

An introduction to

WATER-EFFICIENT LANDSCAPING:

- ❖ BEAUTIFUL
- ❖ HEALTHY
- ❖ PRACTICAL
- ❖ SUSTAINABLE
- ❖ A GOOD INVESTMENT!



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Summary

This electronic brochure provides ideas and information that we think will be useful for many people with a basic knowledge of gardening and landscaping. The primary question that we want to answer for you is:

How can I have landscape and/or lawn areas that are beautiful, enhance the value of my property, are suitable for our local climate and will be simple to maintain at a reasonable cost?

Some key points below are:

1. In a time of uncertainty about future climate conditions and with conservation pricing of OWASA's drinking water, it is increasingly important to think about landscaping and water use in a new way: **Water is a precious resource.**
2. Native, drought-tolerant plants are most likely to do well with practical maintenance and costs.
3. Soil testing and preparation are the key to growing plants with healthy root systems that will provide the nutrients and moisture which plants need under varying conditions.
4. Sustainable landscaping is an investment for your family's and our community's future quality of life with benefits in carbon reduction/oxygen generation, beautification, cooling and erosion control.
5. Overwatering promotes disease in plants. Wise irrigation will not only mean healthier plants, but less cost to you.
6. We encourage you to consider alternatives to using drinking water for irrigation, and to choose plants that will do well without supplemental watering once they are established. Dormancy is not only nature's way of adapting to the winter season, but for surviving droughts.
7. The future cost, time and work needed to maintain a yard or landscaped area should be at least as important a consideration as the cost of the initial plantings. A life cycle approach to landscaping can help optimize the aesthetic, environmental and dollar returns on your plant investments.

Key principles of water-efficient landscaping and lawns

Test your soil at several spots to help determine the kinds of plants that will grow best in various locations and what kinds of soil conditioning may be needed.

Plan your landscaping based sunlight/shade conditions, your uses of yard and garden areas, the soil types where you do plantings, drainage/moisture conditions, and the kinds of plantings that are best suited for your location and conditions including our local climate.

Where practical and needed, aerate or till the soil before plantings so that the soil will have tiny but numerous spaces for air, moisture and root growth. Dense, compacted soil is hard on plants. Aerating soil around established trees or shrubs should be done with care to avoid damaging the roots. For established trees, we recommend having an arborist do the tilling (with special equipment such as an air spade) to avoid root damage.

Use soil conditioners such as lime, organic material and low-intensity fertilizer as needed. Be careful to minimize the opportunity for fertilizer to be washed into creeks and streams, and

eventually into Jordan Lake, where fertilizer encourages growth of algae and therefore reduces water quality.

Choose native, drought-tolerant plants that are adapted to our dry climate.

Prudent maintenance including pruning (or mowing, for lawn grasses) will encourage healthy, attractive plant growth for years into the future. Mulching lawn mowers will return moisture and nutrients to the soil.

Take the time to learn how much water your plants and lawn need, and set your watering schedule accordingly. Minimize the potential for overwatering, which kills plants more often than underwatering.

The benefits of beautiful, healthy landscaping and lawns

Landscaping is critical to the quality of our environment because:

- Plants absorb carbon dioxide and produce oxygen.
- Shade trees help reduce energy use and costs for cooling; if the trees are deciduous, they can reduce energy use in cold months by allowing sunlight to warm a building. Lawns also have a cooling effect when water evaporates from grass, a process called “transpiration.”
- Plants help prevent erosion from wind and rain because roots help stabilize the soil.
- In areas near creeks and streams as well as in ponds, plants catch and absorb pollutants such as sediment, phosphorus and nitrogen. Phosphorus and nitrogen harm water quality by encouraging the growth of algae, which take up oxygen in water when algae die and decompose. Organic matter in lake water can also cause problems in and increase the cost of drinking water treatment. The effect of phosphorus, nitrogen and algae on Jordan Lake water quality has been a matter of concern for several years. Jordan Lake is a water source for several communities in the Triangle region.
- Because drinking water is pumped and a significant part of the energy to operate pumps comes from non-renewable sources such as fossil fuels, water conservation also saves energy and helps reduce carbon emissions.

Drinking water costs and landscaping

The information below shows the incremental costs for 1,000 gallons of water and sewer service with our conservation rate structures.

OWASA implemented its first water conservation rate system, called **SEASONAL RATES**, in 2002. **INCREASING BLOCK** water rates went into effect for individually-metered residences in October, 2007 to further encourage conservation.

SEASONAL RATES are higher from May through September, when peak water demand occurs and the cost of having adequate drinking water system capacity is highest. While water demand normally averages 7 to 8 million gallons per day over a full year, summer water demand has been as high as 14 million gallons in one day. To meet peak demands, OWASA expanded capacities at its Jones Ferry Road drinking water treatment plant in Carrboro from 1999 to 2002 at a cost of about \$13 million. In addition to requiring more water treatment capacity, high peak demand affects the water storage, pumping and piping capacities (and costs) needed to serve the community. (The **off-peak** seasonal rate in effect from October 2010 through April, 2011 is \$4.08 per 1,000 gallons. The **peak** seasonal rate to be in effect from May through September, 2011, is \$7.75 per 1,000 gallons.) Seasonal water rates apply to businesses, institutions and master-metered multi-family developments because their water use varies due to differences in size, operations, water use needs, etc., from those at individual residences.

In October 2007, OWASA first implemented **INCREASING BLOCK WATER RATES** for individually-metered residential customers to further encourage conservation. Increasing block water rates mean that high levels of water use are billed at higher rates per 1,000 gallons:

Water use per month	Water Rates as of October, 2010
1,000 - 2,000 gallons	\$2.58 per 1,000 gallons
3,000 -5,000 gallons	\$6.26 per 1,000 gallons
6,000 -10,000 gallons	\$7.68 per 1,000 gallons
11,000 -15,000 gallons	\$10.73 per 1,000 gallons
16,000 gallons or more	\$19.40 per 1,000 gallons

The average monthly water use at single-family residences in our community is now about 5,000 gallons per month, and the increasing block rates therefore put a premium on the cost of water use above 5,000 gallons.

In addition, most water use as measured by the water meter is subject to our sewer use rate of \$6.35 per 1,000 gallons (as of October, 2008). However, sewer charges do not apply to water use above 15,000 gallons per month at **individually-metered** residences. Residential water use at that level is assumed to be outdoor use which does not result in water returning to the OWASA sanitary sewer system.)

Therefore, water-efficient landscaping saves dollars as well as energy and water. For example,

- A business, etc. which pays seasonal water rates can save \$10.43 per 1,000 gallons of water conservation from October, 2010 through April, 2011; or \$14.10 per 1,000 gallons of water conservation from May through September, 2011.
- A resident who pays block water rates and uses 11,000 to 15,000 gallons of water per month can save \$17.08 per 1,000 gallons of conservation (as of October, 2010; based on the block 4

water rate of \$10.73 per 1,000 gallons plus the sewer rate of \$6.35/1,000 gallons for up to 15,000 gallons of sewer service per month).

Testing your soil

The starting point for gardening and landscaping is to understand your soil conditions and characteristics. You can have soil samples tested free by contacting the Orange County office of NC State University's Cooperative Extension Service at 245-2050 to get containers and forms for soil samples. Private landscape companies also do soil testing.

If your soil is too acidic, plants that require neutral to alkaline soil may have a difficult time even if you aerate and condition the soil with organic material, use appropriate fertilizers, and choose drought resistant plants. It is very important to choose plants that are suited for your soil conditions as well as other factors such as sunlight/shade conditions.

Planning your landscape

We recommend planning your landscape and lawn areas with information including:

- Soil type(s) on your site,
- Drainage/slopes
- Sunlight conditions in various places,
- Areas to be used for walking and other active use, and
- Areas where you want shade from plantings.

If your site has a significant slope, you can develop a plan that will provide good drainage, limit or prevent erosion and even enable you to catch water in a cistern or rain garden areas that hold water in the soil.

Plants with similar watering needs should be grouped together to enable more efficient watering.

There are numerous kinds of flowering and otherwise attractive plants that are well suited to our dry climate. For information on choosing drought-tolerant, non-invasive plants, you may wish to

- Visit a Website page such as NC State's "Xeriscape North Carolina" page at <http://www.ncsu.edu/ncsu/CIL/WRRRI/uwc/xeriscape.pdf>.
- consult with local garden supply and landscaping businesses, a landscape architect, etc.
- contact the Orange County office of NC State University's Cooperative Extension Service at 919-245-2050, or the North Carolina Botanical garden at 919-962-0522.

Trees, shrubs, groundcovers and mulch are alternatives to traditional cool season grasses, which require more time, money and water to do well in our climate. For example, cool season grasses go dormant during late summer and early fall and should recover from a drought, but reseeding may be needed.

Deciduous trees will help maintain solar access in winter for the south side of houses and buildings (including neighboring buildings).

Keep clear access to fire hydrants, utility meters and lines, etc.; and maintain visibility for pedestrians, drivers and cyclists. About three feet of clear area is needed around fire hydrants.

If you plan to work where there may be underground utility lines, or if you do any work in a public right of way or public land, please contact the NC utility locating service (One-Call Center) at **811**. There is no charge for calling 811 or for having utility locations marked.

Planning and installing a landscape correctly the first time will take less time, money and energy than having to go back and correct problems that could have been foreseen.

Preparing the soil

To absorb water well, provide oxygen to plants and encourage deep, healthy root systems, your soil may need to be tilled to a depth of about 6 inches, or aerated. Tilling and adding soil conditioners such as organic material will make it easier for roots to penetrate down into the soil.

Because clay soils are prevalent in our community, it is especially important to determine the need for soil conditioners such as lime, bark chips or other organic material. Use no more than 15% to 20% soil conditioner unless you are making a raised planting bed.

Low-intensity or natural fertilizers have less impact on creeks, streams and lakes than high strength fertilizer, etc. if stormwater washes fertilizer off your site. Overfertilizing wastes time and money and may be harmful. Having your soil analyzed will help you determine what kinds of fertilizer are needed.

For areas around shrubs and trees, put down mulch to a depth of about three inches and as far out as the drip line (the area below the tree branches and leaves) to help reduce evaporation of water in the soil. Mulch will decompose and add organic material to improve the soil. However, keep mulch away from trunks and stems in order to reduce the potential for pest and disease problems.

For more information and advice, please contact the Orange County office of NC State University's Cooperative Extension Service at 919-245-2050.

Water-smart irrigation

One of the most frequent problems with irrigation systems is overwatering, which can result in plant-killing diseases.

Water only one day per week or every other week, but water enough to get moisture several inches into the soil to promote deep, healthy roots. Healthy roots will better support and feed grass and other plants if the soil surface dries out because of intense sunlight or dry weather.

It is better to water infrequently and moisten the soil to a depth of about 6 inches than to water frequently and moisten only the top layer of soil. Shallow watering promotes shallow root growth and is less effective than encouraging deep root growth. You can put a screwdriver into the soil to check the depth of moisture.

Of course, good soil preparation means more effective watering: loosening the soil will make it easier to water in depth and to retain water in the soil.

Especially if you have a spray irrigation system, it is important to monitor and adjust its operation to achieve in-depth moisture rather than shallow irrigation. You may need to get advice from an irrigation professional to optimize your watering schedule and effectiveness.

A key principle is: when the soil is no longer absorbing water and it is running off or ponding and evaporating, it is time for that water cycle to end. The ***cycle and soak*** method refers to stopping irrigation when water is no longer absorbed in the ground, and resuming irrigation to achieve in-depth moisture when the soil can absorb more water. For example, you may need to set the controller for 3 or 4 short cycles on the same day for better water absorption and less runoff.

However, your choice of plants and grass types is closely related to irrigation needs and costs. We recommend choosing drought tolerant plants and grasses that will need little or no supplemental watering once they are established, and grouping plants with similar watering needs.

Maintenance

Fertilize with the right types of fertilizer at the appropriate time of year. Avoid overfertilizing, which wastes money and can harm water quality. Consider using natural and low-intensity fertilizers, which are less likely to cause water pollution.

Pruning should be done at the appropriate time of year for a given plant type, and with safety in mind. In general, pruning is needed to remove dead and diseased limbs, to promote flowering and to prevent excessive growth.

Mowing grass properly is important for the vitality of your lawn. The taller the grass, the deeper the roots will grow, so avoid “shaving” your lawn. For cool season grasses, a height of 3 inches is suitable.

Taller grass will also help protect the soil and reduce evaporation in hot, sunny weather. Warm season grasses such as Bermuda should be cut to a height of about 1.5 inches and mowed more often than cool season grasses.

A landscaping sustainability formula:

Soil testing > appropriate soil preparation

- + appropriate plant choices and locations
- + good maintenance

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healthy, attractive, drought-resistant landscaping

- + lower water use
- + lower water costs
- + positive environmental benefits:
 - cooling,
 - water quality,
 - oxygen production,
 - carbon dioxide uptake.