California Gardening

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Gardening Basics | How do I practice sustainable gardening?

To sustain means to keep going or continue, and sustainable is the ability to carry on an activity indefinitely with minimal impact on the environment. 1)The concept of sustainable gardening has evolved as a result of current environmental concerns about the broader affects of our gardening practices on: 1) water availability, 2) off-site water quality, 3) energy use, 4) landfill space, 5) fire-safe landscaping, 6) soil degradation, and 7) the spread of invasive plant species and 8) protection and enhancement of wildlife habitat. All of these issues are critically important today, and harmful impacts of our gardening practices on any of these concerns can potentially affect the quality of our lives, our health, or the health of the ecosystem upon which we depend.

Gardening practices are only one of many issues affecting the sustainability of human activities, but they are practices that most people can implement immediately, and enormous benefits can be gained by a large fraction of households engaging in sustainable gardening. Using sustainable gardening practices can increase our understanding of the broader affects of all our activities on the environment as a whole.

Garden Design and Selection of Materials

Sustainable gardening includes all plants and hardscape (walkways, structures, etc.) in the landscape. It begins by designing the landscape in a way that reduces the seven environmental impacts listed above. For example, planting species that are adapted to your region and that use less water, and grouping plant types that use similar amounts of water together on separate irrigation valves can save water. Many Mediterranean and California native species can get by with little water once established. Lawns can use up to 3 to 4 times as much water as drought-tolerant species, so reducing the size of your lawn to the minimum space you need will also conserve water. Many people are eliminating lawns entirely. Lawns throughout the state require the use of large amounts of fossil fuels in power mowers and in hauling away the green waste, and air quality is greatly impacted by the use of vast numbers of mower engines. Finally, lawns often require much more pesticide and fertilizer inputs than most drought-tolerant plant species.

When you choose plants for your garden, be sure to select plants that are well adapted to your climate zone and those that are not considered invasive species. Look for plants such as the UC Arboretum All-Stars or check Plant-Right for non-invasive and garden-adapted plants. If you already have invasive species of plants in your garden such as Ivy (*Hedera helix*), Vinca (*Vinca major*), Pampas grass (*Cortaderia selloana*) or others known to be invasive, take action and replace those species with adapted non-invasive species. Ask your local UC Master Gardener or nursery person for suggestions.

Another design feature includes the use of low-volume irrigation where feasible, such as drip and micro sprinkler. Consider using a “smart” controller that uses weather or soil information to determine how much water to apply. The goals are to use less water and to prevent runoff water from leaving your irrigated area and moving into the storm water system. This runoff can carry pesticides and fertilizers into rivers and streams and negatively impact riparian and marine ecosystems.

Request your local water district to visit your site to calculate the efficiency of your irrigation systems and determine how to make improvements.

An important way to reduce off-site green waste removal is to design the garden so that plants are not crowded when mature, so less pruning is required. This may mean planting farther apart and using wood chip mulch to reduce weed growth until the plants fill in. Consider including an on-site compost area to reuse the non-woody plant waste. If you do include a lawn in your garden design, plan to mow with a mulching mower and leave the clippings on the lawn. With a mulching mower, blades of the turfgrass are chopped fine and filter down into the soil over time as compost.

Landscapes can be used to help sustain certain wildlife and insects, and choosing the right plant species may enhance pest management. Many flowers attract insect predators and parasites that feed on insect pests, possibly reducing the need for insecticides. For example, flowers of common yarrow *(Achillea millefolium)* and California buckwheat *(Eriogonum fasciculatum foliolosum)* attract beneficial hoverflies and tiny parasitic wasps. These and other plant species also attract butterflies, native bees, and hummingbirds.

When possible, use hardscape materials that are porous, recycled and/or derived from local sources, and consider reusing on-site waste, such as broken concrete for retaining walls or walkways. Instead of solid concrete walkways or driveways, use pavers that allow water to drain in between, or use pervious concrete or other permeable materials to increase water infiltration into the soil and reduce runoff.

Maintenance Practices

On established gardens, use maintenance practices that reduce impacts on the environment and enhance natural pest management. The most important first step is to prepare the soil. Healthy soil will lead to healthy plants. Soil compaction is a common problem, as roots will not grow into compacted soil, nor will water penetrate well through it. The soil must be loosened where compacted, or use raised beds. Compost is an excellent amendment for soil – especially compost that has been turned and watered, and that has attained sufficiently high temperatures to kill weed seeds and pathogens. Other amendments, such as gypsum, may be useful or even necessary if the soil drains slowly because of poor structure. It is useful to send soil samples to a lab for analysis in order to know what nutrients are lacking or excessive.

Since many environmental problems can arise from the control of pests, integrated pest management (IPM) lies at the heart of sustainable gardening. Pests include weeds, insects and mites, diseases, and vertebrates such as rodents. Preventing pests is always more effective than controlling them once they are established.

Herbicides are often used by gardeners and landscape maintenance workers. Many lawn weeds can be prevented by providing the appropriate amount of water and using an appropriate mowing height and mowing frequency for the species planted. See the UC Guide to Healthy Lawns. In landscaped areas, use a mulch of wood chips and/or landscape fabric to reduce weeds. In all cases, preventing weeds from going to seed goes a long way in avoiding future weed problems.

Insect and disease pests are often specific to certain plant species, so replacing a pest- prone plant with a resistant species or variety can eliminate the need for insecticides or fungicides. When pests do arise, attempt to simply remove affected plant parts. Sometimes pests are present in low numbers. See if you can tolerate them, but remember that pest numbers can increase rapidly given the right conditions. Walk through your garden regularly looking for pests before they become a major

problem. Be sure you are able to identify pests correctly. Know a bit about the pest before making a decision to spray for control. Many pests may only have a minor impact on their hosts.

If a pest problem needs controlling, only use products that will have the least impact on non-target creatures and on the environment. Many organically acceptable products are very safe, but many synthetic products can be safe if applied correctly. Consider the effect of a pesticide that might wash off into a storm drain, and take steps to avoid off-site movement. A major source of contamination of waterways is runoff of pesticides that are applied on sloping and over-irrigated lawns or are inadvertently applied on concrete. In general, pesticides should be used as a last resort.

Vertebrate pests, such as gophers, rats, ground squirrels, deer, and rabbits may cause significant damage to a landscape. Excluding them from your garden and landscape by fencing or caging roots may be the best means of control. Gophers are easily controlled by Macabee gopher traps. These mechanical methods of control tend to have the least impact on non-target vertebrates. In addition to fencing, eliminating habitat for certain vertebrates can be very effective in reducing their numbers. For example, brush piles harbor rats and mice. Keep brush piles to a minimum especially in urban areas.

Proper irrigation is a key practice in sustainable gardening, both for conserving water and maintaining water quality. Knowing when and how much to water and using the least amount of water necessary to grow healthy plants can be challenging, but is increasingly important as water becomes scarcer. Periodically dig into the soil with a shovel or use a soil probe to see how moist it is.

Many of us inherit gardens that were established before we acquired them. There are many things you can do, over time, to convert your garden into a sustainable landscape. Start by just doing one Thing: retrofit your irrigation system so that water doesn't run off into the gutter. That one thing can save thousands of gallons of water and prevent pesticide and fertilizer movement into our rivers and streams.

Fertilizing, especially with nitrogen, is often thought to be a "normal" annual activity for landscapes. However, much research indicates that for most landscape situations, other than lawns, fertilization as a regular maintenance activity is not required. There is often no real benefit and in fact, there can actually be a negative impact if it leads to excessive plant growth that requires more pruning which produces green waste. In addition, there are negative consequences if fertilizers are leached into local aquifers or move in runoff into streams and rivers. Fertilize only when a soil test indicates that it is required. Never fertilize without knowing if a plant is in need of it. If you find you must fertilize, use natural fertilizers like compost, rock phosphate, kelp, seaweed, fish meal, or alfalfa meal. These also feed the soil and the microorganisms it contains. They also encourage a slower, natural rate of plant growth, which helps avoid some pest problems.

Sustainable landscape practices also conserve energy. When landscaping, consider tree placement so that it shades your home from the hot afternoon sun by placing deciduous trees on the west and/or the south side of your home. On the west side, plant trees that tend to have low branches to block late day sun. On the south, plant trees that have a high, broad canopy. By planting trees that lose their leaves in winter, they will allow the winter sun to help warm the walls of the home. On the north and east sides, consider evergreens to block both winter winds and summer heat.

See River-Friendly Landscape Guidelines (pdf) and UC IPM for more tips and ideas on sustainable landscape practices for California.

In conclusion, sustainable landscape practices are gardening practices that not only save you money by saving energy, water, and time; they will help to improve environmental quality. Remember, the

key goals of sustainable gardening practices are to: sustain water availability; reduce off-site water movement into storm drains, lakes, rivers and creeks; reduce energy use; reduce our green waste to landfill; prevent soil degradation; facilitate wildlife, and reduce the spread of invasive plant species.

The California Gardening web site provides detailed information on sustainable gardening.

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