



Plant and lawn requirements

Water is added to the soil through rain or irrigation. Plants draw water from the soil through their roots. Although large trees, many plant species in the wild and a few garden plants may be very deep rooted, the feeder roots of the majority of garden plants are up to 300 mm deep.

EVAPOTRANSPIRATION

Water is lost from the soil surface through evaporation and is transpired through the leaves of plants as they grow. Transpiration is essential for plant life, but means plants must constantly replenish their supply of water. The rate of evapotranspiration (water lost from the soil and from plants) increases:

- in higher temperatures;
- in stronger winds;
- when there is low humidity; and
- when there is no protective mulch.

Water can also run off the surface and drain through the soil past the root zone.

Your challenge as a gardener is to manage watering so there is just enough water in the root zone for your plants to stay healthy.

Improving your soil, mulching, placing your plants in the right location and using efficient watering practices will help you grow healthy plants using minimal water (see *The importance of soil* Fact Sheet).

The rate at which plants lose water through transpiration varies with the type of plant. Important steps towards saving water include:

- using water efficient plants where possible, such as plants adapted to dry conditions and the Canberra area;

- designing your garden so plants with similar water requirements are grouped together into separate watering zones, in appropriate areas; and
- placing plants in the correct soil and microclimate position to meet their growing needs – the right plants in the right place.

PLANT ADAPTATIONS TO DROUGHT

Hard, thick or waxy coated leaves are common characteristics of waterwise or drought tolerant plants. Others have small or needle-like leaves and therefore fewer pores or stomata through which water is lost by transpiration. Hairy or felty leaves and silver or grey foliage are other indications of drought tolerance. Some plants have fewer, or virtually no leaves, as in the case of cacti, or fleshy leaves that store water, a characteristic of succulent plants.

High water-use plants usually have soft, dark green leaves. Some plants, including many deciduous trees, transpire a lot. However, they have a deep tap root or an extensive root system to draw water from a large volume of soil.

Some, but not all Australian natives, and many Mediterranean plants (e.g. lavender and many herbs), South African plants (e.g. proteas) and Californian plants (e.g. *Oenothera* or evening primrose, *Ceanothus*) are adapted to dry climates.

In Canberra the indigenous or local native plants are largely waterwise, easy care plants that also make an excellent habitat for native birds.

Some exotics, including established roses, photinia, nandina and *Camellia sasanqua* have proven to be relatively tough survivors during extended dry periods. Many new release strappy leafed and architectural plants such as cordylines and yuccas are also relatively drought tolerant.



WATER STRESS SYMPTOMS

If you do not provide adequate water for plant growth, at the correct time, you may observe water stress in your garden. The following table can help you identify if you have water stressed plants.

Symptom	Description
Leaf curl	Leaves may curl during the day as a defence mechanism against heat and the sun. The leaves should uncurl at night.
Wilting	Drooping of the leaves and stems occurs in the non-woody parts of the plant.
Chlorosis	Also known as yellowing of the plant. This predominantly occurs in high water use plants. The tissue turns yellow, and the veins will eventually brown.
Leaf abscission	This is where the leaves of the plant drop off. Older leaves will fall off first. But leaf abscission is also a natural part of plant growth. Look for other symptoms of water stress as well, such as those in this table.
Glossy leaves	Plants which have a glossy leaf surface may lose their glossy appearance when water stressed.
Wrinkled leaves	Leaves of succulents may acquire a wrinkled appearance when water stressed

GARDEN PLANNING

If you are planning a new garden, invest some time in getting to know its aspect and microclimate, particularly its exposure to sun and hot summer northerly and westerly winds, and how these affects plant placement.

Divide the garden into watering zones. Group low water-users together. Medium water-using trees, shrubs and perennials, should be in a different area so they benefit from a thorough soaking, that encourages deeper roots, rather than a light surface watering.

Flowering annuals, vegetables and fruit trees are mostly high water users that like plenty of sun. They generally need shorter, more frequent watering.

Shade loving, high water-users such as impatiens, hydrangea and fuchsia could be in another watering zone.

Most established gardens contain a mixture of plants that originate from many different parts of the world and are diverse in their ability to adapt to reduced rainfall.

Few of us want to dig up our existing garden and start again from scratch. But when plants need replacing or when planting new garden beds, choose low water-use plants suited to your conditions and group plants with similar water needs together.

Some water saving tips:

- Plant trees and shrubs where they create shade and windbreaks to reduce evaporation.
- Take advantage of sheltered spots to grow more sensitive plants, particularly out of the hot summer winds.
- Choose water efficient plants.
- New selections of Australian grasses and strappy leafed plants such as *Lomandra* and *Dianella* are waterwise plants.
- Plant low water-using plants in areas that tend to be dry, such as under eaves.
- Put moisture loving plants in a low lying and sheltered area.
- Control weeds because they compete with garden plants for water.
- Most vegetables are very high water-use plants that need a sunny position. Root vegetables are generally less demanding and can be grouped separately from those that use more water.
- Use a windbreak to protect vegetable plots.
- Remember to continually improve your soil (see *The importance of soil* Fact Sheet).

WATERING HABITS AND TECHNIQUES

Choosing appropriate plants and improving your soil are two effective ways to decrease the amount of water your garden needs. However using appropriate watering techniques is also very important. Regardless of whether you are using drippers, sprinklers or a hose, timing and directing your watering will allow you to use water efficiently on your garden. The *Irrigation methods* Fact Sheet will help you choose the best method of watering your garden.

Keep your soil moist

Canberra's clay soils are prone to drying out and, once dry, are very difficult to get water to sink into the soil where the plant roots can use it. You can avoid this problem by ensuring the soil stays moist, by using groundcover plants, incorporating organic material in soil, introducing structure such as rocks, logs and ponds, and following an effective watering schedule. On hot days, check the moisture content of the soil by pushing your finger or a small trowel into the surface soil. If the soil feels too dry, apply water. Always ensure you comply with any water restrictions.

Pulsing your water effort

Canberra's clay soils allow water to soak in at a very slow rate, compared to a sandy soil. If you apply water at a higher rate than the soil's ability to absorb the water, it will pool and either run off or evaporate before it can reach your plant's roots. When setting up an irrigation system, you or your installation professional should take this into account and pulse your watering. This means water is applied, then left to soak in before another pulse is delivered. This is also easy to do using a hose or watering can, if you follow a series of simple steps.

Water small areas of your garden beds (1 m² patches) until you see water start to run off or pool on the surface. Once this happens, move on to another area, then return and keep watering once the surface water has soaked in. Keep track of how long you spend on each area, to ensure that your garden's overall watering needs have been satisfied, as per the instructions contained in your WaterRight Gardens Webtool recommendations. By doing this you will ensure that all the water you put on your garden is going where it is needed, into your plants' root zone.

PLANT SELECTION

The Canberra Plant Selector can help you choose garden plants on the basis of their water requirements, and sun, shade and frost tolerances.

The Canberra Plant Selector can be found on the ACTSmart web site (www.actsmart.act.gov.au).

Plant nurseries and local garden centres are a good source of advice on water efficient plants suitable for gardens in your area. They can also advise on plants that may become weeds.

Some plant labels contain information about the water requirements and drought tolerance of plants.

LAWN

Lawn plays a key aesthetic and recreational role in gardens. Although you can reduce your lawn area by using permeable paving or planting hardy groundcovers which require less water, turf can still have a place in waterwise garden design.

Warm season grasses can survive on relatively infrequent watering if grown in good soil that fosters deep rooting.

If you refrain from watering your lawn and let it brown off during extended dry periods, you will discover it has an excellent capacity to recover after rain.

If you decide to water your lawn, water infrequently but deeply. This encourages deep root penetration and increased drought tolerance.

There are a number of native, drought-tolerant cool-season grasses that could be used to create a native lawn. Consult your local nursery for further information.

Tips on watering lawns:

- The better the soil beneath your lawn the deeper its roots and the less water is needed to keep it healthy.
- Only water your lawn if it is showing signs of stress, such as losing colour (in summer) or if the grass wilts or leaf blades roll or fold in half lengthways. Another way to tell if your lawn needs watering is to step on it. If the footprints remain visible after you have stepped on it, it needs a good soak.
- Use cyclic watering techniques if your soil is heavy or compacted.
- Don't mow lawns too short. Mow one-third of the leaf blades each time, keeping blade length to 50 mm. Longer leaf blades shade the root zone, reduce evaporation and assist deep rooting.
- Distribute clippings on the lawn as mulch.
- Brown patches on grass may suggest a compacted or water repellent soil. Aerate your lawn regularly to ensure that rain or irrigation penetrates efficiently and evenly. You can also treat this problem with soil wetting agent.
- Brown patches may also suggest invasion of disease and/or pests such as scarab grub. Consult your local nursery for further information on lawn management.

CONTAINER PLANTS

Potted plants, even drought tolerant ones, will require regular watering, as they have less soil to draw water from. Here are some tips to minimise their water use:

- Group together pots to help keep them cooler. Group them according to their watering needs, especially if you are watering them with an irrigation system.
- Use a quality potting mix. Look for the Australian Standard logo on the bag. A premium mix is advised for most potted plants. The compressed coir or coco peat potting mix bricks that you rehydrate have very good water storing capacity. They can be used on their own or mixed with another potting mix to improve water retention.
- Quality potting mixes usually contain some water crystals. Add additional hydrated crystals around the roots of new plantings.
- Mulch the surface of the potting mix. Use an organic (e.g. bark or coir) or inorganic (e.g. pebbles or scoria) mulch.
- Potting mix can become water repellent. Water running down the insides of the pot and straight out the bottom indicates this. Treat with a soil wetter, or soak the pot in a larger container of water and soil wetting agent added until it stops bubbling.
- Larger pots are generally more water efficient than smaller pots.
- Allow the top 20 mm of potting mix to dry out between waterings. Many potted plants die from overwatering.
- Unglazed terracotta pots are very porous, absorbing water readily. Line them with plastic, ensuring you cut out drainage holes, or treat the inside of the pot with a sealant.
- Protect hanging baskets from drying winds.
- Self watering pots work well if used correctly. Water them from above and allow the water to drain through into the well. Plants draw water from the well by capillary action. Don't place a very small plant in a very deep container, as the roots will not be strong enough to draw water up from the well. Tall containers require a more open potting mix for capillary action to work. Use a premium potting mix and consider adding some coir to the potting mix.

MORE INFORMATION

Website: www.actsmart.act.gov.au

Ph: 13 22 81

Email: ACTSmart@act.gov.au