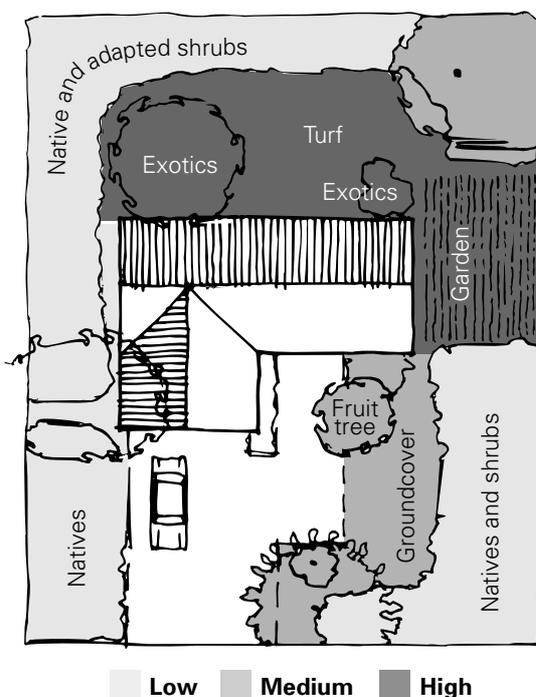


Up to 60 percent of household water is used outdoors, much of which is wasted. Using water conservation techniques in the garden will save you money, time and effort and ultimately benefit every living thing in this country. As the following discussion outlines, there are many easy ways to reduce outdoor water use.



GARDEN DESIGN

Group plants with similar water needs together. Divide plants into high, medium and low water-use zones in your garden.



EXAMPLES OF PLANTS FOR WATER-USE ZONES

High water-use: Lawns, vegetables, fruit trees, exotic shrubs like azaleas and camellias, flowering herbaceous annuals and many bulbs.

Medium water-use: Hardy vegetables like pumpkins and potatoes, hardy fruit trees and vines like nut trees and grapes, many herbs, some exotic shrubs, most grey or hairy leafed (tomentous) plants, roses and daisies.

Low water-use: Most Australian natives including banksias, grevilleas and eucalypts. Succulents and cacti, olive trees and some exotic ornamentals such as bougainvillea.



Plant trees to create natural shade and windbreaks to reduce evaporation. High water-use plants are best located where they can be sheltered from drying winds and strong sunlight.

Direct rainwater run off from downpipes towards high water-use areas.

SOIL IMPROVEMENT

SOIL TYPES AND WATER AVAILABILITY

Soil types differ in their ability to retain water that can be used by plants. This is known as the water availability of a soil.

Water holding capacity is determined by the texture of the soil. Finer soils have a greater capacity to hold water due to their greater particle surface area.

There are three main soil types: sand, loam and clay. Sandy soils drain rapidly, clay soils hold water but make it difficult for many plants to grow. A soil with plenty of organic matter and a mixture of fine and coarse particles that form "peds" is ideal.

Hardy, deep rooted plants can help break up poor soils and adding composted organic matter will encourage microbial activity and worms to improve soil condition and moisture retention.

Organic treatments in various forms are available. Their benefits in encouraging microbial activity and soil remediation are well documented. Contact local permaculture, organic or biodynamic farming groups for more information.

SOIL TESTING

A **simple test** to identify soil type is to take a handful of soil from the garden and add just enough water to mould it into a ball. Test soil from various sites and from different depths in the garden.

- > **Sandy soils** crumble and will not form a ball. They are light coloured, have little or no smell. Water drains away rapidly and they are low in nutrients.
- > **Loam soils** will form a ball that is friable, usually brown with a pleasantly 'earthy' smell. Holds and drains water well and provides good levels of nutrients. Best for plants.
- > **Clay soils** ball easily and range in colour from white to red or dark brown. Clay has fine, dense particles that do not allow water to soak in easily and which become hard and resist water when dry. They may be high in nutrients that are unavailable to most plants.

Garden centres can usually provide advice on the soil type(s) in your local area.

IMPROVING SOIL

Water and nutrient holding capacity of sand and clay soils can be improved by the addition of organic matter such as manure, leaf mould and compost. Dig in to a depth of 15 to 25 cm.

Gypsum and sand added to clay soils help break the clay into clumps, improving air space and drainage. Add gypsum at the rate of 0.5 to 1.0 kg per square metre. A combination of gypsum, sand and composted organic matter will produce the best results in clay soils.

Chemical additives often produce a "quick fix" but may have adverse environmental impacts in the medium or long term. Natural methods are better.

REDUCE LAWN AREA

Lawns consume up to 90 percent of water and most of the energy used in most gardens. They also take the greatest amount of time and money to maintain. Lawns need mowing, weeding, edging & fertilizing, and equipment requires fuel and maintenance.

Reducing lawn area is the easiest way to save water. Create garden beds, or mulch areas that are used infrequently or where grass grows poorly.

Replace lawn areas with porous paving, pebbles or drought-tolerant ground covers such as prostrate grevilleas, snake vine (*Hibbertia scandens*), or myoporum. Seek advice at your local plant nursery.



WAYS TO REDUCE WATER USE ON LAWNS

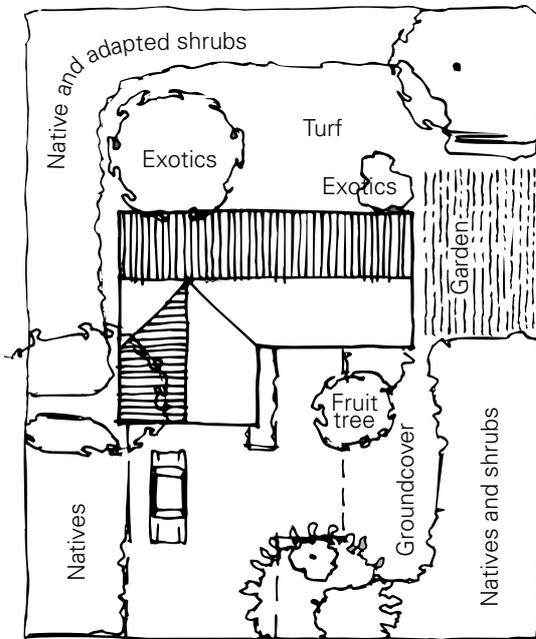
Different grass types have different watering needs. Select a turf that needs less water such as couch, Queensland blue couch, buffalo, Nioaka and Natus Green (*Sporobolus virginicus*), tall fescues and carpet grass. Many blends and species are region specific. Ask your local plant nursery for the most suitable low water species for your climate and soil type.

Do not "scalp" the lawn. Set your mower to cut 4 cm or higher. This encourages a deeper root system and the longer grass blades shade the soil, reducing evaporation.

Only water when the lawn is showing signs of stress. Long, slow soakings that allow water to penetrate to a depth of about 15 cm will encourage a deeper, more hardy root system.

A **lightly fertilised lawn** uses up to 30 percent less water than an unfertilised lawn of the same grass type. A diluted spray of the liquid drained from your composting worm farm (or purchased from a commercial vermiculture operation) is ideal fertiliser. It returns your waste to the soil and plants.

PLANT SELECTION



Select plants that suit the soil and garden conditions. Local indigenous plants will have evolved to handle local conditions. Many other Australian native plants have evolved to cope with very little water.

Some exotics from South Africa, California and the Mediterranean also cope well with limited water.

Explore your neighbourhood to discover what appears to grow well in your area. Take note of street trees, which are rarely watered or maintained.

Incorporating native plants into the garden will provide habitat and food for birds and insects. These in turn can aid in pest control and pollination.

Water early in the morning or evening as this allows water to penetrate before it evaporates.



Courtesy of Sydney Water

MULCHING



Mulching is an essential element of a water-efficient garden. Mulching around plants saves water by preventing evaporation and reducing run-off.

Mulching limits weed growth and can improve soil conditions (depending on the type of mulch).

Mulch can be in the form of leaves and grass clippings, manure, compost, rocks and gravel, straw and other crop residues, worm casts, newspapers, bark and woodchips.

Before mulching, clear weeds, break up the soil crust and water the area. Spread mulch evenly to a depth of 7 to 10 cm. Re-apply mulch at least once a year, or as it breaks down.

Do not allow organic mulch to touch woody plant stems and trunks or it may cause collar rot and kill the plant.

WATERING

Water early in the morning or evening as this allows water to penetrate before it evaporates. Watering early in the morning allows the sun to activate the water (by producing water vapor and stimulating micro-organism activity) to generate the food that plants will draw on during the day.

Less frequent, deep soakings train plant roots to grow down into the soil and increase the drought tolerance of plants.

Water the roots, not the leaves. Water on the leaves evaporates easily and can lead to scorching.

Controlling weeds reduces competition for water with your plants.

Fertilise plants with organic liquid fertiliser. Dry fertilisers take water from the soil and can raise salt levels.

WATER SAVING EQUIPMENT AND PRODUCTS

Irrigation equipment

Automatic irrigation systems that are poorly designed and inefficient may use more water than hand-held hoses and sprinklers. Automatic systems set to turn on regardless of weather conditions and soil moisture content will waste water. Systems not adjusted to seasonal needs may deliver water too fast, resulting in run-off, or supply more water than plants require.

Install soil moisture sensors. These trigger cut-off switches when it rains and adjust watering duration according to soil moisture levels.



Drip irrigation is the most efficient system as it delivers water to the roots of individual plants and minimises evaporation and wind drift.

Water-storing crystals can hold hundreds of times their weight in water. When mixed with water they form a soft gel and retain water that provides a reservoir of moisture for plant roots during dry periods. There are also products that can be sprayed on to plants' surfaces to reduce sunburn and water loss.

Soil wetting agents allow water to penetrate deeply into soil.

Humectants attract moisture from air spaces in the soil. These are particularly effective in sandy soils.

BEYOND THE GARDEN

Water is used outdoors for activities other than gardening and these also provide opportunities for savings.

Wash your car, or boat at a car wash that recycles water and detergents. If washing the car (or dog) at home, washing it on the lawn prevents water and detergent flowing down the drain. Choose a different place on the lawn each time.

Lawns have a limited ability to uptake the nutrients from detergents. If the lawn becomes water-logged or deteriorates, your car may be compacting the soil or the nutrient levels are too high. Aerate the lawn and switch to the car wash for a few months.

Swimming pool covers significantly reduce evaporative losses and can save between 11 thousand and 30 thousand litres of water a year.

Use a broom instead of a hose to clean paths and the outside of buildings.

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