DCD may have unintended effects on aquatic environment, researchers find

January 31 2013

University of Otago researchers have discovered that run-off of the agrichemical DCD may adversely affect some aquatic eco-systems by disrupting natural processes.

The recently-withdrawn chemical had been spread on many New Zealand paddocks to block high rates of microbial nitrification thus reducing greenhouse gas emissions and nitrate leaching into waters.

Findings from the Otago study, which is the first to investigate ecological impacts of DCD residues in aquatic eco-systems, are published this month in the international *Journal of Agriculture, Ecosystems and Environment*.

The study, led by Department of Zoology researcher Dr Marc Schallenberg, detected DCD residues in streams in Otago's lower Taieri Plain in concentrations that cause natural nitrogen transformation processes to be disrupted in aquatic ecosystems.

Dr Schallenberg conducted laboratory experiments showing that in a wetland system, the presence of DCD inhibits the processes of nitrification and denitrification, two natural processes that help to purify and detoxify waters of ammonium by converting it to nitrate and inert nitrogen gas, respectively.

"While DCD's inhibition of nitrification on land is desirable as it reduces the amount of nitrate entering streams, its similar inhibitory effects

within aquatic environments is undesirable, as this could lead to ammonia toxicity in fish and other species, or increased incidences of algal blooms."

Dr Schallenberg says research on downstream impacts of DCD should contribute to a more complete cost-benefit analysis of DCD use, should the DCD withdrawal by Fonterra be reversed in the future.

Provided by University of Otago