



Guide 4

Landscaping: An Integral Aspect of Sustainability

Landscaping should form an integral part of the sustainable house. It is one of the key elements that contribute to the overall liveability of a home.

Go beyond having a garden that is purely ornamental and use landscaping elements that enhance a home's climatic performance.

Introduction

In the past, the Townsville garden has been a water-hungry lawn, running from the front yard to the back fence and passing a mango tree on the way. It often had some shrubs and the occasional weed-ridden planter bed.

A well-designed, Townsville garden should be integrated with the design of the home to maximise its overall sustainability by:

1. Creating optimal shade to the house and garden areas; and
2. Promoting prevailing breezes through the property.

1. Landscaping for Shade

Landscaping should be used to provide shade to the garden areas and to as many of the external walls and as much of the roof of a home as possible.

Providing shade reduces the amount of heat absorbed by the home. Hence, protection in the form of shade is essential and will greatly improve the climate inside the house. This sounds obvious but, in Townsville, using landscaping to shade the home is an uncommon practice.

The way the sun tracks through the sky in Townsville (Figure 1) determines where certain plantings should be located and how they should perform.

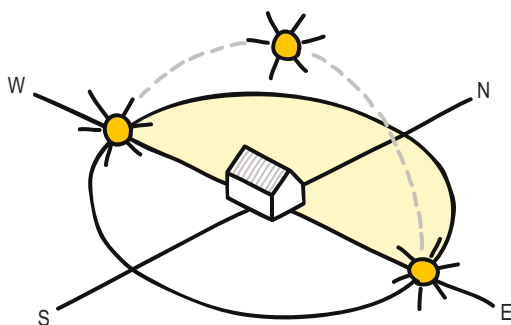


Figure 1 The sun's daily movement through the sky. Further information relevant to the sun's movement can be found in Guide 1 – Orientation for Townsville Homes.

The following information demonstrates appropriate shading solutions according to orientation on a property.

North-Facing Aspect

On a north-facing area (Figure 2) the sun will be high in the sky and often overhead. Landscaping that best provides shade from directly above will be high and horizontal in form and shape.

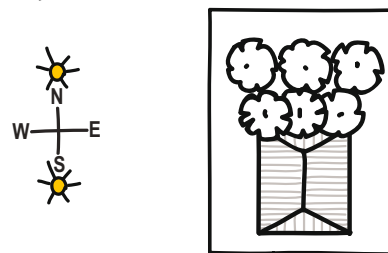


Figure 2 Landscaping on a north-facing area.

Trees with a high horizontal canopy and exposed trunk are most effective in this situation (Figure 3).

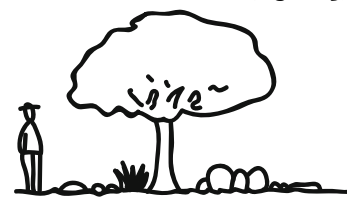


Figure 3 Shape and form of canopy planting for north-facing areas.

Pergolas (Figure 4) are also an effective landscaping device to use on north-facing areas. They may be covered with hard materials such as corrugated iron or plants such as climbers.

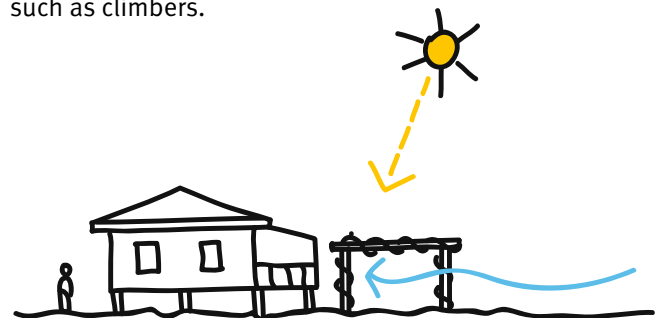


Figure 4 North orientated pergola.

High canopy trees in combination with low shrubs or groundcovers (Figure 5) are a good landscaping combination for north-facing areas. They also cool prevailing breezes, see Section 2 - *Landscaping for Breezes* in the latter part of this guide.

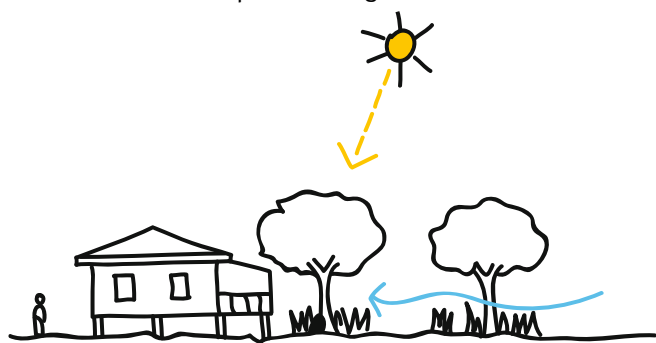


Figure 5 Ideal plant selection for north orientation; high canopy trees and low groundcovers.

West and East-Facing Aspects

On west and east-facing areas (Figure 6), the sun will be low in the sky, penetrating deep into the garden and onto the unprotected walls and windows of the house.

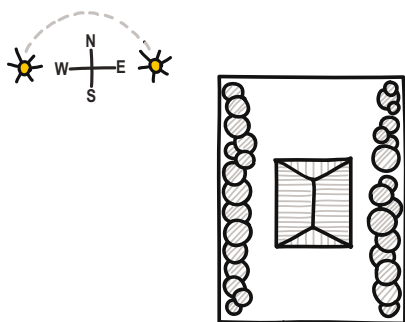


Figure 6 Landscaping to west and east-facing areas.

Landscaping that will offer best protection will be vertical and dense in form and shape (Figure 7).

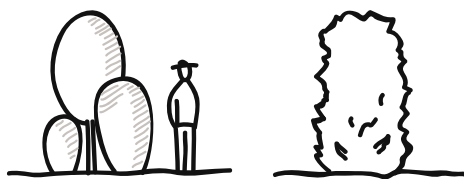


Figure 7 Typical shape and form of planting to west and east-facing areas.

Mixed-height planting, composed of tall-growing shrubs together with trees or multi-stemmed palms, are also useful for shading west and east-facing areas (Figure 8).

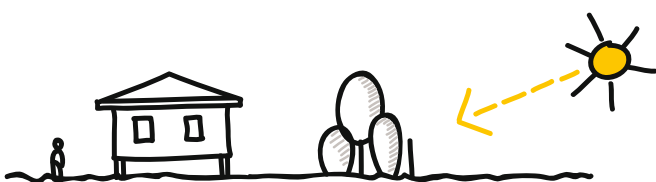


Figure 8 Mixed-height planting will shade east and west orientations.

If space is limited, vertical structures, such as; a trellis or lattice screen covered with climbers (Figure 9), can be just as effective.

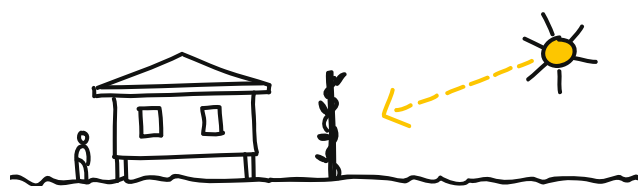


Figure 9 Vertical trellis or lattice screen.

When planting trees and shrubs for shade be careful not to block prevailing breezes. This will be discussed in Section 2 - *Landscaping for Breezes* in the latter part of this guide.

South-Facing Aspect

The southern areas on a property have little influence on the climatic performance of a house. In Townsville, the sun is in the southern sky from approximately mid November to mid January. However, its effect is minimal and can be controlled with simple roof overhangs on the southern side of the house and vertical landscaping to the west and east as mentioned above.



FACT 1

Landscaping correctly can create a micro-climate close to the home. This is because plants affect the air temperature and moisture content (humidity) as well as provide shade.

Plants give cooler shade than man-made structures. This is because of the transpiration and evaporation of water from the plant's leaves.

The shade associated with transpiration created by vegetation can lower the temperature by an estimated 3°C to 5°C.

Which Plants to Use for Shading?

Refer to the Plant List Appendix at the end of this guide for appropriate plant selection according to north, west and east orientations.

Further Shading Tips

A. Shade large paved areas such as the driveway and parking areas to reduce radiating heat and glare. Shade trees, sails and pergolas covered with climbers are good solutions.

B. Combining natural and man-made shade can create some of the best results. For example; install a man-made lattice on west and east areas whilst planting trees on north areas to shade the roof.

C. A tree may take up to five years to reach the height needed to provide the required shade. You may want to install a sail or similar structure to provide instant shade whilst landscaping becomes established (Figure 10).

Horizontal pergolas or vertical lattices are also quick and effective shade solutions as climbing plants can cover them within two years.

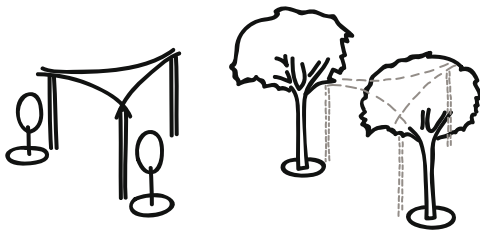


Figure 10 Man-made shade such as a sail structure provides instant shade while trees grow.



FACT 2

Plan your garden carefully. For example, large trees are a great choice; however, they may cause damage if located too close to a slab home or overhead powerlines. Check the predicted mature plant size before you plant and locate them accordingly.

2. Landscaping for Breezes

Landscaping can assist in cooling and directing breezes to indoor and outdoor living areas. However, incorrect planting can block breezes from reaching the house.



FACT 3

The dominant wind direction in Townsville is from the north-east. This is referred to as the prevailing breeze.

Plant sparsely, or select species that allow breezes to filter through on the property's north-east areas, where prevailing breezes come from (Figure 11). For example, high canopy trees in combination with low shrubs and groundcovers are a great combination for this aspect as prevailing breezes will filter through the vegetation and be cooled prior to reaching the house.

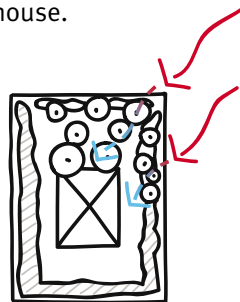
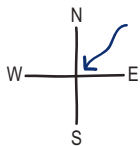


Figure 11 Canopy trees and low groundcovers create the preferred landscaping for north-east areas.

Use Water Features

Position swimming pools and water-features to your advantage. In other words, to the north or north-east (upwind) of your home (Figure 12) and shade where possible.

Breezes increase the rate of evaporation over a body of water. This may result in the air temperature being cooled. A 'cooled' breeze will contribute to a cooler home environment.

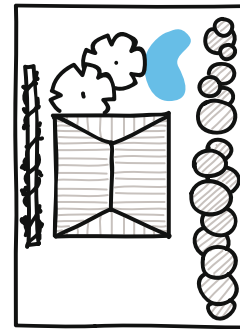
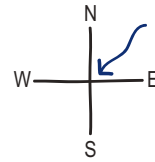


Figure 12 North to north-east. Ideal location of swimming pool or water body.

In the same way that well-designed landscape elements can cool and direct breezes into the home, badly designed landscape elements can heat or block breezes. The following are examples of poor landscaping choices that should be avoided when possible.

The incorrect location of driveways and uncovered car parks (Figure 13) constructed from materials such as concrete, bitumen and pavers will alter the quality of the breeze as it enters the house. A breeze moving over 'hard' surfaces will heat up.

Reducing the amount of hard surfaces that radiate heat around the house can be as simple as choosing tracks for your driveway instead of full solid concrete. Consider alternative materials and methods before you make your choice.

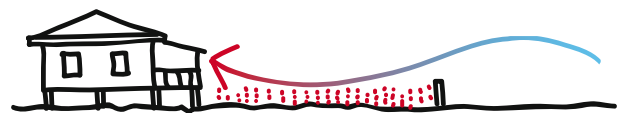
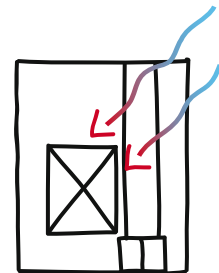
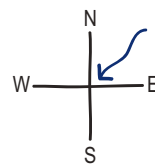


Figure 13 Unshaded 'hard' surface areas radiating heat.

Do Not Block Prevailing Breezes

Dense landscaping can shade and significantly cool the house and garden, but avoid dense planting to the north and north-east of the property (Figure 14) as it will block and redirect breezes away from the house.

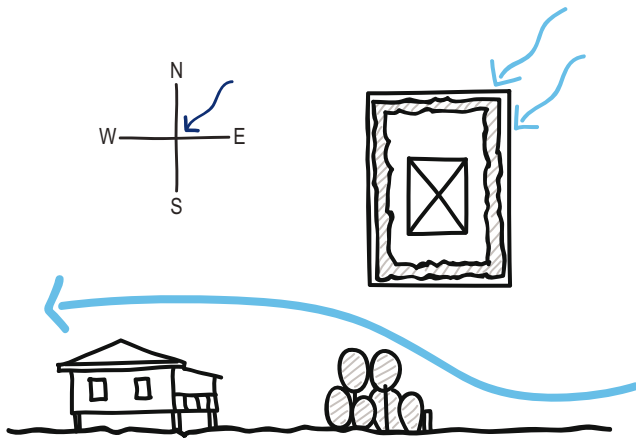


Figure 14 Avoid dense planting to the north and north-east.

Avoid locating structures, such as garages, carports, sheds and greenhouses (Figure 15) in the way of prevailing breezes.

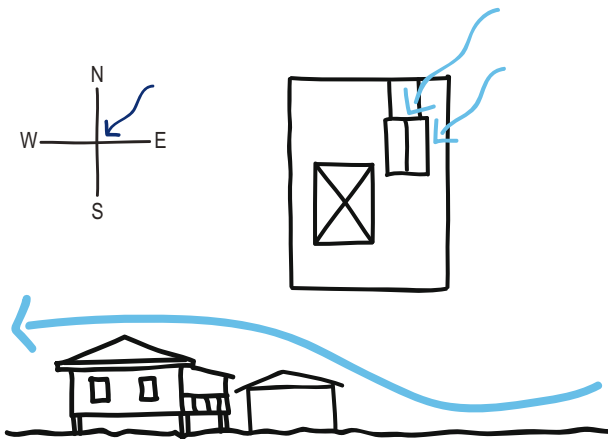


Figure 15 A structure redirecting prevailing breezes.



FACT 4

Neighbourhoods with street trees are cooler because shade reduces radiating heat from hard surfaces. Shading in combination with transpiration contributes to lower surrounding temperatures.

If you would like to have trees planted on your footpath you can apply to Council's Parks Department.

Three Effective Landscaping Scenarios

Scenario 1 - Simple shade solution with shade trees on the north and mixed canopy planting on east and west.

The north and north-east orientations are more sparsely planted to allow prevailing breezes through.

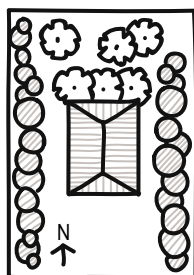


Figure 16 - Scenario 1.

Scenario 2 - A horizontal pergola and vertical lattice provides extra shade to the north. Screening and mixed canopy planting to the east and west.

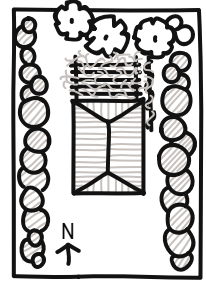


Figure 17 - Scenario 2.

Scenario 3 - Even in a narrow side-boundary space, the house can be effectively shaded from the hot afternoon sun with a vertical lattice. A pool to the north-east cools prevailing breezes entering the property.

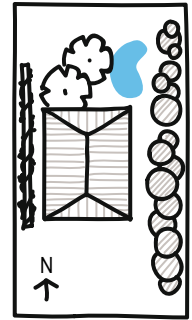


Figure 18 - Scenario 3.

Plant List Appendix (All Natives)

Shade Trees for North Orientation

Wide spreading canopy and exposed trunk.

- Acacia auriculiformis* - Black Wattle
- Terminalia sericocarpa* - Sovereign Wood
- Terminalia muellerii* - Mueller's Damson
- Ganophyllum falcatum* - Scaly Ash
- Syzygium tierneyanum* - River Cherry
- Cassia javanica* - Pink Cassia

Trees and Shrubs for West and East Orientation

Trees and shrubs of vertical form to create mixed-height screen planting.

- Bursaria spinosa* - Sweet Bursaria or Blackthorn
- Premna serratifolia* - Creek Premna
- Brachychiton acerifolius* - Flame Tree
- Brachychiton populneus* - Kurrajong
- Grevillea baileyana* - Findlay's Silky Oak
- Syzygium leuhmannii* - Small-leaved Lillypilly
- Syzygium fibrosum* - Fibrous Satinash
- Syzygium australe* - Scrub Cherry
- Phyllanthus cuscutiflorus* - Cuscus
- Polyalthia longifolia* - Pendula
- Eugenia reinwardtiana* - Cedar Bay Cherry

Climbers for Pergolas and Trellises

- Pandorea jasminoides* - including 'Rosea', 'Lady Di' and 'Alba' - Bower of Beauty
- Pandorea pandorana* - Wonga Vine
- Ipomea horsfalliae* - Cardinal Creeper
- Trachelospermum jasminoides* - Star Jasmin



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