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Honey production in Western Australia

By Rob Manning, Apiculture Research Officer, South Perth

The first ever survey of the potential production and value of apiary products from the south-west of Western Australia has shown beekeepers are collecting only 40 per cent of the potential honey crop.

The biggest losses in honey production are caused by the environment, such as protracted drought, and extreme temperatures, heavy rain and cyclones during flowering. Fire, apiary sites leased but not used, and logging of forests also reduce the availability of apiary sites for honey production.

It takes a great deal of skill, together with observations of phenomena learned over a number of generations, to locate commercial nectar flows. As temperature and rainfall records seem to be constantly rewritten these days, it is becoming increasingly difficult for the commercial apiarist to maintain economic production.

The 1990-91 survey identified the major areas of honey production. The results will help government to manage these areas to maximise production and avoid conflicts with other activities such as forestry, flower picking and leisure.

Flowering cycles of trees
Honey is produced in a number of cycles that are directly related to the flowering cycles of the targeted plants (see Figures 1 and 2).

The annual honey production cycle accounts for nearly 60 per cent of the total harvest each year. The floral source for this honey is located along the coastal sandplain north of Perth to approximately Kalbarri. Coastal wildflowers targeted by beekeepers are Dryandra sessilis (parrot bush), Hakea triflora and several banksia species, the most important being Banksia menziesii and Banksia attenuata.

Exotic species such as capeweed and Paterson’s curse are also valuable and in most years contribute substantially to annual honey production.

Plants that flower prolifically every second year produce a two-year production cycle. Plants such as jarrah, blackbutt and marri growing in the forests south of Perth contribute a fifth of overall honey production each year.

Plants flowering every three and four years are mainly wandoo and/or karri trees. Combined, they contribute a tenth of the honey production each year.

The last cycle of six years or more contributes just under a tenth of overall production each year. Nectar is harvested from eucalypts in the goldfields near Coolgardie, and karri trees.

Production from apiary sites
Honey
The survey provided a detailed analysis of when apiary sites were used in three hundred 68,000-ha grids from an area south of a line from Kalbarri to Kalgoorlie and Esperance (see ‘Honey production, economic value and geographical significance of apiary sites in Western Australia’ published by the Apiculture Section, Western Australian Department of Agriculture).
Karri nectar contributes to the three- and four-year honey flow.

Figure 1. Average honey production. The 'swe' represents the estimated honey production of 2814 tonnes for 1990-91.

Flowering marri (red gum).

FAR LEFT: Eucalyptus transcontinentalis. PHOTO: WA Herbarium.

Development is encroaching on ungrazed coastal heathland, putting productive apiary sites at risk.
Figure 2. Distribution of registered apiary sites of commercial beekeepers for annual, two-year, three-year, four-year and more than six-year honey production cycles over the south-west of Western Australia.

Note: The colour of each of these cycles matches those in Figure 1. The highest producing areas are circled.

Figure 3. Average honey production from commercial and non-commercial registered apiary sites.

Figure 4. Average honey production from commercial and non-commercial apiary sites on private property.

Commercial beekeepers owning more than 300 beehives collected about 77 per cent of the State’s honey harvest each year. The remainder was from amateur and part-time commercial beekeepers (see Figures 3 and 4).

The most productive apiary sites were those registered to commercial beekeepers, with average mean production just over 4,000 kg of honey per apiary site.

Private apiary sites also used by commercial beekeepers produced 3,624 kg of honey while honey production from non-commercial beekeepers on registered and private apiary sites was much less, at 2,725 and 1,836 kg respectively. A registered apiary site is an area of crown land of about 700 ha that is administered by the Department of Conservation and Land Management.

The production differences can be attributed to commercial beekeepers, by the very nature of their business, having located better areas of production. They also have a much higher stocking density. Commercial beekeepers average 101 beehives per apiary site compared with the 60 beehives per site of non-commercial beekeepers. These differences in stocking densities are possibly ironed out because non-commercial beekeepers keep hives on apiary sites for about 26 weeks, twice as long as commercial beekeepers.
Other products
In average years, pollen production is estimated at 78 tonnes, though in 1990-91, the failure of jarrah and marri to flower reduced this to about 10 tonnes.

Queen bee production was estimated at 57,109 queens per year, most of which were used by beekeepers to maintain productive hives while a few thousand were exported.

Beeswax production was calculated at 198 tonnes; this was based on research on honey/beeswax ratios at the Department of Agriculture. Much of the beeswax is exported, the rest being either sold locally or recycled by beekeepers to make wax foundations for new honey frames and wax dipping bee boxes to preserve timber.

Exports of bee products
Of the estimated 2814 tonnes of honey produced in 1990-91, about 45 per cent was exported. The value of this export including beeswax exceeded $2 million. Local and interstate trade accounts for the rest of the sales.

Germany bought 34 per cent of the export crop followed by Singapore with 22 per cent. The Asian market buys nearly half of Western Australia's exports while European countries take the balance (see Figure 5). The 1991-92 data show bee products were also exported to India, Japan, Saudi Arabia, Sweden and Djibouti, though the amounts exported changed from year to year.

Information on the exports of pollen and queen bees is not available but, based on experience within the Department of Agriculture, the markets for queen bees are Canada, Asia and the Middle East. About 54 tonnes of beeswax was exported in 1990-91, mainly to the United Kingdom, Malaysia, France and Singapore.

Marketing of honey
Western Australia is a major supplier of natural honey because the State's production comes mainly from native plants and apiary sites are distant from industrial and urban sources of pollutants. Western Australia is also the only State in Australia free of European Brood Disease, which requires antibiotic medication for its control.

![Figure 5. Exports of honey from Western Australia, 1990-91. Countries with less than 1 per cent of exports are excluded; these were United Arab Emirates, USA and ships and aircraft stores.](image)
In many other countries the source of nectar is from plantations and crops in which chemical fertilisers, pesticides and herbicides are used and which could eventually contaminate the honey. Many countries have specific maximum residue levels that imported foods, including honey, must meet.

Western Australian beekeepers, therefore, have a great advantage on the export market as well as having a unique honey source from native plants. Capitalising on this and trying to capture niche markets could lift the price of honey substantially.

The future

Beekeepers, unlike most other primary producers, work outside their own properties and depend very much on government agencies and private landholders for access to native and exotic flora for their livelihood. Their livelihood could be impeded by social developments in three ways:

- Restrictions proposed on access to crown reserves where, in many cases, beekeeping has been practised for many years. The changing status of large tracts of vacant crown land into new parks and reserves, which restrict beekeeping, is of concern to the apiculture industry.

- Increasing volumes of logs being harvested from south-west forests.

- Gradual coastal development of human population centres to the north of Perth will inevitably encroach on the most productive honey producing areas in Western Australia.

These impediments mean that beekeepers are facing a non-expansionary phase or even possible contraction of their industry.

The unpredictable nature of the environment will continue to harm the industry, and losses arising from environmental extremes can be enormous. The record number of consecutive frosts in 1990, and the two days over 45°C in the summer of 1991, caused bud drop that virtually destroyed an estimated honey harvest of 1400 tonnes per year from jarrah and marri trees.

Wild fires can affect honey production for five years, with full production being achieved after nine years of plant regeneration. The effect of fire at the time of the survey was the further loss of more than 1000 tonnes honey. Beekeepers normally have back-up sites to compensate for this but they are generally less productive.

Diversification into other sources of income such as pollination is underdeveloped because the demand from horticulturalists is not strong. Most Western Australian orchards are located near forest areas where there is no shortage of pollinators such as native insects and feral honey bees. The survey estimated that 17 per cent of apiary sites were within range of horticultural or agricultural crops where primary producers were benefiting from pollination. Fruit trees and pasture clovers received the greatest benefit.

With the crippling exotic bee disease *Varroa* prevalent in countries to the north of Australia, accidental introduction to Western Australia of this or other exotic disease could damage the feral bee population and cause major changes for the orchard industry.

Prospects of package bees and queen bees for export and pollen production offer perhaps a limited expansion for some beekeepers. However, experience in these areas has caused some uncertainty amongst beekeepers because of the amount of paper work and associated costs of export.

'Package bees' is a term used to describe a special container holding about 2 kg of young bees (15,000 bees) and a queen. Package bees are exported to countries such as Canada, where beekeepers replace their entire beehive, which normally dies out during winter, with a package of bees. This ensures maximum production is achieved.

The survey report contains important information that can be used by beekeepers, land managers and State planners for many years to come, to resolve possible conflicts and maintain a viable industry.