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A wet season and Soil Mineral Nitrogen

The high levels of rainfall last year and the continuing bad weather into this year have caused many concerns over Nitrogen losses from agricultural land. This may have raised questions in the industry on whether additional or supplemental applications of Nitrogen are required. Losses will mainly have come from leaching of Nitrogen through the soil profile and into natural water courses and also from denitrification in areas where water logging has occurred.

The exact extent of Nitrogen losses through leaching and/or denitrification following heavy/sustained rainfall can be hard to quantify. Nitrogen loss from leaching and denitrification occur via the nitrate form of Nitrogen, so the potential for significant loss is determined by the amount of the crop Nitrogen supply that was in the nitrate form when the excess rainfall occurred.

Losses of Nitrogen are dependant on a number of factors. These include the timing of Nitrogen application, the form in which Nitrogen was applied or expected to become available, soil characteristics, and the level of saturation of the soil at the time of application. In general, leaching losses are more likely on sandy soils where water can move through the profile quickly. Denitrification will be more apparent on medium and fine textured soils that have poor drainage. These soils will have high water saturation and will retain flooded areas several days after heavy rainfall.

This season it is more important than ever to have your soil mineral nitrogen analysis carried out to understand more about Nitrogen losses that may have occurred.

Calculating your Nitrogen application

SNS = SMN + estimate of N already in the crop + estimate of mineralisable soil N

Where:

- Soil Mineral Nitrogen (kgN/ha) is the Nitrate-N plus Ammonium-N content of the soil within the potential rooting depth of the crop.
- Nitrogen already in the crop (kgN/ha) is the total content of Nitrogen in the crop when the soil is sampled for SMN.
- Mineralisable Soil Nitrogen (kgN/ha) is the estimated amount of Nitrogen which becomes available for crop uptake from mineralization of soil organic matter and crop debris during the growing season after sampling for SMN.

The key to applying the correct amount of Nitrogen is by determining the Soil Nitrogen Supply (SNS) index. The SNS is the amount of Nitrogen (kgN/ha) in the soil (apart from that applied for the crop in manufactured fertiliser and manures) that is available for uptake by the crop throughout its entire life, taking into account N losses.

The SNS index can be determined by using the results you obtain from the NRM Soil Mineral Nitrogen analysis, an assessment of any Nitrogen already taken up by the crop and the amount of Nitrogen that may become available (an analysis which can also be carried out at NRM). By referring to the RB209 these results can then be used to determine Nitrogen recommendations. The recommendations are based on seven SNS indices and each index is related to a quantity of SNS in KgN/ha. In turn because the amount of Nitrate leached is heavily dependant on the soil type and the amount of water draining through the soil (the excess winter rainfall) separate SNS index tables are given for different rainfall situations in the RB209.

For more information on the service offered by NRM please either refer to the relevant technical bulletins on our website or please contact either Sean Stevenson or Duncan Rose on the contact details provided below:

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