



## Soil Nutrient Concerns in Areas with High Spring Rainfall

High rainfall in the spring, especially after the fertilizer is in the ground, causes a variety of concerns, some perceived and some real. Below are some things to consider when concerns arise.

### Nitrogen

#### What is lost?

Nitrogen losses occur when nitrogen is in the form of **Nitrate** Nitrogen. This is the form that your soil test report contains as “**available**” Nitrogen or “**soil test**” Nitrogen. It is not your fertilizer Nitrogen, unless you have applied Ammonium Nitrate (34-0-0).

#### What is not lost?

Ammonium - Nitrogen clings onto the clay particles (absorbed) and is neither leached nor gassed off. This is the form that urea and ammonia fertilizer nitrogen is initially converted to, before it is converted into nitrate nitrogen.

#### What are the loss mechanisms?

There are two loss mechanisms of Nitrate Nitrogen: **denitrification**, during which nitrate is converted to a gas, and leaching, causing nitrate to move at depth. **The major loss mechanism in soils saturated with water is denitrification.** Leaching still occurs but to a much lesser degree, unless the soil is really sandy. Under conditions of surplus soil moisture, various scientists have reported denitrification losses of 1 - 4lbs. N per acre per day.

#### What should I be concerned about?

The actual fertilizer loss from a field is hard to estimate. Generally, banding of urea (of course, ammonia is banded) reduces the rate of conversion from ammonium to nitrate. Cool weather can slow down this conversion even further and neither appreciable denitrification nor leaching will occur.

**Be concerned about the fate of “soil test” Nitrogen.** In soils where high residual soil test nitrogen levels were detected either last fall or this spring, losses can be significant and crops might suffer because lower rates of fertilizer nitrogen have presumably been applied.

**Be concerned about fallow fields.** Fallow fields tend to contain increased levels of nitrate nitrogen and normally receive reduced rates of fertilizer nitrogen.

**Be concerned about fall broadcast nitrogen fertilizer.** Broadcast fertilizer tends to be converted to nitrate faster, so it will be denitrified faster as well.

### **What should I do?**

**Inspect fields as soon as the crop has emerged and regularly for the first while.** Nitrogen deficiency symptoms will be evident as the characteristic yellowing of the leaves. You may wish to confirm the crop fertility status by carrying out a tissue test. Fortunately, there are criteria for early growth stages of almost all crops.

**Do not apply nitrogen if there is no need for it.** Extra nitrogen (when it is not really needed) combined with late seeding may result in delayed maturity.

### **What if I need to apply extra Nitrogen?**

Topdressing Nitrogen as early as possible can be very effective in gaining maximum yield. Ammonium nitrate (34-0-0) tends to perform more consistently than urea (46-0-0), although depending on soil/environmental conditions, urea can be just as effective.

**Avoid topdressing urea on very wet soils.** During the initial drying off period, losses can be substantial. Risk of losses from urea should decrease significantly once the soil surfaced dries out.

## **Sulphur**

### **Should I be concerned about it?**

Yes, the reasons being a bit different from Nitrogen. Sulphur is not gassed off and, although some leaching may occur, concerns are more associated with the overall soil conditions as a result of excess moisture than the nutrient itself. If conditions remain cool and wet, which encourages shallow rooting, canola roots may not be able to tap into the sulphur reserves at depth. Normally sulphur deficiency is expressed in canola as capped leaves but again a tissue test is the best tool to ascertaining if a sulphur deficiency is possible.

### **What form of sulphur should I use?**

Ammonium sulphate (for example 20-0-0-24) is the preferred form. Elemental sulphur may not be leached but will not oxidize in time to provide the crop needs either.

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