

Spring blasts can rob nutrients

WINTER AND early spring are when nutrients are most at risk of getting lost from farms. This can be due to high rainfall, reduced pasture growth, huge urine deposits, soil compaction and pugging.

Rivers, streams and wetlands are important natural ecosystems which provide water for productive land use and help clean up the negative impacts of urban and rural pollutants which flow off the land.

A farm nutrient budget is a valuable indicator of the status of nutrients in a farm system. It indicates where fertiliser applications are



Due to the high risk of soluble nutrients getting washed out through the soil and lost from the farm systems, do not oversupply the soil with soluble nutrients, especially before and during winter.

The high risk winter and early spring period

with high Olsen P levels and on steep to rolling country.

The challenge is to develop farming systems that efficiently cycle nutrients. Adoption of good nutrient management practices for all land uses and activities has the potential to bring about large improvements in the

quality of water resources and profits.

WRC is working with stakeholders to help farmers adopt good industry approved practices.

• *Bala TikkiSETTY is a sustainable agriculture advisor at Waikato Regional Council. Contact him on 0800 800 401 or bala.tikkisetty@waikatoregion.govt.nz*



Wetlands are an important natural ecosystem.

A farm nutrient budget is a valuable indicator of the status of nutrients in a farm system.

inadequate and are leading to a decline in the soil nutrient status. Conversely, a nutrient budget can indicate excessive inputs which result in a nutrient surplus and greater potential for losses to the environment.

The aim of nutrient management is to keep nutrients cycling within the farm system and to keep losses to bare a minimum. Most farmers know that some nutrients are more prone to loss than others, depending on the nature of the nutrient, soil type and climatic conditions.

Nutrients are always leaving the farm system through various channels such as produce (milk, meat, silage, hay, wool, vegetables and crops), atmospheric loss and leaching. Depending on the production levels, these figures can vary greatly between farms. A nutrient budget will provide all this information.

Nutrients such as nitrogen, potassium, calcium, magnesium and sulphur can also be lost by leaching. This occurs when water washes soluble nutrients through the root zone into deeper layers of the soil and become inaccessible to plant roots. The leaching risk depends on, eg soil type, total rainfall and storms, and the quantity of soluble nutrients in the soil.

requires careful planning and understanding of nutrient cycles to reduce the danger of nutrient inefficiencies.

A good understanding of the processes (and the terminology) in the nutrient cycles is important for nutrient budgeting and management. For example, in the nitrogen cycle there are two important processes: immobilisation and its opposite -- mineralisation. Soil biology plays an important role here, as these processes are microbially mediated and hence their speed is determined by the microbial activity in the soil.

Plants cannot utilise organic nitrogen, so it must be first broken down to mineral nitrogen. Mineralisation occurs as the result of action by non-specific fungi and bacteria but the process of nitrification occurs as the result of two specific bacteria: *nitrosomonas* and *nitrobacter*.

Generally, nitrate leaching will increase with an increasing rate of nitrogenous fertiliser. This highlights the environmental risk associated with high (ie, over and above agronomic requirement) nitrogen fertiliser use on farms.

Phosphorus loss, on the other hand, mainly occurs from erosion and run off. Research has revealed that phosphorus losses will be high in soils