



Gray Water: Too Precious to Waste

Water Reuse Options for Arizona

Channah Rock, Ph.D., Water Quality Specialist, Soil, Water and Environmental Science Department, University of Arizona

A nexus of factors are currently pressuring Arizona's water resources; these factors include a growing population, ongoing drought and recognition of the importance of riparian areas. Accordingly, water managers are considering all available sources of water supplies including water reuse. These increasing demands on limited water resources have made water reuse for municipal and residential irrigation an attractive option for extending water supplies in the semiarid southwest.

One viable option for extending the potable (drinking) water supply in the southwest is the use of gray water for irrigation. In Arizona, gray water is defined as wastewater (collected separately from your sewage flow) which originates from a clothes washer, bathtub, shower or sink, but not from a kitchen sink, dishwasher or toilet. In Pima County alone it is estimated that between 20,000 and 30,000 households may currently be using gray water systems. These households involve between 50,000 to 80,000 people with millions of gallons of potable (drinking) water saved each year. In Tucson, recent legislation was passed mandating new residential construction include a gray water infrastructure, and in parts of Cochise County plumbing for residential gray water reuse is also required. Statewide, Arizona residents and home builders who install gray water systems are eligible for a one-time tax credit of 25 percent of the total cost of the system up to a maximum of \$1,000 (residents) or \$200 (home builders).

Some of the factors that motivate people to utilize gray water include environmental sensitivity, water conservation ethics, desire to reduce water/sewer bills, or a desire to prolong the life of their septic tanks. Gray water can be used on a variety of plants including: shrubs, grass, potted plants, wild flowers, compost, shade and ornamental trees, nut trees and annual/bedding plants. Additionally, gray water systems can be constructed to best accommodate irrigation needs. Some of the ways that gray water can be applied to landscapes for irrigation include flood or with fine filtration, drip irrigation systems.

In addition to the added benefit of water savings through gray water reuse, nitrogen and phosphorus are present in recycled water which is beneficial to plant growth. This increased nutrient content may reduce the need to purchase and apply artificial fertilizers to landscaped plants.

Among the concerns with gray water is the use of certain chemicals or detergents that may remain in the water prior to application. Special detergents which have been formulated to easily degrade in the environment should be used in order to prevent detrimental effects when applied to plants. Another concern with the use of gray water is the added salts or salinity that may have negative effects on plants (when salt accumulation occurs, plants cannot take up enough water). Compacted landscape sites that maintain poor drainage are highly

susceptible locations for salt accumulation. These accumulations can be reduced by improving drainage to the irrigated site as well as by flushing the location periodically to prevent salt buildup near the root zone.

When using recycled water for landscape irrigation it is important to remember smart management practices. These include (1) irrigation; improve irrigation uniformity and utilize flood or drip irrigation practices, (2) compaction control; prevent water pooling by maintaining water movement and drainage, (3) fertilization and amendments; reduce nitrogen and phosphorus over-fertilization and (4) plant selection; select salt tolerant species for your garden. By remembering these smart management practices, you can ensure the beneficial use of recycled water for home irrigation.

In order to use gray water from your home you must adhere to the guidelines for a Reclaimed Water Type 1 General Reuse Permit from the Arizona Department of Environmental Quality (ADEQ). This permit outlines specifications for the safe application of gray water at your residence. To decrease the likelihood of water displacement, this permit requires that your home must lie outside of an active flood plain. ADEQ regulates that gray water must originate from your residence and must only be used for landscape irrigation at your residence. Only drip or flood irrigation with gray water is allowed. Spray irrigation is not permitted due to the potential for inhalation or drifting off-site. Additionally, your gray water system needs to have a way to discharge to the septic or sewer system in the event of plugging or any other problem with your gray water quality or the system itself. If above ground, be sure your gray water storage is not only childproof, but also has a secure cover for safety and mosquito control. Also, try to use stored gray water within 72 hours to reduce potential odors.

The use of gray water conserves drinking-quality water and may also delay costly expansion of water treatment facilities, which means lower water rates for city water customers. In addition, water reuse provides a readily available and reliable source of water, even during times of shortage, like a drought. **It is important to remember that every gallon of gray water used for outdoor watering represents a gallon of potable water saved for drinking.**

There are several ways you, as a citizen, can have a voice in the decisions made regarding the water systems in your community. You can attend and participate in City Council meetings or Citizen Bond Committee meetings. These forums provide ways for you to express your opinions regarding water usage in your community and allow you to learn more about the decision-making process.

You can also get involved by learning more about water sources and water uses in your area through active participation in the Master

Charles Gerba



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Watershed Stewards Program. Additionally, as part of the Extension community, one of the Water Quality Program's goals is to increase water reuse education throughout communities in Arizona. Currently, we are developing interactive programs to engage the public and inform them about the water that is being produced and recycled in various Arizona communities. Our goal is to increase awareness of water issues here in Arizona and promote sustainability through the use of recycled water.

Resources

Information on gray water reuse can be found on the ADEQ brochure at <http://www.azdeq.gov/envirom/water/permits/download/graybro.pdf>

Gray water guidelines can be found through the Water Casa publication at http://www.watercasa.org/publications/Graywater_Guidelines.pdf

Common gray water questions are answered in the University of Arizona Cooperative Extension Water Wise website at www.ag.arizona.edu/cochise/waterwise as well as a gray water brochure at http://cals.arizona.edu/cochise/waterwise/pdfgraywater_4fold_10_25_07.pdf

For more information about gray water and the use of home detergents visit http://cals.arizona.edu/cochise/waterwise/pdf/graywater_detergent.pdf

For tax credit application forms and further information, go to www.azdor.gov (click on "credit pre-certification" on the left hand side of the home page).

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Fencing for Wildlife

Cori Dolan, Program Coordinator and Bill Mannan, Ph.D., Professor, School of Natural Resources, University of Arizona

Fences can be an effective way to control animal movements, whether livestock or wildlife, and protect gardens and landscaping. Depending on your goal, fences can be built to completely exclude most animals from your property or be built in a way that allows access by some species while excluding others. When considering options for fencing designs, it is important to understand the potential impacts to the wildlife inhabiting the area. Where livestock and human safety are issues, fences can be designed to exclude most wild animals completely while keeping pets or livestock in. Where safety is not an issue, fences can be built that do not restrict the movement of wild animals and can benefit them by allowing movements along seasonal migration routes as well as daily movements to food, cover, and water.

WILDLIFE-FRIENDLY FENCING

While fences that limit access and movement of wild animals may be necessary to protect crops and livestock, they can impede wildlife in a way that contributes to the decline of populations. If your property contains native habitats and the fences exclude wildlife, consequences include loss of food, resting areas and travel corridors. In addition, fences that restrict movement can trap animals inside the area making it difficult to remove them. Wildlife-friendly fencing can address at least two issues for areas that have wildlife fencing needs. First, it provides fencing which excludes wildlife without harm and second, it allows wildlife to move through an area without barriers or health and safety issues. An important guideline is to fence in only