

# Recycled Water Use in the Landscape

## How do recycled water and gray water differ? Where can they be used?

Recycled water is highly treated wastewater from various sources such as domestic sewage, industrial wastewater and storm water runoff. Most recycled water treatment plants produce tertiary treated water, meaning the water has been through three levels of treatment including filtration and disinfection. Tertiary treated recycled water can be used for landscape, agricultural irrigation, car washing, fish ponds, fire fighting, groundwater recharge and in fountains and recreational lakes where swimming is allowed. Gray water is untreated, non-disinfected wastewater that has *not* come into contact with toilet waste. Gray water includes wastewater from residential showers, bath tubs, bathroom sinks and washing machines which may be used in landscapes using an onsite collection system and must employ a subsurface irrigation method. Recycled water is cleaner, safer and has far less restrictions on its use than gray water. It does not require an onsite collection system and is delivered through a separate plumbing system. Most recycled water is applied by drip irrigation or conventional sprinkler irrigation.

By law, all pipes and equipment conveying recycled water must be purple or have purple markings as a universal sign to prevent cross connection with potable supplies. This includes flow control knobs, solenoids, valve boxes, sprinkler heads and of course all piping. In addition, public areas must post signs stating "Caution: Recycled Water Do Not Drink".

## How good is the quality of recycled water?

The quality of recycled water depends upon the source water and the level of treatment. Generally recycled water will have a higher concentration of dissolved salts than drinking water. Water with high levels of salts can have adverse effects on plant health and appearance; however, most recycled water produced does not have harmful levels of salts for most plants. Irrigation constituents of greatest

concern to agricultural crops or ornamental species are chloride, sodium, bicarbonate, boron, and fluoride. Appropriate plant selection and good irrigation management can minimize the potential impacts of the salts or specific ions of concern.

## Is the same amount of recycled water used as potable water when irrigating?

There is a potential for salt accumulation when using recycled water. As a result, it may be necessary to slightly over-water or leach plants irrigated with recycled water. A general rule of thumb is to allow for a 10% over watering depending on soil type and plant characteristics. Well drained soils and rainwater will help mitigate salt accumulation effects.

## What are the effects on plants?

Plants sensitive to salts may be affected mostly by tip burning when recycled water with high saline content is applied by spray leaving salts behind when the water evaporates. Drip irrigation rather than overhead irrigation will minimize foliar injury. Two studies done by University of California at Davis showed low occurrence of injury to many common landscape plants. In fact, one study showed health ratings were equal or higher using recycled water over potable water in all species tested. In some cases, nutrient rich recycled water can be beneficial to plant growth and might reduce the need for additional fertilizers. Summaries of these studies are found in the UC Department of Environmental Horticulture newsletter "Growing Points" Fall 2001 and Fall/Winter 1996/97 issues available on the internet at: <http://envhort.ucdavis.edu>.

## What plants can be irrigated with recycled water?

Turf grasses, most annuals, and deciduous trees are more tolerant of saline water than evergreens. Turf grasses either have built in tolerance of saline conditions or do not accumulate high levels of salt because of frequent mowing. Deciduous plants don't accumulate salts in plant tissues because they shed their leaves each fall. A list of plants with high salt tolerance is on the reverse side.

## Laws that regulate recycled water:

Water Recycling In Landscaping Act (SB 2095 year 2000):

<http://www.leginfo.ca.gov/>

Health and Safety Code, Water Code:

<http://www.leginfo.ca.gov/calaw.html>

Title 17, Division 1, Chapter 5:

<http://www.calregs.com/default.htm>

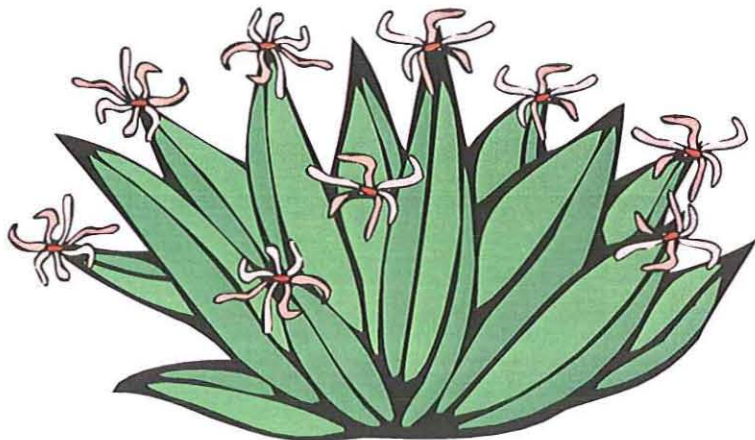
Title 22, Division 4, Chapter 3

<http://www.calregs.com/default.htm>

More info:

The Department of Water Resources has developed guidelines for the use of gray water in landscapes, available on the Office of Water Use Efficiency Website at:

<http://www.owue.water.ca.gov/landscape/pubs/pubs.cfm>



## Plants with High Tolerance of Salt in Irrigation Water

Common Name	Scientific Name	Common Name	Scientific Name
Agave	Agave spp.	Lemonade Berry *	Rhus integrifolia *
Alkali Sakaton *	Sporobolus airoides *	Leyland Cypress	Cupressocyparis X leylandi
Aloe	Aloe spp.	Melaleuca	Melaleuca spp.
Arizona Ash	Fraxinus velutina *	Mexican Palo Verde	Parkinsonia aculeata
Modesto Ash*		Mexican Pinon Pine	Pinus cembroides
Beefwood	Casuarina stricta	Mirror Plant	Coprosma spp.
Bermuda Grass	Cynodon dactylon	Myoporum	Myoporum parvifolium
Bladderpod *	Isomeris arborea *	Natal Plum	Carissa macrocarpa
Blue Blossom *	Ceanothus thrysiflorus *	New Zealand Christmas Tree	Metrosideros excelsus
Blue Dracaena	Cordyline indivisa	Northern Red Oak	Quercus rubra
Blue Palo Verde *	Cercidium floridum *	Oleander	Nerium oleander
Blue Spruce	Picea pungens	Parney Cotoneaster	Cotoneaster lacteus
Blue Wildrye *	Elymus glaucus *	Pindo Palm	Butia capitata
Bougainvillea	Bougainvillea spectabilis	Pride of Madeira	Echium fatuosum
Breath of Heaven	Coleonema spp.	Pt. Reyes Ceanothus *	Ceanothus gloriosus *
California Brome *	Bromus carinatus *	Purple Needlegrass *	Stipa pulchra *
California Buckwheat *	Eriogonum fasciculatum *	Redolen Acacia	Acacia redolens
California Fan Palm *	Washingtonia filifera *	Rose Iceplant	Drosanthemum hispidum
California Fescue *	Festuca californica *	Rose Moss	Portulaca grandiflora
California Juniper *	Juniperus californica *	Rosemary	Rosmarinus officinalis
California Sycamore *	Platanus racemosa *	Saltbush *	Atriplex spp. *
Callery Pear	Pyrus calleryana	Sandhill Sage *	Artemisia pycnocephala *
Canary Island Palm	Phoenix canariensis	Seashore Paspalum	Paspalum vaginatum
Cape Plumbago	Plumbago auriculata	Silk Oak	Grevillea robusta
Catalina Cherry *	Prunus lyonii *	Skyrocket Juniper	Juniperus virginiana "Skyrocket"
Catclaw Acacia *	Acacia greggii *	Slender Hairgrass	Deschampsia elongate
Coast Live Oak *	Quercus agrifolia *	Southern Flannel Bush *	Fremontia mexicana *
Coffeeberry *	Rhamnus californica *	Southern Live Oak	Quercus virginiana
Cushion Bush	Calocephalus brownii	Spanish Bayonet	Yucca aloifolia
Date Palm	Phoenix dactylifera	St. Augustine Grass	Stenotaphrum secundatum
Deer Grass	Muhlenbergia rigens	Strawberry Tree	Arbutus unedo
Deodar Cedar	Cedrus deodara	Sugar Bush *	Rhus ovata *
Dwarf Coyote Brush *	Baccharis pilularis *	Texas Ranger	Leucophyllum frutescens
Dwarf Olive	Olea europaea "Montra"	Toyon *	Heteromeles arbutifolia *
Escallonia	Escallonia rubra	Tree Mallow *	Lavatera assurgentiflora *
European Fan Palm	Chamaerops humilis	Tree Myrtle	Myrtus communis
Evening Primrose	Oenothera speciosa	Trident Maple	Acer buergerianum
Evergreen Euonymus	Euonymus japonica	Weeping Bottlebrush	Callistemon viminalis
Evergreen Pear	Pyrus kawakamii	Western Cottonwood *	Populus fremontii *
Feathery Cassia	Senna (Cassia) artemisioides	Western Redbud*	Cercis occidentalis *
Firethorn	Pyracantha coccinea	White Ice Plant	Delosperma alba
Fortnight Lily	Dietes irioides	Zoysia Grass	Zoysia tenuifolia
Gazania	Gazania spp.		
Giant Honeysuckle	Lonicera hildebrandiana		
Gum Trees	Eucalyptus sp.		
Hardtack *	Cercocarpus betuloides *		
Hedge Maple	Acer campestre		
Hollyleaf Cherry *	Prunus ilicifolia *		
Horsetail Tree	Casuarina cunninghamiana		
Indian Hawthorn	Rhaphiolepis indica		
Italian Cypress	Cupressus sempervirens		
Italian Stone Pine	Pinus pinea		
Jacaranda	Jacaranda acutifolia		
Japanese Boxwood	Buxus japonica		
Japanese Honeysuckle	Lonicera japonica		
Japanese Pagoda Tree	Sophora japonica		
Jojoba *	Simmondsia chinensis *		
Jujube, Chinese Date	Ziziphus jujuba		
Lemon Bottlebrush	Callistemon citrinus		

\*California Native

### References:

Abiotic Disorders of Landscape Plants: A Diagnostic Guide  
University of California, Agriculture and Natural Resources  
Costello, L. et al

"Growing Points" Newsletter,  
Department of Environmental Horticulture, University of California, Davis Fall 2001, Fall/Winter 1996/1997