Seasonal High Tunnels for Specialty Crop Production - 798 (Interim) Fact Sheet

North Dakota Natural Resources Conservation Service January 2010

What are Seasonal High Tunnels?
A seasonal high tunnel is a polyethylene covered structure with no electrical, ventilation, or heating system, at least six feet in height, which modifies the climate in the tunnel to create more favorable growing conditions for vegetable and other specialty crops grown in the natural soil beneath it. Evidence suggests conservation benefits associated with these structures, though scientific research is scarce. This three-year pilot will test the validity of potential conservation benefits.

Potential Benefits of a Seasonal High Tunnel
Potential benefits from using seasonal high tunnel structures include: (1) improved plant quality, (2) improved soil quality, (3) improved water quality through methods such as reduced nutrient and pesticide transport and (4) an extended growing season for specialty crops in our region.

Features of Seasonal High Tunnels
Seasonal high tunnel kits in various widths and lengths are available from numerous vendors. Seasonal high tunnels are constructed of metal or plastic 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. A seasonal high tunnel structure should cover several crop rows, 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.

Why an Interim Conservation Practice Standard
The NRCS will use an interim conservation practice standard to field test this new technology. NRCS is required to prepare annual reports to discuss the resulting strengths and weaknesses of interim conservation practices, and to provide recommendations about whether to develop a national conservation practice or to discontinue the use of this practice.

Conservation Planning Approach
Water runoff from the seasonal high tunnel can cause issues that will require the application of other practices such as roof runoff structures and critical area plantings. These additional practices must be planned and installed as a condition for the installation of a seasonal high tunnel. Additional practices should be considered as a part of a conservation plan, such as nutrient and pest management, residue management and crop rotation.

Plans and Specifications for High Tunnel Systems
Producers who plan to install seasonal high tunnel systems need to provide the following information:

1) The layout and location of the high tunnel structure
2) Planned erosion and/or drainage control practices
3) Structure design, including a list of materials and options needed for the complete system to be operational, as provided by the vendor

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Plans and Specifications for High Tunnel Systems (cont.)

4) Planned installation schedule for the seasonal high tunnel and additional practices, including site preparation requirements
5) Operation and maintenance plan that includes procedures for removal of the covering at the end of the growing season.

Financial Assistance for Seasonal High Tunnels

In North Dakota, EQIP funding for seasonal high tunnels will be offered to current organic producers or those producers transitioning to organic production.

During the pilot period, seasonal high tunnel systems may be eligible for financial assistance through the Environmental Quality Incentives Program (EQIP). Financial assistance will be limited to tunnels covering up to 5 percent of one acre (2,178 square feet) per farming operation – equivalent to a structure size of approximately 30 feet x 72 feet. Minimum height for a high tunnel system is 6 feet. Seasonal high tunnels have an expected practice life of four years.

Options and Features Not Eligible for Financial Assistance

EQIP funding is **not** available for:

- Irrigation systems in the seasonal high tunnel
- Utilities (electrical, water, etc)
- Power ventilation systems
- Heating systems

Documentation Requirements

In addition to the design and structural layout requirements noted above, the seasonal high tunnel system is an interim conservation practice NRCS will be evaluating during this 3-year pilot period. Several aspects of the performance of seasonal high tunnels impacting various natural resource concerns and production issues need to be addressed.

To effectively assess the performance of seasonal high tunnel systems, NRCS will require the following economic and production information from successful EQIP applicants:

1) The size and cost of the season high tunnel system (1st year only)
2) Annual maintenance cost and requirements for the high tunnel system
3) What resource concerns are being addressed with installation of the high tunnel system
4) Wind, sheet and rill erosion before and after installation of the high tunnel system (this will be provided by NRCS)
5) Documentation of erosion and drainage concerns and specific practices installed to address those concerns
6) What was the effectiveness of the installed practices for erosion and drainage control
7) How did the seasonal high tunnel system extend the growing season, (ie. planting and harvest dates inside and outside of the high tunnel system)
8) Did the seasonal high tunnel system increase production, if so, how much?
9) Records and documentation on applied nutrients from all sources, before and after high tunnel system installation
10) Records and documentation for applied pesticides, before and after high tunnel system installation
11) Producer observations and recommendations