Note 7 — 1999

native shelterbelts

BENEFITS FOR WILDLIFE

'An area of living trees, or shrubs, or both, established and maintained for the protection of grazing animals from adverse climatic conditions. Shelterbelts may also serve as windbreak…'

'A single or multiple row of trees, or a strip of retained natural vegetation. It may be used for various purposes, including stock shelter and shade; or timber production…' (Brouwer and Dutton 1992)

value of native shelterbelts

This note outlines some of the advantages of having native shelterbelts on your property, as opposed to shelterbelts of exotic or non-local native tree species. Recommendations are provided for designing, locating and managing of native shelterbelts.

Some of the advantages of well designed native shelterbelts are:

- protection of livestock from the extremes of temperatures and harsh winds—in wet and cold conditions, shelterbelts can assist in reducing the loss of stock during calving and lambing offshears (*Farming for the Future* 1999);
- protection of crops and pastures—shelterbelts assist in crop and pasture production by reducing plant and soil moisture loss caused by extreme winds;
- provision of habitat for local fauna and flora;
- improvement to the aesthetic value of the property;
- prevention of soil and wind erosion;
- protection from fire— a shelterbelt can reduce wind speed, which affects the rate of fire spread. They can also deflect burning debris around the home and filter out sparks (Petris 1992).

advantages of selecting locally native species

By choosing local native species for shelterbelts in preference to exotics and non-local natives, you will establish superior habitat for wildlife. Local native species also surpass alternatives in a range of other qualities:

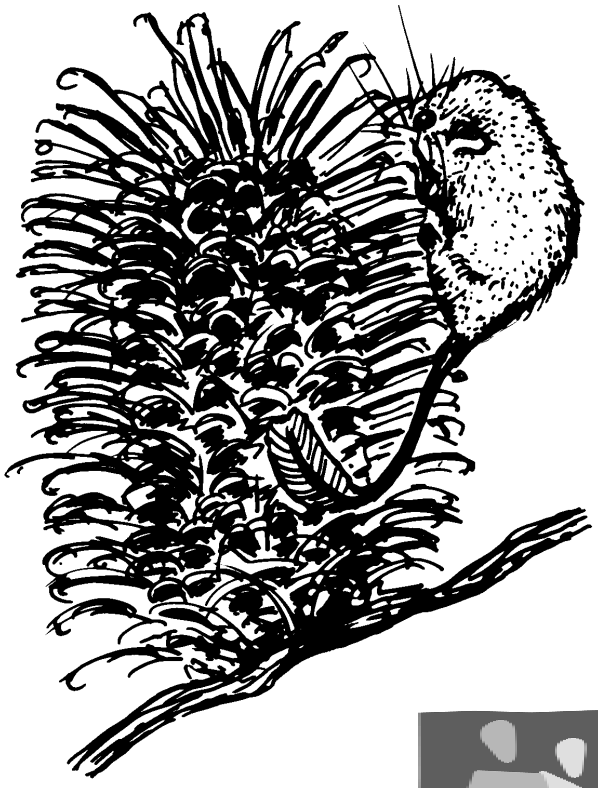
- ADAPTED TO LOCAL CONDITIONS

  Local native plants are likely to be better adapted to the local environment, including the soil and climatic conditions (Stelling 1998). They are more likely to readily establish and regenerate than those from alternate sources—requiring less management. Exotic and non-local plants are more prone to local pests and diseased than well-adapted, local native plants.

- PERMEABILITY

  Shelterbelts need to be semi-permeable in order to reduce windspeed without creating turbulence. Impermeable barriers (such as rows of cypress trees) can create turbulence on the downward side, reducing their effectiveness as windbreaks and may even serve to increase windspeed.

  Mature cypress and pine trees generally exclude native understorey plants, and the gap between the ground and the lowest branches can act as a wind channel. In contrast, most native plant communities include understorey species, such as grasses and shrubs. For best results, shelterbelts should have several rows of native trees, shrubs and grasses.



- COST AND LABOUR

  The cost of establishing native shelterbelts varies depending on the circumstances. With techniques such as direct seeding, native shelterbelts can be established at a lower cost than exotic species or nursery grown plants. Local native species often regenerate naturally (avoiding long periods without shelter) and do not require high maintenance such as summer watering that exotic species may require (Stelling 1998).

- LANDSCAPE AND CONSERVATION VALUES

  Use of local native trees, shrubs and grasses helps to maintain the character of the natural landscape and is of great benefit to the local fauna providing food and shelter areas. Local natives can help retain or regain a sense of local identity, improving the aesthetic values of properties and rural landscapes (Stelling 1998).

- NATURAL PEST CONTROL

  Areas of local native plant species can attract native wildlife that prey upon pasture, tree and crop insect pests (Williams, J in Stelling 1998). Native wildlife also carry predatory parasites and diseases that can assist in lowering pests numbers. This is a good complement or alternative to pesticides, which are costly and can be extremely harmful to native wildlife.

  A diverse shelterbelt habitat, consisting of a variety of native plant species including trees and a healthy understorey, will help in natural pest control. Many native farmland birds and bats feed on insects (Williams, J in Stelling 1998):

  'honeyeaters generally inhabit the understorey, including shrubs amongst eucalypts, and are able to consume 24-36 kg of insects per hectare per year' (Farming for the Future 1999).

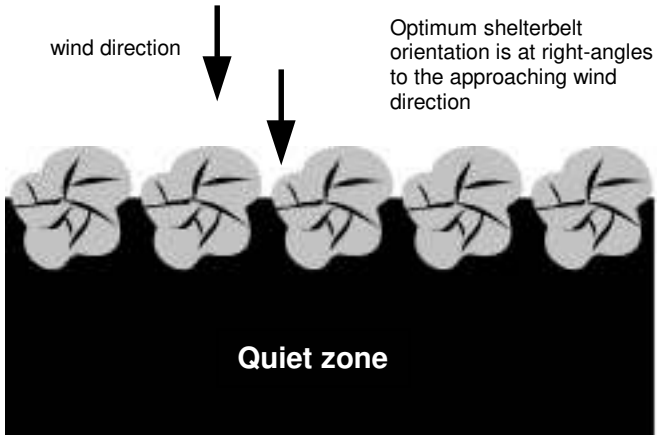
  '*insectivorous bats can consume up to 600 small flying insects in an hour. Bats are known to eat army worms, moths and mosquitos. Many bats require the older trees, with hollows for roosting'* (Farming for the Future 1998).

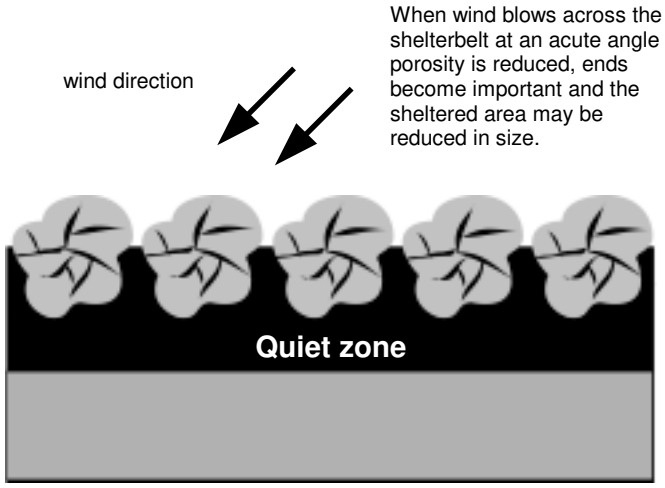
Many species of native parasitic wasps and other insects as well as spiders are extremely useful in controlling farm pests (Williams, J. in Stelling 1998). For these to be present in shelterbelts, a diverse mix of plant species, including local native trees and shrubs and grasses is required. This will ensure that nectar and nesting sites are provided throughout the year. Logs, leaf litter and rock material are also essential (Farming for the Future 1999).

- LANDSCAPE AND CONSERVATION VALUES

  Some species (mainly non local) have the potential to become environmental weeds. Environmental weeds are plants that rapidly spread and invade bushland or pasture areas (Brunskill, S in Stelling 1998). Many of these weeds are unpredictable and will rapidly colonise an area where they are not wanted. Some environmental weeds include cape broom (*Genista monspessulana*), Cootamundra wattle and sweet pittosporum (*Pittosporum undulatum*). These plants reduce the habitat value of bushland as well as destroying the food supply of many native animals that rely on local native plants (Brunskill, S. in Stelling 1998). They pose a long term threat to local regeneration of native vegetation (ANPWS 1991).

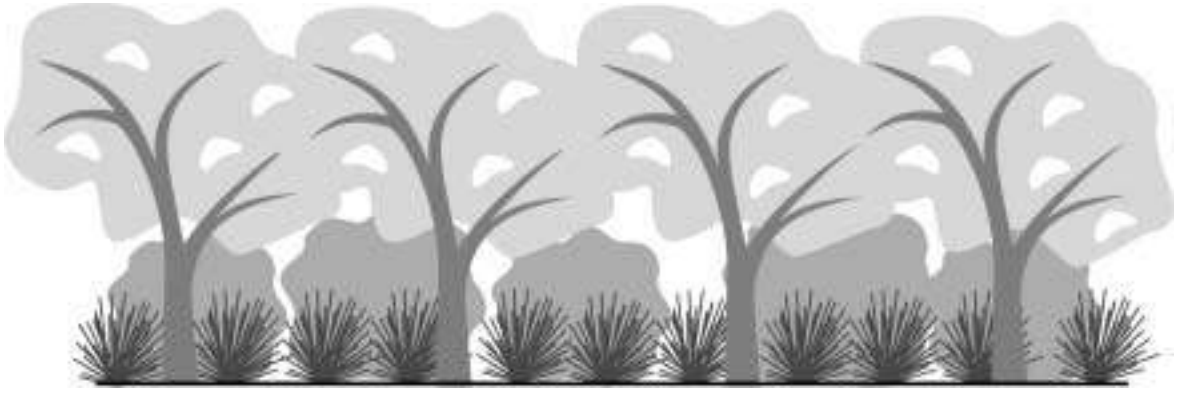
Achieving maximum shelter from your shelterbelt





(Abel et al. 1998)

a porous shelterbelt (porosity — 50%–60%)



a non-porous shelterbelt (porosity —20%)

(Abel et al. 1998)

- TOLERANCE OF FIRE AND DURABILITY

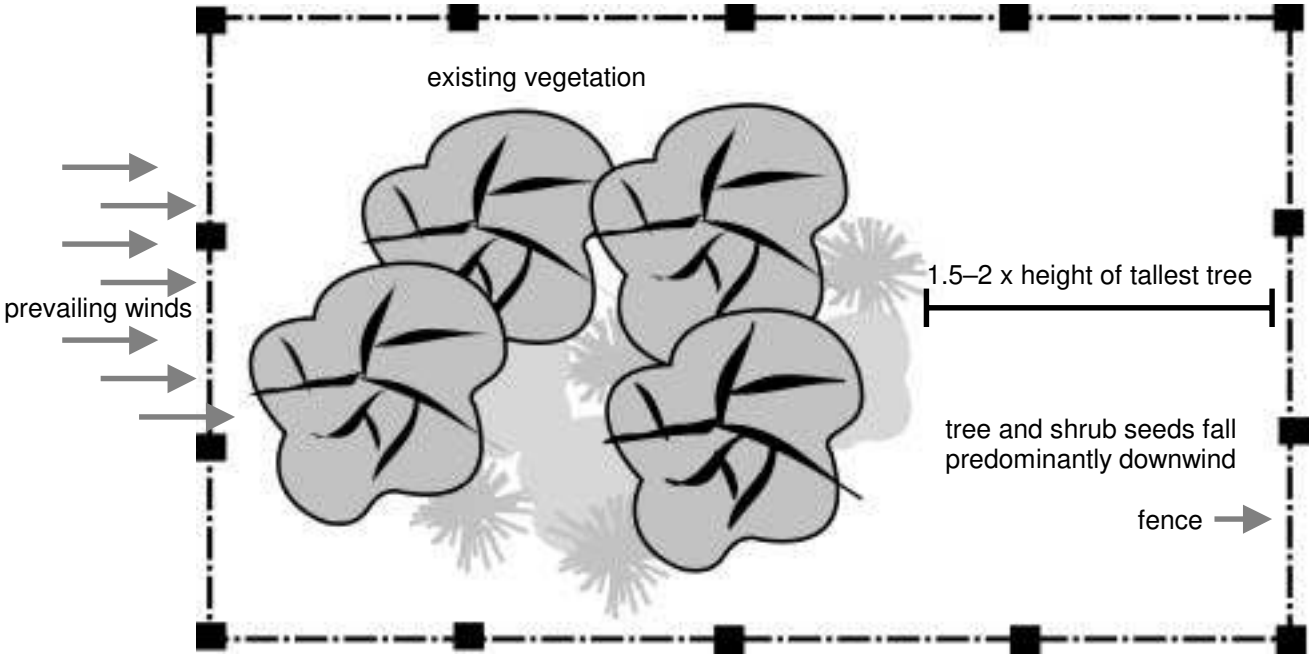
  '*Traditionally, many shelterbelts have been planted using cypress trees. However, multiple rows of indigenous trees will often perform better as shelterbelt species. Many indigenous trees are often taller than cypresses, and subsequently provide more protection. Furthermore, most indigenous trees will also recover from fire, while cypresses are extremely susceptible to fire'* (Petris 1992). Local native species of plants are generally much better able to withstand the threats of frost and drought unlike introduced species such as conifers.

features of a good shelterbelt

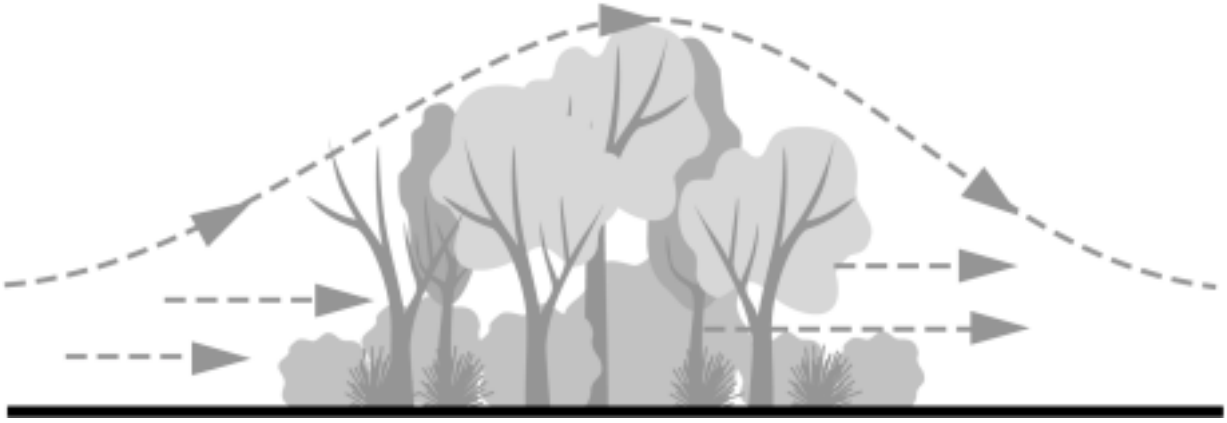
- Shelterbelts that are open but without large gaps provide semi-permeable protection and are usually recommended for crops and pastures. Allowing some airflow through the shelterbelt ensures that deflected air is not prone to descending too rapidly causing unwanted turbulence on the leeside of the shelterbelt, providing a greater area of protection (Breckwoldt 1983).
- Dense or impermeable shelterbelts can be used to protect small, confined areas such as farm buildings or yards (Breckwoldt 1983). L-shaped shelterbelts are ideal for areas requiring high protection.
- Shelterbelts do not need to be a strictly linear shape. Ones that follow the contour of the land or a creek or river line can still offer areas for stock shelter, regardless of changes in the direction of the wind.
- The height of shelterbelts determines what area of land is to be protected (Breckwoldt 1983). The area of land protected by the shelterbelt is approximately 20 times the height of the tallest trees in the shelterbelt (Brouwer and Dutton 1992; Breckwoldt 1983; Stelling 1998). Large properties may require numerous of shelterbelts for protection.

- Generally, longer shelterbelts are more desirable than shorter ones. Short shelterbelts tend to channel wind sideways around them — detracting from their effectiveness (Breckwoldt 1983). It is suggested that a shelterbelt's length be approximately 12 times the mature height of its trees, ie. 240 metres long for a shelterbelt 20 metres high (Stelling 1998 and Breckwoldt 1983). Linking shelterbelts to other corridors of natural vegetation greatly reduces windspeed when compared to single isolated shelterbelts (Simpfendorfer 1989).
- Environmental weeds can significantly threaten wildlife by decreasing the habitat value of bushland areas by competing with remnant vegetation. They can also cause problems for agricultural lands. Environmental weeds should be avoided in shelterbelts. For further information concerning environmental weeds in your area, contact either your NSW National Parks and Wildlife Service District office or your local council.
- The shape and width of shelterbelts determine their effectiveness. An ideal shelterbelt may be one, for instance, whose entire length and height is relatively uniform in providing semi-permeable protection. If, however, there are large gaps along the length of the shelterbelt this can lead to 'jets' of wind that can reduce the effectiveness of the shelterbelt (Abel et. al. 1997).
- The greatest potential for wildlife habitat is in wide shelterbelts (around 5-7 rows of trees or more) connected to large areas of native bushland (Stelling 1998). In narrow shelterbelts (around 2-3 rows of trees) gaps are difficult to manage and widely spaced individual or isolated trees are prone to dieback and are unlikely to be replaced by natural regeneration (Dorricott and Roberts 1993)
- Native wildlife will benefit and be attracted to shelterbelts if they are planted with a wide range of local native trees, shrubs and grasses. If a variety of species is not planted, the shelterbelt is prone to outbreaks of disease and pests — increasing the likelihood of dieback (Archer 1997).
- Consider species that provide good shade and are vigorous growers. These may be species that already grow on the property, or that are known survivors locally (*Farming for the Future* 1995). They will contribute to the effectiveness of the shelterbelt, as well as providing quality habitat and protection for native fauna.

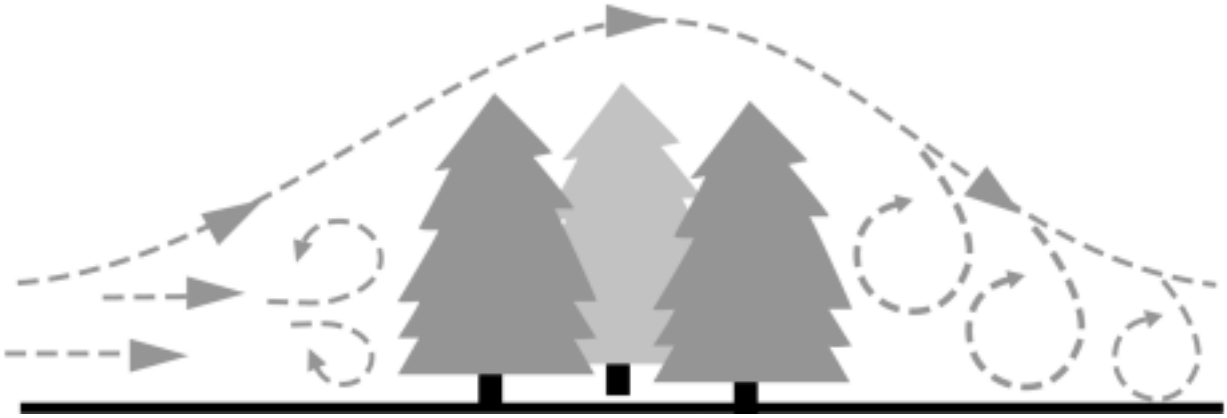
Plan view of one particular fence design for encouraging natural regeneration



Permeable shelterbelts planted with a variety of local native species provide habitat for native wildlife without creating turbulence.



Non-permeable windbreaks planted with conifers create turbulence and provide little habitat for native animals.



(Abel et al. 1998)

identifying shelterbelt locations

- Choosing suitable locations for shelterbelts is part of developing a Physical Property Plan (Whole Farm Plan) for the property, (*Farming for the Future 1995*).
- Shelterbelts that form natural corridors with other areas of native vegetation provide the opportunity for wildlife movement. Take into consideration naturally occurring shelterbelts such as along tree lined watercourses, ridges, farm boundaries, roadsides, and native vegetation occurring along travelling stock routes. These areas can provide high quality habitat for wildlife.
- Take advantage of existing habitat features. Consider establishing a shelterbelt that includes existing native plants such as old paddock trees and native grasses. These established areas will assist in any further regeneration process. Conversely, planting a shelterbelt in an area which is dominated by exotic grasses and has a history of fertiliser use, will reduce the chance of natural regeneration in the shelterbelt. This may lead to weed control problems, and the competition of exotics with the planted natives (Sheahan, M. 1998).
- Planning with neighbours can assist in determining the appropriate location for shelterbelts; maps and aerial photographs are also useful.
- Familiarity with the prevailing winds on your property will assist in determining the orientation of a shelterbelt. Generally, a shelterbelt that is at right angles to the prevailing winds will provide the best protection (Abel et al. 1997). When planting for shade, plan to avoid runoff from stock camps

damaging waterways. Planting a buffer zone of native vegetation near watercourses can help in intercepting runoff as well as providing habitat for native fauna.

- A shelterbelt on level ground will be most effective if orientated at right angles to the prevailing winds.
- It is recommended that buildings be sited more than 1.5 and less than 5 times the shelterbelt height from a dense shelterbelt for protection from fire (Simpfendorfer 1989). Fire resistant species should be considered for these locations.
- Pasture or crop yields may be reduced if located very close to shelterbelts, as plants compete for moisture and light. These areas can be used as firebreaks or laneways.
- On undulating lands, wind flows parallel with the ground rather than from one direction (Simpfendorfer 1989). Shelterbelts on ridgetops give the greatest deflection of wind but are the most vulnerable to damage. A wide shelterbelt provides greater protection in exposed, windy areas.

shelterbelt management

- Control weeds spreading by keeping disturbance of the shelterbelt to a minimum and avoiding the introduction of non-natives. Control weeds as soon as possible after they invade an area and prior to flowering and seed set so there will be fewer plants to control.
- Control pest animals such as rabbits, cats and foxes.
- Don't let your pets wander unsupervised at night — this will help safeguard your pets as well as native wildlife.
- Use pesticides and herbicides wisely — away from natural bushland, habitat areas and watercourses.
- Keep fences and gates in good condition to exclude grazing animals. Allow at least 2 metres from the shelterbelt to the fenceline to prevent stock browsing — allowing plants to grow to their full potential (Brouwer and Dutton 1992).
- In shelterbelt areas close to buildings and other areas requiring protection from fire, remove fallen twigs and leaves.
- Occasional wildfires may burn a shelterbelt. Many native species are likely to recover from a wildfire, but others, particularly rainforest species and conifers, are severely injured. An occasional wildfire can stimulate natural regeneration. Consult with local authorities and carefully plan where and when burning should take place. A controlled burn at a frequency and intensity similar to the natural regime may help in maintaining healthy bushland. Controlled burns also reduce the intensity of wild fires.
- In areas away from homesteads or other areas needing protection, allow the natural leaf litter to accumulate on the ground. This includes fallen logs and branches, tree stumps, rocks, leaf litter and debris. This will provide essential habitat for wildlife, control erosion and return nutrients to the soil.
- Leave mistletoes as wildlife shelter and food, unless they threaten the host tree. Mistletoe which is threatening or killing a tree may be controlled using light fire. Mechanical removal is often unsuccessful. Seek advice from a NSW National Parks and Wildlife Service district office, a Department of Land and Water Conservation district office or Greening Australia.

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For more information on how the NSW National Parks and Wildlife Service can assist, contact the Conservation Partners Co-ordinator, Education and Community Programs National Parks and Wildlife Service, PO Box 1967, Hurstville NSW 1481
Phone: 02 9585 6040
conservation.partners@npws.nsw.gov.au
www.nationalparks.nsw.gov.au

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