

M. Richards



COMPOST

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GARDENER'S REFERENCE

Soils along this stretch of the Santa Cruz Mountains are notoriously heavy with yellow, hard-packed clay. In summer it cracks along the surface into hard cakes, and in winter it is soggy with moisture that refuses to drain. Many garden plants suffer in clay soils; its fine particles hold jealously to scarce summer moisture and leave little space for air when soaked by winter rains, effectively drowning plant roots. It would be a hair-rending exercise to maintain Filoli's gardens were it not for the wonders of compost; composting manages our large quantities of garden waste, while building the soil structure and fertility of our beds over time into an enviable garden loam.

What goes into compost?

Almost everything removed from the garden—approximately 250 to 350 cubic yards of garden debris per year—goes into Filoli's compost piles. Because of the size of Filoli's operation, even woody debris up to 1.5" in diameter goes into our compost. Anything larger, up to about six inches in diameter, is chipped into mulch on-site. If the debris is too large for Filoli's staff or chipper to handle, it is shipped to the BFI transfer station, where it is mulched and made available to the public. Filoli staff makes an effort to keep noxious weeds (such as nut sedge and oxalis) separate from the compost, because their seeds or bulbs can survive even the high temperatures of an active pile, and be spread back into the garden.

How does compost work?

The nuts and bolts of composting rely on a balance of carbon-rich and nitrogen-rich organic matter, aeration, and moisture. An appropriate carbon to nitrogen ratio is commonly estimated to be 30:1, and can be approximated using equal parts brown, dry or woody matter (leaves, wood chips, newspaper, dry grass) to fresh green debris (grass clippings, fresh weeds, kitchen vegetable scraps). Manure is also an excellent, but highly concentrated nitrogen source.

A proper C:N ratio, plus regular turning and enough water to keep a pile moist—but not soggy—provides the ideal living conditions for the microbes that fuel aerobic decomposition. Two weeks is a common rule of thumb for how often a pile should be turned. Piles will still decompose if turned less often, but less evenly and at a slower rate. Periodic turning also disrupts any nesting rodents. Excessive turning, on the other hand, disrupts the activity of soil microbes and prevents a pile from getting up to heat. A balanced, active pile is indicated by temperatures between 105 and 145 degrees Fahrenheit—heat is a byproduct of microbes' respiration—and does not smell or attract insects.

Although a far cry from the scale of Filoli's windrows, many homeowners reap the benefits of their own compost programs. Piles of kitchen scraps and yard clippings (at least three feet by three feet for an active pile) or worm bins are two viable options. Comparable products can also be purchased in large quantities from municipal waste management, or from nurseries as smaller bags of organic compost.



Lead Horticulturist Mimi Clarke consolidates a windrow of new compost, next to a partially decomposed pile.

In a cold pile with too much moisture or too little air, decomposition will turn to rot—a slow, smelly, slimy process that is less than ideal. Meats, oils, and dairy products should never be added to compost—these rot and attract scavenging animals.

How is Filoli’s compost managed?

Filoli maintains three separate windrows at any one time, constituting three stages of compost: new clippings, partially decomposed (1 year), and mature (2 year). At the end of the day, gardeners empty truckloads of clippings into one windrow at the back of the gardens. Every two weeks, the piles are turned and consolidated using a tractor; wood chips are added with each turn to balance the high nitrogen content of most of our green garden debris, and during the dry months the piles are watered weekly.

In a large pile, the core can become so hot that it poses a fire hazard. To avoid these excessive temperatures, our windrows are kept no larger than approximately 6 feet tall and 15 feet wide. After a year, the young windrow is shifted to a second location for storage, where it continues to mature. Finished compost is moved to one large pile that does not need to be turned, and from which gardeners remove tractor loads for use in the garden and in greenhouse soil mixes.

Where is it used?

Analyses show that Filoli’s compost is slightly alkaline and high in phosphorous and potassium and other micronutrients, but relatively low in nitrogen, calcium and magnesium. Importantly, our compost also has a low salt content. Because it is low in salts, we can amend heavily with compost—up to 33% by soil volume—to significantly improve the soil’s nutrient content and bulk density, without a dangerous increase in salinity.

The perennial border and cutting beds are amended with compost at each planting, for a total of two applications per year. Most of the large flower beds are amended with four inches of compost every two to four years, and in other garden beds compost is used as a top-dressing to build up the soil grade as needed. Compost is also an ingredient in Filoli’s potting soil and makes excellent mulch around camellias, rhododendrons and roses.

References & Further reading:

- Fernandez, A. (2002). Composting Filoli. *The Sundial Times*, 29, 1-4.
- Giesel, P.M. and Unruh, C.L. (2001). *Compost In a Hurry*. (Publication No. 8037). Regents of the University of California, Division of Agriculture and Natural Resources. Retrieved 9 May, 2007 from: <http://anrcatalog.ucdavis.edu/pdf/8037.pdf>

Filoli Gardener’s Reference sheets are created by garden staff to answer common questions regarding Filoli’s traditional horticultural practices. This sheet may be accessed from the Filoli website.

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