

4 Reasons to Make Soil Sampling a Top Priority this Crop Season

Check the Soil Bank Account and Plan for Another Year

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Many of you are coming off a pretty tough year...either no rain when you needed it or too much rain. The first thing that likely comes to mind is "I am going to have to cut back on my expenses". One of the first places many look is soil sampling. We would like to argue that this should be one of last places to cut back, in fact the soil sampling budget should be increased and that it will way more than pay for its self. Of course, you say, "that's how you earn your living" but in fact we earn our living by ensuring our clients make money and see a return on their investment. Without that, as my good colleague from Montana, Markus Braaten says, we should be fired!

So why is soil sampling even more important following a tough year?

1. You will have a credit in your soil bank account

You spent a lot of money on fertilizer last year and safe to say, it didn't all go with the grain.

For many harvest is still in the field so clearly actual yields are nowhere near targeted; this means that some of fertilizer put down in 2016 will be available for the 2017 crop. While it is not

as simple as 50% of normal yield, 50% of fertilizer left, below is a rough example.

If we fertilized to grow 70 bushels of wheat and only pulled off 50, using average crop nutrient requirements, we can calculate nutrients left over in the soil and in the straw residue. Based on N alone, there is enough left over to grow 33 bu of wheat without any additional N fertilizer. Over a 2000-acre farm, that is potentially \$ 66,780 of found nitrogen. Now... what portion of these nutrients will be available for next year's crop? That is what the soil analysis helps determine.

This is especially true for those fields that for years have been fertilized based on average soil test, so parts of the field are under-fertilized and others, the underperforming parts, are over-fertilized. Typically, 10-20% of the field under-performs when compared

to the rest of the field. Why not take \$ spent on areas not needing any more fertilizer and spend it on areas that do. To do this with any accuracy, yes soil samples are needed.

OK, so maybe a soil sample but why so deep?

Here is a comparison of a 0-6" sample vs a full profile sample 0-24". Here's a real world example from a number of years ago. Agri-Coach Phil Parker AgSoilutions Inc. and his then partner Ron Curtis, out of Neepawa were working with a customer who had purchased 3 new fields. For years, this land only had a 0-6" soil sample taken. The first thing they did was take soil samples to depth (0-6", 6-12" and 12-24"). Here are the results from those 3 fields – \$15,845 worth of N credit at current \$/lb N values.

| Field | Acres | lb N/ac | | if N=\$0.46/lb Value of additional N | |
|-------|-------|---------|-------|---|-----------------|
| | | 0-6" | 0-24" | /ac | /field |
| 1 | 137 | 44 | 88 | \$20.09 | \$2,752 |
| 2 | 290 | 16 | 52 | \$16.43 | \$4,766 |
| 3 | 320 | 21 | 78 | \$26.02 | \$8,327 |
| | 747 | | | Total | \$15,845 |

| Yield | (bu/ac) | Portion | N (lb) | P2O5 (lb) | K2O (lb) | S (lb) |
|--------|---------|------------------------------------|-----------|----------------------|----------|--------------|
| Target | 70 | Nutrients required | 133 | 49 | 112 | 14 |
| | | Applied/accounted for | 133 | 35 | 65 | 13 |
| Actual | 50 | Removed in grain | 22922.45 | | | |
| | | Residual in soil/straw | 16760.02 | | | |
| | | If value of nutrient is (\$CND/lb) | 417658.03 | | | |
| | | Value (\$) | 28.76 | 4.60 | 19.40 | 2.60 |
| | | | | Total (\$CND) | | 55.36 |



Nutrients can either increase with depth or decrease with depth – without the soil test how do you know?

Phil can cite another example where they finally convinced another client to take deeper samples and found that over 8000 ac, they were sitting on roughly \$72,000 of nitrogen alone in the lower depths.

There are MANY more examples of “found” nutrients within the Network.

Soil sampling reveals the credit available!

Another good reason to sample to depth is to better understand the other macro nutrients and micronutrient profiles. Nutrients can either increase with depth or decrease with depth – without the soil test how do you know?

For example, let’s look at copper and presume we are growing wheat:

- If surface is below 2.3 ppm but increasing with depth - plants quickly grow through the deficient zone to access the abundance of nutrients below. Unless the growing season is wet, then active roots are predominantly restricted to the soil surface with little access to Cu reserves below. You can plan for tissue tests and a foliar treatment of Cu at flag to boot stage, if necessary.
- If surface above 2.3 ppm but decreasing with depth –plants quickly grow through the abundant zone producing the majority of their root mass in the deficient depths, this is especially true if the growing season is dry. Knowing this you can now plan to get some copper in the soil and foliar treat after tissues.

Soil sampling eliminates the guesswork!

2. You have access to “free” nitrogen

Remember 1% OM contains 1000 lbs of organic N and 100 lbs of organic S. We use the % OM in the top 6 inches to calculate ENR. ENR or estimated nitrogen release approximates the amount of N released from the OM over the growing season. In western Canada, values will range from 4-12 lb/ac depending on many local factors. By not taking into account ENR, you could be missing roughly \$1-5.50/ac worth of nitrogen; again over 2000 acres, nothing to be sneezed at \$2,000 to \$11,000.

Soil sampling reveals the free stuff!

3. You could have a credit limiter or lien on your soil bank account

Other factor(s) might be preventing the full withdrawal from your soil bank account.

We usually find that the biggest hurdle to overcome is not a nutrient shortage but a soil chemical or physical issue such as pH, salts, sodium or magnesium levels that are limiting yields. Here no matter how good your fertility program is, without rectifying the limiting factor you are wasting fertilizer dollars.

Soil sampling is an investment that ensures you are spending your money in the right places.

Another thing we find is that there may be a good level of nutrition but the ratios are out of balance. Here again, adding more nitrogen to a soil that doesn't have enough sulphur or potassium to enable the plants to use that nitrogen is a waste of fertilizer dollars.

The other situation we often see is that, in general, farmers are OK with spending money on nitrogen, sulphur and even micronutrients but for some reason the non-mobile nutrients like phosphorus and potassium are usually applied at far less than removal rates. This usually leaves them in a catch-up situation before more nitrogen is needed to optimize yield.

Soil sampling reveals the factors limiting nutrient utilization.

4. Water drives everything

By using a moisture probe or with a little practice, estimating moisture by feel while we soil sample, we can get an idea of current plant available water. Add to that any fall/winter precipitation that falls after soil sampling, we can more accurately determine a target yield goal and a fertility program to match. It establishes how much fertilizer is recommended up front and how much we hedge, and wait and see to apply.

Soil sampling reveals yield potential.

So to quote Roman playwright Plautus, "You have to spend money to make money", soil sampling is an investment that ensures you are spending your money in the right places. If the goal is to grow profitable bushels then soil sampling and analysis are fundamental.

