GREYWATER SYSTEMS

What is greywater?

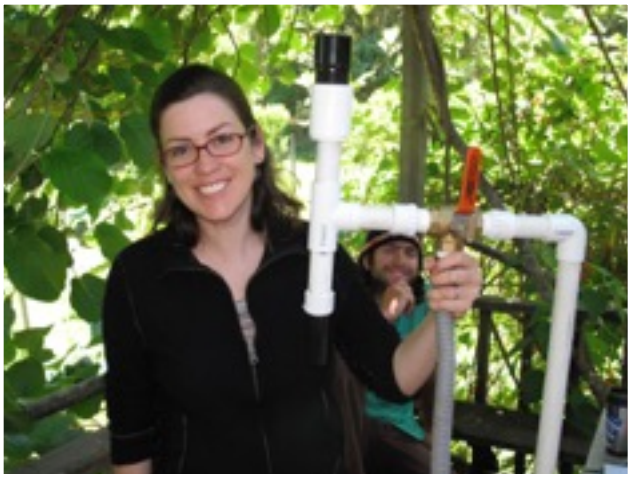
Greywater is gently used water coming from sinks, showers, baths, and washing machines. Greywater is never from toilets or laundry water washing diapers. In California kitchen sink water is not currently considered greywater.

Why use greywater?

Plants don't need clean drinking water to thrive! Using greywater for irrigation saves water and reduces the energy, chemicals, and costs involved in treating water to potable quality. Greywater systems can also extend the life of a septic system, save time spent on watering, be a source of water during extreme drought, and encourage the use of more environmentally friendly products. They also use less energy and fewer chemicals than other forms of wastewater treatment.

How much water will I save?

You can expect to save between 10 and 20 gallons per person per day (or more) from a properly designed greywater system. Studies estimate savings of between 16 and 40 percent of total household use. Your actual savings depends on how much you currently irrigate, whether you use greywater on existing plants or you plant new ones, and how many greywater sources you can access.



Are greywater systems legal?

Yes, greywater systems are legal in California and are regulated by the state plumbing code. Some systems that do not alter the household plumbing don't require a permit if basic guidelines are followed, while most others do require permits.

See http://greywateraction.org/greywater-codes-and-policy/ for more info.

How can you use greywater?

There are many types of greywater systems, ranging from manually collecting water in buckets to fully automated irrigation systems. Some of the most popular, simple, and affordable greywater irrigation systems include the laundry-to-landscape (L2L) and branched-drain systems. Other systems use pumps to send greywater uphill or to pressurize it for drip irrigation (with manually cleaned filters). There are also sophisticated "high-tech" systems that provide automated drip irrigation with self-cleaning filters in high-end residential houses and larger-scale commercial or multifamily buildings.

Greywater can also be used to flush toilets, however, it's typically cheaper and easier to set up an outdoor greywater irrigation system. It's also easier to install a rainwater system to flush the toilet, rather than a greywater one. But if your site doesn't need irrigation, there are systems that treat greywater for use in flushing the toilet.

Note that toilet-flushing greywater systems usually require frequent maintenance, filter cleaning or replacement, and chemical disinfectant to prevent odors in the bathroom. They also tend to be relatively complicated, and it's critical that they be designed and installed properly.

GREYWATER SYSTEMS

What plants can you water?

With simple greywater systems plan to irrigate your larger plants. Trees, bushes, shrubs, vines, and perennials, or larger annuals are good options. Large plants need more water than small ones, making it easier to distribute more greywater to fewer plants.

You can safely irrigate edible plants with greywater so long as the greywater doesn't touch the edible portion of the plant. (You don't want someone to accidentally ingest greywater, so keep it off the part of the plant you eat, for example root vegetables.)

Some landscape areas aren't well suited for greywater irrigation, such as lawns or areas full of small plants (although high-tech systems can irrigate these types of plants).

How much does a greywater system cost?

Materials for simple greywater systems typically cost a few hundred dollars. Someone who does basic home repair can typically install a system themselves in a day or two. Professional installations range from around $1,000 to many thousands of dollars, depending on the type of system and your site.

Soaps and products

With any greywater irrigation system it's important that you use "plant friendly" products; the quality of greywater as a source of irrigation water is directly connected to what you put down the drain. Luckily, it's easy to choose products that are plant-friendly, just choose biodegradable products that are low in salts and free of boron and chlorine bleach.

Laundry detergents: Use liquid detergents free of boron and low in salts, such as ECOS, Trader Joes Liquid Detergent, Vaska, Biopac, Puretergent, or Oasis.

Showers/bath products: Most shampoos and conditioners are fine for the plants. (Though they may not be so healthy for people, visit the EWG's Skin Deep database to find out about toxins in your personal care products. http://www.ewg.org/skindeep/).

Cleaning products are often harmful to plants, so either turn off the system or use vinegar based cleaners (avoid white powder cleaners, they are high in salts). Sodium-based water softeners are also not suitable for greywater irrigation.

Resources

• WEB

- Greywater Action: *www.greywateraction.org* Includes a technical support forum and resources in Spanish.

- *Oasisdesign.net:* Site of Art Ludwig.

• Video

Ask This Old House episode:
Learn how to construct a simple laundry greywater system.

• Manuals

San Francisco Graywater Design Manual for Outdoor Irrigation. Free download from sfwater.org/graywater

• Books

- The Water Wise Home: How to Conserve, Capture, and Reuse Water in Your Home and Landscape, by Laura Allen. Comprehensive "how-to" resource for residential greywater systems (as well as rainwater harvesting and composting toilet systems). Includes step-by-step construction details.

- The New Create an Oasis with Greywater: Choosing Building and Using Greywater Systems, by Art Ludwig. Information packed resource from the originator of the L2L and branched drain systems.

-Dam Nation: Dispatches from the Water Underground. Editors C. Woelfle-Erskine, L. Allen, J. Cole. Anthology covering the history and political context of water development and struggles for justice.