

# The Dirty Dozen

## 12 Easy Steps to Healthy Soil and a Healthier Climate

by the Sierra Club, Loma Prieta Chapter, Soils Committee

[sierraclub.org/loma-prieta/soils-committee](http://sierraclub.org/loma-prieta/soils-committee)



For a vigorous garden that improves your soil, cleans the air, and lessens climate change, follow these twelve easy steps. As the health of your soil improves, your plants will flourish and pull more carbon dioxide from the air while storing carbon in the ground—building richer, darker, more fertile soil. For every ton of carbon your plants’ roots store in the soil, more than three tons of carbon dioxide is removed from the air. Your healthier, more fertile soil will not just grow more vibrant plants and nutritious fruits and vegetables but also minimize plant disease and blight and hold at least 30% more water, making your garden virtually drought resistant.

### **DON'T USE HERBICIDES AND PESTICIDES**



Fertile soil depends on healthy soil life-forms. Herbicides and pesticides kill not only “bad” bugs like aphids, snails, and slugs but also “good” bugs like earthworms, ladybugs, and bees, not to mention butterflies, birds, lizards, and other creatures. The more life-forms in your soil, the more vigorous your garden, and the more resistant your plants are to blight and disease.

*For more information:*

[en.wikipedia.org/wiki/Environmental\\_impact\\_of\\_pesticides](http://en.wikipedia.org/wiki/Environmental_impact_of_pesticides)

[nativeplantwildlifegarden.com/how-chemicals-affect-your-soil/](http://nativeplantwildlifegarden.com/how-chemicals-affect-your-soil/)

### **DON'T COMPACT YOUR SOIL**



Stick to designated paths. Walking on soil causes compaction and hurts and kills soil life-forms, which require small underground pockets of air and water. Healthy, “living” soil is spongy, because beneficial soil life-forms have built tiny pockets to capture air and water. Healthy soil absorbs and holds at least 30% more water than weak or dead soil. Indeed, this productive, spongy soil makes your garden virtually drought resistant.

*For more information:*

[allthingsdiscussed.com/Gardening/Why-compacted-soil-is-bad-for-plants](http://allthingsdiscussed.com/Gardening/Why-compacted-soil-is-bad-for-plants)

[www2.ca.uky.edu/agc/pubs/ho/ho93/ho93.pdf](http://www2.ca.uky.edu/agc/pubs/ho/ho93/ho93.pdf)

### **LEAVE LEAVES ON THE GROUND**



Rather than raking up, bagging, and throwing away leaves, pine needles, and other organic debris, leave them on the ground—they’re “free mulch” and will increase the life in your soil and the health of your garden. This is a case where less (less work) is more (a thriving garden).

*For more information:*

[ecosystemgardening.com/life-in-the-leaf-litter-dont-throw-a-good-thing-away.html](http://ecosystemgardening.com/life-in-the-leaf-litter-dont-throw-a-good-thing-away.html)

[king5.com/story/news/local/2014/11/18/do-not-rake-your-leaves/19248923/](http://king5.com/story/news/local/2014/11/18/do-not-rake-your-leaves/19248923/)

### **MULCH**



Cover most of the exposed soil in your garden with one to three inches of organic mulch. Be sure to leave at least a three-inch mulch-free diameter around each of your plants to prevent disease and blight. Mulch moderates soil temperatures, feeds valuable soil life-forms that build fertile soil, and saves water, all of which will benefit your plants and increase their resiliency and drought resistance.

*For more information:*

[clemson.edu/extension/hgic/plants/pdf/hgic1604.pdf](http://clemson.edu/extension/hgic/plants/pdf/hgic1604.pdf)

[arborday.org/trees/tips/mulching.cfm](http://arborday.org/trees/tips/mulching.cfm)

### **DON'T DIG UP OR TILL**



Don't dig up or till your garden. This disturbs or kills soil fungi, worms, and other beneficial microbes while unnecessarily releasing carbon dioxide into the air. Dig a sufficient hole only to plant something. Placing organic compost on top of your soil, covered by mulch, and following the other tips noted here will begin building the living soil your plants need.

*For more information:*

[waldeneffect.org/blog/Disadvantages\\_of\\_tilling\\_and\\_bare\\_soil/](http://waldeneffect.org/blog/Disadvantages_of_tilling_and_bare_soil/)

[eartheasy.com/blog/2009/01/no-till-gardening/](http://eartheasy.com/blog/2009/01/no-till-gardening/)



### REMOVE YOUR LAWN AND PLANT CALIFORNIA NATIVES

California native plants are best. They evolved to thrive in our soils and dry climate and, unlike lawns and popular exotic plants, they require less water and support California's endangered bugs—like butterflies, grasshoppers, and beetles—along with the birds, lizards, and other creatures that eat these bugs.

*For more information:*

[nps.gov/plants/restore/pubs/intronatplant/whyusenatives.htm](http://nps.gov/plants/restore/pubs/intronatplant/whyusenatives.htm)

<http://essig.berkeley.edu/endins/listed.htm>



### ENCOURAGE FUNGI IN YOUR SOIL

Soil fungi (or mycorrhiza) work with and “extend” roots, maximizing plants' ability to draw nutrients from the soil. Applying organic compost or compost extract to your soil will encourage and support soil fungi, which are vital to the health of your plants and soil.

*For more information:*

[motherearthnews.com/organic-gardening/creating-your-own-mycorrhiza-zbcz1403.aspx](http://motherearthnews.com/organic-gardening/creating-your-own-mycorrhiza-zbcz1403.aspx)

[nracs.usda.gov/wps/portal/nracs/detailfull/soils/health/biology/?cid=nracs142p2\\_053864](http://nracs.usda.gov/wps/portal/nracs/detailfull/soils/health/biology/?cid=nracs142p2_053864)



### PLANT COVER CROPS

Cover crops, or plants in the legume, grass, and forb families, nourish and rebuild depleted soils by increasing soil life and aeration along with nitrogen, phosphorous, and other vital plant nutrients. Among the many cover crops are sweet peas, fava beans, California lupine, California barley, wheat, and wild rye.

*For more information:*

[plantcovercrops.com/why-plant-cover-crops/](http://plantcovercrops.com/why-plant-cover-crops/)

[ucanr.org/sites/intvit/files/24446.pdf](http://ucanr.org/sites/intvit/files/24446.pdf)



### GROW NUMEROUS AND DIVERSE PLANTS

The greater the diversity and number of plants, the healthier the soil. This is because the biodiversity of plant life above ground mirrors the biodiversity of soil life-forms below ground. Deep-rooted perennials, such as many native California grasses, are especially beneficial, as they work with larger volumes of soil, forming networks with more fungi, bacteria, and microbes.

*For more information:*

“Diversity of Soil and Soil Organisms,” [soilquality.org/functions/biodiversity.html](http://soilquality.org/functions/biodiversity.html)

[journals.plos.org/plosone/article?id=10.1371/journal.pone.0170494](http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0170494)



### USE ORGANIC COMPOST

Organic compost can be made by putting kitchen food scraps, yard cuttings, coffee grounds, tea bags, or shredded newspaper and cardboard into a pile or bin in your backyard. Keep the compost slightly damp and turn it with a pitchfork or shovel about once a week. Worms, beetles, fungi, and other soil microbes will eat the waste, transforming it into excellent fertilizer. Apply the fertilizer only to the surface of your soil and, for best results, cover with mulch.

*For more information:*

[anrcatalog.ucdavis.edu/pdf/8367.pdf](http://anrcatalog.ucdavis.edu/pdf/8367.pdf)

[sciencedaily.com/releases/2008/02/080225072624.htm](http://sciencedaily.com/releases/2008/02/080225072624.htm)



### MAKE COMPOST EXTRACT

Use your organic compost to make a liquid extract fertilizer. Applying such an extract is the fastest way to improve soil health. Add a few trowels of organic compost to a bucket of water, stir vigorously, then promptly pour it around your plants. This not only boosts the life in your soil and increases plant vigor but also suppresses plant disease and bug blight.

*For more information:*

[permaculturenews.org/2012/07/11/compost-teas-and-extracts-brewin-and-bubblin-basics/](http://permaculturenews.org/2012/07/11/compost-teas-and-extracts-brewin-and-bubblin-basics/)

[soilfoodweb.com/Using\\_Tea\\_or\\_Extract.html](http://soilfoodweb.com/Using_Tea_or_Extract.html)



### DON'T USE SYNTHETIC FERTILIZERS

Synthetic fertilizers kill life in the soil. As plant roots begin to rely on synthetic fertilizer for nourishment, the roots stop working with natural soil life forms, which causes them to die off. Salts from synthetic fertilizers also harm or kill soil microbes. This weakens and destroys soil life forms, making plants increasingly dependent on manmade chemicals.

*For more information:*

[grist.org/article/2010-02-23-new-research-synthetic-nitrogen-destroys-soil-carbon-undermines/](http://grist.org/article/2010-02-23-new-research-synthetic-nitrogen-destroys-soil-carbon-undermines/)

[homeguides.sfgate.com/effects-synthetic-fertilizers-45466.html](http://homeguides.sfgate.com/effects-synthetic-fertilizers-45466.html)