

Seasonal High Tunnel System for Crops

Interim Conservation Practice Job Sheet **798**

Definition

A seasonal high tunnel is an unheated, polyethylene-covered structure with no electricity. High tunnels modify the climate to create more favorable growing conditions for vegetable and other specialty crops. The structure utilizes passive solar heating only. Ventilation is provided by manually rolling the sides up or down as needed. High tunnel systems are not greenhouses.



Purpose

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

General Specifications

The structure, including post ribs, or hoops, purlins, ridgepole, coverings and all other components are constructed and anchored according to the manufacturer's recommendations.

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 should be tall enough to allow spraying, cultivation, harvest and other operations to occur with the tunnel intact. The high tunnel structure covers several crop rows and is wide enough to allow crop growth to full maturity under the tunnel.

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 crops that will be grown.

Usually, a north-south orientation will optimize sun exposure.

Ventilation is important to moderate temperature within the tunnel. Ventilation is achieved by means of a combination of roll-up or roll-down side vents, end vents, and occasionally, roof vents. Generally the end walls are framed-in to create door and ventilation areas. Airflow is greatly influenced by the height of the structure. Taller structures allow for better airflow

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

The baseboard should be treated lumber or rot-resistant wood. *(Note: Treated lumber may not be acceptable in organic production. Please check your organic plan for acceptable material).*

The plastic covering of the tunnel should be a minimum 6 mils thick, greenhouse grade, & UV resistant polyethylene.

All disturbed areas need to be seeded to control erosion.

Raised beds of natural soil are allowed in the high tunnel, but structures such as growing tables, permanently formed beds and potted plants are not allowed. Plants must be grown in the natural soil.



Conservation management system

Water runoff from the high tunnels or from other nearby sources can cause erosion and ponding issues that may require the application of other supporting practices such as grassed waterways, 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.

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:

- Critical Area Planting (job sheet attached)
- Grassed Waterway (job sheet 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.

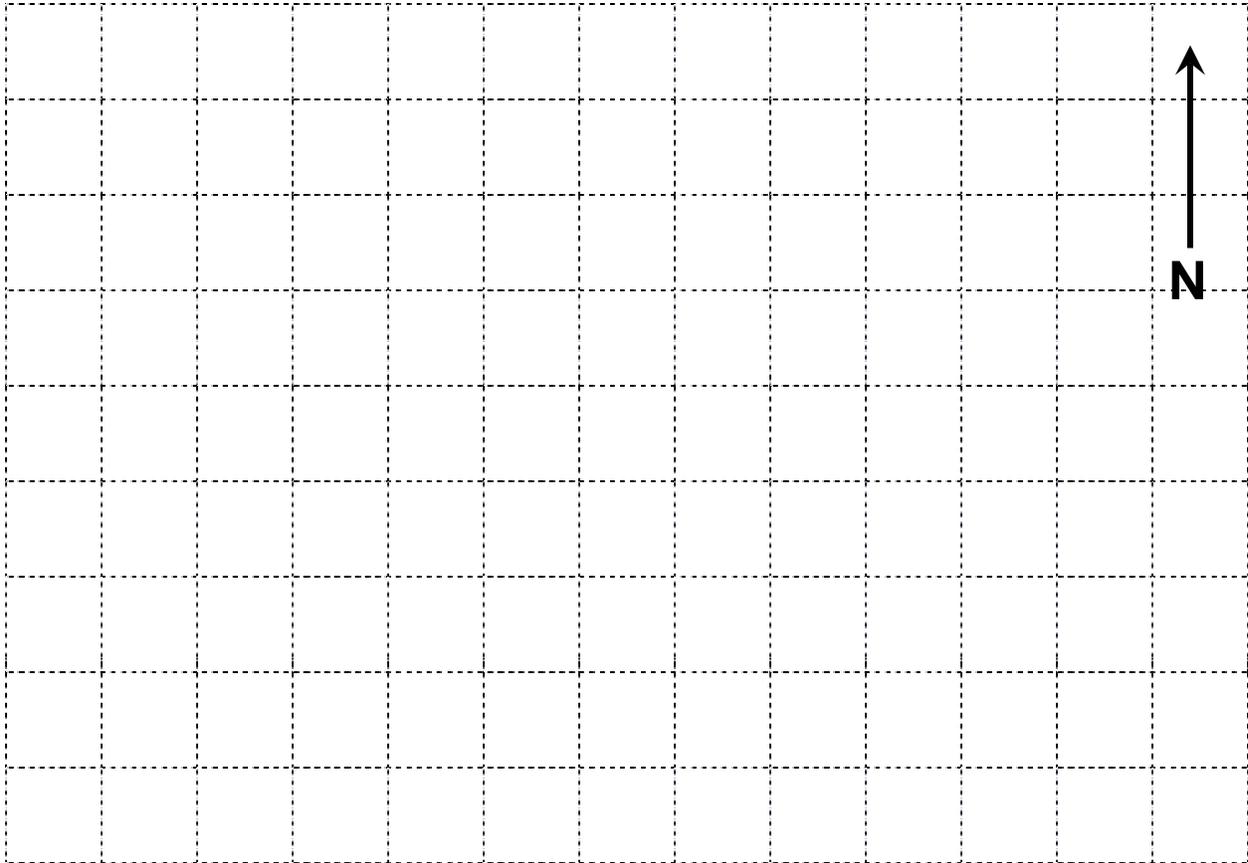
Operation and Maintenance

- 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.
- High tunnels are intended to be “seasonal structures which are not designed to sustain heavy snow loads. The participant will decide if the cover will be removed in the “snow season.” Accumulated snow should be periodically removed to avoid structural weakening and/or collapse.
- Regardless of the decision to seasonally remove the plastic covering, each participant is responsible for repairing and/or replacing damage from wind, snow or other weather-related occurrences for the four-year life span of the structure. The plastic covers will be inspected regularly for wear and tear. Tears in the plastic will be repaired immediately.
- Drainage and other associated conservation practices will be maintained and drainage problems near the tunnel will be corrected.

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 structure was constructed and installed using all manufactures recommendations. I have read and understand the operation and maintenance requirements associated with this practice.

 Producer

 Date

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

 NRCS Signature

 Title

 Date

Seasonal High Tunnel System – Construction Checkout

Seasonal High Tunnel Structure – <i>as-built measurements</i>	
Length (ft)	Height in Center (ft)
Width (ft)	Structure Manufacturer

Supporting Practices Installed	
<input type="checkbox"/> Critical Area Planting <input type="checkbox"/> Grassed Waterway <input type="checkbox"/> Underground Outlets <input type="checkbox"/> Diversion <input type="checkbox"/> Other _____	Quantities and detailed checkout information for supporting practices shall be documented separately on the MO-CONS-10.

CHECK OUT:	
Amount Completed: _____ square feet.	Mark As-Built location on plan map.
Remarks _____	
Check out by: _____	Date: _____

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Seasonal High Tunnel System – First Year Annual Report **page 1 of 2**

Producer _____ Location _____
 Field Office _____ Conservation Contract _____
 Report Date _____

Report Due On Or Before December 15, _____

- Actual cost of Seasonal High Tunnel System \$ _____ (attach copies of bills)
- First year maintenance requirements : (add more sheets if necessary)

Activity or Item (list)	Cost
	\$

- Cropping history before installation of Seasonal High Tunnel: (add more sheets if necessary)

Crop (type)	Crop Year	Yield	Nutrients (Fertilizer)			Pesticide(s)		
			Type	Rate	Timing	Type	Rate	Timing

- First year's crop in Seasonal High Tunnel:

Crop (type)	Crop Year	Yield	Nutrients (Fertilizer)			Pesticide(s)		
			Type	Rate	Timing	Type	Rate	Timing

Seasonal High Tunnel System – First Year Annual Report **page 2 of 2**

- Growing season (2 past years, plus the first year in the Seasonal High Tunnel):

Crop (type)	Crop Year	Season Dates	Length of Growing Season (Days)

Benefits for plant quality: _____

Benefits for soil quality: _____

Benefits for air quality: _____

Benefits for energy conservation: _____

Benefits for reducing nutrient and pesticide transport: _____

Producer’s recommendations and observations: _____

Seasonal High Tunnel System – Second Year Annual Report

Producer _____ Location _____
 Field Office _____ Conservation Contract _____
 Report Date _____

Report Due On Or Before December 15, _____

- This year's maintenance requirements : *(add more sheets if necessary)*

Activity or Item <i>(list)</i>	Cost
	\$

- This year's crop in Seasonal High Tunnel:

Crop (type)	Crop Year	Yield	Nutrients (Fertilizer)			Pesticide(s)		
			Type	Rate	Timing	Type	Rate	Timing

- This year's growing season:

Crop (type)	Crop Year	Season Dates	Length of Growing Season (Days)

- Benefits for plant quality: _____
- Benefits for soil quality: _____
- Benefits for air quality: _____
- Benefits for energy conservation: _____
- Benefits for reducing nutrient and pesticide transport: _____
- Producer's recommendations and observations: _____

Seasonal High Tunnel System – Third Year Annual Report

Producer _____ Location _____
 Field Office _____ Conservation Contract _____
 Report Date _____

Report Due On Or Before December 15, _____

- This year's maintenance requirements : *(add more sheets if necessary)*

Activity or Item <i>(list)</i>	Cost
	\$

- This year's crop in Seasonal High Tunnel:

Crop (type)	Crop Year	Yield	Nutrients (Fertilizer)			Pesticide(s)		
			Type	Rate	Timing	Type	Rate	Timing

- This year's growing season:

Crop (type)	Crop Year	Season Dates	Length of Growing Season (Days)

- Benefits for plant quality: _____
- Benefits for soil quality: _____
- Benefits for air quality: _____
- Benefits for energy conservation: _____
- Benefits for reducing nutrient and pesticide transport: _____
- Producer's recommendations and observations: _____

Manufacturers of High Tunnel Kits

Interim Conservation Practice 798 – Seasonal High Tunnel

March 16, 2010

Subject to update – Manufacturer lists with later dates may supersede this list.

This manufacturer list represents information provided to Missouri NRCS by vendors of seasonal high tunnel products and is not all inclusive. This list is for guidance purposes only and does constitute any endorsement by NRCS.

Source	Manufacturer / Style
Agra Tech, Inc Pittsburg, CA Toll Free: 877-432-3336 Web Site: www.agra-tech.com	Agra Tunnel, Cold Frame
Farm Tek South Windsor, CT Toll Free: 800-327-6835 Web Site: www.FarmTek.com Contact: Chad Pogonelski, ext. 216	ClearSpan Products: Economy Round Style, High-Roller, Premium, Gro-Max, Pro Solar Star, Single Bay, Colossal, Cold Frames
Growers Supply South Windsor, CT Toll Free: 800-476-9715 Web Site: www.growerssupply.com Contact: Chad Pogonelski, ext 216	
Tek Supply Dyerville, IA Toll Free: 800-835-7877 Web Site: www.teksupply.com Contact: Chad Pogonelski, ext. 216	
Haygrove Elizabethtown, PA Toll Free: 866-429-4768 Web Site: www.tunnelbuzz.com Contact: Mike Deitrich	
Poly-Tex, Inc. Castle Rock, MN Toll Free: 800-852-3443 Fax: 651-463-2479 E-Mail: info@poly-tex.com Web Site: www.poly-tex.com	FieldPro, PT-30, Kool House

<p>Morgan County Seeds Barnett, MO Telephone: 573-378-2655 Email: mcs@pcfremail.com Web Site: www.morgancountyseeds.com</p>	<p>Zimmerman's Welding High Tunnels</p>
<p>Four Season Tools Kansas City, MO 64111 Phone: 816-444-7330 Email: info@smallfarmtools.com Web Site: www.smallfarmtools.com</p>	<p>Gothic Arch Style Frames Specializing in Movable, Fixed High Tunnels and Farm Consultation</p>