Natural Resources Conservation Service

Missouri

Seasonal High Tunnel System for Crops

Interim Conservation Practice Job Sheet 798

Photo Source: www.hightunnels.org

Definition

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. The high tunnel modifies the climate to create more favorable growing conditions for vegetable and other edible specialty crops grown in the natural soil within the covered space. High tunnel systems are not greenhouses.

Purpose

The purpose of the seasonal high tunnel is to improve plant quality, improve soil quality, improve water quality from reduced nutrient and pesticide transport, improve air quality through reduced transportation inputs, and to reduce energy use through local consumption.

General Specifications

Commercially available high tunnel structures are made in numerous widths and lengths. The high tunnel structure will be constructed from a manufactured kit. The structure, including post ribs, or hoops, purlins, ridgepole, coverings and all other components are constructed and anchored according to the manufacturer's recommendations. The high tunnel frame is constructed of metal, durable plastic, or wood and is covered with a single or double layer of polyethylene. The polyethylene will be a minimum of 6 mil greenhouse-grade, UV resistant material. Ventilation is achieved by means of a combination of roll-up or roll-down side vents, end vents, and occasionally, roof vents. The end walls are framed-in to create door and ventilation areas.

High tunnel systems are commercially available in many lengths, widths, and designs. The width of a tunnel should not exceed 30 feet and has a minimum height of 6 feet. It will be tall enough to allow spraying, cultivation, harvest, and other operations to occur with the tunnel intact. The high tunnel structure covers several rows and is wide enough to allow crop growth to full maturity under the tunnel.

High tunnels are to be placed in sites with adequate drainage in full sun and, if possible, with protection from the wind. The orientation of the tunnel is dependent on the season and the crops that will be grown. Usually a north-south orientation will optimize sun exposure for

spring/summer/fall production. An east-west orientation will maximize sunlight for winter production.

It is important to select a structure to match the local snow and wind conditions.

The baseboard should be treated lumber or rot-resistant wood such as cedar, black locust, or osage orange. (Note: Treated lumber may not be acceptable in organic production. Please check your organic plan for acceptable material).

Raised beds of natural soil are allowed and the beds can be permanent. The plant roots must be able to grow in the natural soil profile. Structures such as growing tables, benches and potted plants are not allowed.

Electricity, heating, and mechanical ventilation systems are allowed.

Where used

A seasonal high tunnel may be used where existing specialty commodity crops are grown in open field conditions, and extension of the growing season is needed due to climate conditions.

Conservation management system

Water runoff from the high tunnel can cause erosion and ponding issues that may require the application of other practices such as infiltration trenches, diversions, underground outlets and critical area plantings. These additional practices must be planned and installed as a condition for the installation of a high tunnel. Additional practices should be considered as a part of a conservation plan, such as nutrient and pest management and crop rotation. All disturbed areas need to be seeded to control erosion.

Seasonal High Tunnel System – Job Sheet

Producer_____ Location _____

Field Office _____ Conservation Contract _____

Materials List

- ☐ High Tunnel Structure size(s) _____
- ☐ Polyethylene cover, 6 mil greenhouse grade or better, UV resistant

Supporting Practices Required:

- ☐ Manufactured Gutter System (included with high tunnel kit)
- ☐ Critical Area Planting (job sheet attached)
- ☐ Infiltration Trench along each side (construction plan attached)
- ☐ Underground Outlet (construction plan attached)
- ☐ Diversion (construction plan attached)
- ☐ Other _____

High Tunnel System Construction

- Contact the Missouri One Call System at 1-800-344-7483 at least 2 working days in advance of construction, for location of underground utilities.
- Obtain any required permits.
- Prepare site according to manufacturer's instructions.
- Lay out building location according to site plan.
- Assemble high tunnel structure according to manufacturer's instructions.
- Install supporting practices as required, according to construction plans provided.

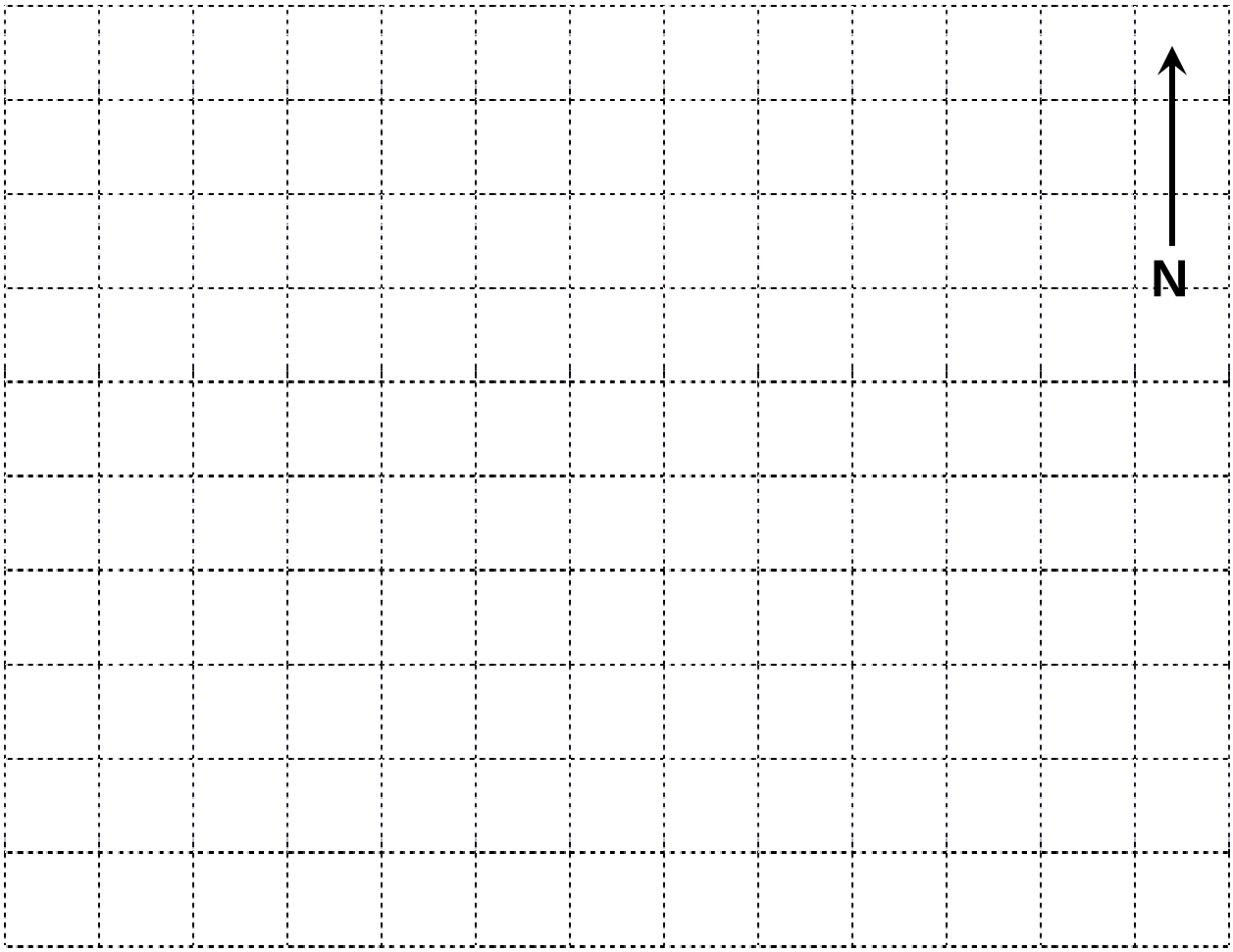
Operation and Maintenance

- Periodically inspect structure and cover for damage. Reinstall or repair promptly.
- Follow manufacturer's instructions for operation and maintenance of the high tunnel structure.
- Avoid damage to structure from equipment operated in and around the seasonal high tunnel.
- Inspect runoff control measures after every significant rainfall event. Repair promptly.
- Lifespan of the high tunnel conservation practice is 4 years. In climate conditions where snow loads may damage the structure, the tunnel cover shall be removed at the end of the growing season unless the structure is designed to withstand expected snow loads.

Seasonal High Tunnel System – Layout and Location

Plan view of seasonal high tunnel system site shown below.

Scale 1"=_____ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")



Additional Specifications and Notes:

Design Certification

This Seasonal High Tunnel System plan meets the requirements of NRCS Interim Conservation Practice Standard 798.

_____	_____	_____
Signature	Title	Date

Seasonal High Tunnel System – Construction Checkout

Seasonal High Tunnel Structure – *as-built measurements*	
Length (ft)	Height in Center (ft)
Width (ft)	Structure Manufacturer and Cost

Supporting Practices Installed

- ☐ Manufactured Gutter System
- ☐ Critical Area Planting
- ☐ Infiltration Trench along each side
- ☐ Underground Outlets
- ☐ Diversion
- ☐ Other _____

Quantities and detailed checkout information for supporting practices shall be documented separately.

CHECK OUT:

Amount Completed: _____square feet. Mark As-Built location on plan map.

Remarks_____

This practice as constructed meets NRCS standards and specifications ☐ Yes ☐ No

Check out by: _____ Date: _____

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