

NATURAL RESOURCES CONSERVATION SERVICE
INTERIM MONTANA CONSERVATION PRACTICE JOB SHEET

SEASONAL HIGH TUNNEL SYSTEM FOR CROPS (FT².)

CODE 798A



Definition

A seasonal high tunnel is a polyethylene covered structure 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. Permanently raised beds may be used but crops have to be grown in natural soil and not on tables/benches, portable pots, etc.

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.

MT798A-JS2

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 with a minimum of 3 purlins per high tunnel.
3. High tunnels shall be constructed on-site according to manufacturer's specifications.
4. High tunnels shall be anchored according to manufacturer's specifications to ensure structures can withstand high winds and micro-bursts.
5. Any changes in construction of the high tunnel including anchoring shall be in accordance with manufacturer's recommendations and approval.
6. To ensure proper alignment and adequate anchoring the foundation shall be level.
7. Anchor depth shall be uniform around the structure.
8. Internal bracing adds additional strength and stability to high tunnels, especially if tunnels are to be moved.
9. Two-inch x six-inch heartwood (higher grade) redwood or cedar or 5/4 x 6" recycled plastic lumber baseboards shall be fastened to the structure in accordance with the manufacturer's recommendations.
10. As a minimum, a 6-mil greenhouse grade, UV resistant polyethylene cover, with a 4-year warranty shall be used.
11. Means shall be provided to allow the sides to be rolled up in accordance with the manufacturer's recommendations.
12. 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.

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.

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

High Tunnel Structure, size(s) _____

Supporting Practices:

- Critical Area Planting (job sheet attached)
- Underground Outlet (construction plan attached)
- Diversion (construction plan attached)
- Other _____
- Other _____

High Tunnel System Construction

- 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

- 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.

Approval

I have received a copy of the jobsheet and understand the contents and requirements.

Producer Signature	Date
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Certification

I hereby certify that this practice has been installed in accordance with NRCS standards and specifications.

NRCS Conservationist

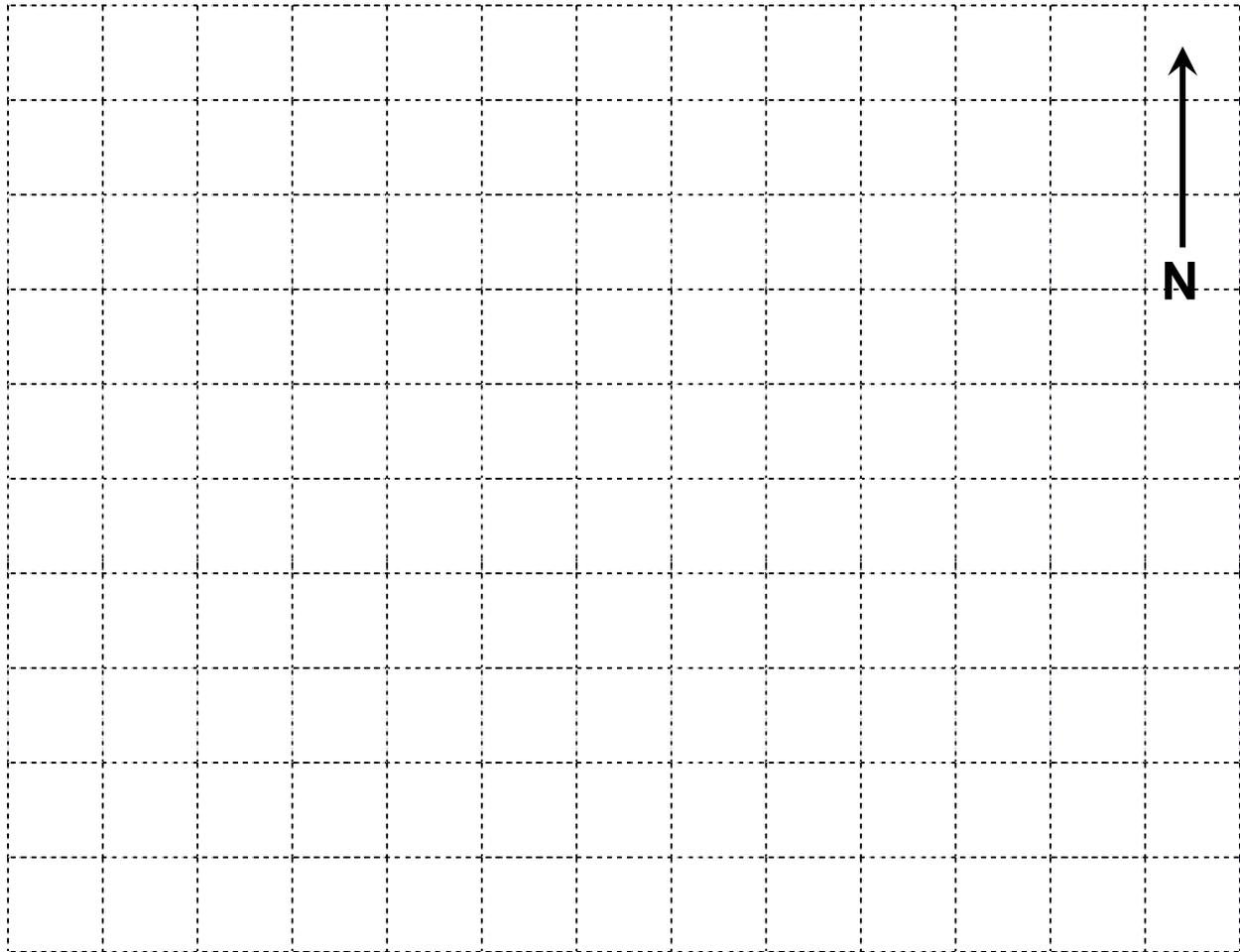
Job Approval Authority

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.	
Anchoring system; type, measurements, depth, number and location of anchors.	
Foundation/base level and structure properly aligned.	

Supporting Practices Installed (check all that apply):

- Critical Area Planting
- Underground Outlets
- Diversion
- Other_____
- Other_____
- Other_____

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

NRCS Approval

Engineering Approval by_____ Job Class_____ Date_____

Bio/Veg Approval by_____ Job Class_____ Date_____

Owner/Operator Review

I have reviewed the drawings, construction specifications, and special provisions, and agree to construct this project in accordance with them. Modifications to the final drawings, specifications, or special provisions during construction will require approval from the NRCS prior to installation.

I agree to obtain all the necessary permits, easements, and water rights. I will inform the NRCS of all conditions pertaining to project construction as stated in the acquired permits. I agree to comply with all Federal, State, and local laws and regulations pertaining to this construction.

I acknowledge responsibility for marking private underground utilities affected by the project. The excavator will call the Utility Notification Center at least two full working days before excavation begins to ensure that all publicly owned underground utilities will be marked. The "Call Before You Dig" phone number for Montana (except for Lincoln and Flathead Counties) is 811 or 1-800-424-5555. The "Call Before You Dig" phone number for Flathead and Lincoln Counties is: 1-800-551-8344 (there is no 811 equivalent for this area).

One-Call Ticket Number _____
Date

Owner/Operator _____
Date