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Farmer 'nitrogen market' could reduce Reef runoff impacts

Scientists have found a 'nitrogen trading scheme' amongst cane farmers could help protect the Great Barrier Reef.

Runoff from the Queensland coast contains dissolved inorganic nitrogen (DIN), originating from the nitrogen-based fertilizers used in cane farming.

DIN is thought to be one of the primary causes of Crown of Thorns Starfish outbreaks and other water quality impacts.

A team of economists and scientists led by Dr Jim Smart from Griffith University simulated a nitrogen cap-and-trade scheme on the Tully River catchment and found it would reduce the amount of DIN finding its way out to the Great Barrier Reef.

The simulation divided the catchment into paddock-sized 'cells', which were each allocated permits for the use of a certain amount of dissolved inorganic nitrogen.

In the simulation, farmers were able to trade these permits amongst themselves, in line with the amount of fertilizer they wanted to use on their paddocks.

Dr Smart said market forces in the simulation promoted innovation amongst farmers.

"What we saw was that there was a real pressure to improve practices," he said.

"If farmers converted low-quality cane paddocks into wetland, which soaks up nitrogen, they could then sell their unused permits to the market for a higher profit than they were making off the cane in that bad field.

"If they weren't trying to minimise their nitrogen use, they had to keep purchasing permits and were out of pocket that way."

The total amount of permits in the market was reduced over time, gradually increasing their value and hence the gains to be made by reducing nitrogen use.

Dr Smart said the system had a lot of potential.

“I think one of the good things about this system is that it’s flexible – instead of a blanket regulation coming down that simply says ‘farmers are only allowed to use X amount of nitrogen’, the nitrogen trading market allows farmers to approach nitrogen use under their own terms and find their own solutions.

“Detailed water quality monitoring at a paddock and catchment scale would be critical to making this system work.”

The project was funded under the Tropical Water Quality Hub of the Australian Government’s National Environmental Science Programme.

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