

Seasonal High Tunnel System for Crops (798)

Overview

A seasonal high tunnel is a polyethylene covered structure that is used to cover crops to extend the growing season in an environmentally safe manner.

High tunnels are usually free-standing or gutter-connected plastic-covered structures. The sides covers of high tunnels may be rolled up or down as need to regulate the temperature or other climatic conditions inside. The entire cover or structure may be removed or dismantled if needed to protect it from an impending storm or hurricane. High tunnels may also be moved from location to location.



Benefits

Seasonal high tunnel structures extend the growing season by modifying the climate to create more favorable growing conditions for vegetable and other specialty crops. Seasonal high tunnels provide farmers the opportunity to successfully grow crops, and to increase production, quality, and yields.

Potential natural resource benefits of high tunnels include:

- improving plant quality;
- improving soil quality;
- reducing nutrient and pesticide transport;
- improving air quality through reduced transportation inputs; and
- reducing energy use through local consumption.

This is an interim conservation practice standard to support the use of high tunnels to extend the

growing season and to test the validity of potential natural resource benefits via a 3 year pilot program.

Conditions Where Practice Applies

This practice applies to existing cropland that has an active cropping history where the growing season extension is needed due to climate conditions.

Crops must be grown in the natural soil profile. Permanently raised beds of the natural soil may be used, but the use of tables, benches, growing racks, portable pots, hydroponics etc. is ineligible.

Application in the Pacific Islands Area

In temperate regions of the continental U.S., high tunnels usually extend the growing season by increasing temperature. In the Pacific Islands Area (PIA), high tunnels may be used to extend the growing season in other ways, such as acting as “rain-shelters” to allow for the production of high-value horticultural crops during the rainy months (when crop prices are normally higher). Runoff captured from the tunnel covers may also extend the growing season by providing a supply of irrigation water during the drier months.

There is potential that high tunnels may provide benefits associated with situations unique to the State of Hawaii, like volcanic smog (vog) and acid rain.

Most seriously affected are flower and vegetable crops. Certain orchard crops, range grasses, and native plants are also known to be affected by vog.

Plant damage from vog and acid rain include: yellowing or chlorosis of foliage, slowed growth and productivity, increased susceptibility to diseases, and plant death.

University of Hawaii researchers have suggested that growing plants under the cover of structures such as high tunnels may lessen crop damage caused by vog and acid rain.

Vog may cause some maintenance issues for high tunnel structures because it may increase degradation of the frame and covers.

Seasonal High Tunnel System Requirements

Participants are required to purchase, plan, design and construct the tunnel structure in accordance with the commercial manufacturer's recommendations.

The frame must be constructed of metal, wood, or durable plastic, and be at least 6 feet in height at their highest point.

Some high tunnels require components such as end panels or doors as well as baseboards. These components may either be purchased from the kit manufacturer or constructed by participants from locally purchased materials based on the manufacturer's recommendations.

As a minimum, the cover must be 6 mil greenhouse-grade UV resistant polyethylene.

High tunnels must be maintained for a minimum of four years. Participants are responsible to repair and/or replace any materials damaged by wind, and other weather conditions or situations for the entire four year period.

These are intended to be seasonal structures. The participant will be responsible for deciding whether or not to remove the cover at the end of the growing season based on the manufacturer's recommendations.

Water runoff from and into the high tunnels must be controlled so that it does not cause ponding, erosion, sedimentation, and/or water quality problems. Runoff may also be captured and used for irrigation. Vegetation shall be established on all disturbed earth surfaces.

Participants who receive financial assistance are required to install supporting practices to address all environmental concerns associated with the use of high tunnels as part of a complete system. The following are some supporting practices that may be required to be installed with the high tunnels to address those concerns: Diversion (362), Grassed Waterway (412), Underground Outlet (620), Roof Runoff Structure (558), Critical Area Planting (342), and Conservation Cover (327).

Additional practices may be needed to be installed as a condition for the installation of a high tunnel and should be considered as part of the conservation plan.

Participants are required to complete a first, second

and a third year annual report to document their growing season, crop yields and quality, and use of nutrients and pesticides. This info will be used by NRCS to evaluate the natural resource benefits of high tunnel systems and decide whether to continue the use of the practice after the end of the 3 year pilot.



What is NOT Eligible as a High Tunnel

High tunnels are often called hoop houses and are often confused with greenhouses. These structures are NOT: greenhouses, permanent structures, or low hoop houses that are used to cover single crop rows.

The use of these structures for housing livestock is not allowable through this program and is only for use in growing crops. Participants are also not allowed to build tunnels on their own from scratch.

Financial Assistance for High Tunnels

Financial assistance through the Environmental Quality Incentives Program (EQIP) is limited to a maximum size of 2,178 square feet of land under the high tunnel per USDA identified agricultural operation. This may be installed as one or more high tunnels, and may be planned or installed with more than 2,178 square feet; however, the program payment will be limited to this amount.

More Information

For more information about EQIP and Seasonal High Tunnel Systems, visit your local NRCS Field Office, or the Pacific Islands Area NRCS web site at www.pia.nrcs.usda.gov, under the Programs tab.

Photo Sources: [Cornell University](http://www.cornell.edu) and the Lihue NRCS Field Office.