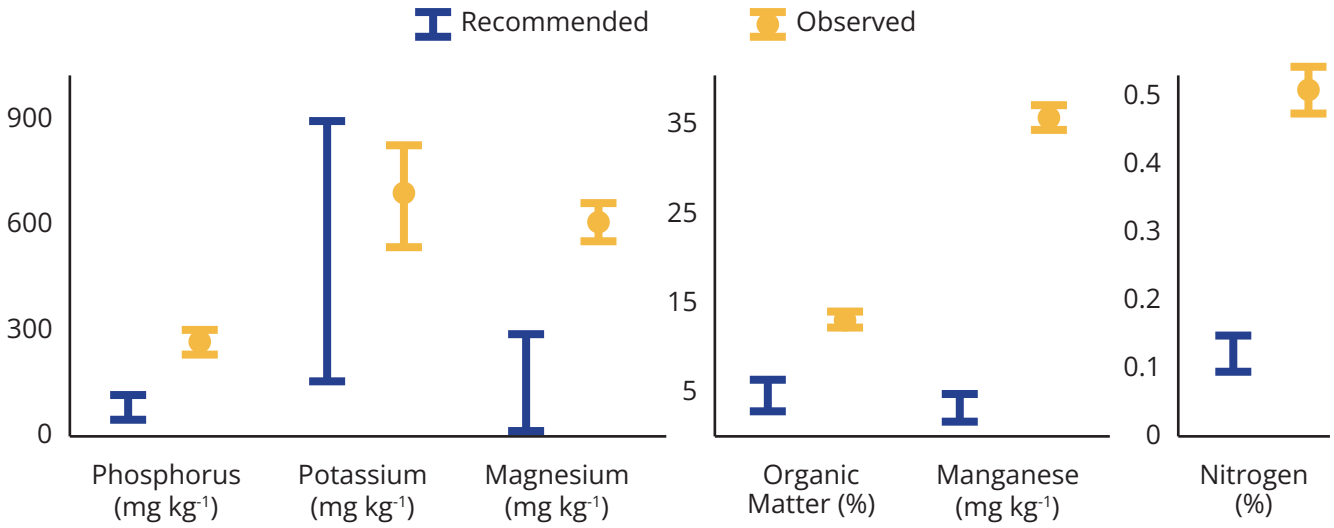
Gardeners Overapply Compost & Fertilizer

Our research

Healthy soils are the basis for sustainable gardening. Although agricultural soils have been extensively studied, we know surprisingly little about residential and community garden soils. We studied the physical, biological, and chemical characteristics of soils from 67 vegetable garden in the Willamette Valley, and compared these to published recommendations for healthy soils. We collected soil samples from in-ground and raised garden beds. The soil samples came from gardens tended by Oregon State University Extension Master Gardener™ volunteers. Since Master Gardeners receive training in soil health and fertility, we anticipated that soils would thus fall within recommended ranges.

What we found



Gardens had 2-3 times the recommended rates of phosphorus, magnesium, organic matter, and nitrogen for healthy soils. We found that manganese was 7 times higher than the upper limit of the recommended range. Gardens also had 2-3 times the recommended range for soil potassium. Excessive nutrients were also more common in raised bed gardens compared to in-ground gardens. Many other soil characteristics were found to be extremely high, including calcium, copper, and zinc, though upper range recommendations do not exist for these elements.

We suspect that gardeners are over-relying on organic matter to fertilize vegetable garden soils. Growers who take a "more is better" approach to soil management may be wasting money on soil fertilizers and amendments. In other cases, such soils could contribute to leaching of soil nutrients into local waterways.

GARDEN ECOLOGY LAB BRIEFS

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How does this relate to your garden?

Resist applying organic matter or fertilizers until you have information from a soil test to guide your management practices. When testing your soil, seek out a lab that specializes in garden soils. The higher organic matter typical of garden soils requires modifications of standard lab protocols, which some agronomic labs cannot do. Use the same lab in subsequent years so it's easier to compare results. We suggest testing your soil before you create a new garden. Once established, test your garden soil every few years.

Strive to achieve soil that is not over- or under-enriched. Over-enrichment will be particularly difficult to avoid if you garden in raised beds. When gardening in raised beds, remember to include actual soil, not just compost. Although clay soils can be challenging to some gardeners, they do a good job of retaining plant nutrients and water, and may reduce the need for repeated additions of fertilizers and amendments.

An overreliance on compost as a growing medium, at the expense of actual soil, creates a positive feedback loop: when you add compost to a garden, it breaks down, which encourages the addition of even more compost to a garden. This can lead to overapplication and an excess of soil nutrients.

Additional Information

- Nelson, M., Mhuireach, G. A., Langellotto, G. A. (2022). Excess fertility in residential-scale urban agriculture soils in two western Oregon cities, USA. Urban Agriculture and Regional Food Systems 7(1): e20027. https://doi.org/10.1002/uar2.20027
- Fery, M., Choate, J., Murphy, E. (2022). A guide to collecting soil samples for farms and gardens. OSU Extension Catalog EC628. https://catalog.extension.oregonstate.edu/ec628

- See our brief on soil bacterial microbes: Cultivating Garden Soil Bacterial Microbes
- See our brief on soil bacterial microbe taxa: Common Garden Soil Bacterial Microbes

Master Gardener™ Advice

- Contact your local extension office for Master Gardener advice, or look for Master Gardeners at local farmers' markets.
- For more 10-Minute University™ handouts, videos, and the class schedule, visit https://cmastergardeners.org.

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Oregon State University College of Agricultural Sciences