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Improving garden soil

If your garden soil is poor, consider giving it some help. Adding organic materials to sandy soils improves their nutrient- and water-holding capacity. Adding organic materials to clay soil improves drainage and aeration, and helps the soil dry and warm up more quickly in the spring.

Good organic amendments (additions) for garden soils include wood byproducts such as sawdust and bark mulch, peat moss, cured manure, grass or wheat straw, and compost. Inorganic amendments include pumice, perlite, vermiculite, and sand.

Any composted material that has been reduced to humus is a good soil amendment. For example, cured manure is an excellent soil amendment if it has been properly composted to kill weed seeds.

Unfortunately, many manures contain a lot of uncomposted bedding materials such as sawdust, wood chips, or straw. These organic materials are high in carbon content and low in nitrogen and will inhibit plant growth unless you add extra nitrogen.

Microorganisms in carbon-rich amendments take free nitrate nitrogen out of the soil to build their own tissues. Therefore, less nitrogen is available for plants until the excess carbon-rich organic matter breaks down.

The breakdown of organic matter high in carbon content would take years with the nitrogen naturally present in cattle or horse manure. To speed up the process, mix additional nitrogen into your garden—at least 6 pounds of ammonium nitrate or 10 pounds of ammonium sulfate per inch of organic matter applied over a 1,000 square foot area.

Peat moss, with its high humus content, is the ideal amendment for raised beds or small gardens because it is nearly weed-free. However, it is expensive to use in large gardens.

Inorganic amendments such as perlite, sand, and vermiculite don't contain humus or contribute to its production. Inorganics function primarily as wedges that separate soil particles, increasing soil porosity and aeration.

Sand is low in both water- and nutrient-holding capacity and causes finer silt or clay soils to compact. Mix sand with an organic amendment such as peat moss or sawdust to improve the sand's amending properties.

Thoroughly till any amendment into garden soil to prevent layering. Tilling organic amendments into gardens in the fall gives soil microorganisms an early start on converting organic matter to humus. Another tilling in spring will thoroughly mix in the amendments.

For more information

Gardening with Composts, Mulches, and Row Covers
(EC 1247)

Improving Garden Soils with Organic Matter
(EC 1561)

Laboratories Serving Oregon (EM 8677)

Soil Sampling for Home Gardens and Small Acreages (EC 628)

Available in the OSU Extension catalog:

<http://extension.oregonstate.edu/catalog>

Amending garden soil

To make a significant change in your garden soil, an amendment must equal at least one-third of the volume of the soil you are amending. For example, to amend a garden to a depth of 1 foot, you need to add one-third of a foot (4 inches) of material. Here is how to figure out the volume of material needed (using a 20-foot x 50-foot garden as an example):

1. Multiply width x length to get area:
20 feet x 50 feet = 1,000 square feet
2. Multiply area x 0.333 (one-third of a foot) to get cubic feet: 1,000 square feet x 0.333 = 333 cubic feet
3. Divide cubic feet by 27 to get cubic yards:
333 cubic feet ÷ 27 = 12.33 (12²/₃) cubic yards

Tilling advice

Tilling the garden performs a number of necessary functions. It mixes organic matter and fertilizer into garden soil and temporarily loosens the soil and helps control weeds that compete with crops for moisture and nutrients.

Frequent tilling, however, may do more harm than good. Too much tilling tends to destroy the structural qualities of soil and eventually may leave you with soil that is better suited to making bricks than garden produce.

Till garden soil only when it will accomplish some useful purpose, such as turning under organic matter, controlling weeds, breaking crusted soil for water penetration, or loosening a small amount of soil for planting seeds.

Never till soil when it is wet. Doing so will leave you with cloddy, compacted soil. To test soil moisture, take a handful of soil and squeeze it. If it stays in a mud ball, it's too wet to till. If it is powdery and clumped, it is too dry. If it crumbles freely, it is just right.



To preserve soil structure, till with a purpose and only when soil moisture is neither too wet or too dry.

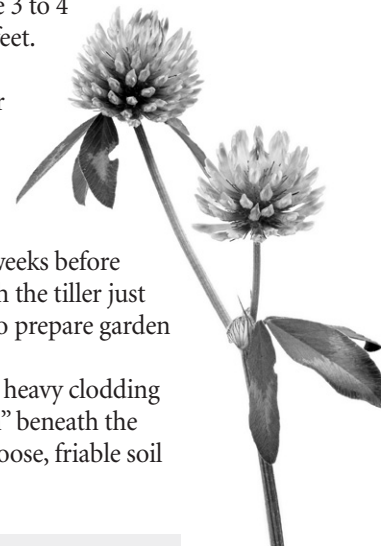
Cover crops improve soil

One way to amend garden soils that requires minimum effort is to plant a green manure cover crop. An excellent winter cover crop for western Oregon is crimson clover. Plant $\frac{1}{2}$ pound of seed per 1,000 square feet. Plant no later than October 1 and water the bed so the crop is established before cold weather sets in. When tilled under in late April, crimson clover will produce 3 to 4 pounds of nitrogen per 1,000 square feet.

Fava beans or Austrian winter peas make an excellent spring cover crop for tilling under in the summer. Plant in early April at a rate of $\frac{1}{2}$ pound of seed per 1,000 square feet. Till the crop when it begins to bloom.

Till green manure crops at least 2 weeks before planting your garden. A final pass with the tiller just before you plant usually is sufficient to prepare garden soil for seeding vegetables.

Never till wet soil or you will cause heavy clodding in the soil and a compacted "tiller pan" beneath the tilled layer. A good seedbed contains loose, friable soil that is free of compacted lumps.



For more information

Cover Crops for Home Gardens (FS 304)

Available in the OSU Extension catalog:

<http://extension.oregonstate.edu/catalog>



Fava beans make an excellent spring cover crop.

Recycling with compost pile

The compost pile is the home gardener's recycling factory. Instead of throwing away valuable organic materials, recycle them for use in your garden.

Compost is a good fertilizer and soil conditioner when worked into garden soil. Compost is also an excellent mulch.

You can compost many types of organic materials. Sod, grass clippings (avoid clippings from lawns recently treated with weed killers), healthy leaves, hay, straw, young weeds (avoid seed-laden weed material), manure, chopped corn stalks, shredded newspaper, and many kinds of vegetable and fruit refuse from the kitchen are good materials for composting. Shredding or otherwise converting the material into small particles speeds up the composting process.



A closed composting bin is a good way to recycle fruit and vegetable scraps while keeping out pests.

Oak, walnut, and laurel leaves are slow to decay and do not make good composting materials. Do not put diseased plant materials, meat or dairy products, or dog, cat, or pig manure in a compost pile.

Two piles or bins are better than one for making compost. Make them 4 to 6 feet high, 3 to 5 feet wide, and any convenient length.

Add a variety of organic materials to the pile and mix them together. Add a cup of fertilizer high in nitrogen, such as ammonium sulfate, for each cubic foot of compost material. If compost contains animal manure, add less fertilizer.

Moisten the organic material thoroughly and continue adding material until the bin is full or the pile is the size you want. Pack the material tightly around the edges, but only lightly in the center. The center of the pile will settle more than the edges.

Although the compost pile needs watering periodically during the summer, steady rains will leach nutrients out of the compost during the winter. Prevent this

loss by covering the pile with plastic sheeting during the winter.

Autumn leaves may not compost completely during the winter. Turn them over every month or so to promote decomposition. To turn, fork the material from one bin to another, putting the drier outside materials in the center of the pile.

When all of the ingredients have decomposed to a uniform, loamy-appearing material, the compost is ready to use.

For more information

Backyard Composting (WAEB 1784)

Gardening with Composts, Mulches, and Row Covers (EC 1247)

Available in the OSU Extension catalog:

<http://extension.oregonstate.edu/catalog>

Where is your garden?

Oregon is divided into four growing regions. Identifying your region will help you choose vegetable varieties and planting dates suitable to the growing conditions in your area:

- Region 1 **Oregon coast:** cool, long season of 190 to 250 days.
- Region 2 **Western valleys:** 150- to 250-day season; warm days, cool nights; length of season may vary from year to year.
- Region 3 **High elevations:** short growing season of 90 to 120 days; frost can occur during any month.
- Region 4 **Columbia and Snake River valleys:** 120- to 200-day season; hot days, warm nights; length of season fairly well defined.

