RESEARCH ON RECYCLED WATER IN ORNAMENTAL LANDSCAPES

Use of recycled water is already the norm in some parts of the world with limited water supplies, and it is becoming increasingly common in California. As wastewater treatment plants expand their capacity to deliver recycled water to customers, landscape irrigation is expected to become the second largest use for recycled water after groundwater recharge.

Recycled water is wastewater treated to a quality high enough to be safe and effective for many purposes, including landscape irrigation. This water is clear, odorless, and free of harmful bacteria, but it does contain more salts and nutrients than are found in drinking water. Some of these, such as nitrogen, calcium, and magnesium, can enrich the soil and promote plant growth. Others, such as sodium and chloride, can cause leaf burn, dieback, stunted growth, and even death of salt-sensitive plants if the landscape is not carefully managed.

Most of the problems experienced with recycled water also occur with potable water if the site is poorly drained or the landscape is watered incorrectly. It just takes longer for plant symptoms to become serious enough to notice or a trained eye to see the early signs. Learning to use recycled water may help us become better gardeners by requiring that we pay close attention to soils, plants, and watering schedules.

A river cleans itself by depositing silt along its banks. ı convert organic matter into more stable compounds ıt settle out. Water is disinfected by the sun's ultraviolet ıs. As water percolates through rock and soil, impurities ? left behind. We mimic these natural processes when we treat wastewater so it can be used again.

Research by the University of California at Davis and several northern California water utilities suggests that many of the plants most commonly used in California landscapes will thrive with recycled water. Field and greenhouse studies over a ten-year period tested the responses of a wide range of plants with varying cultural needs and growth habits. These studies have demonstrated that site management, particularly water management, is the key to successful use of recycled water in ornamental landscapes. Among the study findings are:

- Plants that show sensitivity to recycled water applied with overhead sprinklers often show no symptoms with drip irrigation.
- Sprinkler irrigation often has no negative effects if water is applied deeply and infrequently, allowing time for leaves to dry and salts to leach below the root zone.
- Salt buildup in soils is insignificant where annual rainfall is at least moderate and drainage is reasonably good.
- Even salt-sensitive plants in poorly draining soils may show no symptoms of distress if the right amount of water is applied at the right time.

Following are some of the plants that have proved tolerant or moderately tolerant of irrigation water containing 300ppm chloride and 200ppm sodium, levels comparable to or higher than most recycled waters.

SOME SALT-TOLERANT PLANTS

Trees

Albizia julibrissin (silk tree)
Cedrus deodara (deodar cedar)
Fraxinus augustifolia 'Raywood' (Raywood ash)
Koelreuteria paniculata (goldenrain tree)
Pinus cembroides (Mexican piñon pine)
Platanus x *acerifolia* 'Bloodgood' (London plane)
Quercus agrifolia (coast live oak)
Quercus lobata (valley oak)
Sequoia sempervirens 'Los Altos' (redwood)
Washingtonia filifera (California fan palm)

Shrubs

Acacia redolens (prostrate acacia)
Arbutus unedo (strawberry tree)
Arctostaphylos uva-ursi 'Point Reyes' (bearberry manzanita)
Baccharis pilularis 'Twin Peaks #2' (coyote brush)
Ceanothus 'Concha' (California lilac)
Ceanothus griseus var. *horizontalis* 'Yankee Point' (Carmel creeper)
Ceanothus thyrsiflorus (California lilac)
Cotoneaster dammeri 'Coral Beauty' (bearberry cotoneaster)
Cotoneaster microphyllus (rockspray cotoneaster)
Escallonia rubra (red escallonia)
Heteromeles arbutifolia (toyon)
Juniperis horizontalis 'Wiltonii' (juniper)
Lantana camara (lantana)
Mahonia pinnata (California holly grape)
Myrtus communis (myrtle)
Nandina domestica (heavenly bamboo)
Nerium oleander (oleander)
Olea europaea 'Montra' (dwarf olive)
Photinia x *fraseri* (photinia)
Pittosporum tobira (tobira)
Prunus caroliniana (Carolina laurel)
Rhaphiolepis indica (Indian hawthorn)
Rosmarinus officinalis 'Prostrata' (rosemary)
Sambucus nigra (elderberry)
Xylosma congestum (xylosma)

Ceanothus 'Concha'

Grasses

Bromus carinatus (California brome)
Deschampsia cespitosa (tufted hairgrass)
Deschampsia elongata (slender hairgrass)
Elymus glaucus (blue wild rye)
Festuca californica (California fescue)
Melica californica (California melic)
Muhlenbergia rigens (deergrass)
Sporobolus airoides (alkali sacaton)

Vine

Jasminum polyanthum (pink jasmine)

—Roger Waters, president
National Urban Agriculture Council
Woodacre, California