

1. Why plant trees?
2. Grow a tree with a strong root system to improve its ability to take up water.
3. Water Wise forest (trees)
4. Indigenous vs exotic which is more Water Wise. OR Are all indigenous plants Water Wise?
5. Symptoms of water stress in trees

1. Why plant trees?

- Air pollution reduction.
- Property value enhancement.
- Protection of soil and water.
- Wildlife habitats.
- Wind reduction and control.
- In the honour of an individual or event.
- They do well in low maintenance zones if they are chosen to suit the environment.
- Leaves help to reduce soil compaction by breaking the fall of large rain drops.
- Roots help bind the soil and reduce soil erosion.
- Fallen leaves act as good mulch.
- Shaded areas created by trees allow space for specific shade loving plants and reduce evaporation of water from soil by the sun.

Design considerations:

- Do plant trees to provide a screen or backdrop.
- Do plant trees to add visual interest or accent to a space.
- Do not plant trees where they may block views or traffic signs or intersection.
- Do not plant large trees under utility lines or where they may overhang a street, chimney or neighbor's yard.

Where can we plant trees?

- In our gardens and around the home to beautify our living area and provide shade and fruit.
- In the fields together with your crops.

- In the veld, forest and woodland savanna for firewood and fruit.
- In dongas, for soil reclamation.
- Windbreaks around fields and orchards to prevent storm damage and wind erosion.
- Along the contours in hilly terrain to prevent water erosion.
- Along rivers to stabilise the banks and prevent silting. Trees must be planted at least 30 meters from the edge of the river to prevent choking the water flow. (Preferably use local indigenous trees only.)
- Along streets for beautification.
- At important places such as water points, schools, markets, shops and parks.

2. Grow a tree with a strong root system to improve its ability to take up water

- Did you know that trees have predominately lateral roots that can spread two to three times as wide as the branches spread?
- Strong tap roots are limited to few species such as Oaks (*Quercus*) and walnut (*Juglans*).
- In fact only 2.5 percent of all trees develop true tap roots.
- Most trees grown in the nursery will not develop taproots.
- The lateral roots have finer roots containing even finer root hairs that take up water and nutrients from the soil. The thicker roots are used for anchorage and storage.
- It is important to choose your planting site carefully. Bear in mind the shade you require and the proximity to buildings, paving and pools. You do not want to cut the tree down at a later stage because it is causing damage.

Five tips to encourage strong root systems.

- **Shape of the hole:** Ensure that the planting hole is two to three times larger than the root ball of the tree to be planted. This is to ensure that future root growth, which is predominately in the top 300mm, has enough space to grow into. This will have the added advantage of widening the water basin. The larger the basin the more water is available to sink deep into the soil for thorough watering. Glazing or compacting of the sides of the hole caused by spade digging can be avoided by using a fork to loosening and roughening the edges.
- **Soil preparation:** Ultimately you want the root system to spread beyond the planting hole. The larger the root system the healthier the plant. Providing too much compost and fertilizer will encourage the tree to become hole dependent. Therefore mix one-third well-decomposed compost into the soil removed from the hole and back fill with this mixture. Water polymers/absorbant crystals have benefits for growth and survival especially if subjected to drought. Mycorrhiza can be added to speed up root development and encourage beneficial microbial activity in the soil. They will improve the absorptive surface of the root system by up to seven times increasing the growth and health of the tree. Mycorrhiza also helps to discourage many diseases caused by pathogenic fungi and nematodes. For more information on soil and soil preparation, refer to SOIL (2).
- **Watering:** The tree should be watered once a week deeply and thoroughly. This will encourage the tree roots to follow the water deeper into the profile. Frequent watering will discourage the roots to establish and over watering will drown the tree, as the roots need oxygen to grow. Deciduous trees (they lose their leaves in winter) should not be watered. Water each tree individually according to how much it needs, not with a sprinkler. A pipe can be inserted down to the root ball at the time of planting for direct watering below the soil surface preventing water loss to evaporation. This is a very successful method of watering in dry conditions. Another idea is to use an old plastic bottle. Make small little holes in the bottle and plant it full of water next to the

tree. The bottle will act a reservoir of water for the tree. Remember to put the lid onto the bottle to moderate the drainage of water into the soil. You could try this method with other plants in the garden that need extra watering with out having to water the entire section. The bottle can be topped up whenever needed.

- **Mulch:** Use a thick layer of any, well decomposed; mulch to cover exposed soil around your tree. This helps to prevent evaporation and controls the soil humidity. Dried grass, pebbles, bark and wood chips are examples of suitable mulches. The majority of tree species used in the landscape evolved in a forest environment and their root systems do not compete well with lawn grass. In newly planted trees, mulching at the time of planting results in a 400 percent increase in fine root development, partially because grass competition is eliminated. Above ground growth is also increased by mulching. High levels of watering and fertilization would be needed to overcome the competition for water and nutrients. Some lawn grasses may also reduce the growth of the tree through chemicals they produce. This is called allelophy. Fescues have been shown to stunt the growth of trees. Mulch should be spread 5 to 10cm deep around the tree. Do not cover the base of trunk, as this will cause the trunk to rot. For more information on mulch refer to MULCH (3).
- **Staking:** the tree: Trees that are correctly grown should not require staking. However, should the tree need staking, it should be done in a balanced manner allowing for some safe movement that does not damage the tree. As soon as the tree is able to support itself the stakes should be removed.

3. Water Wise forest (trees)

Creating a canopy

- By creating a forest of trees, a dense canopy can be formed under which plants can be grown that will require large amounts of water.
- In smaller gardens this can be created by using single trees and in larger gardens, closely planted trees create this idea setting.
- This would form a medium water zone.
- Examples of some plants to plant under trees would be;

Pscilla natalensis

Eucomid

Scidoxis

Aspidista

Begonias

Ruscus

Cooling the air in your garden

- A grouping of trees can assist in cooling the garden on hot afternoons for example a *Cedrus* on the eastern side of the garden will give off the pine scent and cool the garden.
- Trees with canopies that are not very dense are able to filter the sun and cool the area. The cooling effect creates a different microclimate.

Frost control

- Evergreen trees in the garden such as *Rhus*, *Cedrus* and *Olea* can help protect sensitive plants during periods of frost.

Deciduous trees

- They play an important role in the garden to provide shade in summer and let the sunlight through in winter.
- This can be used very effectively on the south side of houses.

4. Indigenous vs. exotic which is more Water Wise?

Are all indigenous plants Water Wise?

- All plants can be Water Wise, only if planted in the correct water use zone of your garden. This means it will survive a drought.
- A drought resistant plant is one that requires very little water +250mm/yr and is not pampered in the garden setting.
- Water Wise plant can be described as one that uses water at the same rate to the area in which you live i.e. in Johannesburg area plants that grow comfortably using +650mm/yr or + 20mm/week. (For Sept to April).
- Indigenous plants from tropical South Africa used in a dryer area are not Water Wise for that area, unless specifically zoned in a high water use zone in the garden. The same rule applies to exotic plants.
- The issue is not to plant only indigenous or only exotic, but to zone correctly and then to use plants that need water requirements similar to your local rainfall patterns.
- Allow plants their selected dormant periods by specially reducing water e.g.
 - Cape plants - don't overwater in summer.
 - Highveld plants - don't water in winter.
 - Allow bulbs their specific time of rest.
 - Avoid mixing summer and winter rainfall plants in the same bed.
 - Allow your lawn a period of dormancy in the dry months.

5. Symptoms of water stress in trees

- Leaves that curl up or fold up against the normal growth style of the tree.
- Leaf drop out of season.
- Stunted growth of stems.
- New leaves are smaller than is the norm.
- Failure to shoot new leaves and branches in growing season.
- Die-back of stems.
- Unable to produce good flowers and fruits.