

Extending the Growing Season

WSU Cowlitz County
Master Gardener

WASHINGTON STATE UNIVERSITY
 EXTENSION

Master Gardener Program



The Only Way to Prevent is to Protect!



Protection from continuous rain and cold can extend the life of your garden!

Topics Covered:

- Damages caused by rain and frost.
- Longview rainfall graph.
- Frost days.
- Microclimates.
- Facts.
- Ways to extend the growing season.
- Setting up & types of row covers/garden fabric.
- Types of season extenders.

Prolonged Rains Can:



Saturate the Soil



Ideal Environment for Leaf Disease



Encourage Slugs



Centralia/Chehalis 2007



Too Much Water!

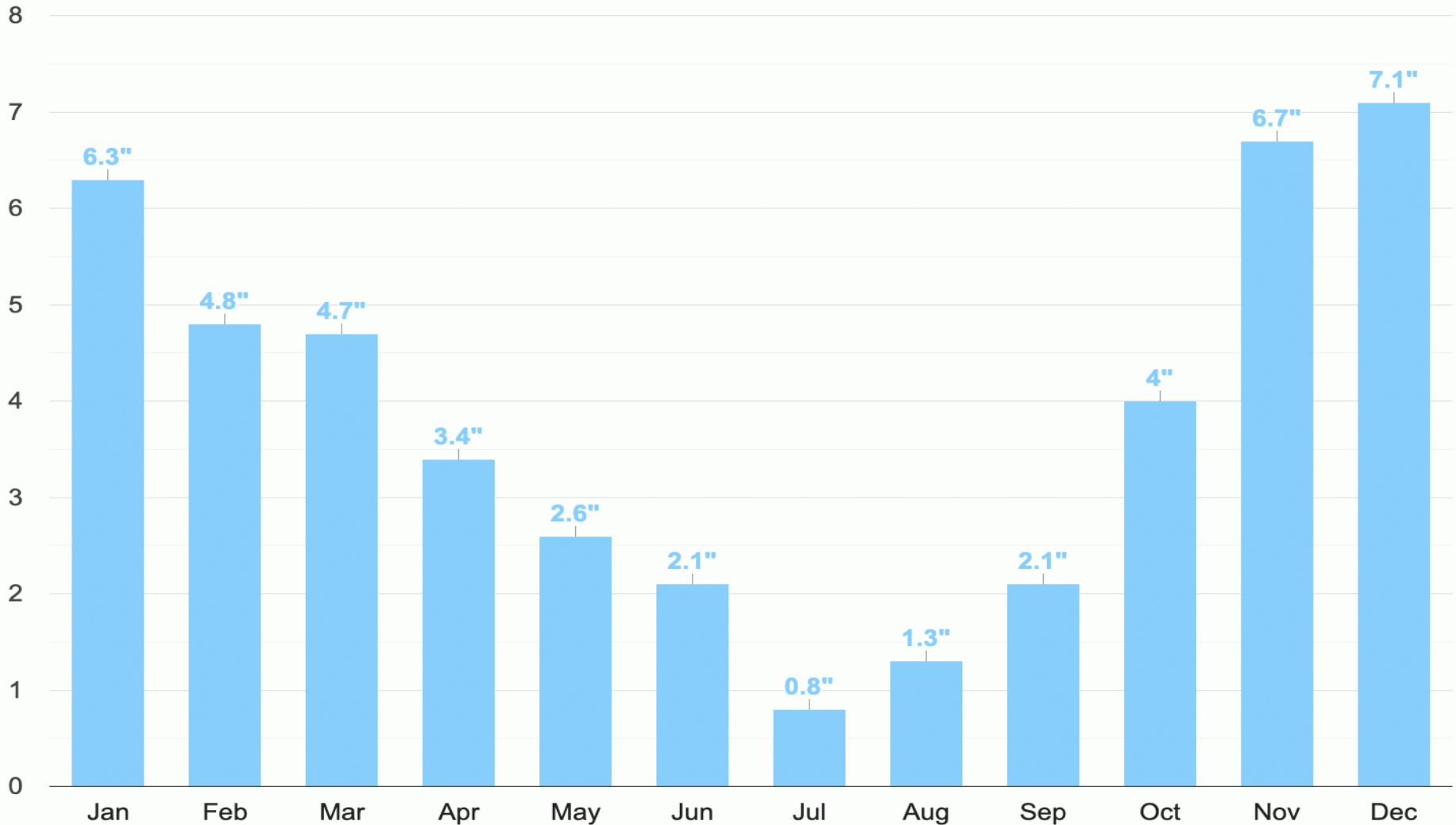


The most common reason for tomatoes splitting on the vine is water fluctuation. If the soil regularly dries out and then gets flooded with a lot of water at once, tomato fruit size outpaces the growth of the skin and causes splitting.

Longview Rainfall Graph for the Year:

Rainfall - Longview, WA

Rainfall (")



Early Cold Can:

(stop/stunt growth and frost can damage vegetables)



Cucumbers



Tomatoes



Important Dates to be Concerned About:

1st predicted frost of the year
is approximately 23 Oct.

Last predicted frost day of 2023
is approximately 9 May.

2022 OCTOBER						
SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

www.free-printable-calendar.com

2023 MAY						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

www.calendar-to-print.com

Some factors that effect frost are altitude, trees,
microclimates, walls, hills, etc.

I can have frost on my property but the house below
mine might not get a frost.

Fall and Spring Frost Days for Longview:

In the Fall:

Temperature	10%	20%	30%	40%	50%	60%	70%	80%	90%
First 16°	Dec 18	Jan 1	Jan 14	Jan 30	--	--	--	--	--
First 20°	Nov 30	Dec 15	Dec 26	Jan 6	Jan 17	Feb 1	--	--	--
First 24°	Nov 15	Nov 28	Dec 7	Dec 15	Dec 23	Jan 1	Jan 11	Jan 26	--
First 28°	Nov 3	Nov 13	Nov 19	Nov 25	Nov 30	Dec 5	Dec 11	Dec 17	Dec 26
First 32°	Oct 23	Oct 29	Nov 3	Nov 7	Nov 10	Nov 14	Nov 18	Nov 22	Nov 29
First 36°	Sep 30	Oct 6	Oct 10	Oct 14	Oct 17	Oct 21	Oct 24	Oct 29	Nov 4

In the Spring:

Temperature	10%	20%	30%	40%	50%	60%	70%	80%	90%
Last 16°	Jan 31	Jan 18	Jan 6	Dec 22	--	--	--	--	--
Last 20°	Feb 15	Feb 3	Jan 24	Jan 14	Jan 4	Dec 20	--	--	--
Last 24°	Feb 23	Feb 14	Feb 7	Feb 2	Jan 27	Jan 21	Jan 14	Jan 3	--
Last 28°	Mar 24	Mar 14	Mar 6	Feb 27	Feb 21	Feb 15	Feb 8	Jan 31	Jan 20
Last 32°	May 9	May 2	Apr 26	Apr 21	Apr 17	Apr 12	Apr 8	Apr 2	Mar 25
Last 36°	May 27	May 20	May 15	May 11	May 7	May 3	Apr 29	Apr 24	Apr 17

Location:

- ◆ Microclimates caused by walls, buildings, trees, hills, etc. all play into the climate of your garden (varies from yard to yard and can vary in the same yard).
- ◆ Choose the warmest location.
- ◆ Don't plant in a spot that is prone to early frost (bottom of a hill or exposed to wind).
- ◆ Area that gets as much sun as possible during autumn & winter (such as a south-facing slope).
- ◆ Easily accessible.

Facts:

- ◆ Cold weather doesn't kill hardy plants; it simply slows their growth rate.
- ◆ For every rise of 18 degrees, growth rate doubles, but that guideline is only applicable for an air temperature range of 40 to 98 degrees.
- ◆ The hardiest vegetables that can withstand heavy frost of air temperatures below 28 include: spinach, Walla Walla sweet onion, garlic, leeks, rhubarb, rutabaga, broccoli, kohlrabi, kale, cabbage, chicory, Brussels sprouts, corn salad, arugula, fava beans, radish, mustard, Austrian winter pea and turnip.

Facts:

- ◆ Semi-hardy vegetables that can withstand light frost of air temperatures in the range of 28 to 32 degrees include: beets, spring market carrots, parsnip, lettuce, chard, pea, Chinese cabbage, endive, radicchio, cauliflower, parsley and celery.
- ◆ For beets, spring market carrots and parsnips, the tops will die but the roots will tolerate lower temperatures.

Ways to Extend the Growing Season:

- ◆ Row Covers/
Garden Fabrics.



- ◆ Cloches/Low
Tunnels.

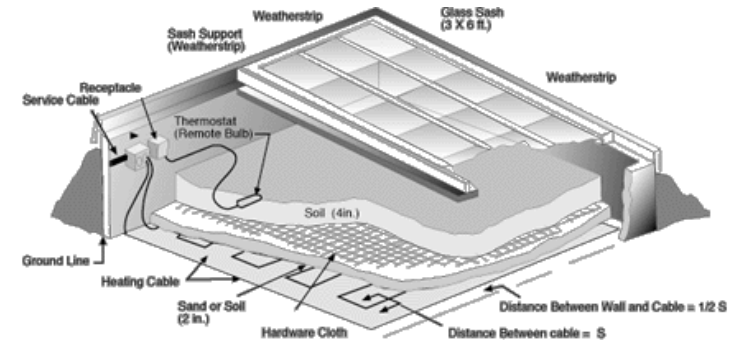


- ◆ High Tunnels.

- ◆ Greenhouses.

- ◆ Cold Frames.

- ◆ Hot Boxes.



Construction of an electrically heated hotbed

Most row covers/garden fabric do better with a frame:

- ◆ This frame is set up with PVC bent into an arc to make a frame (rebar pushed into the ground to anchor).
- ◆ You can buy commercial frames.
- ◆ You can make your own frames - #9 gauge wire 50 feet for \$16.45. (just under 1/8 " dia., 76" covers a 3 - 4' bed, space them 2 - 4' apart).
- ◆ **If using row covers to prevent frost damage - the fabric should NOT touch the plant.**



Something to Secure the Fabric:



- ◆ Unless you want to chase the fabric every time the wind blows - you need to secure it . . .
- ◆ You can certainly secure by pegs - but a 2" x 4", sand bag or brick will work just as well.



Types of Row Cover/Garden Fabric:

Frost Blanket:

- ◆ Protection to 24° - 26°F.
- ◆ Only 50% light penetration.
- ◆ Prices: 1.5 oz./sq. yd.
 - Territorial Seed: 6' x 20' \$24.95.
 - Amazon: 6' x 50' \$29.11.
 - AM Leonard: 10°F, 6' x 250' \$124.59.



Types of Row Cover/Garden Fabric:

Reemay:

- ◆ Many names - most with the same general properties.
- ◆ Moderate protection down to 30°F.
- ◆ 75 - 85% light transmission.
- ◆ Prices: .5 oz. - .6 oz./sq. yd.
Territorial Seed: (.6 oz.) 67" x 20' \$20.95.
Amazon: (.55 oz.) 10' x 50' \$31.24.



Types of Row Cover/Garden Fabric:

Grow Guard: used for germination and insect protection.

- ◆ Similar to Reemay - gentler on tender young plants.
- ◆ 85% light transmission.
- ◆ Protects to 27° with NO wind.
- ◆ Prices:
 - Territorial: (.6 oz./sq yd) 6' x 20' \$16.95.
 - Amazon: 6' x 25' \$12.99/6' x 200' \$49.92.
 - AM Leonard: (.5 oz./sq yd) 6' x 250' \$33.59.



Types of Row Cover/Garden Fabric:

Insect Barrier:

- ◆ Protects plants from insect damage.
- ◆ Micro-mesh/micro-barrier.
- ◆ 90% - 93% light transmission.
- ◆ Prices:
 - Territorial: (.4 oz.) 6' x 20' \$14.95.
 - Amazon: 6.5' x 15' \$13.99.
 - AM Leonard: (.5 oz. 85%) 6' x 250' - \$33.59.



Types of Row Cover/Garden Fabric:

Growtherm:

- ◆ Clear perforated plastic.
- ◆ Designed to provide extra warmth (10°F) to heat loving crops (melons - sweet potatoes).
- ◆ Prices:
Territorial: 6' x 20' \$14.95.



Lots of commercial kits available . . .

- ◆ Choice is up to you - pick something that fits your needs and budget.



\$10.99 Amazon



\$66.99 Walmart



\$49.95 Amazon

Types of Season Extenders: Cloches/Low Tunnels



Lots of options - depending on your needs.



Most are about 12 -18" tall & 2 - 3' wide.

Types of Season Extenders: Cloches/Low Tunnels



Cloches - a small translucent dome shaped cover for protecting or forcing outdoor plants. (Original used to be a glass dome but has changed)



Types of Season Extenders: High Tunnels

High tunnels are unheated, plastic-covered structures that provide an intermediate level of environmental protection and control compared to open field conditions and heated greenhouses. High tunnels can be walked through or tractors can be driven through.



PennState
College of Agricultural Sciences



Types of Season Extenders: Greenhouses

A **greenhouse** is a structure with walls and roof made chiefly of transparent material in which plants requiring regulated climatic conditions are grown.

These structures range in size from small sheds to industrial-sized buildings.



Installed Greenhouse 2015 10 ft X 12 ft from Harbor Freight (bought 2014). Almost a year planning prior to installing.

Simple Greenhouse



- Purchased for \$450.
- Concrete \$100.
- Weed block \$10.
- Gravel \$30.
- 4 shelves & bench/shelf including hardware \$120.
- Conduit & water piping \$7.
- A little muscle, sweat, head scratching and approximately \$720 later.

Same Greenhouse 2017:



Types of Season Extenders: Cold Frames

A **cold frame** is a transparent-roofed enclosure, built low to the ground, used to protect plants from adverse weather, primarily excessive cold or wet. The transparent top admits sunlight and prevents heat escape via convection that would otherwise occur, particularly at night.



Types of Season Extenders: Hot Bed/Box

A **hot bed**, also known as a hot box, is a heated cold frame. The bed is heated with a heating element or material (heating cables, manure, hot water, etc.) under the planting surface.

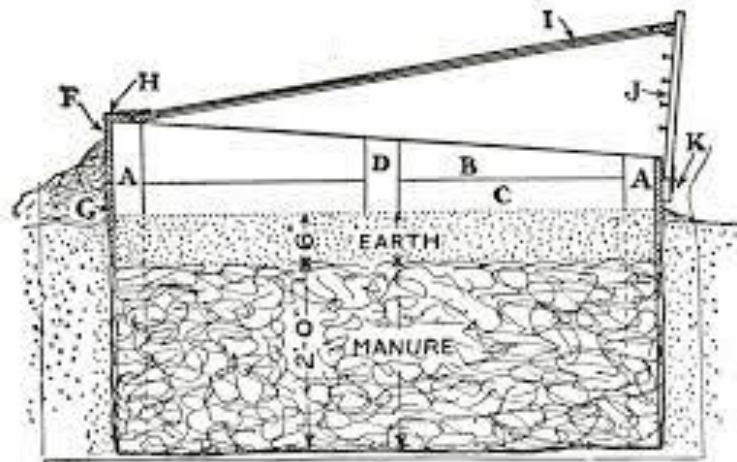
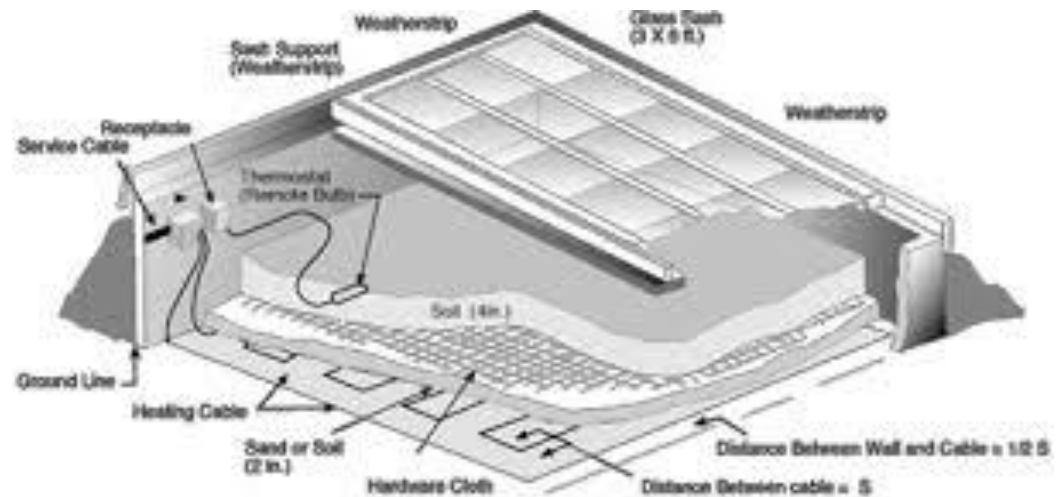


FIG. 583. — Longitudinal Section of Hotbed Frame and Pit



Construction of an electrically heated hotbed

Wall o Water:



Fill the tubes of these plant protectors with water, and you can plant earlier and harvest later.

Full Description

The Wall O Water will add 8 weeks to your growing season. Fill the tubes of these self-standing plant protectors with water, and they provide additional heat for plants, so you can plant earlier and harvest later. Protects plants down to 16 F. Reusable. 18" diam. x 18" high (3 for \$25.95 Amazon).

In Summary:

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- Types of season extenders.

QUESTIONS?



References:

WSU:

<https://extension.wsu.edu/snohomish/plastic-culture-to-extend-growing-season/>

<https://s3.wp.wsu.edu/uploads/sites/2079/2014/02/ProtectingYoungPlants.pdf>

WSU Master Gardener Training Manual (Chap 6 & 25).

OSU:

<https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/pnw548.pdf>

<https://extension.oregonstate.edu/news/these-cold-hardy-vegetables-may-stick-it-out-through-winter>

<https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/ec1627.pdf>

UMaine:

<https://extension.umaine.edu/publications/2752e/>

UW:

<https://hort.extension.wisc.edu/articles/extending-garden-season/>

How to build a hoop house:

<https://www.motherearthnews.com/organic-gardening/low-tunnel-construction-mini-hoop-house>

WASHINGTON STATE UNIVERSITY



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Evidence of noncompliance should be reported to your local WSU Extension office.

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