WET
WATER & ENERGY TOPICS

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From the Agent

Using reclaimed water to irrigate landscapes has increased in recent years as a way of conserving surface and groundwater resources. Reclaimed water irrigation conserves fresh water resources by replacing drinking quality water with reclaimed water. Opportunities for reusing reclaimed water are numerous and include irrigation, industrial cooling water, groundwater recharge, and preventing salt water intrusion in coastal groundwater aquifers. This month's WET we will focus on using reclaimed water for landscape irrigation. I hope you find the information helpful. Thanks for reading WET. As always, you can also find more updated information on water and energy from the WET Facebook page (www.facebook.com/marionwet).

Yilin Zhuang

All reclaimed waters contain some amount of dissolved mineral salts. The salinity of reclaimed water may be the single most important parameter in determining its suitability for irrigation

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Reclaimed Water Basics

Reclaimed water is water from municipal wastewater treatment plants that has been treated to levels that allow safe use for designated purposes. "Water reuse" is the term used to describe the application of reclaimed water for beneficial purposes. Reusing water helps conserve drinking water supplies by replacing the use of drinking quality water for non-drinking water purposes. Opportunities for reusing reclaimed water are numerous and include irrigation, industrial cooling water, groundwater recharge, and preventing salt water intrusion in coastal groundwater aquifers.

In Florida, reclaimed water is used in a variety of ways with the largest amount used for irrigating public access areas (shown in Figure 1). Public access areas include residential areas, golf courses, athletic fields, parks, etc. Following public access areas, the next largest uses are groundwater recharge and industrial uses such as cooling water in power plants. Most of the reclaimed water used for agricultural irrigation is used to grow feed, fiber, or other crops that are not for direct human consumption. Reclaimed water can be used to grow crops for human consumption in Florida, but it must meet the same stringent treatment and disinfection requirements as water for public access area use and it is not allowed to come in direct contact with crops that will not be peeled, skinned, cooked, or thermally processed.

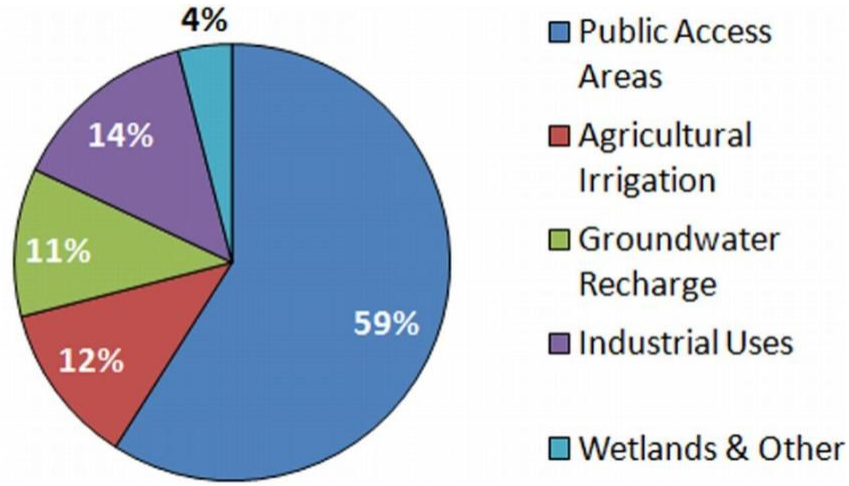

Figure 1. Reuse Activities in Florida (Florida Department of Environmental Protection, 2009)

Florida is a recognized leader in the use of reclaimed water and its reuse program was the first recipient of the United States Environmental Protection Agency Water Efficiency Leader Award in 2006. Encouraging and promoting reuse in Florida is a state objective for conserving freshwater supplies and preserving rivers, streams, lakes, and aquifers.

Reclaimed Water for Landscape Irrigation

The water quality of reclaimed water differs from that of drinking quality water or rainfall and should be considered when used to irrigate landscapes. Of particular importance to landscape health and environmental quality are the salts and nutrients in reclaimed water. Special management practices may be required depending on the quantity of salts supplied in reclaimed water and the salt-sensitivity of the plants irrigated. Depending on the quantity and timing of nutrients supplied by reclaimed water, the need for additional fertilizers could be significantly reduced. Applying fertilizers at recommended rates without accounting for the nutrients in reclaimed water could result in applying more nutrients than is necessary or that can be used by the plant or retained by the soil, potentially resulting in excess nutrients running off or leaching to groundwater and degrading water quality.

The nutrient content of reclaimed water varies depending on the treatment processes used. In general, treatment plants that use advanced treatment methods typically produce reclaimed water with lower nutrient levels than those that use secondary treatment methods. However, advanced treated reclaimed water still often contains higher nutrients than drinking-quality water or rainfall. The amount of nutrients contained in reclaimed water also varies from utility to utility and can vary at different times of year, so it is important to know the nutrient content of the water you receive so you can incorporate this source into a landscape fertility plan.

Reclaimed water is treated wastewater that has received, at a minimum, secondary-level treatment and basic disinfection at a wastewater treatment facility. The main difference between reclaimed water that has received secondary vs. tertiary treatment is the level of nutrients that remain in the water. Tertiary treated water typically has 25% of the nitrogen and phosphorus contained in secondary treated reclaimed water

Figure 2. Landscaping with Reclaimed Water in Pinellas County

The nitrogen and phosphorus in reclaimed water are mainly present as inorganic ammonium, nitrate, and phosphate ions with a smaller proportion of organic forms. The organic forms are typically composed of dissolved and fine particulates and are a mixture of amino acids, proteins, sugars, and starches. The exact composition of a given reclaimed water will vary from utility to utility. The simple organic forms found in reclaimed water are products of the decomposition of more complex forms during treatment at the wastewater treatment facility. In warm climates such as Florida these simple organic nutrient forms are typically readily converted to inorganic forms (ammonium and phosphate) by soil microorganisms. Ammonium is then rapidly converted to nitrate in well drained soils. However the exact amount of the organic forms that can be converted to inorganic forms and used by plants may vary by reclaimed water source and is a topic in need of further research.

Use of reclaimed water can significantly reduce demand on high quality fresh water, allowing those resources to be conserved for more important uses. However, nutrients in reclaimed water, if not managed appropriately, can result in impacts to downstream environments. All nutrient applications to the landscape should be accounted for whether they are in the form of fertilizers or reclaimed water. Soil tests should be used to determine the need for fertilizer application. Special caution should be taken when using reclaimed water in soils that already contain adequate phosphorus for plant growth. Overspray of reclaimed water onto impervious surfaces such as roads, driveways, and sidewalks should be avoided since this results in reclaimed water entering the stormwater system, increasing nutrient loads to retention ponds and increasing plant and algal growth. Grass clippings and fertilizer left in a curb or gutter also will be washed down the drain in the next storm and can create problems downstream.

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To receive future electronic copies of WET, please contact Yilin Zhuang.

Energy Efficient Home Workshop

Reducing energy consumption while improving your home's comfort.

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Please call 352-671-8400 to register by July 3.

Registration includes materials and refreshments.

Topics and Dates

July 9: Air Conditioning and Duct System

July 16: Lighting and Windows

July 23: Appliances and Electronics

July 30: Indoor Environmental Quality

Instructor and Cost

Yilin Zhuang, Ph.D.
UF/IFAS Extension Agent
$10 for each session and $30 for all.

Time and Location

6:30 pm - 8:30 pm
UF/IFAS Extension Marion County
2232 NE Jacksonville Rd.
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