

# Emily Herb, Master Gardener

Tonight's Topics:

Soil, organic matter, compost, fertilizer,  
soil testing, soil temperature, mulch, and  
row covers



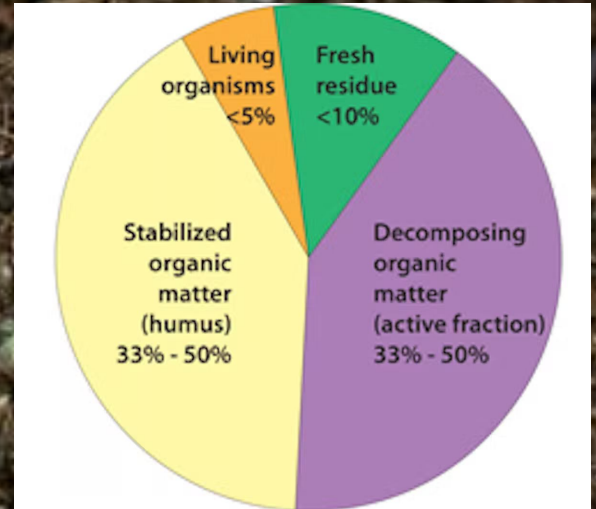
# What is SOIL?

- Rock 45-48%
- Air & Water 50%
- Organic matter 2-5%



# What is Organic Matter?

The Living  
The Dead  
The Dying  
The Very Dead



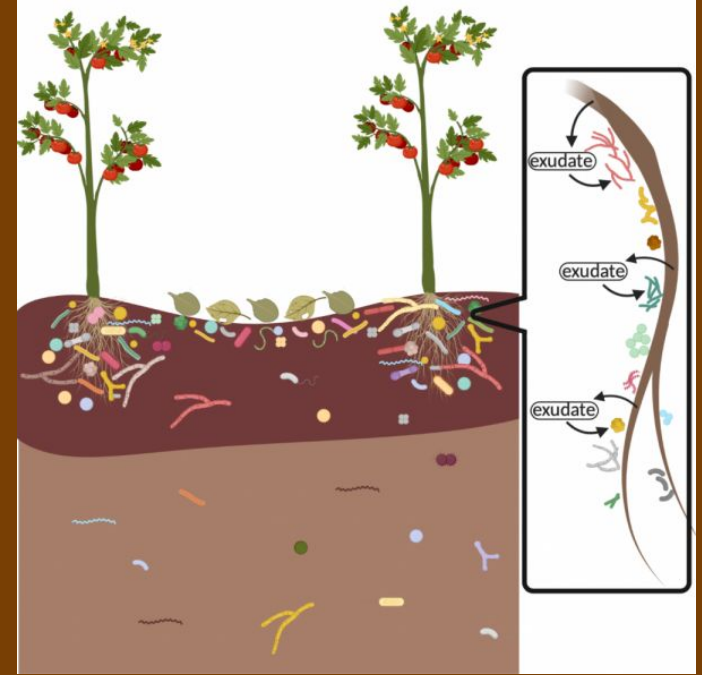
# Why do we care about organic matter?

Because organic matter is food for our soil microbes.



# Why do we care about soil microbes?

- They break down the soil organic matter nutrients into a form the plant can use
- They deliver those nutrients to the plants
- They create soil structure that allows the soil to hold air and water (50%)
- They control pathogens in the soil



“A single teaspoon (1 gram) of rich garden soil can hold up to one billion bacteria, several yards of fungal filaments, several thousand protozoa, and scores of nematodes.” Kathy Merrified retired nematologist OSU

<https://extension.oregonstate.edu/news/secret-life-soil>

# Why Add Compost Every Year?



- Increases soil organic matter
- Feeds soil microbes
- Soil holds moisture better
- 2-6 inches per year
- <https://www.landscapecalculator.com/calculators/mulch>

<https://today.oregonstate.edu/news/study-shows-some-urban-gardens-contain-too-much-organic-matter>

# Why Make and Add Complete Organic Fertilizer Every Year?

- Organic fertilizer feeds the soil microbes too. It makes sure that everything the microbes need to do their job is present in the soil.
- Preplant - Annually (spring) spread 4-6 quarts per 100 square feet of raised bed.
- Follow Territorial Seed Catalog recommendations for how much to use with transplants (it varies)
- Sidedress - as needed for vegetable type, 4-6 quarts per 100 square feet during growing season



# Complete Organic Fertilizer #1

- 4 parts seed meal
- ½ part lime
- ½ part phosphate rock
- ½ part kelp meal

Steve Solomon

*Growing Vegetable West of the Cascades*

# Complete Organic Fertilizer #2

- 3 parts seed meal
- 1 part “tankage” (blood and bone meal, feather meal)
- ¼ part agricultural lime
- ¼ part gypsum
- ½ part dolomite lime
- 1 part phosphorus (rock phosphate, bonemeal, guano)
- 1 part kelpmeal and/or basalt rock dust

Steve Solomon

*Gardening When it Counts*





# Chicken Poo / Compost Tea

## A liquid fertilizer option

<https://rodaleinstitute.org/blog/compost-tea-a-how-to-guide/>



# Our Beloved (CLAY) Soil

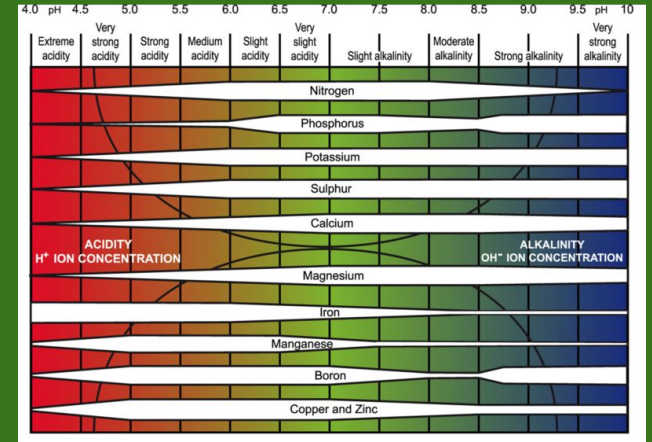
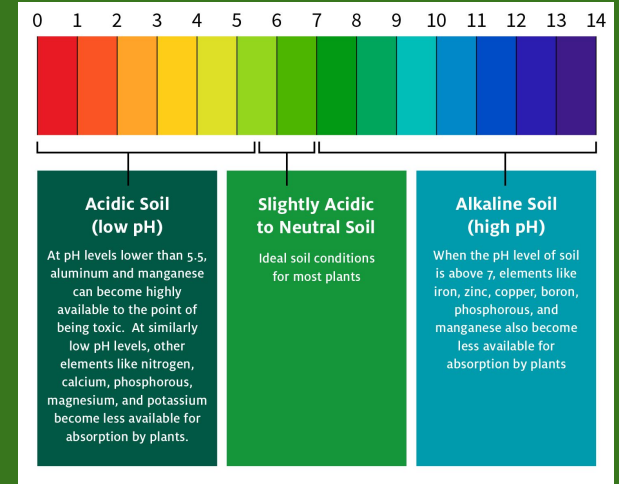
“Like diamonds, clay soils are forever”

<https://today.oregonstate.edu/news/diamonds-clay-soils-are-forever>

**Steve Solomon - Clay is basically subsoil**

Strategies - raised beds, importing soil,  
Tons of compost, cover cropping

**Soil pH - The lower the number the more acidic. We are slightly acidic typically.**



# Soil Testing - does it matter?

- Oregon State University  
<https://cropandsoil.oregonstate.edu/sh/testing-services/soil-testing>
- Logan Labs  
<https://www.loganlabs.com/customer-tools>
- Grow Abundant Gardens  
<https://growabundant.com/>



# Soil Temperature

## Why it Matters

### Oregon State University Soil Temps

<https://extension.oregonstate.edu/gardening/soil-compost/soil-temperature-conditions-vegetable-seed-germination>

### University of California Soil Temp Sheet

<https://sacmg.ucanr.edu/files/164220.pdf>

### Check out a Soil Thermometer

<https://library.ci.corvallis.or.us/#section=resource&resourceid=2805437492&currentIndex=0&view=fullDetailsDetailsTab>



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Website: [sacmg.ucanr.edu](http://sacmg.ucanr.edu)

## Garden Notes

GN 154

### SOIL TEMPERATURE CONDITIONS FOR VEGETABLE SEED GERMINATION

Many internal and environmental conditions influence seed germination: condition of the seed, presence of water, sufficient air, soil conditions, and temperature. The chart below lists the optimum soil temperatures at which they do best. This does not mean your seeds will not germinate at higher or lower temperatures, but greater success will be achieved if optimum conditions are provided. Using a probe-type thermometer is an accurate method for testing soil temperatures prior to planting seeds and small plants.

Crops	Minimum (°F)	Optimum range (°F)	Maximum (°F)
Asparagus	50	75-85	95
Beans, Lima	60	75-85	85
Beans, Snap	60	75-85	95
Beets	40	65-85	95
Broccoli	40	60-85	95
Cabbage	40	60-85	95
Carrots	40	65-85	95
Cauliflower	40	65-85	95
Celery	40	*	*
Chard, Swiss	40	65-85	95
Corn	50	65-95	105
Cucumbers	60	65-95	105
Eggplant	60	75-85	95
Garlic	32	65-85	95
Leeks	32	65-85	95
Lettuce	32	60-75	85
Muskmelons (Cantaloupe)	60	75-85	105
Okra	60	85-95	105
Onions	32	65-85	95
Parsley	40	65-85	95
Parsnips	32	65-75	85
Peas	40	65-75	85
Peppers	60	65-75	95
Pumpkins	60	85-95	105
Radishes	40	65-85	95
Spinach	32	65-75	75
Squash	60	85-95	105
Tomatoes	50	65-85	95
Turnips	40	60-95	105
Watermelons	60	75-95	105

Source: *California Master Gardener Handbook*, 2nd edition, Regents of the University of California, Division of Agriculture and Natural Resources, Publication 3382 (Table 5.2, page 114).

\*Note: Celery requires diffuse light and a night temperature from 10° to 15°F lower than the day temperature for good germination. Optimal conditions are 85°F day, 70°F night with diffuse light and high moisture.

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# What is Mulch?

A protective covering spread or left on the ground to reduce evaporation, maintain even soil temperature, prevent erosion, control weeds, enrich the soil, or keep fruit clean.

Plastic, straw, leaves, bark, nut shells, sawdust. If organic “the dead or dying” from previous slide



# Mulching - When, What, and Why?

- Fall and Winter - mulch to protect the soil from heavy rains and reduce weed growth.
- Spring and Summer - one can mulch with 2-3 inches of straw or leaves to help reduce weed growth and potentially help with water retention and regulation.
- Plastic mulch to warm up soil and serve as weed barrier.



# PNW Beware **DEEP** Mulch for Vegetable Gardens (meaning more than 2-3 inches) (and I don't mean compost)

- Leaves can become an impermeable mat
- Mulch keeps the soil cooler - so this can mean it takes longer for the soil to warm up in the spring and also inhibits seed germination
- Overhead watering doesn't work with mulch deeper than 2-3 inches
- One can't weed with a regular hoe with deep mulching
- Leaves and straw can lead to more slugs and weeds still need to be pulled and removed. Mulches may or may not reduce labor.

# What I've Learned



# Why Row Covers?



# Row Cover Gear

- 3/4 inch conduit bender \$50
- 3/4 inch conduit - 10ft for a 4 foot raised bed
- Greenhouse plastic 6 mil clear UV protection against degradation (4 yrs +)  
Provides frost protection, early start, season extension
- Floating row / “spunbonded” cover protection from frost, insects, birds, etc. Allows light and rain in.
- Snap clamps for 3/4 inch conduit



# This Spring



- Refer to both your planting guide and your soil temperature.
- Don't delay with your greenhouse work.
- Cold plants need more nitrogen to grow - give them tea.
- Trial and error



# Corvallis Public Seed Library

A collaborative project between the Corvallis Sustainability Coalition and the Corvallis Benton County Public Library, with educational support from the OSU Extension Service. Volunteer run, with free seeds and events, open to all for personal use. Stocked with donated vegetable, herb & flower seeds.

**Thanks to these generous contributors:**

**Adaptive Seeds**

**Garland Nursery**

**First Alternative Co-op**

**Shonnard's Nursery**

**Friends of the Corvallis-Benton Co Library**

**Individual Seed Donors & Volunteers**