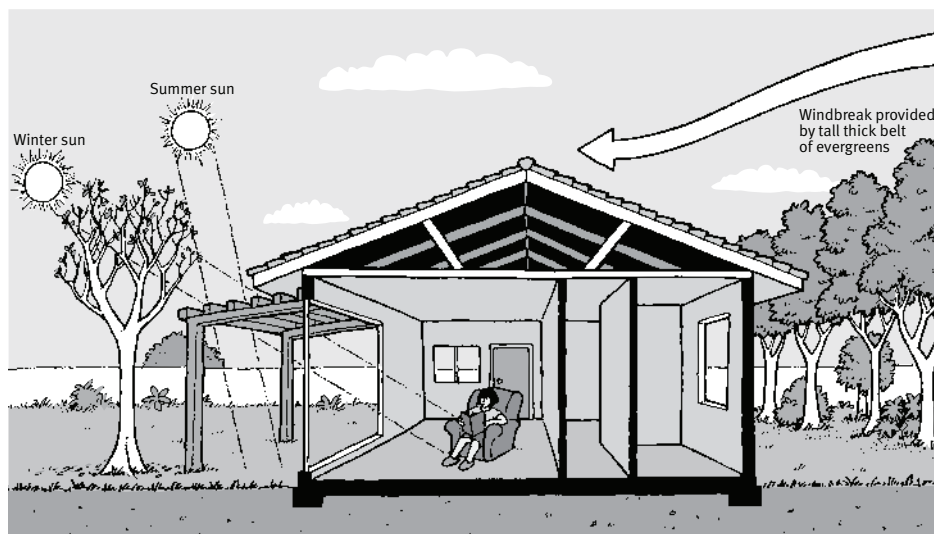


# Landscaping for energy efficiency

## GUIDELINES

Careful selection and planting  
of trees around your home can  
help reduce your energy bills.



Landscaping for energy efficiency makes your  
home more comfortable and may add thousands  
of dollars to the value of your property

## Sunshading

Natural shading can be achieved by planting specific trees, shrubs and vines to:

- Shade the house from the summer sun (especially east and west sun).
- Provide outdoor shade for summer and greatly reduce the ground temperature around your home.

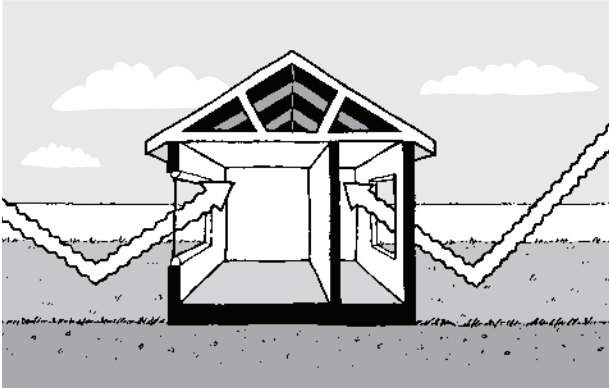


Figure 1 - Reflection from tree-less ground cover

- Exposed ground can reflect a lot of heat and light, especially from paved areas, full width concrete driveways, car parks and fields of dry grass. Therefore, it is of value to shade the surrounding ground, as well as the house. See Figures 1 and 2.

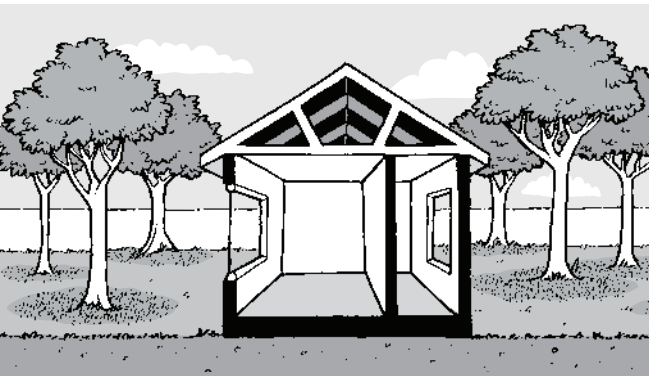


Figure 2 - Shade and dark foliage reduces reflection

- Growing deciduous vines on a pergola over north facing windows is an ideal way of protecting windows from summer sun. Vines on a vertical trellis can protect east and west facing windows.

## Tree shape and shading

- Always consider the shape and height of the tree when fully grown.
- If planting trees to the north, choose deciduous trees with a wide canopy that can shade the house in summer and let the sun through in winter. See Figure 3.

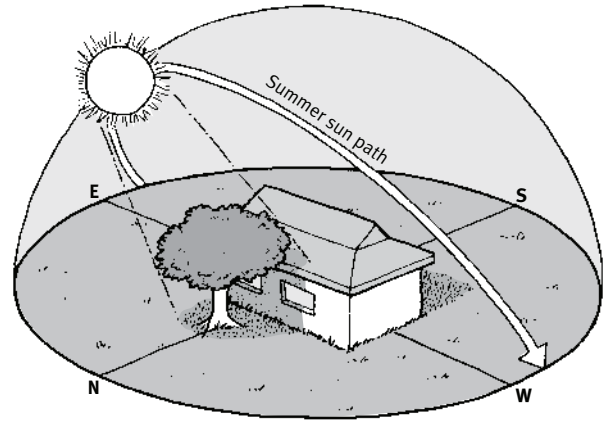


Figure 3 - Deciduous trees to the north

- Plant deciduous trees with wide canopies close to the house, in the sun's path, but not right up against the wall. Use trees with non-invasive roots so as not to damage pipes and foundations. See Figure 3.

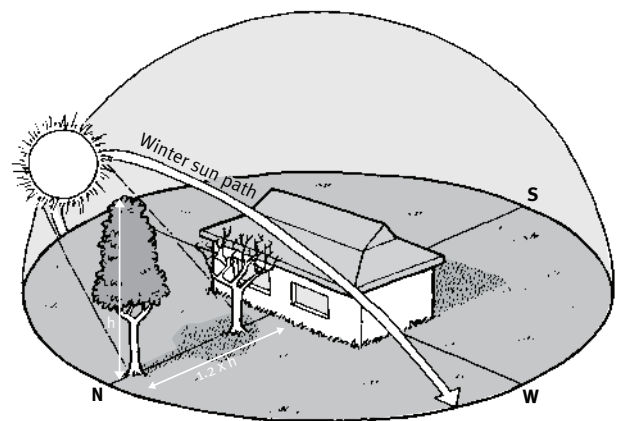


Figure 4 - Tall evergreens to the north

- Plant trees such as palms, with tall bare trunks and high canopies, near your house to shade the roof but not the walls or windows. See Figure 4.

- Tall, cone-shaped trees, planted in a row, will shade your house from low sun on the eastern and western sides. See Figure 5.

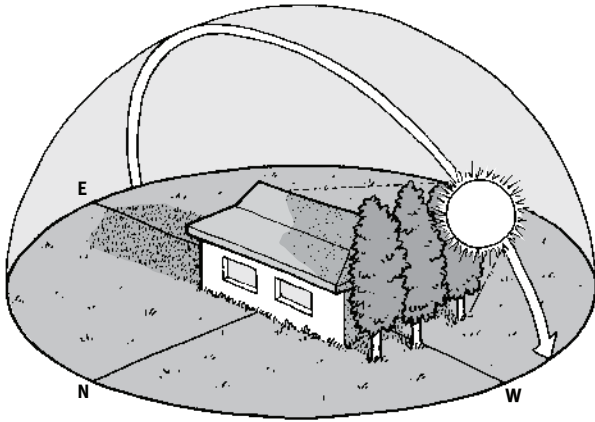


Figure 5 - Tall cone-shaped trees to the west and east

- Ensure that mature trees do not shade your solar hot water collector at any time of the year.
- The midday sun in the middle of winter in southern Queensland has an angle of altitude of approximately  $40^\circ$ . At that time, a tree, or building will cast a shadow 1.2 times its height (See Figure 6.) In northern Queensland the sun has an altitude of  $50^\circ$  and trees and buildings will cast a shadow only 0.8 times their height.

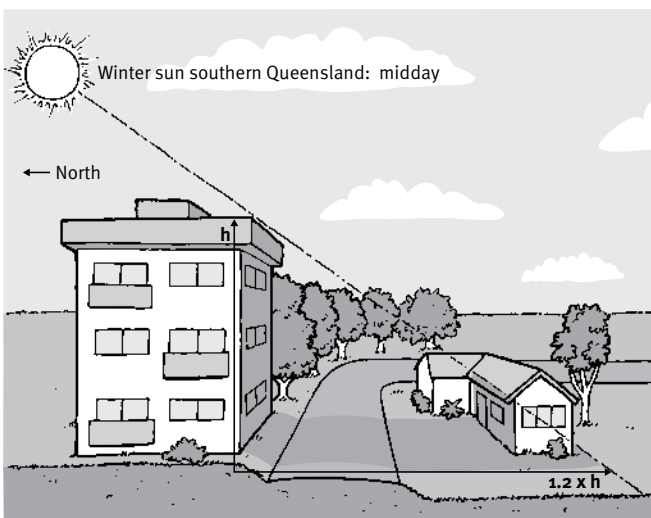


Figure 6 - Shadowing by buildings and trees in mid winter

## Planting for ventilation and windbreaks

- Rows of evergreen trees can screen your home from cold winter winds but should be planted away from the house to avoid shadows and prevent root damage to foundations and pipes.

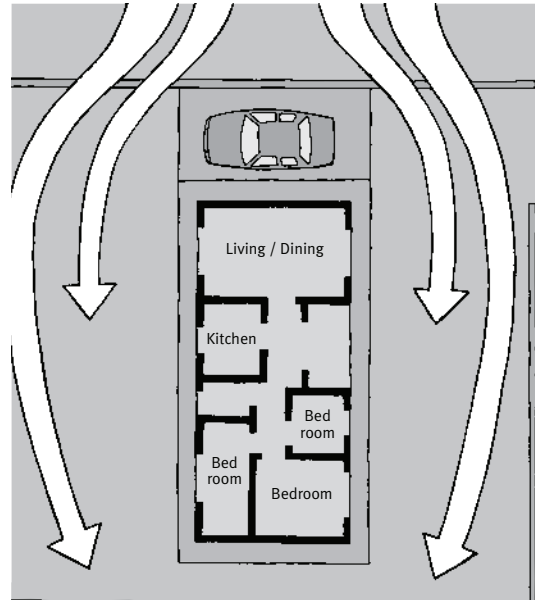


Figure 7 - Prevailing breeze blows past the home

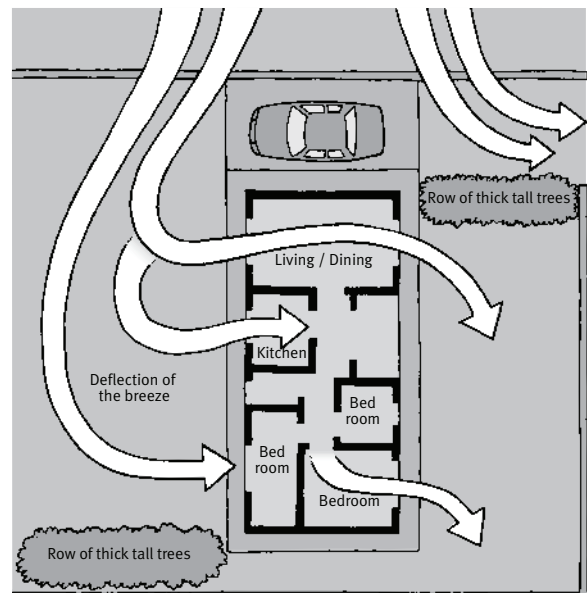


Figure 8 - Thick row of trees deflects breeze through the home

- Plant thick rows of trees or shrubs to deflect desirable cooling breezes into the rooms of your house.

## Insulation and evaporative cooling

- Plant vines on the outside wall and around windows to increase the effectiveness of an insulated wall. The air space left between the walls/windows and the vine reduces absorption of summer heat and reduces winter heat loss.

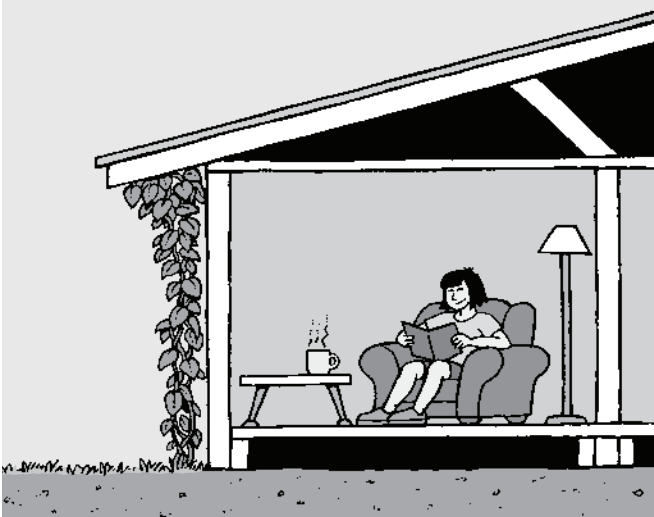


Figure 9 - Insulating air layer between the wall and the vines

- Trees and vines provide added cooling through the leaf transpiration process. When leaf moisture is converted to vapour there is an evaporative cooling effect as heat is absorbed from the air to convert the moisture into vapour. Cooling by evaporation decreases as the humidity in the air increases.

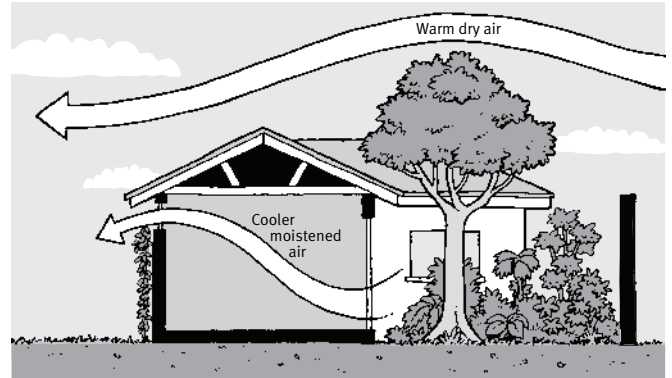


Figure 10 - Courtyard with dense planting

- In warm, dry climates, sheltered courtyards adjacent to the house can help you to grow a lush garden enabling you to take advantage of the cooling effect of the leaf transpiration process. The cooler air can be drawn into the house through windows and doors facing into the courtyard, and flow out through high windows or roof vents.

## What to choose

- There are many deciduous vines and trees that are excellent for shading, as well as numerous evergreens and hedges that can be useful for shading, privacy and wind breaks.
- Select trees and plants with non-invasive root systems if planting them near the house.
- It is recommended that you do some research and consult with your local nursery or council for advice on what and where to plant.

## For more information

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