

Nitrate fertiliser wasted on sugarcane

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(PhysOrg.com) -- Rising nitrogen fertiliser application to sugarcane crops globally and the potential for this fertiliser to be leached from soil and lost to the atmosphere have been highlighted in a new study led by The University of Queensland (UQ) and BSES Ltd.

It was also shown that, given the choice of different forms of nitrogen, sugarcane strongly prefers ammonium over [nitrate](#) and that nitrate fertiliser is an inefficient source of nitrogen for commercial sugarcane crops.

UQ School of Agriculture and Food Science Research Fellow, Dr Nicole Robinson, said sugarcane plants are much less effective in acquiring and storing nitrate in root and shoot tissue compared to [grain crops](#) such as [sorghum](#) and [maize](#).

“We have found high concentrations of both ammonium and nitrate in the soil early in the growing season. This ammonium decreases the ability of sugarcane to take up nitrate from the soil,” Dr Robinson said.

“Our studies found that although sugarcane roots can take up some nitrate from the [soil](#), there is then a bottleneck in the transfer of nitrate from roots to shoots.

“We conclude that discrimination against nitrate and a low capacity to store nitrate in shoots prevents commercial sugarcane varieties from taking advantage of the high nitrate concentrations in fertilised soils in the first three months of the growing season, leaving nitrate vulnerable to

loss.”

The study results indicate that grower management practices should aim to reduce nitrate content in soils in favour of ammonium and organic forms of nitrogen.

Dr Robinson said further work was required to breed new sugarcane varieties that have an enhanced ability to use nitrate. She said erianthus, a closely related giant grass, currently used in the breeding programme, showed promising results and would provide an avenue for further investigation.

The study was published last week in the scientific journal *PLoS One*.

Provided by University of Queensland

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