

NATURAL RESOURCES CONSERVATION SERVICE
MONTANA CONSERVATION PRACTICE JOB SHEET**SEASONAL HIGH TUNNEL SYSTEM FOR CROPS (FT².)**

CODE 798A



Photo Source: www.hightunnels.org

Definition

A seasonal high tunnel is a polyethylene covered structure with no electrical, ventilation, or heating system, at least 6 feet in height, which modifies the climate to create more favorable growing conditions for vegetable and other specialty crops grown in the natural soil within the covered space.

Purpose

The purpose of the seasonal high tunnel is to extend the crop growing season, improve plant quality, improve soil quality, and improve water quality from reduced nutrient and pesticide transport.

Where Used

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

Commercially available high tunnel structures are made in numerous widths and lengths. The high tunnels are constructed of metal bow frames that are covered with a single layer of polyethylene. Ventilation is achieved by means of a combination of roll-up side vents, end vents, and occasionally, roof vents. Generally, the end walls are framed-in to create door and ventilation areas. The high tunnel structure covers several crop rows or beds, is wide enough to allow crop growth to full maturity under the tunnel, and is tall enough to allow spraying, cultivation and harvest to occur with the tunnel intact.

Special Provisions

GENERAL REQUIREMENTS:

Seasonal High Tunnels shall be purchased from a kit complete with ground posts, steel tubing, side support rails, and shall meet the following minimum specifications:

1. Tubing shall be manufactured from minimum 1.66-inch diameter, 16 gauge steel.
2. The rafter spacing shall be 4-foot maximum.
3. As a minimum, a 6 mil greenhouse grade, UV resistant polyethylene cover, with a 4-year warranty shall be used.
4. Means shall be provided to allow the sides to be rolled up in accordance with the manufacturer's recommendations.
5. Two-inch x 6" redwood or 5/4 x 6" recycled plastic lumber baseboards shall be fastened to the structure in accordance with the manufacturer's recommendations.
6. High tunnels shall be constructed on-site according to manufacturer's specifications.
7. High tunnels should be oriented to ensure adequate ventilation and to reduce shading of plants. Generally, high tunnels are oriented perpendicular to prevailing winds for best ventilation. A secondary consideration is to locate the high tunnel axis in a north-south direction to provide more uniform sun exposure to plants and minimize plant shading.
8. Where heavy snow loads are a concern, a gothic arch instead of the tunnel design is preferred. The gothic structure allows heavy snows to slide off easier than the rounded tunnel shape.
9. In areas with high winds and/or snow loads, or where high tunnels are moved intact, internal bracing would add additional strength and stability to high tunnels.
10. In areas with high winds, rope or other tie-down systems shall be used to be used to prevent cover from billowing in the wind and to reduce chance of tearing cover.

NOTE: Cover should be removed at the end of the growing season in areas where snow loads may damage the structure. If cover is not removed at the end of the growing season, then damage and replacement of the structure is the responsibility of the owner and the applicant.

The salient features may be met by using kits from manufacturers on the "Approved Product List" or from other companies that manufacture structures meeting these specifications.

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 practices such as, diversions, underground outlets and critical area plantings. These additional practices may be planned and installed as a condition for the installation of a high tunnel. Consideration should be given to weed control and compaction inside high tunnels, walkways may need straw, bark, sawdust or other mulches to control weeds and reduce compaction. Additional practices should be considered as a part of a conservation plan, such as nutrient and pest management, crop rotation and irrigation water management.

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LANDOWNER/OPERATOR FIELD NUMBER TRACT CTU

PLANNER FIELD OFFICE DATE

| |
|---|
| Materials List |
| <input type="checkbox"/> High Tunnel Structure, size(s) _____ Supporting Practices: <input type="checkbox"/> Critical Area Planting (job sheet attached) <input type="checkbox"/> Underground Outlet (construction plan attached) <input type="checkbox"/> Diversion (construction plan attached) <input type="checkbox"/> Other _____ <input type="checkbox"/> Other _____ |
| High Tunnel System Construction |
| <ul style="list-style-type: none"> • Contact the Montana One Call Center at 811 at least two (2) working days in advance of construction, for location of underground utilities. • 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 |
| <ul style="list-style-type: none"> • 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. • Remove and store high tunnel cover at the end of each growing season, unless manufacturer warrants the cover for snow loads. Replace cover prior to use in the spring. _____ _____ |
| Design Certification |
| <p>This Seasonal High Tunnel System plan meets the requirements of NRCS Conservation Practice Standard 798.</p> _____ _____ _____ Signature Title Date |

Seasonal High Tunnel System – Layout and Location

Plan view of seasonal high tunnel system site shown below. Include prevailing wind direction, runoff, erosion control, weed control and compaction reduction measures, if any.

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



Additional Specifications and Notes:

Seasonal High Tunnel System – Construction Checkout

| Seasonal High Tunnel Structure – <i>as-built</i> measurements | |
|--|-----------------------------------|
| Dimensions | Length (ft)_____ Width (ft)_____. |
| Height in Center (ft) | |
| Polyethylene type and thickness | |
| Structure Manufacturer and series name. | |

| Supporting Practices Installed | |
|--|---|
| <input type="checkbox"/> Critical Area Planting <input type="checkbox"/> Underground Outlets <input type="checkbox"/> Diversion <input type="checkbox"/> Other _____. <input type="checkbox"/> Other _____. <input type="checkbox"/> 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 meets NRCS standards and specifications. <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| Check out by: _____ | Date: _____. |

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Approved High Tunnel Product List

January 21, 2010

| Source | Manufacturer / Style |
|---|---|
| Agra Tech, Inc., Pittsburg, CA Toll Free: 877-432-3336 Web Site: http://www.agra-tech.com/menu.php | Agra Tunnel, Cold Frame |
| Atlas Manufacturing, Inc., Alapaha, GA Toll Free: 800-346-9902 Web Site: http://www.atlasgreenhouse.com/ | 16' Hoop House, 20' RT series, 30' Price Buster, 30' Budget Plus, Emerald Cold Frame |
| FarmTek South Windsor, CT Toll Free: 800-327-6835 Web Site: http://www.farmtek.com/farm/supplies/home | All three companies sell ClearSpan Products: (manufactured and shipped from IA.) 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: http://www.growerssupply.com/farm/supplies/home | |
| Tek Supply Dyersville, IA Toll Free: 800-835-7877 Web Site: http://www.teksupply.com/farm/supplies/home | |
| Haygrove Elizabethtown, PA Toll Free: 866-429-4768 Web Site: http://www.tunnelbuzz.com/ | Solo Series |
| Poly-Tex, Inc. Castle Rock, MN Toll Free: 800-852-3443 Fax: 651-463-2479 E-Mail: info@poly-tex.com Web Site: http://www.poly-tex.com/ | FieldPro, PT-30, Kool House |
| Stuppy Greenhouse MFG. Inc., 1212 Clay North Kansas City MO 64116-4027 Toll Free: 800-733 5025 Web Site: http://www.stuppy.com/ | Polar Cold Frame |

This list represents current manufactured kits and is subject to change and is not all inclusive.