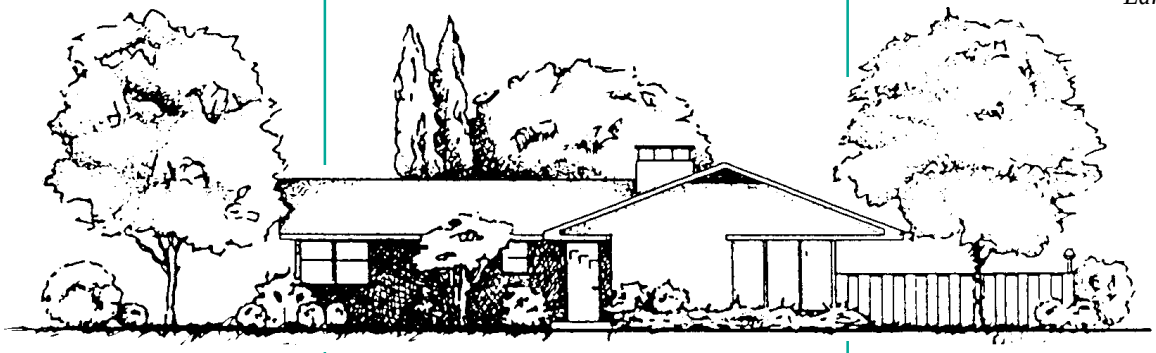
WATER CONSERVATION IN THE HOME LANDSCAPE

Landscaping



It has been estimated that nearly 50 percent of the water used by the average household goes for the outdoor landscape and turfgrass areas. Any improvements that homeowners make to conserve water in the home landscape can result in significant savings.

Reducing outdoor water use doesn't mean replacing lawns and trees with plastic and gravel, or turning flower gardens into cactus gardens. Water conserving landscapes don't have to look any different or cost any more than water wasting ones. A well thought-out design, along with soil improvement, careful watering, use of mulches, and proper selection of plants can make a big difference in your water

Even when water is in ample supply, reducing water use is a good idea. It lessens the demand on rural and municipal water supplies and treatment plants. It can greatly decrease your maintenance time and equipment costs. Also, a landscape with a record of low water bills may add to the resale value of your home.

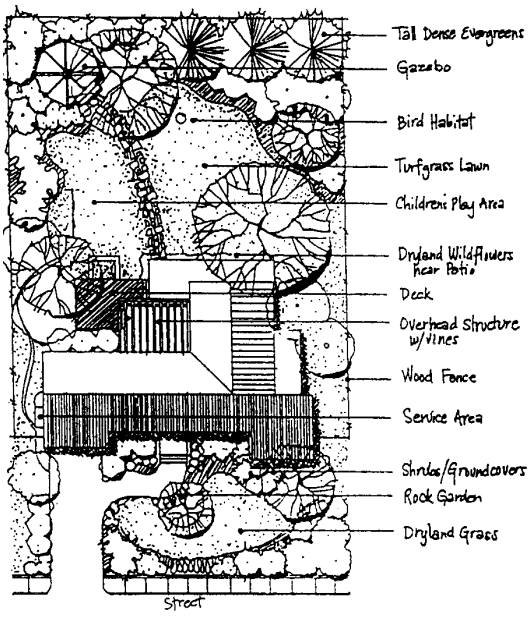
1. Make a plan.
2. Improve soil conditions.
3. Choose appropriate quality plants.
4. Water slowly, deeply and infrequently.
5. Make use of mulch.

Make a Plan

Plans can be simple or elaborate, but every plan should take into consideration the factors that affect water use. Steep slopes or grades encourage water runoff and soil erosion. Drought tolerant groundcovers, shrubs or trees can be used to slow down and absorb water while at the same time reduce evaporation by shading the soil. Terracing with appropriate plants is another possibility.

South or west-facing exposures receive maximum sunlight and can benefit from the use of mulches or drought tolerant plants. Wind increases the amount of plant moisture lost through transpiration. Fences and screens can greatly reduce the amount of supplemental water needed by slowing or blocking the wind. Using trees and shrubs as windbreaks can be effective, but unless they are low water use ones, they may use more water than they save.

Trees provide shade, which lowers the soil temperature and reduces moisture lost through evaporation. Another benefit is that trees actually reduce the air temperature, which also reduces water loss. Certain trees, such as maples and beeches, should be avoided in the low water use landscape since their invasive surface-feeding roots compete with nearby plants for water and nutrients.



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Turfgrass areas usually require the most water and maintenance of any part of a landscape. Limit turf areas to those places with high use or high visibility. Consider using mulches, groundcovers, ornamental or native grasses, shrub beds, decks, or patios instead.

Design your turf areas so they can be watered efficiently. Odd shapes or long narrow strips less than 8-feet wide can result in wasted water. Lowering turf areas next to sidewalks and curbs is another way to reduce runoff.

Group plants by water use. Avoid placing trees or shrubs in the middle of turf areas since in order to water the plants sufficiently, the turf will be overwatered and likewise, watering the turf adequately will underwater the other plants.

Improve the Soil

Of all the improvements that can be made to soil to help conserve water, adding organic matter is by far the most important. A soil test (available through your local county Extension office) will determine the present organic matter level of your soil.

All of the soil types found in Kansas can greatly benefit from the addition of organic matter. In sandy soils, organic matter slows down the rapid movement of water through the soil, thus making it more available to plant roots. In heavy clay soils, the addition of organic matter increases infiltration of moisture, which prevents run-off and wasted water.

Adding organic material is easiest and most effective before planting. Incorporate at least 2 to 3 inches of organic matter into the top 8 inches of the planting area before planting, unless your soil test indicates otherwise. After planting, add at least an additional 2 inches of organic material as a mulch.

Since organic matter continually decomposes, it needs to be replenished on a yearly basis. Applying an organic-type mulch is the most effective way to accomplish this in an established landscape situation (see mulch section).

For areas where hardpan (an underlying layer of clay) exists, subsoiling is recommended before any planting is done. Plants growing on top of unbroken hardpan are more vulnerable to water fluctuations because of the shallow growing area. Planting a deep-rooted legume can be effective in breaking up hardpan, although it may take some time to accomplish.

Types of Organic Matter

- Straw
- Well-rotted manure
- Leaf mulch
- Peat moss
- Lawn clippings
- Compost
- Well rotted sawdust
- Wood chips
- Shredded bark
- Green manure

Choose Appropriate Quality Plants

Shopping for plants is just like shopping for any other type of product. High dollar trees, shrubs, and other plants are available, along with discount ones. Paying more doesn't guarantee a good plant, but a cheap plant is rarely a bargain. Reputable nurseries usually will replace any plant that fails to grow, providing it was given adequate care.

Choose plants that take advantage of the unique features of your particular landscape. Match the plant to the site—drought tolerant plants for dry areas, plants with high water requirements in poorly drained areas. For cultural requirements of a particular plant, refer to a reference book on plant material. For a list of recommended low water use plant material, refer to Kansas State University Special Horticulture Report "Low Water Use Plants for Kansas Landscapes."

It is important to remember that "drought tolerant" doesn't mean "plant and forget." Even drought tolerant plants need regular watering for the first several years. It is only after they are established that irrigation can be curtailed.

Maintenance also is important in the low water use landscape. Plants that are already stressed by receiving minimal amounts of water are more susceptible to insects and diseases. Be sure to prune when necessary, fertilize, and control insects and diseases as needed.

Watering the Home Landscape

Efficiently

There are two factors that influences the general practices of watering: (1) the water supply available to the plant in the soil environment, and (2) the rate of water being used by the plant. The first depends primarily on the soil water holding capacity, as well as the extensiveness of the root system or the plant. The second depends on some special characteristics of plants to retard water use and, more importantly, on the weather conditions such as temperature, wind, and humidity.

Soil Types

The soil you have influences watering, practices since different soil textures hold different quantities of water. Soil is composed of small particles with the largest particles classified as sand; medium sized particles as silt; and fine particles as clay. Varying amounts of each sized particles in any soil influences its texture.

	Coarse Soils (sand)	Mixed coarse/ fine (loam)	Fine Soils (clay)
Water available (gal/cu ft)	½ gal	1 gal	1½ gal
Depth 1" of water penetrates	24"	16"	11"
Infiltration in 1 hour	2"/hr	¾"/hr	¼"/hr

Some soils may have different textures of soils at different depths. A layer of clay or hardpan beneath a loamy soil can restrict drainage into a soil. In many landscape situations there has been considerable disturbance of the present soil by construction or hauling fill soil into an area.

Deep Watering = Deep Roots

Each type of plant has a maximum depth to which its roots will grow. Roots will only penetrate to that depth where water, air, and nutrients are present. Deep watering encourages deep rooting, increasing the reservoir of water so plants can go longer between waterings. Also, deeply placed water is less subject to water loss by evaporation from the soil surface.

The roots of most small trees and shrubs may reach up to 6 feet deep, while smaller shrubs or flowers may root up to 2 to 4 feet deep. Consider grouping plants together that may be shallow rooted and require more frequent watering such as flower beds or a mixed border of small shrubs.

It is important to water only long enough to wet the soil to the depth of the root system and not beyond since this is a waste of water. A soil probe or thin rod pressed into the soil will go in easily until it reaches the dry zone.

How Often to Water

The most critical factor in determining water use is weather, which includes temperature, humidity, wind, sunlight, and precipitation. There is a constant use of water as it flows through the plant, bringing nutrients to the upper plant parts. This transpiration flow of water increases as conditions cause greater movement of water through the plant.

Most of the absorption of water and nutrients occurs in the upper half of the root system, therefore, water should be applied directly to the soil surface or to the root zone. Water is wasted, especially in hot weather, if it is applied to plant leaves and tops since much of it will evaporate before it reaches the ground.

Most small trees and shrubs should be watered to wet the soil to a depth of 4 feet, once per month or every 6 weeks. Shallower rooted plants will require more frequent soaking, perhaps to a depth of 2 to 3 feet every 2 to 4 weeks.

It should be remembered that supplying only a portion of the plants' water need in mature landscaping plants may not be a bad situation. Since growth occurs at optimum rates in a normally watered plant, some stress may reduce growth which is not critical for many plants reaching their mature size. Your goal may be to simply keep the plants alive, but not thriving. However, on a young, newly planted tree or in situations where you are wanting a fuller landscape, greater watering will support greater growth.

Signs of Possible Water Deficiency

- Grayish, dull, or off-color foliage
- Wilted foliage, especially on new leaves
- Flowers are short-lived and drop off prematurely
- Older leaves dry and drop off

Watering Systems

There are several ways to apply water to plants. No one way is ideal. A combination of systems may turn out to be the best for your particular situation.

Flooding—An inexpensive technique that works well only where very flat, even soil areas are present. Little water is lost from evaporation. Used with a furrow or basin system.

Soaker Hoses—Perforated or porous soaker hoses that apply water slowly and efficiently since little is lost by exposure to the air. They do not form a crust or disturb soil structure. Soaker hoses can be "snaked" through mixed shrub borders and around small trees. Use on all sides of larger trees. Best used in short lengths because of pressure loss towards the hose end.

Sprinklers—Inexpensive and flexible. Often inefficient due to water loss through evaporation Sprinkler patterns may apply water unevenly.

Underground Sprinklers—Large expanses of landscapes may benefit from this system which is expensive to install and usually requires professional design to ensure thorough, even water application to all areas. Sprinklers can be purchased to cover various sized and shaped areas. Sprinkler heads can "pop up" when in use and then automatically lower when not in use. Automation with timers or "controller boxes" reduces labor.

Porous Wall Hose or Pipe—Similar to soaker hose but water flow is much slower and longer distances (up to 400 feet) can be covered. Little water is wasted.

Drip/Trickle Systems—Drip systems apply water frequently and efficiently to a portion of the plant's root system. They can save up to 60 percent on water over a conventional sprinkler system. Since the water is applied through small holes, filtration of all water, even municipal water, is necessary. A pressure regulator is usually required since most systems operate at 3 to 30 psi pressure.

Various forms are available—tubing with pre-punched holes to wet a continuous strip, or small emitters or "drippers" inserted into solid tubes at certain points. Be sure to carefully observe the water patterns and flow rates in order to know how much water is being applied and where. Operate the system at the pressures recommended. Drip systems can be automated with timers or controllers.

10 Ways to Improve Water Use in the Landscape

1. Water deeply, but no deeper than the root zone of the plant.
2. Water slowly. Turn down the flow. Use a small, pencil-sized stream when soaking trees or shrubs. If you notice water puddling or running off, shut off the hose, wait one hour, then start again with less water flowing.
3. Water infrequently. Frequent, shallow watering causes plant roots to concentrate close to the surface, making the plant more susceptible to water fluctuations.
4. Loosen the soil surface and use mulches. Compacted areas absorb water slowly. Most mulches help to keep soil surfaces loose and receptive to water absorption.

5. Avoid runoff by creating "basins" around trees and making use of furrows and ridges to contain water.
6. Follow directions for operating and maintaining all irrigation systems. Check regularly for leaks, malfunctions, or worn parts.
7. Reduce fertilizer applications. Plant survival should be emphasized at this time rather than new growth, which would require more water.
8. Keep your landscape well-weeded to eliminate water-competing weeds. Also, consider removing surplus plants from over-crowded beds to ease water demands.
9. When water restrictions are imposed, lower your standards for a perfect landscape. This isn't the time for trying to achieve a lush, green picture-perfect yard.
10. If water restrictions are severe, save your trees and shrubs first. They are more difficult and expensive to replace than lawns.

Water Conserving Mulches

Mulches can do much more than cut down on water use. They also can improve soil texture, suppress weeds, lower soil temperature, and add ornamental value to the landscape. How well a mulch conserves moisture is determined by its composition and how deeply it is applied.

At first glance, it might appear that replacing all lawn, shrubs, and trees with a layer of mulch would be the ideal way to save on water bills and maintenance. Without the cooling, evaporative effect of grass and other greenery, though, higher temperatures would result, in addition to problems with dust and erosion. The proven psychological benefits of having green growing plants in view should also be considered.

Listed below are several of the most commonly used landscape mulches available. Deciding which mulch to use will depend on its cost, availability, ease of use, durability, and its appearance in your particular landscape situation.

Plastic or polyethylene film—clear, black, or perforated

Advantages: Prevents moisture evaporation effectively; thin; lightweight; inexpensive, though perforated plastic is more expensive.

Disadvantages: Holes must be punched to let in water and air, unless perforated plastic is used; unsightly; must be covered with another material; doesn't improve soil; can cause roots to concentrate at soil surface, increasing drought susceptibility

Landscape fabric—Geotextiles, "Weed Barrier," "Weed-X," "Weed Block"

Advantages: Water permeable, suppresses most water-competing weeds; durable.

Disadvantages: Expensive; allows some weeds to grow; must be covered by top mulch layer

Wood or Bark Material—wood chips, tree trimmings, shredded or chunk bark

Advantages: Inexpensive to relatively expensive; lets in water and retains it in soil; breaks down to improve soil texture; smaller sizes suppress weeds better.

Disadvantages: Breaks down in one to three years depending on particle size and type of tree used; smaller sized particles may require addition of nitrogen.

Most effective depth: 3 to 4 inches

Stone/Gravel—

Advantages: Allows moisture in and retains it in the soil; long lasting; variety of sizes; can have ornamental appearance; suppresses weeds.

Disadvantages: Doesn't improve soil; unattractive if used in too large an area; increases temperature. Tends to get scattered by lawnmowers and small children. Price varies with size and type.

Most effective depth: 1 to 3 inches

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MF 2066 December 1996

File Code: Horticulture-6