

Managing crop nutrients in a saturated environment

Excessive water is tough on soil nutrient levels. Understanding how different soils and nutrients are impacted by moisture is key to keeping the crop fed

BY ELSTON SOLBERG

With the millions of saturated acres sitting waiting for the 2011 seeding/growing season, the biggest question on both the farmers' and agronomists' mind is, "What can I do to give crops a fighting chance?" While the task may seem daunting, if we understand a few guiding principles and use a few tools, we can greatly improve the chance of a successful seeding and growing season.

With the last year's precipitation and this winter's snows, we know that this spring we will be dealing with obviously wet soils which means:

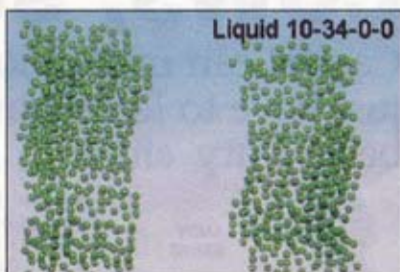
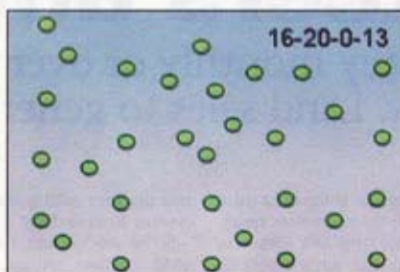
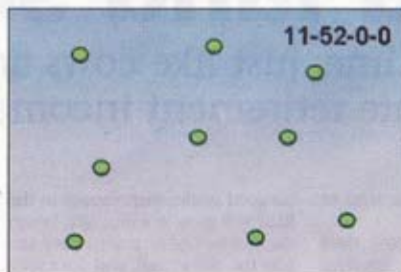
1) Leaching losses of all mobile nutrients. Nitrogen, sulphur, boron and chloride are mobile in the soil profile and will move

down and out of the root zone with water

2) Denitrification losses of nitrogen, which occurs under saturated conditions

Wet soils will also be cold soils, which means:

3) Immobile nutrients (phosphorus, in particular) will need to be placed near seed and/



The phosphorus fertility product you use and how it's applied has a huge impact on its availability because P is immobile in the soil profile.

or roots to ensure plants have early access.

4) Soil organisms are relatively inactive at cool temperatures which may help limit denitrification but also means biological process that make immobile nutrients available will be slower.

5) The more residue on top of the soil, the colder the soil and the

longer it takes to warm. Residues reflect incoming sun's energy, thereby keeping the cold in and the heat out.

6) The longer the seed sits in cold, wet soil, the greater the probability it will succumb to disease and/or run out of nutrients needed to germinate and emerge. Seeds germinating in cold soils will have

challenges, as root systems will grow slowly, and cold, wet soil will not release nutrients quickly.

Root-dominated crops are predisposed to higher yields and better quality with less disease and lodging, and are able to utilize soil water and nutrients more effectively. If we concentrate on growing root-dominant crops at optimal plant densities, we create an early aggressive solar panel (crop canopy) that competes well against the weeds and drives yield and quality.

THE STRATEGY

If this is what we're to expect this spring, what tools can we use to optimize our chance of successful seeding season?

Because seeds and seedlings will face additional stresses under cold, wet soils, choose a seeding rate that will help to achieve the optimal plant density for that crop. Recognize that mortality will be higher than usual and factor that in your calculations.

Under cold, wet soils, pay particular attention to the placement of immobile nutrient, like P.

To ensure phosphorus is available to that germinating seed, the number of feeding sites and placement will be critical.

1) Place P as near the seed as possible, take advantage of precision placement so this year's crops can feed on last year's phosphorus application

2) Maximize the number of feeding sites for early, easy access. This can be achieved by using

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- Lower P analysis with granulars (eg. 16-20-0-13 or 13-33-0-15)
- Seed primer
- Liquid fertilizer — 1,000s of feeding sites per ft²
- Add phosphite. Early evidence is that plants readily take up this form and it will help pull in other nutrients with it.

DENITRIFICATION AND LEACHING

Because it is the NO₃ form of nitrogen that is denitrified and leached, the main goal is to keep added N in the NH₄⁺ form for as long as possible to avoid leaching and denitrification. Using products like ESN or Agrotain will help keep N in the ammonia form for longer.

Let's spend a bit of time talking about soil cation exchange capacity (CEC) relative to leaching, denitrification and soil warming. In general, higher CEC soils (clay) will be wetter and stay colder for longer. They will not be as prone to leaching. Low CEC soils or sandier textured soils will be drivable sooner but more prone to leaching losses.

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