

'Cash crops' at risk from pollinator decline?

An international study of long-term trends in crop pollination has concluded that an increasing reliance of developing countries on pollinator-dependent crops, such as coffee, could reduce these nations' crop harvests if pollinator numbers continue to decline.

'The fact that while pollinators are declining in various parts of the world, global agricultural systems are becoming more dependent on pollinators could create serious problems in the future,' says CSIRO's Dr Saul Cunningham, a co-author of the study, published in the journal *Current Biology*.

The researchers are concerned that pollinator shortages – including the well-documented global decline in bee populations – might have already started to affect crops that rely heavily on pollination.

However, pollinator decline to date does not appear to have limited global crop yields, according to the study's analysis of FAO data from 1961–2006.

'While this is a positive finding, the interaction between yields and pollination is a hugely complex issue which



The unsolved mystery of a global decline in honeybees may affect people reliant on 'cash crop' income in developing countries in future.

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needs to be teased out further,' Dr Cunningham says.

'In some places, local pollinator shortages are affecting local production. While these don't threaten overall global food supplies, they can have very significant impacts on local communities and their economies.'

Dr Cunningham says the team would now like to examine how declining pollinator supply might be leading to increased farm production costs – such as

those associated with higher inputs of fertiliser, labour, water and arable land.

The global decline in bee populations has been attributed to the spread of bee pests and diseases such as the *Varroa* mite, habitat destruction and agricultural chemicals, particularly pesticides. Authorities in some European countries have banned a group of pesticides known as neonicotinoids, which they believe may affect bee mortality and pollination.

Unprecedented slowdown in coral growth

The rate at which Great Barrier Reef corals absorb calcium from seawater to calcify their hard skeletons has declined sharply in the past 20 years, slowing coral growth, according to a paper published by Australian researchers in the journal *Science*.

The researchers from the Australian Institute of Marine Science (AIMS) provided empirical data for the impact of increased atmospheric carbon dioxide in oceanic warming and acidification, which both change the chemistry of calcification.

They studied growth bands in archived coral samples from inshore and offshore sites along the length of the reef for signs of a slowdown in calcification. They then correlated growth rates with sea surface temperature and other environmental data for the same periods.

Results showed calcification rates increased between 1900 and 1970, but dropped by 14 per cent from 1990 to 2005. On current trends, the corals would stop growing altogether by 2050.

'It is cause for extreme concern that such changes are already evident, with the relatively modest climate changes observed to date, in the world's best protected and managed coral reef ecosystem,' said AIMS scientist and co-author Dr Janice Lough.



A heat-stressed massive *Porites* coral from the northern Great Barrier Reef in December 2008.

Katharina Fabricius

Greywater gets standard treatment

Researchers have developed a simple laboratory protocol for testing greywater treatment technologies to determine if they meet national recycled water standards, a breakthrough that could boost efforts to conserve national water resources.

Greywater may contain not only chemicals such as phosphorus and chlorine from personal and household cleaning products, but a range of disease microorganisms – bacteria, viruses, protozoa and helminths.

While most greywater treatment technologies can



CSIRO's Melissa Toifl, one of the scientists who developed a new protocol for testing greywater treatment technologies.

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remove these, technology uptake has been slow due to the lack of a national testing standard for the detection of

different contaminants. States and territories have each had their own legislation for greywater collection, treatment and use.

Researchers from CSIRO's Water for a Healthy Country Flagship developed the new testing protocol in association with Victoria's Smart Water Fund.

CSIRO researcher Melissa Toifl says because the protocol is practical, robust and reproducible, it could be used to establish a national greywater treatment technology testing regime, simplifying the process for manufacturers and increasing consumer adoption rates.