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Attack on pollinators

Farming to suffer for research gap

By MATHEW CAWOOD

THE mysterious loss of as much as a quarter of the US bee population in the past six months is a wake-up call to Australia agriculture to start investing in one of its greatest unsung assets, local experts say.

The US bee industry, and the billions of dollars in agricultural operations that depend on bees for pollination, are in crisis mode as the massive bee decline continues and researchers scramble for answers.

The die-off - called Colony Collapse Disorder (CCD) - has claimed about a quarter of the US's 2.4 million hives, and threatens pollination services estimated to be worth \$US14 billion a year to US agriculture.

The US problem remains unexplained, but local authorities say Australia will inevitably be hit with its own bee die-off from a known threat, the deadly bee mite, *varroa destructor*, that has swept through every major honey-producing country in the world except Australia.

Varroa's arrival here is a matter of "when, not if", says Dr Max Whitten, former chief of CSIRO Entomology and adjunct professor in Integrative Biology at the University of Queensland.

Last week the odds narrowed considerably when a swarm of Asian honeybees, the original host for *varroa destructor*, was found living in a yacht mast in Cairns.

It may have been there for two years. Tests are ongoing to determine if the swarm carries the mite, and whether there are other swarms nearby.

When varroa hits, Dr Whitten said, experience showed Australia would within a few years lose the millions of "feral" honeybee colonies that deliver millions of unaccounted dollars in



pollination services, not just to horticultural crops, but to essential pasture species like clover and lucerne.

A recent paper co-authored by CSIRO Entomology and Australian National University scientists estimate if Australia spent up to \$50 million a year for the next 30 years to prevent varroa gaining a foothold in Australia, the country could still break even compared to the cost of letting the mite decimate the honeybee population.

The latest estimates put the value of honeybee pollination services to Australian agriculture at about \$4 billion a year if pastures are included, on top of the \$65m honey the bees deliver. One in every three bites of food depends on the honeybee. Scaling up commercial beekeeping - apiarists can use chemicals to keep varroa to a minimum in their hives - isn't currently a viable solution, Dr Whitten said.

Part of the problem lies in the logistics.

For the almond sector to reach its objective of becoming a \$1b industry, for instance, about 250,000 hives will be needed. There are currently only about 500,000 hives across Australia.

Even commercial pollination services, like those in the US, are unlikely to cover graziers, who need bees for clover and lucerne, or even canola and cot-

ton growers, whose yields are boosted about 15 per cent by cross-pollination by bees.

Another issue concerns expertise, Dr Whitten said. Like most farming sectors, the bee industry is aging.

Nor does Australia currently have nearly enough investment in bee science to effectively manage such challenges.

Bee research facilities, here and overseas, have been successively abandoned through the years as commercially-focused research replaced public good science, leaving local bee expertise at an all-time low.

Dr Denis Anderson, principal research scientist with CSIRO Entomology, is himself one of the world's few remaining experienced bee pathologists.

He will be retiring in a few years, and has been unable to train anybody to take his place. Nor does the country have a dedicated pollination expert.

"We don't have the funds to even start thinking about how we deal with varroa," Dr Anderson said.

A belated first step was taken last month, when the Rural Industries Research and Development Corporation (RIRDC) put together a workshop that brought honeybee representatives together with members of industries dependent on bee pollination.

■ **Mendooran apiarist all the buzz in US, see p41**

Value of bees now realised

THEY are largely ignored by mainstream agriculture, but beekeepers are about to get a lot more of the limelight, thanks to the unexplained deaths of millions of bees in the US and genuine threats to our own honeybee population.

Agriculture in general is only now waking up to the value of the honeybee, and the cost of losing or replacing its pollination services should the bee population be annihilated by a threat like the deadly varroa mite.

"It's time farming organisations recognised the importance of the bee to agriculture," says apiarist and bee exporter, Terry Brown of Brown's Bees, Mendooran, pictured attending a bee frame on a property east of Guyra.

Small hive beetle is already destroying honeybee colonies in year-round warm areas, like the coast, and varroa mite is expected to eventually wipe out the nation's feral bee hives.

"When that happens, specialised pollination services will become big business, as they already are in the US," Mr Brown says.

In the meantime, he and others in the honeybee industry hope the emerging realisation of the value of bees will prompt a major investment in bee research, and much greater collaboration between the bee industry and agriculture in general.

What's The Buzz?

THEORIES abound as to why millions of bees are dying in the US and Europe, but answers are rarer. European research that has variously focused the blame on chemicals, mobile phone tower radiation and proteins expressed in genetically modified crops. However, none of the research has

provided a definitive answer, and to date there is no pattern to the US bee deaths - called Colony Collapse Disorder - that can link the problem to these factors. Researchers are alternatively guessing the bees' immune system has been somehow weakened, leaving the insects vulnerable to health challenges they

might have otherwise dealt with. Bee immune systems could be compromised by the deadly varroa mite, the chemicals and antibiotics routinely used in the US bee industry as part of hive maintenance, or inadequate winter nutrition - or all three. Australian bee pathologist, Dr Denis

Anderson, said there was so little bee research capability left in the world that what might have otherwise been a straightforward scientific process had been complicated. His own best guess was a new deadly fungus, possibly an unintended consequence of a bio-control program.

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