

# Soil Fertility References

February 2024

## Getting started

### ***Visual inspection of a shovelful of soil***

- Do you see three or more animals (worms, centipede, larvae, ants, eggs)?
- Are there earthworm and root bipores?

[https://efotg.sc.egov.usda.gov/references/public/OR/Cropland\\_In-Field\\_Soil\\_Health\\_Assessment.pdf](https://efotg.sc.egov.usda.gov/references/public/OR/Cropland_In-Field_Soil_Health_Assessment.pdf) USDA-Natural Resources Conservation Service

### ***A Guide to Collecting Soil Samples for Farms and Gardens***

<https://catalog.extension.oregonstate.edu/ec628>

By Fery, Choate, and Murphy (2018)

### ***Certified Soil Testing Laboratories***

<https://www.naptprogram.org/pap/>

By Soil Science Society of America (2023)

***Suggested analyses for western Oregon gardeners from Pacific NW labs  
(if these links do not work, try using a different browser, like Chrome):***

- ***Simply Soil Testing (Burlington WA): S1 - Basic Soil Test***  
<https://www.simplysoiltesting.com/>
- ***SoilTest Farm Consultants (Moses Lake WA): S10 - W of Cascades***  
<https://soiltestlab.com/>

***PDF document of the slides Dean showed to Hillsboro gardeners on Feb. 21, 2024:***

[https://bf8334ec-2428-41c1-acfd-5c67163c0387.usrfiles.com/ugd/bf8334\\_66e62a346e114292af938c5e30e8d2ba.pdf](https://bf8334ec-2428-41c1-acfd-5c67163c0387.usrfiles.com/ugd/bf8334_66e62a346e114292af938c5e30e8d2ba.pdf)

## Interpreting soil test results

**From Soil Test Interpretation Guide – EC 1478**

<https://catalog.extension.oregonstate.edu/ec1478>

By Horneck, Sullivan, Owen, and Hart (2011)

**Table 10. Lime requirement for gardens in western Oregon based on the SMP test.**

When the SMP test result is ...	Apply this amount of lime (lb/1,000 ft <sup>2</sup> ):
<5.5	250
5.5–6.0	150–250
6.0–6.5	100–150
>6.5	0

**Table 2. Phosphorus (P) soil test categories and suggested fertilizer rate recommendations.**

	West of Cascades Bray P1 test P (ppm)	East of Cascades Olsen test P (ppm)	Recommendation (lb P <sub>2</sub> O <sub>5</sub> /acre)
Low	<20	<10	0–300
Medium	20–40	10–25	0–200
High	40–100	25–50	0–30
Excessive	>100	>50	0

**From Soil Test Interpretation Guide – EC 1478 (continued)**

<https://catalog.extension.oregonstate.edu/ec1478>

By Horneck, Sullivan, Owen, and Hart (2011)

**Table 3. Extractable potassium (K) soil test categories and suggested fertilizer rate recommendations.**

	Extractable or soil test K	Recommendation (lb K <sub>2</sub> O/acre)
Low	<150 ppm* <0.4 meq/100 g soil	100–300
Medium	150–250 ppm 0.4–0.6 meq/100 g soil	60–250
High	250–800 ppm 0.6–2.0 meq/100 g soil	0
Excessive	>800 ppm >2.0 meq/100 g soil	0†

\* For ammonium acetate or sodium bicarbonate extraction method.

† When extractable K is excessive, determine soil and irrigation water electrical conductivity.

**Table 4. Extractable magnesium (Mg) soil test categories and suggested fertilizer rate recommendations.**

	Extractable or soil test Mg	Recommendation (lb Mg/acre)
Low	<60 ppm <0.5 meq/100 g soil	10–100
Medium	60–300 ppm 0.5–2.5 meq/100 g soil	0–60
High	>300 ppm >2.5 meq/100 g soil	0

**From Soil Test Interpretation Guide – EC 1478 (continued)**

<https://catalog.extension.oregonstate.edu/ec1478>

By Horneck, Sullivan, Owen, and Hart (2011)

**Table 6. Extractable boron (B) soil test categories and suggested fertilizer rate recommendations.**

	Soil test B (ppm)	Recommendation (lb B/acre)*
Very low	<0.2	1–3
Low	0.2–0.5	0–3
Medium	0.5–1	0–1
High	1–2	0
Excessive	>2†	0

\* Do not apply B in a concentrated area such as a fertilizer band.

† When soil test B is excessive, determine soil and irrigation water electrical conductivity and B in irrigation water.

**From NRCS Nutrient Management Plan for Organic Systems**

<https://tilth.org/wp-content/uploads/2015/03/Nutrient-Management-in-Organic-Systems-Western-States-Implementation-Guide.pdf>

By Dufour, Brown, and Troxell (2014)

<b>Table 1. Nitrogen requirement of vegetable crops based on seasonal nitrogen uptake</b>		
<b>Low Total N Need &lt;120 lb/acre</b>	<b>Medium Total N Need &lt;120-200 lb/acre</b>	<b>High Total N Need &gt;200 lb/acre</b>
<b>Baby greens</b>	<b>Carrot</b>	<b>Broccoli</b>
<b>Beans</b>	<b>Corn, Sweet</b>	<b>Cabbage</b>
<b>Cucumbers</b>	<b>Garlic</b>	<b>Cauliflower</b>
<b>Radish</b>	<b>Lettuce</b>	<b>Celery</b>
<b>Spinach</b>	<b>Melons</b>	<b>Potato</b>
<b>Squashes</b>	<b>Onion</b>	
	<b>Peppers</b>	
	<b>Tomatoes</b>	

— Gaskell et al. 2006, *Soil Fertility Management for Organic Crops*

**Other useful publications:**

***Nutrient Management for Blueberries in Oregon***

<https://catalog.extension.oregonstate.edu/em8918>

By Hart, Strik, White, and Yang

***Organic Fertilizer and Cover Crop Calculator***

<https://smallfarms.oregonstate.edu/calculator>

By Andrews, Sullivan, Julian, and Pool