

## TREES FOR BEES CORNER

# STRATEGIC PLANTING FOR BEE FEED



Dr Linda Newstrom-Lloyd, Dr Angus McPherson and Marco Gonzalez

Strategic bee planting can stimulate good bee health and build colonies up to great strength. It is more than just randomly or casually picking out a bunch of plants from a bee plant list and planting them out with the hope that it will all work out to cover the seasons for bees. The process of maximising or optimising bee nutrition involves a few steps that will ensure the best results for the time, effort and money spent.

If the apiary site is owned by a landowner such as farmers or councils, then the first task is to encourage them to plant for bees by being clear about the benefits of multi-functional plants.

If the apiary site is owned by the beekeeper, then full control of planning the floral resources is possible. If the apiary site is owned by a landowner such as farmers or councils, then the first task is to encourage them to plant for bees by being clear about the benefits of multi-functional plants. If your landowner is going to plant trees for erosion, riparian protection or shade and shelter anyway, it won't be hard to convince them to plant useful trees or shrubs that will also deliver good nutrition for bees. These multi-functional plants can meet both landowner's and beekeeper's needs, as well as help to provide better pollination services if the timing is right.

## The bee layer

There can be multiple layers of different goals for planting. They need to be sorted by priority. If the land is owned by the beekeeper and is dedicated to raising bees only, such as queen raising or nuc sites, then considerations for moderate shade and shelter for hives are important, along with striving for a wide diversity of plants to promote best nutrition.



*The spring flowering tulip tree (Liriodendron tulipifera) has huge 'super bowl' flowers with whorls of bounteous stamens opening sequentially even when the flower bud is just beginning to open. You can often see multiple bees inside newly opened flower buds. Although the tree does not have many flowers, each flower alone contains a massive number of stamens with quantities of pollen. The tulip tree grows to a large tree (over 30 metres) with golden-yellow autumn colours, and is an ideal specimen tree for paddock shade and shelter, woodland or avenue/allenway. The fastigiata (upright) form is great for avenues or where space is limited. It tolerates some exposure, and grows best in deep, well drained loams with thick dark topsoil.*

Clusters of the same species planted together are highly attractive to bees.

If the plot is small, then bee plants with the highest density of flowers and the highest protein content in the pollen would be a top priority. Clusters of the same species planted together are highly attractive to bees. Bees often go first to the largest clumps of suitable bee forage that are easy for them to find.

For arable farms, the priority would be to attract beneficial insects that keep insect pests in control and to avoid attracting seed-eating birds or other animals. Arable farmers do not want large trees that take water away from the crop. In contrast, sheep and beef farmers have the space to plant huge trees that will provide shade and shelter, avenues, or diverse plantations for riverbank protection or erosion control. Councils have a range of goals and priorities including water quality, soil conservation and planting park-like plants for shade and beauty, among others. The bee layer might be the last priority for the landowner, but many plants that are good for bees also fulfil the other goals quite well.

### The flowering calendar

The flowering calendar is the sequence of plant species within foraging range that supply pollen and nectar through the seasons. This calendar will differ according to climate, vegetation, floral diversity and micro-habitat.

The four steps to planting a balanced flowering calendar for a given bee feed budget are:

- explore the existing bee feed supply at the site and identify the timing of any deficits of pollen or nectar
- determine the timing of your target goals for pollination, honey harvesting, or queen raising
- create a flowering sequence in a table that illustrates how they will meet the life cycle needs of the colonies

- make sure the bees have nothing major around to distract them away from the target plant when it flowers.

The flowering calendar needs to be looked at in three different ways. First, is there enough diversity of plant species in each month to take care of any non-flowering years in some species or the loss of some plant species due to diseases or frost, etc? Many of New Zealand's native plants have peak flowering years followed by several poor or no flowering years, and some exotic cultivated plants have alternate bearing years. Planting high diversity of plant species (five to 10 species flowering per month) can cover these issues.

Second, is there enough quantity of pollen and nectar in each month for the number of beehives desired on the site? This is about carrying capacity and experienced beekeepers are quite good at estimating this. From a scientific point of view, it is possible to estimate quantity of pollen or nectar and match it to the seasonal demands of an average hive. However, we are only in the early stages of this research and have attempted it only for flax flowers and willow catkins to date. Planting in large clusters of the same plant species allows efficient foraging (for example, 10 to 15 or more plants per cluster depending on the size of the trees or shrubs).

Third, is there a reasonable mix of plants that mature to flowering quickly with those that mature to flowering slowly? Planting large-grade plants are more expensive but can start delivering flowers in the first year

**Floral resources are still declining in many areas with land conversions, agricultural intensification and weed elimination programmes.**

(for example, manna ash and lacebark). Often shrubs come into flower in the first year (e.g., rosemary, California lilac, Tree Lucerne) although some of these are short-lived plants and will need to be replaced after five years or so. Other species may take three to five or more years to start flowering but they can keep going for decades or even more than 100 years (e.g., oaks).

Beekeepers are currently facing the overcrowding effects of a doubling of hives (from 300,000 to 600,000) in the last five years. This is without a concomitant doubling of floral resources. Instead, floral resources are still declining in many areas with land conversions, agricultural intensification and weed elimination programmes. Strategic plantings of high-quality, fresh, natural pollen and nectar sources are part of the solution to combat these two trends that are compromising bee health and colony survival.

*The spring flowering Christmas berry (Photinia beauverdiana) is covered with a dense mat of flowers closely packed together, which attracts bees. The flowers have an open dish shape with whorls of numerous stamens typical of other Rose family species such as apples and pears. It is a medium shrub to small tree, growing to three to 10 metres. It is deciduous with excellent orange-red autumn colour, with late summer fruit loved by birds. It can be planted as a small specimen, a garden border or woodland plant, or used as screening or hedging. It grows best in full sun, but will also grow in partial shade. It tolerates drought, but prefers medium moisture and free-draining average soils. Photos: Valentine Tournon.*

