

GRAY (WATER)'S ANATOMY

Multitask your home water by recycling it for use in your garden and yard, when possible.

BY DIANA K. WILLIAMS

Creating a water-conservation lifestyle on an urban farm consists of more than just using less water. You can expand your conservation efforts by reusing the gray water produced in your home to hydrate some of your fruits, vegetables and ornamental plants.

To reuse water safely, it's important to know the difference between gray and black water; which soaps and products to avoid; and easy transport methods so reusing water is a pleasant experience rather than a cumbersome chore. By using gray water you'll offset the consumption of freshwater resources and reduce your water bill at the same time.

GRAY VS. BLACK

Wastewater in the home is classified as either gray water or black water. The U.S. Environmental Protection Agency defines gray water as "reusable wastewater from residential ... bathroom sinks, bathtub shower drains and clothes-washing equipment drains. Gray water [can be] reused onsite, typically for landscape irrigation. Use of non-toxic and low-sodium ... soap and personal care products is required to protect vegetation when reusing gray water for irrigation."

Black water is defined as water from toilets, but some states also include water from sinks that contain a high amount of organic matter. Black water should never be reused in the landscape, as it may contain bacteria

harmful to humans. It's important to know your state's definition of gray water and black water so you don't violate any reuse laws. Contact the state governmental agency that regulates your water use for this information.

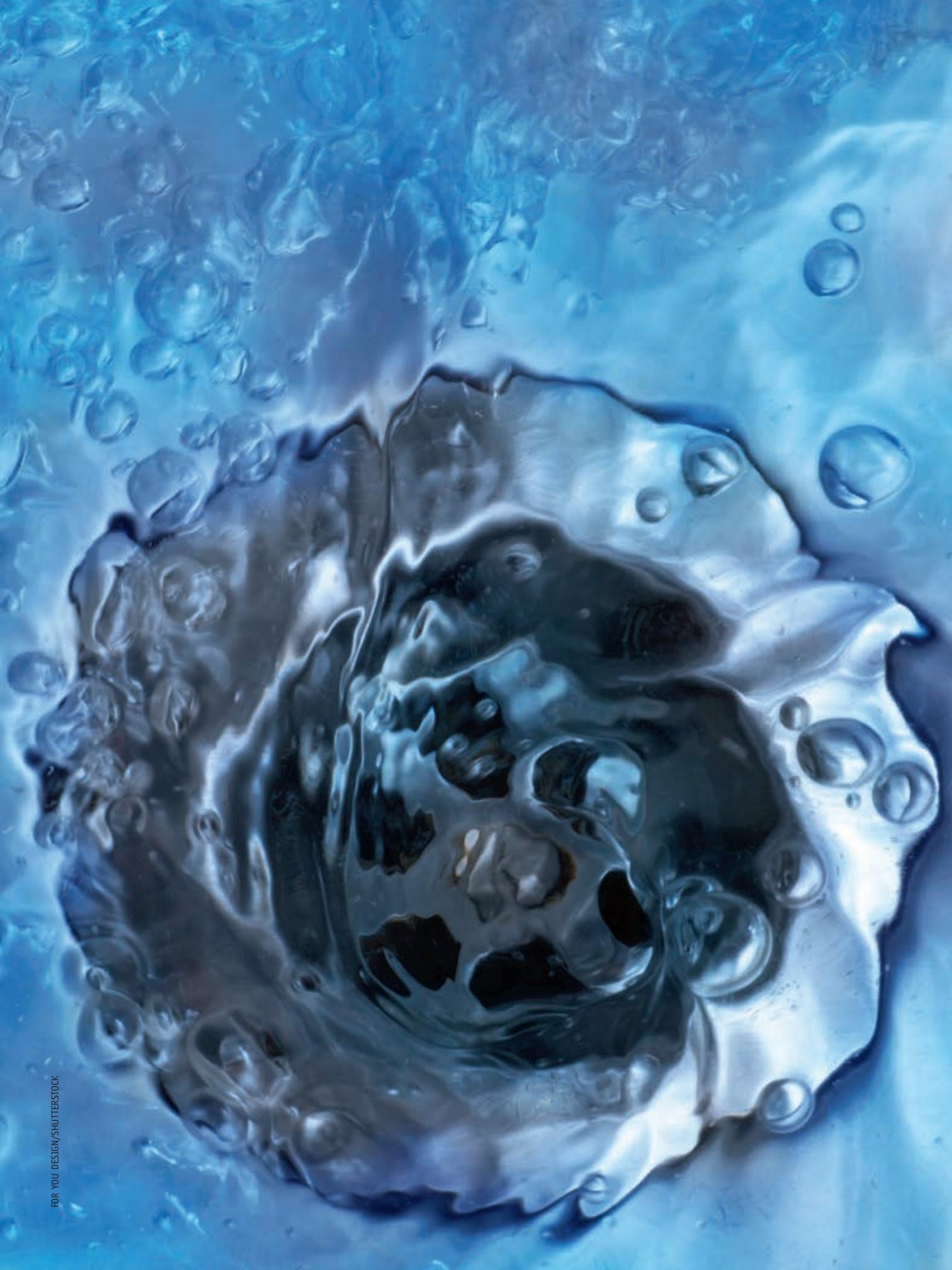
What's in gray water determines if it can be used on edible plants or should only be used on ornamentals. In general, gray water used on edible plants should be free from ingredients that can accumulate in the plant and be harmful to you if ingested or that can affect the plant's growth.

Ornamental plants can receive a wider range of products found in gray water because they are not consumed by humans. You also want to consider that some components in gray water are beneficial to plants but can pollute groundwater by leaching through the soil over time or, if poured too heavily onto the soil, can pool and run off into nearby storm-water drains or lakes, causing algal blooms that kill fish.

WATER FROM WHERE?

Where do you find water in your home that is suitable for reuse on your urban farm?

KITCHEN: In the kitchen, you will find many sources, including your pet's water bowl. Pouring stale water from your pet's dish onto edible and ornamental plants is safe, unless your pet is taking medication. Medication can leach into the pet's water dish through its saliva and could later be





COURTESY GREYWATER ACTION

As lawns wither and shrubs shrivel while water bills creep higher, more people are realizing that “gray water” is a great way to irrigate landscaping and even gardens.

found in trace amounts in plants. Talk to your vet before using this water on plants.

Leftover boiled water from making a cup of tea or boiling vegetables for your lunch are both good choices for reusing water on fruits and vegetables. Just be sure to let boiled water cool completely before applying it to plants. Water that has been used to cook vegetables contains nutrients plants need to survive. Heat pulls nutrients out of the vegetables and into the water. For instance, plants need iron to make chlorophyll. Spinach is high in iron, and when cooked in water, some will leach into the cooking water. Pour this water onto the soil, and edible and ornamental plants will benefit from the additional iron. Do not reuse water that has been used to prepare meat. The fats and odors will draw insects and other animals to the area.

The kitchen sink creates an abundance of water from preparing meals and cleaning dishes, but when it comes to reusing water, quality is more important than quantity. The state of Florida classifies wastewater from kitchen sinks as “black water due to higher organic contents (food waste), which can lead to greater microbial activity, and thus is of greater concern to public health.” Microbes break down organic matter in the soil, but food particles applied directly to edible plants could contain bacteria harmful to humans and draw pests to your garden. The state of Florida requires water from sinks and automatic dishwashers be disposed

Gray Water Guidelines

When applying gray water to an urban farm, whether with a bucket or transport system, keep the following guidelines in mind:

- Gray water should never be stored for more than 24 hours. The impurities will breed bacteria and give off a foul odor.
- Do not use gray water on seedlings; they cannot tolerate the soaps and detergents in the water.
- Gray water tends to be alkaline — a pH higher than 7.0. Use gray water on plants that can tolerate a higher pH. Nitrogen, phosphorous and potassium are not available to acid-loving plants when the pH is higher than 6.0.
- Over time, the buildup of sodium salts will raise the pH of the soil. To slow down buildup, alternate the use of gray water with freshwater. To flush salts below the root zone in the soil, water deeply occasionally with freshwater.
- When applying gray water, do not allow contact with the plant; instead, apply it directly to the soil. Do not use on root crops or leafy green vegetables. Only use on fruiting edible plants that grow aboveground when freshwater is not available.
- Mulch around plants, and pour gray water onto the mulch. This will help products in recycled water break down quickly and prevent pooling.
- As a rule, the University of Massachusetts Extension Service recommends applying not more than a 1/2 gallon of gray water per square foot each week to loamy, well-drained soil, with the most desirable gray water being from your shower or bathtub, followed by the bathroom sink, washing machine and then the kitchen sink.



HOBZNY/SHUTTERSTOCK

To reuse water from your sink or dishwasher, do not use products that contain bleach, phosphates or other harsh detergents.

Survey estimates that the average American uses 80 to 100 gallons of water per day. If your bathroom is not fitted with low-flow fixtures, in one day, you could use 36 gallons taking a bath (or 5 gallons per minute showering), 2 gallons brushing your teeth and 1 gallon each time you wash your hands. That's about 40 gallons of gray water per day per person.

Shower and bath water are the most desirable for reuse in the landscape (as long as you use environmentally friendly soaps, shampoos and other products), but they do pose some risks if used on edible plants. According to the University of Massachusetts Extension Service, water from the bathtub can contain dead skin, residue from cosmetics and organisms known to cause disease in humans. However, the organisms usually die when they come in contact with soil high in organic matter, and they are not taken up

Do not use gray water on seedlings, as they cannot tolerate the extra pollutants in the water.

of into septic systems. The University of Massachusetts Extension Service suggests using water from kitchen sinks and dishwashers only if other more desirable sources are not available, and if you limit food and grease particles in the water you reuse.

To reuse water from your sink or dishwasher, do not use products that contain bleach, phosphates or other harsh detergents. Phosphorous is an essential element for plant growth and root formation, but cleaning products containing phosphates also contain high amounts of sodium. Sodium salts build up in the soil and interfere with a plant's ability to take up water, leading to plant damage and, in extreme cases, plant death. Phosphate from runoff is also a key factor in forming harmful algal blooms in lakes and storm-water ponds. Gray water from your kitchen sink and dishwasher — containing low-sodium, natural products safe for plants and free of phosphates and chlorine — can be used on ornamental plants. Because of the organic matter and potential for harmful bacteria, do not reuse this water among edible plants.

BATHROOMS: Step into the bathroom, and you're surrounded with opportunities to reuse water. The United States Geological

Pour gray water directly onto the soil, and avoid contact with the plants' fruits and foliage.



WITHGOD/SHUTTERSTOCK



COURTESY GAVIN ANDERSON/FLECKA

Now here is an awesome idea for reusing gray water: a sink that empties directly into the back of a commode (above)!

If you use biodegradable soaps and toxin-free detergents, your laundry water (above right) may be safe for use among ornamental garden beds.

ROB BYRON/SHUTTERSTOCK



by the roots and transported into the fruit like heavy metals. For safety, the University of Massachusetts recommends its use only on lawns and ornamental plants. Greywater Action (www.greywateraction.org) promotes reusing water from your bathtub on fruit trees and edible vines, such as raspberries, as long as the water does not splash onto the foliage or edible parts of the plant.

Water from your bathroom sink can be used on edible plants if it doesn't contain grease or harsh soaps. Keep in mind that bar soaps are usually alkaline and raise the pH

of gray water. Acid-loving plants, such as blueberries, will not like this. Choose soaps that are pH neutral and low in sodium.

Your laundry machine can produce 25 to 40 gallons of gray water per load. As with kitchen products, detergents and fabric softeners can contain phosphates and sodium that damage soil structure. Some laundry products also contain boron and chlorine, both of which are toxic to plants. Reduce the amount of sodium in the wash water by avoiding products containing phosphates and water softeners. Replace chlorine bleach



A simple bucket system may be the easiest way to transport gray water from your home to the garden.

DENIS AND YULIA POGOSTINS/SHUTTERSTOCK

with hydrogen peroxide bleach, and liquid fabric softeners with dryer sheets. After switching to these more environmentally friendly products, reuse water from your washing machine on ornamentals and on the soil around edible plants where the water will not contact the edible portion.

Water from washing diapers or clothes soiled with petroleum products is not suitable for reuse on any plant on an urban farm. Bacteria from fecal matter renders washing-machine water as black water, and environmentally toxic compounds should never be dumped onto the soil. Dispose of this water via a septic system.

TRANSPORTATION SUGGESTIONS

Using soaps and detergents that make gray water safe for use on your urban farm and knowing what to avoid is only half the story when it comes to reusing water. The other half is transporting it out to your crops.

For small quantities, a bucket works well, but for larger volumes from your washing machine or tub, the easiest way is to pipe it directly to your landscape. There are a variety of options for doing this.

Greywater Action recommends using a system that is gravity-fed and designed not to clog without the use of filters, and that transports the water at a rate that allows it to sink into the soil without running off to surrounding areas. A gravity-fed system entails little modification to the existing plumbing and only requires switching a valve when you want to divert water to the garden.

Before installing a gray-water system, check with your building code authority to see if a permit is needed and if gray-water use is allowed in your neighborhood. Policies are changing annually as more states embrace reusing water.

Reusing water on your urban farm requires learning about environmentally friendly products and which products are safe for plants used for human consumption. Start one room at a time, and you'll create a water conservation lifestyle that your household will benefit from each growing season. **uf**

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COURTESY GREYWATER ACTION

Some urban farmers are renovating their laundry rooms to allow rinse water from their washing machines to drain directly into the garden patches of their yards.

Considering Condensate?

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On a hot summer day, an air conditioner can produce 10 to 15 gallons of gray water, and in a humid climate, a dehumidifier can wring a significant amount of water from the air. This “free” water is tempting to use on your cayenne peppers and squash plants, but air conditioners and dehumidifiers contain chillers made with copper and joints soldered with lead or zinc. These metals leach into the condensate. When poured onto soil, they are taken up through plant roots and transported throughout the plant. Plants need zinc and copper in trace amounts to survive, but when these metals accumulate in the plant, they become toxic to plants and humans.

A study by Northwestern University showed 100 percent of root vegetables grown in soil contaminated with lead contained the metal; nearly 40 percent of leafy vegetables and herbs were affected, and 3 percent of fruiting crops, such as tomatoes and peas, had lead in them. Lead is toxic to plants in any amount and dangerous to humans when consumed.

Only use condensate from air conditioners and dehumidifiers to water your ornamentals in pots without drain holes. This will keep heavy metals from entering your garden soil. If you can find a dehumidifier or air conditioner not made with heavy metals, this would make reusing this water more appealing, but condensate from these sources might also contain harmful bacteria.