High Tunnels

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DEFINITION

A seasonal polyethylene covered structure with no electrical, heating, and/or mechanical ventilation systems that is used to cover crops to extend the growing season in an environmentally safe manner.


In climate conditions where snow loads may damage the structure, the tunnel cover shall be removed at the end of the growing season.

PURPOSE

- Extend the crop growing season
- Improve plant quality
- Improve soil quality
- Improve water quality from reduced nutrient and pesticide transport

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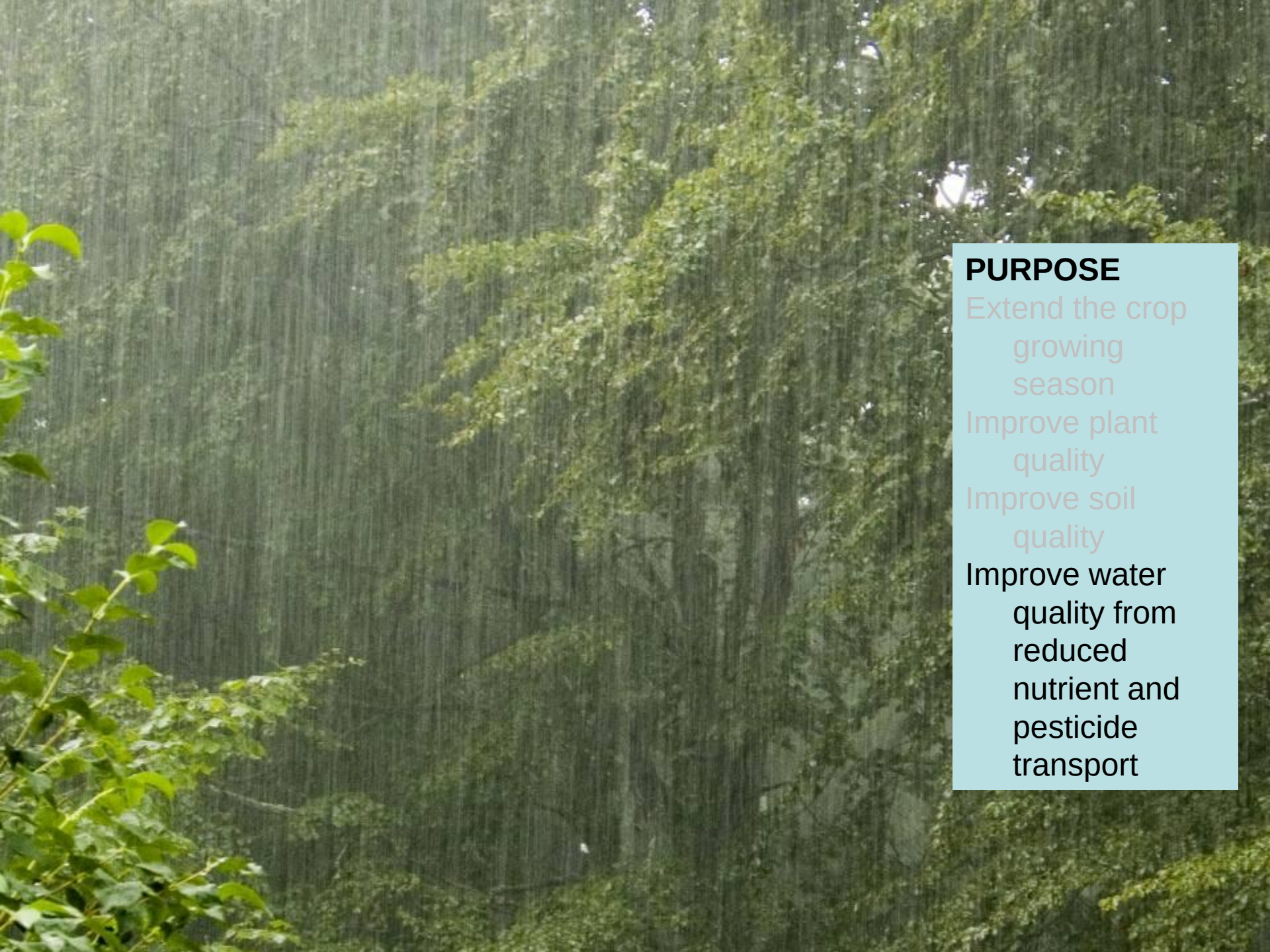

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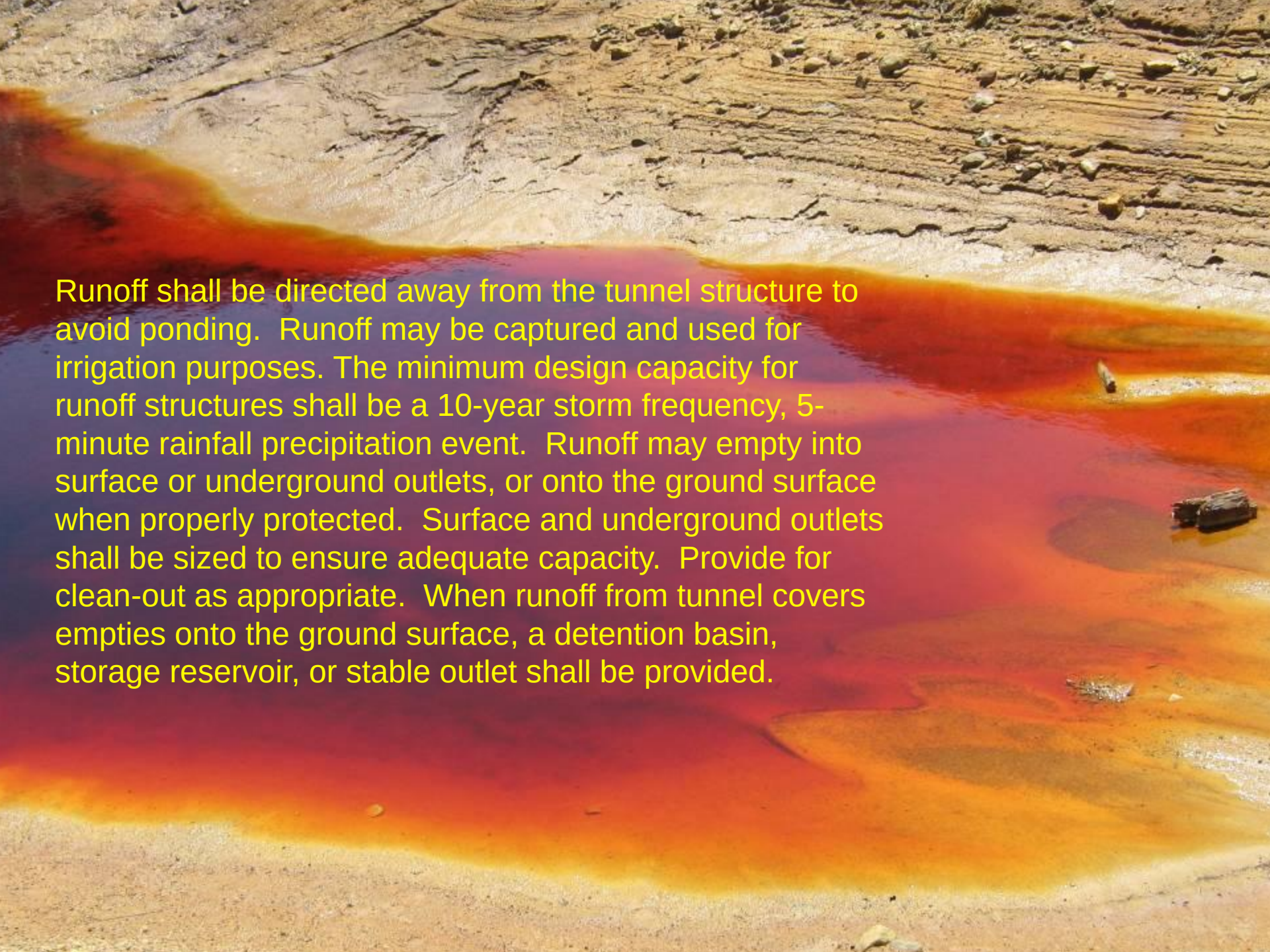
CONDITIONS WHERE PRACTICE APPLIES

This practice applies to existing cultivated cropland where extension of growing season is needed due to climate conditions and crops can be grown in the natural soil profile.

The seasonal tunnel structure must be planned, designed, and constructed in accordance with manufacturer's recommendation. The tunnel frame must be constructed of metal, wood, or durable plastic; and be at least 6 feet in height.

Seasonal tunnel structures shall be selected and applied over the crop area. The material shall be of a significant thickness to withstand the temperature modification for the period required. As a minimum, a 6-mil greenhouse-grade, UV resistant polyethylene cover will be used.

Permanently raised beds may be installed to improve soil condition, fertility, and agri-ability access, but does not apply to crops not grown in the natural soil profile (i.e. tables/benches, portable pots, etc.).
The practice does not include greenhouses or low tunnel systems



Runoff shall be directed away from the tunnel structure to avoid ponding. Runoff may be captured and used for irrigation purposes. The minimum design capacity for runoff structures shall be a 10-year storm frequency, 5-minute rainfall precipitation event. Runoff may empty into surface or underground outlets, or onto the ground surface when properly protected. Surface and underground outlets shall be sized to ensure adequate capacity. Provide for clean-out as appropriate. When runoff from tunnel covers empties onto the ground surface, a detention basin, storage reservoir, or stable outlet shall be provided.

Surface or ground outlets such as rock pads, rock filled trenches with subsurface drains, concrete and other erosion-resistant pads, or preformed channels may be used.
Seeding and vegetation shall be established on all disturbed earth surfaces.

Additional Criteria to Reduce Nutrient and Pesticide Transport

The irrigation water applied under the covered area shall not exceed the available water capacity of the soil to avoid runoff and leaching below the root zone.

Additional Criteria to Improve Soil Quality

The area inside the seasonal structure shall have a positive Soil Conditioning Index and soil loss with tolerable limits using currently approved agency wind and water erosion technology.

CONSIDERATIONS

Locate the tunnel cover convenient for ingress/egress of plant materials.

Remove or manipulate side covers to control internal temperatures.

Rotate the location of the tunnel to allow rain, wind, sun, and cold temperatures to cleanse the soil from disease build up. Rotation allows growing cover crops on the site during the uncovered period.

Plan the appropriate measures to address:

crop rotation
irrigation water management
nutrient management
pest management
runoff from the structure

Have a reliable source of good quality water near or in the tunnel.

Community Garden Guide Season Extension - High Tunnel

http://www.plant-materials.nrcs.usda.gov/pubs/mipmctn5922.pdf

Community Garden Guides

http://plant-materials.nrcs.usda.gov/mipmc/communitygardens.html

Constructing a Low-cost High Tunnel

http://extension.usu.edu/files/publications/publication/HG_High_Tunnels_2008-01photos.pdf

Raspberrries

http://extension.usu.edu/files/publications/publication/Horticulture_HighTunnels_2009-01pr.pdf

Strawberries

http://extension.usu.edu/files/publications/publication/Horticulture_HighTunnels_2010-01pr.pdf