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## Methods for reducing agricultural nutrient loading and eutrophication: The New Zealand story

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In New Zealand, water quality is good compared with international standards. Trend analysis of water quality data, however, shows that over recent years, water quality has declined, particularly in lowland streams and rivers, related to the expansion and intensification of pastoral agriculture (Ballantine and Davies-Colley, 2009). The New Zealand dairy industry has established a number of environmental goals, including the reduction of nitrogen (N) and phosphorus (P) losses from land by 50% for N, and by between 50 and 80% for P (depending on soil type) over the next decade (Dairy Environment Review Group, 2006). To assist farmers to reduce nutrient losses from land and achieve the targets outlined, innovative methods are being tested throughout the country by various research providers, examples of which include:

- Tree bark to reduce nutrients in dairy and piggery farm effluents,
- Constructed farm wetlands to reduce nutrients in subsurface drainage water,
- Iron slag socks to reduce phosphorus concentrations in drains and streamwater
- Tephra to adsorb phosphorus from dairy farm drainage water in mole drainage systems.
- Use of soil amendments to reduce dissolved phosphorus concentrations in wetlands
- Natural zeolite filters to reduce nutrient export from constructed farm wetlands
- Amended zeolite products to adsorb nutrients from water
- Capping materials to lock phosphorus into lake sediments e.g. Phoslock.

In this presentation I aim to present an overview of research undertaken in New Zealand to reduce nutrient loads to freshwater from agriculture and eutrophication and outline the main techniques being tested.

### References

- Ballantine D.J., Davies-Colley R.J. 2009. Water quality trends at National River Water Quality Network sites for 1989-2007. <http://www.mfe.govt.nz/publications/water/water-quality-trends-1989-2007/index.html> Ministry for the Environment, Wellington, 2009, pp. 43.
- Dairy Environment Review Group 2006. Dairy Industry Strategy for Sustainable Environmental Management: Dairy Insight and Dairy 21, 2006.