critical area planting, grassed water ways, surface drainage, subsurface drainage, irrigation system micro irrigation and conservation crop rotation. Your local NRCS office can provide you with more detailed information, as this factoid is general in nature and does not include all program requirements and/or details.