UC MASTER GARDENERS NAPA COUNTY

HEALTHY GARDEN TIPS

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DOUBLE DIGGING
HOME GARDEN SOIL IMPROVEMENT
Adding Air and Organic Matter

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Biggest impact on soil properties is addition of air and organic matter. Soil improvement is part of regular healthy garden management. Other practices include: proper fertilization, water management, crop rotation and regular use of soil-building cover crops. It is important to remember that soil improvement occurs slowly over time. If your soil is 'swampy' or 'too gunky' consider preparing raised beds with a special soil mix. The five step process described below will improve your soil conditions and encourage healthy plant growth. Deep digging should be done every two to four years to maintain healthy root growth. Include deep digging as a part of your regular garden management.

Benefits: helps plant roots grow more easily, improves soil/water relationships; helps air and water penetrate into soil (improves tilth) and makes soil easier to dig.

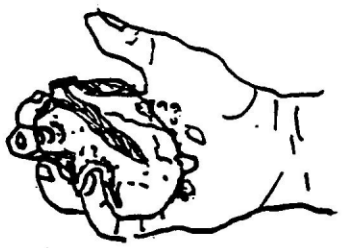
Add small amounts of organic material each time you dig. Repeated small applications of organic material mixed well into your soil is best. The choice of organic matter is not as important as how well you mix it into the soil. Avoid large 'chunks' or 'lumps' of organic material which rob plant nutrients and might generate toxic gasses below the soil surface.

Step 1. Cleaning off the trash.

Remove excess weed growth and old plant residue before you begin to dig. Trash can be composted or added later after the soil has been loosened. If the soil surface is wet and muddy after you clear it off, let it dry before you try to dig.

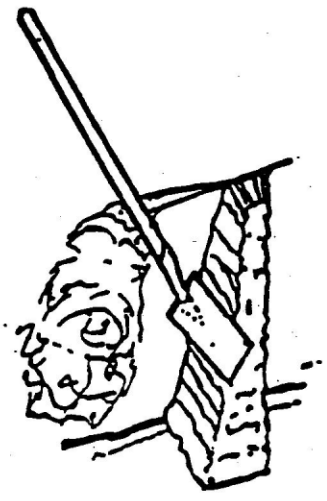
Step. 2 Does soil crumble?

Check your soil to see that it is ready to dig. Work soil only when it easily breaks apart as you cultivate or dig. Soil is ready to dig when a ball of soil cracks and crumbles when you press on it. For 'Adobe' - type soils, several shallow digging sessions will gradually introduce air and organic material as the soil dries. Digging wet soil prevents healthy root growth. Do not dig wet or muddy soils.



Step 3. Start digging.

Use a spading fork or sharp shovel. Make a ditch, taking thin slices of soil and putting the broken soil on top of nearby ground. Break apart the soil to introduce air. The soil should break into small pieces the size of marbles or smaller. If your soil slices look like cheese, it is too wet.



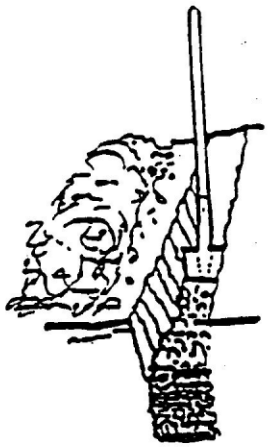
Start digging...make a trench

Step 4. Double Digging

After you make the first ditch as long as desired, dig in the bottom of the ditch to deepen it. This time you turn the soil over inside the ditch, loosening and breaking the soil to let in air. It is desirable to dig as deep as two feet or even deeper. The digging process removes compacted layers and destroys old plant roots. Do not step on freshly dug soil.

This deep digging allows air into the soil and encourages micro-organisms to grow. The microbes help release soil minerals needed by the plants.

Step 4a

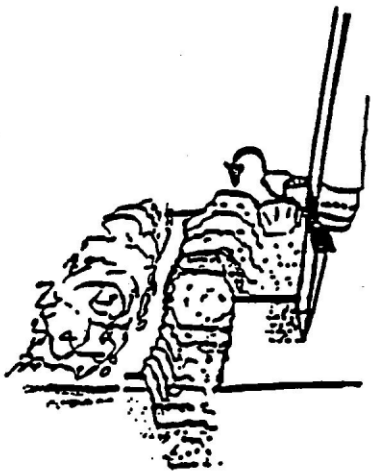


Double Digging...
Dig Deeper

Step 5. Adding organic matter and fertilizer

Add soil amendments after you finish digging. Soil amendments have very low plant nutrient content. Their main benefit is to maintain air channels in the soil promoting good water penetration and a high level of microbial activity. Most useful are organic materials such as: compost, sawdust, leaves, shavings and peat moss). Put a layer about two inches deep on top of the broken soil you have just dug. Mix this in after you add fertilizer. The better it is mixed, the bigger the benefit. Expect organic amendments to last about 6 months.

Step 4b

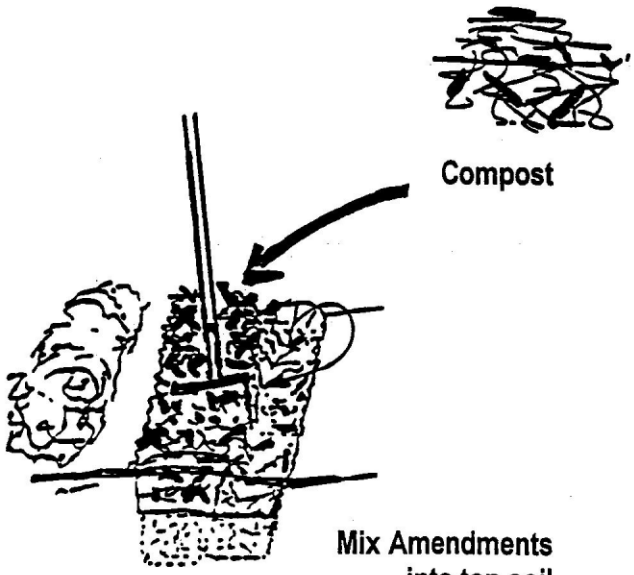


Continue
Double Digging

Add fertilizers to supply essential minerals needed for plant growth. The elements most needed by plants are: Nitrogen (N), Phosphorous (P) and Potassium (K). All Napa County soils lack nitrogen and a few hilltop soils lack phosphorous. Potassium is added to 'high performance' garden beds for strong flower color, but is seldom deficient in our local soils. Potassium and Phosphorous fertilizers need to be mixed into the soil. Nitrogen fertilizers move with water.

Organic fertilizers generally have low concentrations and release nutrients much more slowly that do commercially manufactured fertilizers. In the long run, both kinds equally benefit plant nutrition needs.

Step 5



Compost

Mix Amendments
into top soil

May 1999

Additional Information: This information was prepared from the following UC publications: *Home Vegetable Gardening*, ANR Pub. 21444, *Soil and Water Management for the Home Gardener*, ANR Leaflet 2258, *The Rapid Composting Method*, ANR Leaflet 21251.

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