

# Trees on farms

## Trees for bees

### *Helping bees, helping dairy farms*

Pollination is crucial to agriculture and horticulture in New Zealand and worldwide. Dairy farmers appreciate the value of white clover pollination. Better pollination drives stronger clover growth and more productive grazing. But even seed, leafy vegetable and fruit crops rely on successful bee pollination. In fact, 90% of the world's food relies on pollination by bees and insects. Visit [treesforbees.org.nz](http://treesforbees.org.nz) for further information.

Bees are the greatest pollinating machine in agriculture. Pollen is the ultimate protein meal for hives, containing more amino acids than beef, eggs or cheese. Nectar provides the carbohydrates and energy bees need to survive.

### *First check that your trees are not toxic to animals*

Many trees available and for sale in New Zealand could be harmful to companion animals and livestock. Some of the tree species mentioned on the website below could, in some cases, cause issues in some animals. Before planting, make sure that you have selected the right trees. Check with your vet for advice or visit this site for a general list of toxic plants: [tararuavets.co.nz](http://tararuavets.co.nz)

### *How bee pollination works*

You probably know that bees collect and transfer pollen grains between male (anther) and female (stigma) plant parts. But did you know that bees practice flower fidelity?

Bees tend to concentrate on one specific species of flower at different times of the year, even though over the year they are attracted to a large variety.

### *Help bees to help you*

Flower fidelity makes bees very susceptible to the mix of trees on farm. A good mix is necessary to support colonies from spring to autumn (hives hibernate through winter). If not, bee numbers can crash, reducing pasture and crop pollination.

Focus on plants that fuel bees through late summer and autumn into early winter. Spring and early summer is often catered for on farm by agricultural and horticultural crops.

Pollen sources in late autumn and early winter are the most valuable; they fuel the colony throughout its hibernation. More fuel for hibernation equals more healthy and many more bees ahead of spring pasture and cropping pollination, rewarding you with more production on farm.

You can do two things to help:

- consider bee-friendly planting options or components whenever planting trees
- talk to your local beekeepers about over-wintering on farm ahead of spring pasture pollination.

### *Planting options to attract bees*

All planting projects, whether riparian, shelter or erosion control, can benefit bees. Choose what works for you and your farm below.



Beehives tucked in beside a native species shelterbelt and protected with a hot wire – an ideal location.

### Bee-friendly planting objectives

Planting objective	Plant mix	Reasons why & more info
Riparian Paddock margins Retired blocks Covenants	Mixed natives	Select natives known to be good pollen/nectar producers, include some winter/early spring flowering species such as five finger and tarata (lemonwood). Broaden mix to include some exotics – e.g. selected willows, winter-flowering eucalypts, selected acacias and/or fruit trees if site allows.
Slips Gullies Erosion control	Willows, poplars, alders	Remember to ask for male clones, they produce nectar and pollen (female clones only produce nectar).  Poplars are a good source of propolis (e.g. kawa, yunnanensis, toa), used for hive repair and hygiene. Selected alders can also be useful.
Shade Shelter belts (without pivots)	Poplars, oaks, maples, ash	Include an understorey of flax/tagasaste/small-stature natives or exotic shrubs. If space allows add oaks, ash, maples, selected eucalypts or acacias.  Widen the belt to give understorey species plenty of room so they can flower well.
Shelter belts (with pivots)	Mixed small-stature natives or evergreen exotic shrubs	Include some winter/early spring flowering species.  Plant corners outside pivot circles with bee-friendly species. Give plants plenty of room to flower.  Don't irrigate during the daytime when plants are in flower.
Landscaping	Decorative trees – oaks, maples, tulip tree, ash	Consider fruit trees (apples, pears, citrus), winter-flowering eucalypts, maples, selected chestnuts, oaks, selected alders.
Timber plantation	Ground-durable eucalypts	Many ground-durable eucalypts are prolific flowerers with high quality protein and copious nectar. Flowering times vary depending on site and species, but some flower in late winter/early spring. A mix of species will increase the chances of providing for bees at critical times.
Timber plantation	Radiata pine/ Douglas fir	Radiata pine and Douglas-fir offer little to bees. Leave gorse, broom, tagasaste and other scrub where possible as new plantings will benefit from early shelter. As they grow, they will overtop and shade out scrub plants. Avoid blanket spraying scrub when it's in flower.  Plant selected willows or poplars in wet areas where plantation species will struggle. Leave wide tracks or intersections to retain sunny sites for hives.  Plant winter/early spring flowering trees (e.g. selected eucalypts or acacias) at entrance and around open areas and skid sites.

## Bee considerations

### Pollen calendars

Choose plants to flower in spring-autumn. Note down what flowering trees are on-farm already, when they flower and try to aim for trees that flower outside these seasons. By focussing on summer or autumn flowering trees, you can encourage greater pollination of spring pastures and crops. Talk with a local beekeeper to find the right plant mix that matches their and your needs.

### Exotic or native

Bees like both. A mix of both is beneficial for erosion control and can help fill holes in your farm pollen calendar. Remember, that honey bees on most New Zealand farms are European species. Native bees will also pollinate exotic trees. Diversity is the spice of bee life.

### Not all flowering plants are equal:

The nutritive value of some pollen (measured by protein content) is much higher than others. Some flowers are better-shaped for bees to visit (e.g., land on, gain entry to, access nectaries within). Bees are attracted to flowering plants but inconspicuous flowers like willow catkins are also excellent sources of pollen.

## Bee-friendly plants

Here is a bee-friendly list: but it's only a sampler. Talk to your local beekeeper(s) and nursery who can provide more detailed choices suited to your soils, climate and region.

Always aim for a flowering season mix, try for the big three (spring, summer, autumn or into early winter).

Native species	Flowering Season
Akepiro ( <i>Olearia paniculata</i> )	Summer to early winter
Cabbage tree ( <i>Cordyline australis</i> )	Spring
Five finger ( <i>Pseudopanax arboreus</i> )	Winter-early spring
Flaxes (e.g. <i>Phormium tenax</i> )	Spring-summer
Koromiko ( <i>Hebe stricta</i> ) and other hebes	Spring-autumn
Lacebarks ( <i>Hoheria populnea, sexstylosa and angustifolia</i> )	Spring-autumn
Lemonwood ( <i>Pittosporum eugenoides</i> )	Spring
Kowhai ( <i>Sophora microphylla</i> )	Spring
Kanuka ( <i>Kunzea ericoides</i> )	Spring-summer
Manuka ( <i>Leptospermum scoparium</i> )	Spring-summer
Tree fuchsia ( <i>Fuchsia excorticata</i> )	Winter-summer

  

Exotic species	Flowering Season
Acacia (wattles) (e.g. <i>Acacia dealbata</i> or <i>A. melanoxylon</i> ) and others	Winter to early spring
Ash (e.g. <i>Fraxinus ornus</i> ) and others	Spring
Apples ( <i>Malus spp</i> ) including crab apples	Spring
Camellias (simple flower species)	Autumn-early spring
Eucalypts – many species	Winter-spring

Exotic species (continued)	Flowering Season
Maples (e.g. <i>Acer negundo</i> ) and others	Spring
Oaks ( <i>Quercus spp</i> )	Late spring-summer
Pears ( <i>Pyrus spp</i> )	Spring
Tagasaste/tree lucerne ( <i>Chamaecytisus palmensis</i> )	Winter-early spring
Willow ( <i>Salix spp.</i> ) – male clones especially for pollen. <i>Salix alba</i> and <i>S. nigra</i> are two recommended species. Consult your regional council about choice of willows.	Winter-spring



Honey bees foraging in *Eucalyptus bosistoana*, flowering in March (Photo courtesy of Paul Millen, NZDFI)



Young manuka flowering in October (Wairarapa).



A bee-friendly shelterbelt of exotic species - eucalypts and acacias – also provides good livestock shelter



Making the most of a wide verge – bee-friendly natives, protected from rabbits and mower damage by old tyres.

## Bee friendly budgeting

Your planting budget needs to include:

Cost item	How much	Other considerations
Fencing for stock exclusion	Electric fencing \$5-\$8/m Post and batten \$13-\$17/m	Permanent electric fencing adequate for cattle; sheep may need post and batten fences.
Plants and planting (1100-4500 plants/ha, depending on design)	Trees \$2-\$10+ Planting 50c-\$2 (contractor rates)	Price depends on species, size, quality and numbers. Numbers will vary with planting design. Plant quality is more important than size. Bigger plants cost more but need less future weed control.
Weed control	25-30c per application per tree (contractor rates, including herbicide)	Expect to spot spray at least twice, often 3-4 times over the first few years. 1.4m <sup>2</sup> spots recommended.
Individual shelters (if required)	\$1-\$3 each (some include a mat to prevent weed control inside shelters)	Protect trees from hares, rabbits and herbicides, but do require maintenance.

### Further information

The Trees for Bees website has regional guides on species choice and lots more useful information. Visit [treesforbees.org.nz](http://treesforbees.org.nz)

*Designing the ideal apiary site* visit [kauriparknurseries.co.nz](http://kauriparknurseries.co.nz)

*Winning with Willows* visit [poplarandwillow.org.nz](http://poplarandwillow.org.nz)