Small Farms: High Tunnel System

Overview

What is a high tunnel system?

High tunnels are structures that protect crops from sun, wind, excessive rainfall, or cold, to extend the growing season – and provide an intermediate level of environmental protection and control compared to open field conditions and greenhouses. They can be covered in multiple materials such as polyethylene or plastic, polycarbonate, or fabric. Compared to greenhouses, they are easy to build and maintain and provide an energy-efficient way to extend the growing season. Protection from high tunnels may also reduce exposure to insect pests and help prevent chemical drift from reaching crops.

The frame is typically constructed from metal and covered by UV (ultraviolet) resistant, 6 mil grade polyethylene material. High tunnels are usually covered with a single layer of this plastic sheeting, but another layer of shade cloth may often be seen on the structures. The tunnels are typically passively ventilated with roll-up sides and end walls which can be opened or removed, but ventilation fans may be added for increased temperature and air control.

Can I install electricity, power heating, or cooling units in the high tunnel?

Electricity, venting systems, lighting, etc. can be installed providing the additions meet the manufacturer's designs and specifications. However, the grower is responsible for those costs.

Some municipalities may restrict the size of outdoor structures or limit the use of water or electricity within outdoor structures. It is the responsibility of the producer to obtain the correct permitting and locality permissions.

What type of high tunnels can NRCS assist with?

For NRCS financial assistance, high tunnels must be designed and constructed from a manufactured kit, often called a "high tunnel kit". Kits come with installation instructions and warranty requirements from the manufacturer. NRCS requires that high tunnels be installed in accordance with the manufacturer specifications.

NRCS cannot provide financial assistance for "DIY" high tunnels that are not constructed from a commercial kit.

Could I install a used tunnel system?

Potentially! However, a used high tunnel still must be planned, designed, and constructed in accordance with manufacturer's specifications *and* backed by a warranty from the manufacturer. In general, the materials should be:

- Suitable for the proposed work
- Meet manufacturer testing and warranty requirements
- Have an expected service life equal or greater than the alternative new materials
- Structurally adequate and environmentally acceptable
- Do not increase operations or maintenance costs over the use of new materials

Significant modifications to the high tunnel structure design, including the use of used materials, must be verified and approved by the manufacturer prior to construction.

Interested in extending the growing season on your small farm?

USDA's Natural Resources Conservation Service (NRCS) can help you evaluate your options and develop a conservation plan to help you reach your goals.

USDA Service Centers are located in every Iowa county and can be easily found using the service center locator: nrcs.usda.gov/contact/find-a-service-center

Are there limitations on what can be produced in a high tunnel?

There are few restrictions to agricultural production within the high tunnel. High tunnels can be used for annual and perennial crops that are **grown in the natural soil profile.** These can include vegetables, small fruit trees and shrubs, cut-flowers, or other high value crops.

Framed and unframed raised beds are permitted below a 12" height, given the raised bed construction allows for root growth into the natural soil profile, **or** the only root-soil barrier is a non-woven geotextile fabric.

Crops grown on tables/benches, in pots, hydroponically, or plant species in violation of State or Federal laws are not applicable. The high tunnel also cannot be used to provide shelter or housing for any livestock, or to store supplies or equipment for the 5-year lifespan of the practice.

Can a high tunnel stay up year-round?

Management of the high tunnel will depend on weather conditions. Many high tunnels are not guaranteed to withstand extreme snow loads or high winds. Research manufacturer specifications for their specific recommendation for each model and material.

In short, so long as repairs are made and materials are replaced when needed, a high tunnel may remain up year-round. It is the responsibility of the contract holder to repair and maintain the structure for the 5-year lifespan of the high tunnel.

Producers may choose to remove and store the cover at the end of each growing season to avoid ice and snow damage.

Where can I place my high tunnel?

NRCS planners will work with you to decide where to place a high tunnel, considering factors like:

- Current land use
- Soil type, slope (below 5%), other landscape features
- Buried utilities, distance to irrigation water
- Shade, wind, other elements related to management

Can a high tunnel be portable?

Yes, they can be moved to facilitate cropping systems as long as the high tunnel remains located within the farm, tract, and field number associated with the Environmental Quality Incentives (EQIP) contract.

If I already have a high tunnel, can I apply for another one?

Yes. An applicant can apply for a high tunnel even if they already have an existing high tunnel.

Are there financial assistance limitations for high tunnel systems?

Iowa NRCS has no payment cap for the high tunnel practice. However, all NRCS contracts are subject to current Farm Bill payment limitations.

Additionally, historically underserved producers, such as Beginning Farmers, may be eligible for a higher payment rate per square foot.

Other program eligibility requirements apply. Contact local NRCS and Farm Service Agency (FSA) staff to help determine financial assistance program eligibility!

Can other NRCS practices be paired with a high tunnel?

Yes, supporting practices are available to ensure that resource concerns associated with implementing and managing high tunnel systems are addressed.

NRCS planners will meet with you on-site and listen to your needs to help identify any resource concerns that may need to be addressed with additional practices.

Common supporting practices include:

- Cover crops
- Crop rotation
- Erosion control measures
- Low tunnels
- Mulching
- Micro-irrigation
- Nutrient and pest management
- Pollinator habitat
- Raised beds