

Pollination Aware

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If you thought bees were only good at producing honey, think again.

It is estimated around 65 percent of agricultural production in Australia relies on honeybees. A number of major commodity groups, such as almonds, apples, pears, strawberries and cherries depend almost totally on bees for fruit and nut production.

Quite simply, these tiny workers are critical to ensuring the ongoing viability of many of Australia's agriculture and horticulture industries.

But with the threat of a varroa mite incursion a very real possibility in Australia (Varroa is not present in Australia, but experts are predicting that Varroa mites will enter Australia at some time in the future), research efforts in Australia are focussing on securing the pollination of Australia's horticultural and agricultural crops into the future on a sustainable and profitable basis.

Central to this research is work being undertaken under the Pollination Program - a co-funded initiative between RIRDC, Horticulture Australia Limited and the Australian Government.

Research and development in this program is primarily aimed at raising awareness to protect pollination in Australia, which includes examining the significant risks associated with relying on incidental pollination (i.e. wild European honeybees) to pollinate agricultural and horticulture crops.

Australia has one of the largest populations of wild European honeybees in the world, which allows pollination responsive crop producers to take advantage of the free services they provide.

However, if there was a varroa outbreak in Australia, it would potentially decimate wild honeybee colonies, in turn devastating producers who rely on them to pollinate their crops.

Pollination Aware - The Real Value of Pollination in Australia, (RIRDC Pub. No. 10/081) spells out how an over-reliance on wild honeybees by pollination responsive crop producers in Australia may compromise the future resilience of Australia's \$30 billion horticulture and agriculture sectors.

The report also quantifies the likely demand for paid pollination services should anything happen to Australia's European honeybee population.

Gerald Martin, Chairman of the Pollination R&D Advisory Committee, says gathering current knowledge on

pollination and gaining an overview of supply and demand is seen as critical by the scientific community

"It is vital that we manage potential risks and determine our future priorities for investment and funding to both maintain - and improve - crop yields and harvest quality," Mr Martin said.

"Australia is fortunate to have a massive population of wild honeybees that pollinate our crops, but if these were decimated by Varroa mite, producers would have limited options in sourcing managed beehives, which would also suffer heavy losses.

"The report also points out that a heavy reliance on this incidental pollination means the yield and quality of produce is often not reaching its potential because plants are not being pollinated at optimal levels - compromising profits.

"*Pollination Aware* provides for the first time an analysis of pollination-responsive crops in this country and outlines how we can protect our valuable agricultural output by developing a larger apiary industry."

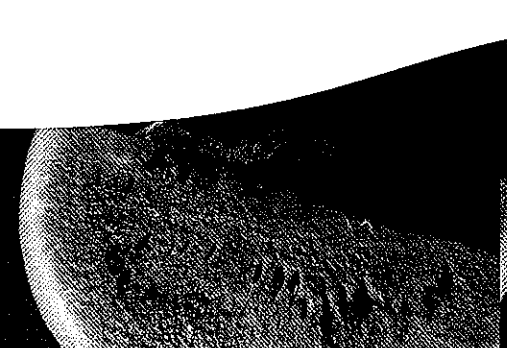
According to the report, Varroa mite could 'diminish to insignificance' the contribution from incidental pollination within 5-10 years.

The study suggests that if pollination by wild European honeybees was eliminated by Varroa mite, almost 480,000 colonies of honeybees would be needed to provide pollination services every September. Peak demand could lift this to 750,000 - far exceeding current apiary capability.

Apiarists would also incur significant costs from the presence of a serious pest or disease to monitor, manage and maintain colony strength. In the United States, the entry of Varroa Mite in 1987 led to an initial three-fold increase in the cost of pollination services due to control measures and high demand.

While the apiary industry's highest priority is to resist exotic pests and diseases, the report is seen as a first step in addressing both the potential challenges and future opportunities of the pollination industry.

To download or receive a printed copy of the *Pollination Aware* report or one of the 35 crop-specific case studies visit the Pollination page of the RIRDC website (www.rirdc.gov.au)



Hard day at the office

A day in the life of Barb the worker honeybee

Worker bees (pollinators):

Worker honeybees are female. Among other duties they gather pollen and take it back to the hive. On the way to the hive this pollen may be carried to another flower or crop where a portion of the pollen can rub off, thus resulting in pollination.

Meet Barb, our tough little worker honeybee. Barb is one of 3 billion worker honeybees who are currently hard at work in Victoria pollinating almond blossoms.

She didn't get there by chance – she would have come on the back of a ute, a semi-trailer or road train from New South Wales, Queensland or Victoria for her one month's worth of work.

Each August, around 100,000 bee hives are transported to the Robinvale region in northern Victoria to pollinate almond blossoms.

In her month's work, Barb clocks up more miles than most people travel in a lifetime. She'll fly upwards of 100 kilometres per day for around 30 days straight (including weekends!) with her wings beating thousands of times per minute.

That's thousands of kilometres travelled, and millions of flaps in just one month.

No wonder honeybees have a relatively short lifespan of about six weeks when working this hard.

At the centre of this major logistical operation is apiarist Trevor Monson.

Trevor is a member of the RIRDC pollination R&D advisory committee, and has been coordinating pollination services to the almond industry for around 30 years.

In Trevor's words, coordinating hives during almond season is much like a game of chess. To get the job done, he needs to move his pieces around the board to get the optimal outcome.

Drones:

Drones are male. Their main function is to fertilise a receptive queen. Drones do not exhibit typical worker bee behaviors such as nectar and pollen gathering, nursing or hive construction. Their role is to mate and continue the propagation of the hive. Although, when they sense the hive's temperature is changing they join the workers and move the air with their wings.

"Quality assurance is a major component of my job," Trevor says.

"It's not simply a case of sitting back and letting the bees do their job. I'm continually trying different combinations at different farms to get the best outcome for almond growers."

And it's a job which is critical to Australia's small but growing almond industry.

Total almond plantings in Australia are estimated at 27,000 hectares, with exports valued at \$75 million.



Paid pollination services are critical to sustaining the growth of the almond industry, which is 100 percent responsive to biological pollination agents.

The almond industry is one of the most proactive agricultural sectors using managed pollination services.

It was a fact highlighted in a recent Landline story on ABC Television, which profiled the significant role that bees, like Barb, play maintaining the growth of Australia's almond industry.

While the almond industry is among the most proactive agricultural sectors using managed pollination services, scientists are now asking whether there are enough bee hives to meet future demand for pollination services by almond orchards.

A research report released this month, *Pollination Aware: The Real Value of Pollination in Australia* (see opposite), highlights the significant risks associated with relying on incidental pollination and quantifies the likely demand for paid pollination services should anything happen to these escaped European honeybee populations.

Among the most severe threat to agricultural production is that posed by exotic pests and diseases of honeybees, such as the highly destructive Varroa mite, which would decimate Australia's wild honeybee colonies.

Pollination Aware consolidates available information and for the first time puts a value on pollination services for 35 different commodity groups—including almonds—by analysing the effect of honeybees on production in these industries.

The report is one of the most comprehensive studies ever into the critical role that paid pollination services play underpinning Australia's horticulture and agriculture industries.

The only thing it doesn't do is mention specifically the role of Barb. Not that she's worried, because she'd be too busy to read it anyway.

