

### **Perennials (cont.)**

*Mirabilis jalapa*—Four O’Clock  
*Oenothera caespitosa*—Tufted Evening  
Primrose  
*Psilostrophe bakerii*—Paperflower  
*Sphaeralcea coccinea*—Scarlet  
Globemallow  
*Stanely pinnata*—Prince’s Plume  
*Yucca elata* — Soaptree Yucca  
*Yucca glauca*—Small Soapweed

### **Vines**

*Lonicera japonica*—Japanese Hall’s  
Honeysuckle  
*Lonicera tataricum ‘Zabelii’* - Zabel’s  
Honeysuckle  
*Parthenocissus quinquefolia*—Virginia  
Creeper

### **Fruit, Nut and Vegetable**

*Allium cepa*—Onion  
*Apium graveolens*—Celery  
*Beta vulgaris*—Beets  
*Beta vulgaris var. cicla*—Swiss Chard  
*Brassica napobrassica*—Rutabaga  
*Brassica oleracea*—Broccoli  
*Brassica oleracea Acephala*—Kale  
*Capsicum spp*—Bell Pepper  
*Cucumis Sativus*—Cucumber  
*Daucus carota subsp sativus*—Carrot  
*Ficus carica*—Fig  
*Juglans regia*—English Walnut  
*Pistacia vera*—Pistacio  
*Rhem rhabarbarum*—Rhubarb  
*Prunus dulcis*—Almond  
*Punica sp*—Pomegranate  
*Solanum tuberosum*—Potato  
*Solanum lycopersicon*—Tomato  
*Spinacia oleracea*—Spinach  
*Zea mays*—Corn

## **Brackish Water Study**

*This study observed ornamental plants irrigated with untreated Virgin River water that can have a total dissolved solids (TDS) count on the average 0 to 2,000 ppm.*

*Water from the Virgin River was applied to a variety of shrubs, trees, grasses and vegetables using various irrigation methods. Observations indicate that the suggestions in this brochure should be followed when using untreated Virgin River water on landscape.*

*This study is being performed by Dr. Frank Williams.*

### **Washington County Water Conservancy District**

533 E. Waterworks Drive  
St. George, UT 84770  
Phone: 435-673-3617

Webpage: <http://www.wcwcd.org>  
Follow us on TWITTER at WATERDIST

These subsections are based on the preliminary results observed at the Washington Fields research plot. Untreated water from the Virgin River has been used on a variety of low growing shrubs, trees, grasses and vegetables. Several methods of irrigation are being evaluated for use with the untreated irrigation water. Over the last year, small shrubs that have had water on the foliage from the sprinklers have shown very little growth or have been lost. Observations indicate that the following suggestions be followed when using untreated Virgin River water on landscape.

## Irrigation

Proper irrigation is essential for successful growth of plants in the St. George area. Quality of the water is also important, so one needs to understand the importance of the quality of water that is going to be used. Poor quality irrigation water and over watering are two of the main reasons landscapes fail. When we irrigate, all of the air is forced out of the soil. When this occurs, the roots no longer have the air they need to remain healthy and grow. So the longer the period between irrigation, the better the environment for root growth and health. Therefore, watering less frequently and for longer periods will enable the roots to grow to a greater depth which will result in healthy plants.

Water quality concerns have not been taken into considering because good quality water supplies have been plentiful and readily available. This situation is now changing in many areas including the St. George area. Intensive use of the good water supplies is making it difficult to have high quality water for all our needs. New irrigation methods need to be put in place using lower quality water. It is important that we adapt and learn how to use lesser quality water on our landscapes. The following suggestions are designed to help you use water of a lesser quality.

### Suggested plant material

#### Trees

*Albizia julibrissin*—Silk tree Mimosa  
*Cupressus arizonica*—Arizona Cypress  
*Elaeagnus commutata*—Silverberry  
*Fraxinus velutina*—Modesto Ash  
*Gymnocladus dioica*—Kentucky Coffee  
*Jacaranda mimosifolia*—Jacaranda  
*Liquidambar styraciflua*—Sweet Gum  
*Lagerstroemia indica*—Crape Myrtle  
*Magnolia grandiflora*—So. Magnolia  
*Melia azedarach*—Texas Umbrella  
*Platanus racemosa*—California Sycamore  
*Quercus rubra*—Red Oak  
*Quercus virginiana*—Live Oak  
*Quercus emorui*—Emery Oak  
*Tilia cordata*—Littleleaf Linden  
*Ulmus parvifolia*—Chinese Elm

#### Shrubs

*Abelia grandiflora*—Glossy Abelia  
*Buxus microphylla*—Japanese Boxwood  
*Callistemon citrinus*—Bottlebrush  
*Carissa grandiflora*—Natal Plum  
*Cercocarpus*—Mountain Mahogany  
*Cotoneaster glaucophyllus*—Grayleaf Cotoneaster  
*Cowania Mexicana stansfuriana*—Cliffrose  
*Elaeagnus pungens*—Silverthorn  
*Euonymus japonicus*—Japanese Euonymus  
*Fallugia paradoxa*—Apache Plume  
*Feijoa sellowiana*—Pineapple Guava  
*Hesperaloe parviflora*—Red Yucca  
*Hibiscus syriacus*—Rose of Sharon  
*Ilex cornuta*—Chinese Holly  
*Juniperus chinensis*—Chinese Juniper  
*Lantana camara*—Lantana  
*Lavandula angustifolia*—Lavender  
*Leucophyllum frutescens*—Texas Ranger

*Ligustrum japonicum*—Japanese Privet  
*Mahonia Fremontii*—Fremont's Barberry  
*Mahonia aquifolium*—Oregon Grape  
*Nerium oleander*—Oleander  
*Photinia xfraseri*—Fraser Photinia  
*Pittosporum tobira*—Mock Orange  
*Platyclusus orientalis*—Chinese Arborvitae  
*Podocarpus macrophyllus*—Podocarpus  
*Raphiolepis indica*—Hawthorn  
*Rosa woodsii*—Woods Rose  
*Rosmarinus officinalis*—Rosemary  
*Shepherdia argentea*—Silver Buffaloberry  
*Syringa x chinesis*—Chinese Lilac  
*Syringa reticulata*—Japanese Lilac  
*Syzygium paniculatum*—Brush Cherry  
*Viburnum tinus*—Spring Bouquet  
*Xylosma congestum*—Shiny Xylosma

#### Grasses and Ground Covers

*Agrostis palustris*—Creeping Bentgrass  
*Agrostis tenuis* Bentgrass  
*Cynodon dactylon*—Bermuda  
*Festuca arundinacea*—Tall Fescue  
*Lolium perenne*—Perennial Rye  
*Lotus corniculatus*—Bird's foot Trefoil  
*Puccinellia distans*—Weeping Alkaligrass  
*Zoysia japonica*—Zoysia

#### Perennials

*Aquilegia micrantha*—Cliff Columbine  
*Baileya multiradiata*—Desert Marigold  
*Gardenia hybrids*—Gardenia  
*Lantana*—Lantana  
*Lavandula angustifolia*—Lavendar  
*Linum*—Blue Flax

A well prepared soil will account for 90 percent of your success in the future. A healthy plant is the best defense against attack or invasion of various pests.

## Soil Conditioning Best Management Practices

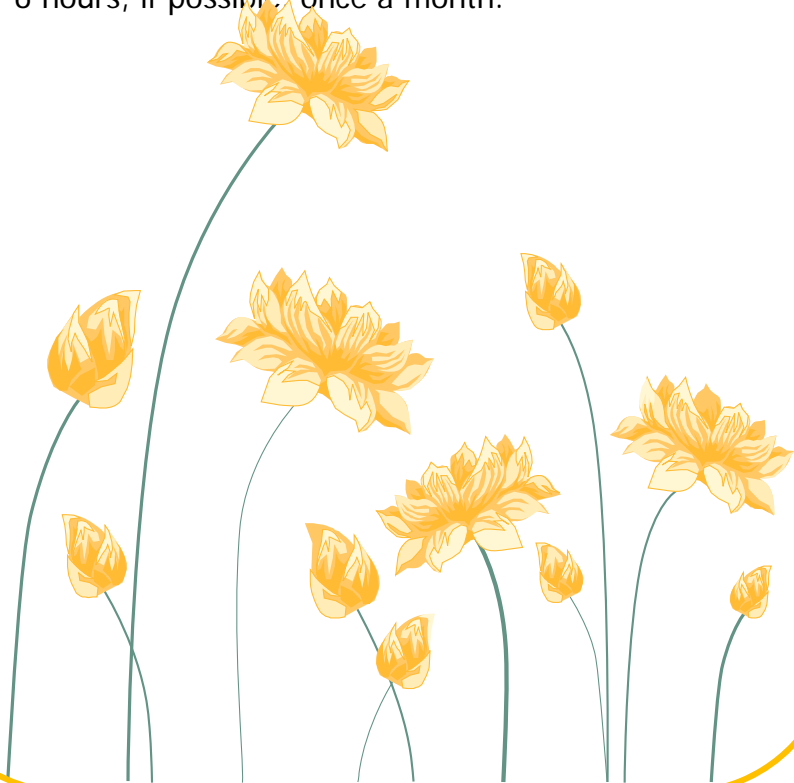
- \* Clean and rough grade the area to be planted and remove any debris from the location to be planted. Remove rocks that are larger than a chicken egg.
- \* Tilling the soil to a depth of 8-10 inches will reduce soil compaction and allow air and water movement in the soil.
- \* If you plan to replace the top soil, it is important that you replace it with at least 8-10 inches of top soil. If top soil is to be added, you should lay down 2-3 inches of new top soil and rototill it to mix the top soil with some of the subsoil. This will reduce layering of soil that can reduce air and water movement in the soil. Then place the remainder of the topsoil on top.
- \* Irrigate to the depth of 16-18 inches.
- \* Before bringing to final grade and planting, spread fertilizer and incorporate it to a depth of 4-6 inches. If turf is to be planted, roll the surface to firm it up. If rolled properly, the soil should be firm enough to leave a 1/2-inch depression when stepped upon.

## Irrigation Best Management Practices

- \* The best method of irrigation is a drip or trickle system that would not put water on the foliage.
- \* If sprinklers must be used, a low profile head should be utilized in order to keep as much water off the foliage as possible.
- \* **If cycling irrigation time, plants should only be allowed to dry only the once for that irrigation period when the irrigation is turned off. This means that the rotation of the sprinklers must be fast enough that the surface of the plants remains moist during the entire sprinkling cycle.**



- \* Water as infrequently as possible.
- \* When possible, water during the coolest and calmest period of the 24-hour day. The best time to water is during early morning before sunrise if there is no air movement or just slight air movement.
- \* Make sure that your sprinklers don't mist, but have the correct pressure to water correctly.
- \* If the winter months have been dry, the first irrigation in the spring should exceed the normal cycle to allow the salts to leach out of the root zone.
- \* When watering trees, water deeply. If the tree is planted in the lawn, give it an extended watering of 4-6 hours, if possible, once a month.



## Soils and Soil Quality

Soil is the store house for all nutrients that plants require for growth. Therefore, the physical and chemical composition of the soil is of great importance if our horticulture endeavors are to be successful. Physical conditions can be changed by drainage and tillage and incorporation of organic matter. If plants are to achieve excellent growth, it is essential that the soil be in good physical condition. Soil must have a good texture and be well prepared. Addition of a good organic matter is very important. Adding good organic matter is a must. Excellent soil consists of 5-10 percent of compost worked into a depth of 6 to 8 inches.

Southern Utah has another factor to consider in soil quality. The chemical make-up of local soils is very high in salt. Boron (B), sodium (Na), sodium bicarbonate ( $\text{NaHCO}_3$ ) and gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) must be evaluated in the content of the soil to minimize the impact of the salt factor. In fact, in many areas the amount of gypsum, which normally would have little effect, is so high that the growth of plants is greatly reduced or non-existent. It has been observed that many grasses will show reduced growth and reduced seed germination. If you feel you are in an area where this is a problem, consult your county agent at 435-634-5706.