

TOWARDS THE GREY

RUTH CZERMAK
HORTICULTURIST & LANDSCAPE ARCHITECT

Every effort has been taken to ensure the accuracy of the information. It is provided for general guidance on matters of interest only. Accordingly, the information is provided with the understanding that the authors and publishers are not herein engaged in rendering professional advice. As such, it should not be used as a substitute for professional and other competent advisers. Before making any decision or taking any action, you should consult a professional.

This article offers general information on greywater and greywater systems, but it is important to consult with your local council, EPA and a licensed plumber in your state to ensure you are fully informed and compliant.

Australia is in the grip of an unprecedented water shortage. Across the country, dams and rivers are running dry, cities and towns face restrictions and farmers confront an uncertain future.

Obviously, the fundamental challenge and a grass roots approach to the water shortage is to use a lot less water and to use what there is much more efficiently. Various government measures to grapple with the crisis are underway or have been announced, but many individuals are taking the initiative and responsibility for reducing their total water consumption around the home now, rather than waiting for the government to take the lead.

The increased media coverage of the water shortage has created a large amount of consumer interest in using greywater for garden irrigation and toilet flushing - most experts agree that these two uses account for around 50% of all water used domestically. As professionals we must encourage the responsible use of greywater and not gloss over the various health and environmental risks involved if greywater is not used safely.

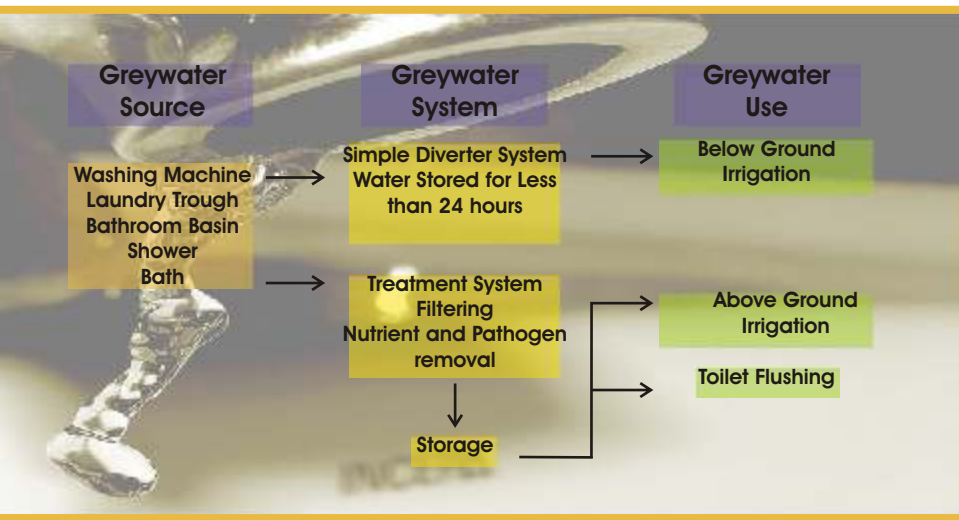
Greywater forms a large portion of wastewater and can be either light greywater from the shower, bathroom sink and laundry, or dark greywater from the kitchen. It is estimated that an average household produces around 450L a day of greywater.

Greywater use is regulated by different organisations depending on your state or territory, with only two regulations common to all. Firstly, a licensed plumber must carry out all work that involves changes or additions to your sewer. Secondly, in sewered areas, diverting pipes and greywater away from the sewer system may require permission from your local water authority. Each state and territory has different regulations on whether you can store greywater and for how long, and how you disperse and use the greywater. In all cases greywater can legally be used for different purposes ranging from landscape or agricultural irrigation, to industrial and domestic use.

The suitability of greywater for these purposes depends on the regulations and quality of the greywater. The quality of the greywater depends on the source of the greywater and any treatment that it goes through. To improve the quality of greywater at the source, water that has been used to wash soiled nappies or pets should not be diverted through a greywater system. It is also generally recommended that dark greywater from the kitchen is not used, as it is contaminated with grease.

Ruth Czermak is the principal designer at Botanical Traditions, a landscape design office which specialises in sustainable landscape design.
www.botanicaltraditions.com.au
Phone: 0411 313 312





The decision to use a greywater diverter system or a greywater treatment system is based on the budget constraints, the proposed use of the greywater, existing pipework and space limitations. Systems can only be retrofitted where the existing pipework can be altered to separate the grey and blackwater (toilet waste).

Some of the common contaminants in greywater include salts, detergents, soaps, bacteria and other microorganisms. In particular I have

There are many greywater systems for sale. These systems can be broadly classified as either simple greywater diverter systems or greywater treatment systems. Simple greywater diversion systems divert the greywater from the sewer system to the garden without any intermediate steps while, treatment systems take the greywater and process it through a number of intermediate steps before disposal.

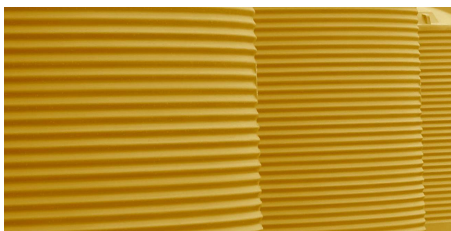
In Victoria untreated greywater can be diverted from the house and used for subsurface garden irrigation only when water. It must be used as it is produced and cannot be stored for longer than 24 hours. Legally it cannot be used in above ground irrigation systems (microsprays, pop-up or shrub sprays), or in the house (including toilet flushing).

Greywater that has been treated can be stored and used depending on the quality of the treated water. In Victoria, greywater which has been treated to a 'Class A' standard can be stored and used in any type of irrigation system as well as for flushing toilets. One advantage of having a greywater treatment system is that the water can be easily used to irrigate as normal in fully automatic irrigation systems with multiple zones. As the water can be stored you can irrigate deeply every few days or as needed, rather than lightly many times a day as occurs with the simple diverter systems. The treated greywater can also be used to flush the toilet, something we hardly need to be doing with drinking quality water.

seen problems with the salt content of both untreated and treated greywater. The salts originate in laundry detergents. These are often alkaline and high in sodium (which is used as a bulking agent) and phosphorous. In Australia we have a labeling system for laundry detergents, 'NP' means no phosphate is included in the product and 'P' means that the level of phosphate in the product is below the maximum phosphorous level set by an agreed Australian standard. Using products that are labeled 'NP' will reduce the amount of phosphorous that ends up in the greywater. Phosphorous is also a major waterway pollutant and is implicated in algal blooms.

I have been asked numerous times what laundry detergent people should use and have developed a good rule of thumb to determine if people should consider changing detergents. Take about a tablespoon of detergent and dissolve it in 200ml of warm water. If the water is cloudy or if sediment settles to the bottom of the jar as the water cools consider changing to a different detergent. The sediment will black subsurface irrigation hoses and usually indicates high levels of salt.

Some laundry detergents also contain chlorine. Chlorine is a general biocide and may kill soil bacteria and in sufficient levels plants. You can see the effect of chlorine on plants around pools. Typically the plants which receive the most pool spray will be stunted. The chlorine burns leaves and also seems to prevent adequate root growth. An environmentally friendly option to using





response to the environment. In times of water stress the plant has the ability to close these pores to prevent further water loss. If detergents are applied to leaves and the protective wax layer is dissolved the plant is unable to retain water within the leaves. These leaves will dehydrate and die and in extreme situations so will the plant.

bleach is to use hydrogen peroxide, which breaks down quickly to hydrogen and water in the environment.

Continual garden re-use of laundry water containing high levels of sodium and phosphorus can lead to salt accumulations in re-use areas, and is especially detrimental to Australian plants that have low phosphorus tolerance. In clay soils where greywater is used for extended periods of time the salts will build up very quickly in the soil profile and not be leached away. Alternating untreated greywater with rainwater will help to reduce the chance of salt build-up in the soil.

If the pH of the greywater is either very acidic or alkaline there will be an impact on the absorption of nutrients by plants. In alkaline soils phosphorus and boron become so easily absorbed by plants that they take up toxic amounts, while other nutrients such as iron and nitrogen, although in the soil can not be utilised by the plants.

Another common problem is the use of high strength cleaners, these should not be diverted to the garden, as they are often toxic to both people and the environment. If caustic cleaners are washed down the drain, they are likely to kill beneficial bacteria in the soil and the greywater treatment systems.

Allowing greywater to come into contact with the leaves of plants will also be detrimental. Most detergents are designed to dissolve fats, oils and waxes. It is important to remember that the leaves of plants are coated with waxes that prevent the plant cells from drying out. Plants control moisture loss through stomata - the plants are able to control the opening and closing of these pores in

Another issue to be aware of when discussing greywater irrigation is the temptation for people to over water - especially with simple diverter systems. People divert all of the greywater produced to the garden regardless of existing soil moisture levels and root zones become waterlogged. I suggest that people monitor the soil moisture levels to prevent this occurring.

There are maintenance issues to also be aware of. Many of the simple diverter systems need regular maintenance and cleaning of filters. The amount of times a filter needs to be cleaned depends on the quality of the water. Different filters should be considered depending on the individual households greywater quality.

Recycling household greywater for use on garden beds is an excellent way of saving water and your conscience! Unlike rainwater, which is seasonally available, greywater is available every time you shower or wash.

