

# Making Use of Greywater in the Garden Tipsheet 50p



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Help save valuable clean water by reusing wastewater on your plants.

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## Introduction

Greywater is all household wastewater except that from the toilet. In the UK we each produce around 120 litres of greywater per day, but if you're concerned about water use and take efficiency measures (see **1** and **6** in resources below) this can be reduced to around 30 litres per day. If this is the case, it may not be worth the effort of creating a system to reuse this relatively small amount of water; you would be better advised to collect and reuse rainwater as this is cleaner and easier to do. Nonetheless, greywater is produced all year round so you won't run short in the summer. Although only around 6% of domestic water use is in the garden, everyone wants to water their plants just as water reserves are at their lowest: up to 70% of water demand on a summer evening can be due to hose-pipes and sprinkler systems.

If you haven't got a mains sewer connection then you will have to treat all of your greywater. The garden irrigation systems outlined may help you achieve this, but you will need a default treatment system as well. For details of permanent wastewater treatment systems such as soakaways, filters or reedbeds read 'Sewage Solutions', and for alternatives to the flush toilet read 'Lifting the Lid' (see **2** and **4** below).

It is possible to clean greywater and reuse it for flushing toilets in the house. Commercial systems are available to do this, but so far they can only handle bathroom water, are expensive to buy and use large amounts of energy. It is usually far 'greener' and cheaper to spend money on other water saving measures or collecting rainwater.

## Making your garden water efficient

Before you start recycling greywater in the garden, make sure you have taken steps to conserve water – allow more ground cover, mulch your flower beds to reduce water loss and add organic material to the soil to retain moisture. Fit a trigger nozzle to your hose to reduce wastage, and install a rainwater butt.

## How 'dirty' is your greywater?

Some of the things that make your greywater dirty, such as soaps, shampoos, washing powder and cleaning agents may not be good for your soil. Here are a few components that it is worth being aware of:

- **Sodium content** – Using standard washing powders can be the equivalent of throwing 90g of salt down the drain with every wash. Although sodium is an essential nutrient, high doses have a similar effect as drought stress on plants. Sodium is not essential for cleaning and low sodium laundry detergents are available.
- **Phosphorous** – Phosphorous is an essential nutrient and shouldn't do any harm in your garden. But it is worth being aware of its negative effect in ponds and waterways where it can cause eutrophication.
- **pH** – Household cleaning chemicals tend to be very alkaline (high pH). It is best not to water plants that prefer acidic soils with greywater.
- **Solids and fats** – Greywater contains varying amounts of organic solids such as skin and hair. Kitchen sink greywater

contains food, solids and greasy fats. These residues tend to block pipework and should be taken into consideration.

- **Bacteria and other pathogens** – Since greywater contains bacteria and a nutrient source and is often discharged warm, you have an ideal situation for pathogens to multiply.

**Warning:** do not store greywater! After 24 hours it will quickly stagnate, become unpleasant to handle, and pose a health risk.

## Which sources of greywater are worth recycling?

All greywater is potentially recyclable, with water from each use having its particular merits and drawbacks. You will need to consider the following:

- amount available (and how regular the supply is)
- quality (i.e. likelihood it contains contaminants and/or solids)
- ease of getting the water
- type of use to which the water is going to be put.

Kitchen water contains lots of solids and fats and is best filtered before use. You may be better off collecting the waste nutrients rather than water from the kitchen using a simple straw trap. Laundry water may be high in sodium and detergents, so spread it around the garden, rather than using it all in one place. Consider using less detergent, or an alternative such as "Eco balls" (see **2** below). Don't use the washing machine's own pump to move water uphill or around the garden as it will rapidly burn out.

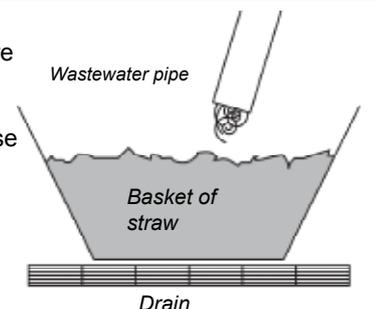
Water from showers, baths and washbasins tends to be quite abundant and is usually reasonably clean. For irrigation systems the water from upstairs can be of more use as the height allows the force of gravity to move the water further for you.

## Reusing greywater: Direct application

Dirty water can be decanted directly from the washing-up bowl onto suitable garden plants. This is efficient as you can target particular areas and deliver appropriate doses. Pour the water onto the soil, not the plants. Similarly, use your bath water for house plants or fit a 'DroughtBuster' inline siphon pump to your hose-pipe and run it from your bath out into your garden.

## The Straw Trap

Whatever your situation, there is one simple thing you can do to reduce pollution and reclaim valuable nutrients: use a straw trap. This is simply a basket of straw or dry grass inserted into your kitchen drain. It will filter out coffee grounds, food, some fats, and other bits and bobs. It also reduces the risk of your drain getting blocked. From time to time, say once a fortnight, remove the basket and dump its contents in the compost. Then, simply fill with fresh straw and replace.



### More complex approaches

Anything more advanced and you will need to get acquainted with your plumbing, possibly separating your greywater waste pipes from your main sewage soil-pipe.

Under sinks there will be an S-trap that contains water all the time to isolate the sink from the outside drains. Then the pipe will either go straight out through the wall or snake along a bit before going through. Nip outside and take a look at where the pipe comes out of the wall. Generally it will emerge in a 32mm (1 ¼") or 40mm (1 ½") pipe. On the ground floor it will go directly into an open drain with a grille in it. This drain may also take waste from pipes such as those removing water from a washing machine, upstairs sinks or a bath, etc.

If you want to collect water from these pipes you will only be able to do so if they emerge at a high enough level to drain into a watering can or other vessel. You'll need to cut the existing pipe(s) and insert a hose spigot, or something similar, along with a flexible hose that can be put into the container. Ordinary ½" garden hose is liable to clog, so it's advisable to fit a ¾" bore flexible hose in your divert system.

If you have an upstairs toilet there will be a 110mm (3") vertical soil-pipe to the sewer (either inside or outside the house), and greywater from upstairs will join this pipe at a high level. If the soil-pipe is outside it is simpler to capture greywater before it enters. With an internal soil-pipe you will have to drill a hole through the wall to pipe your greywater outside the house (so consider carefully whether this would be a good use of your time and money).

So now you've found the appropriate pipes, how do you use the water? Remember that you should only store greywater for a maximum of 24 hours. If you don't want to be watering the garden 365 days a year, then you will either have to have a continuous-use system (as outlined below) or a system of capturing some of the water when you want it and letting the rest run to the sewer. There are valves available to help you do this, the 'Water-two', for example (see 5 below). Before taking a shower or pulling the bath plug you have to pop outside and pull a string on the valve and change the flow direction away from the sewer and into a tank (or watering can). Remember to reset the valve again afterwards.

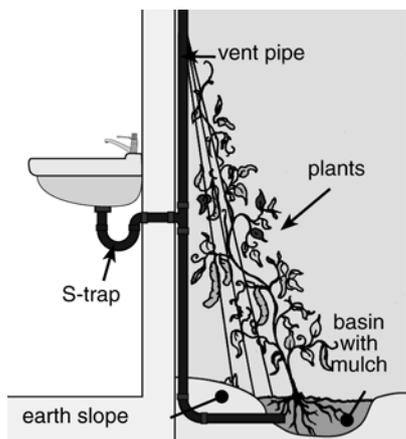


Figure 1: Simple washbasin system  
Source: The Water Book (CAT Publications)

### Simple washbasin system

Greywater from washbasins can be reused quite simply using the system illustrated (Figure 1). The outlet pipe can potentially travel any distance to a suitable spot as long as it has a 2% slope. A more robust solution is required for the kitchen sink because of the larger volumes of water and the problems of grease and solids blocking pipes.

### Whole house greywater system

To continuously collect and use greywater from large volume sources like baths and washing machines you will need to install a simple surge tank and filter, as illustrated (Figure 2). The tank can act as a hopper combining flows from several sources if required. It then temporarily stores water allowing your appliances to drain quickly and the water to cool. The straw removes solids, minimising the risk of blockages, and can be removed and composted every few months. A 40 litre tank should be sufficient for an average household.

### Irrigation with greywater

Since you don't want to store greywater for any length of time, but use it straight away, direct irrigation of the garden is the simplest solution overall. On no account should a spray irrigation system be used for untreated

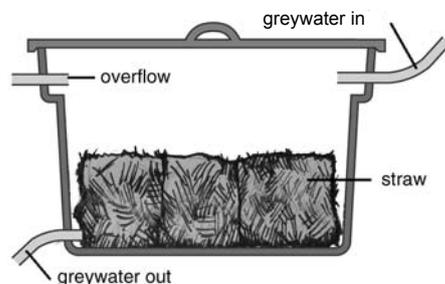


Figure 2: Surge tank and filter  
Source: The Water Book (CAT Publications)

greywater. Greywater should be applied below the surface to minimise the possible risk of infection from contact with faecal bacteria. What's needed is a system of perforated pipes running through the areas to be irrigated, allowing water to drip out into the soil. Your flowers and vegetables will thrive on it.

Commercial drip-irrigation pipes will quickly become clogged with greywater impurities, so you'll have to make your own. You can use a hose-pipe pierced with holes (3mm holes every 20cm) or plastic waste pipe (32mm/40mm, with 8mm holes every 30cm).

Water pressure will drop along the length of the pipe so it's better to have a system of branched pipes rather than one long snake. With branches you can also install isolating taps to direct the greywater where it's most needed. The end of each pipe branch should have a stopper to improve distribution. This can be removed periodically and the system flushed through to clear out any blockages.

Better distribution is achieved with less likelihood of blockages when pipes are laid in a trench full of woodchip next to your plants (10-20cm deep), rather than directly in the soil. The woodchip will break down and compost and will need replacing every two years. More details can be found in Judith Thornton's *The Water Book* from CAT Publications (see below).

Finally, some legalities: don't run tap water down your irrigation system unless you have the required 'Type DB device' backflow prevention.

### Conclusion

Greywater reuse is far more complex and problematic than you might at first expect. Unless you are particularly keen, we recommend you use greywater only for garden irrigation and only if the simple, cheap systems outlined above fit your particular situation. Finally, it is not recommended that you dilute your greywater with rainwater; it is better to use these two supplies separately. Plus, greywater will not store safely any longer than 24 hours even when diluted.

### Notes & further information

1. *Water Conservation*, CAT tipsheet
2. *Sewage Solutions: answering the call of nature*, Grant, Moodie and Weedon, CAT Publications
3. *Reedbeds and Constructed Wetlands*, CAT tipsheet
4. *Lifting the Lid: An ecological approach to toilet systems*, Harper and Halestrap, CAT Publications
5. 'Water-two' Valve  
tel. 01539 623429 [www.watertwo.co.uk](http://www.watertwo.co.uk)
6. *The Water book: find it, move it, store it, clean it...use it*, Thornton, CAT Publications
7. *Create an Oasis with Greywater*, Ludwig, Poor Richards Press
8. [www.oasisdesign.net](http://www.oasisdesign.net) American site with wealth of information on greywater use in the garden

The above titles are available direct from CAT Mail Order – tel. 01654 705959 to order or receive the complete Buy Green By Mail catalogue. Visit [www.cat.org.uk/catpubs](http://www.cat.org.uk/catpubs) to order, read reviews or download tipsheets and factsheets.