getting STUCK leaving RUTS SOIL COMPACTION

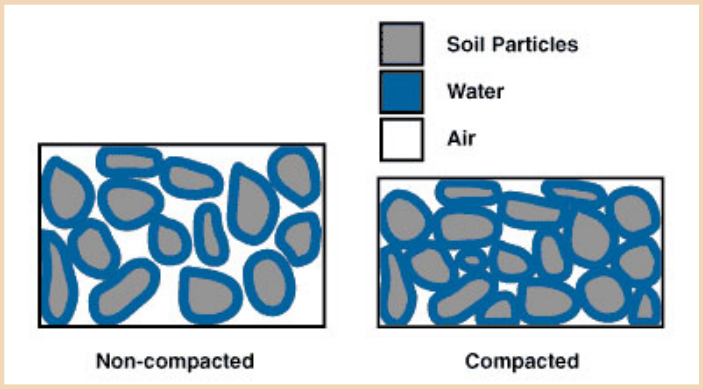
BATTLE RIVER IMPLEMENTS

AGRONOMY UPDATE
JUNE 2017

In a very challenging spring that saw us pressed for time, circumstances often forced us on to fields that were not quite dry enough to safely bear the weight of large equipment. This led to something that was common to almost all farmers this spring…..getting stuck! And leaving ruts!

We not only got stuck and left ruts – we also caused a lot of soil compaction that may cause future issues.

So what exactly is soil compaction and what can it do to our fields? First, just a basic refresher on what our soil is made of. Soil is comprised of sand, silt and clay particles, along with organic matter and the spaces between all these particles. How big those spaces are depends on the percentage of each component of all these particles. What happens in compaction is that when our large equipment presses down on the soil, it compresses the soil into a smaller volume by squeezing out the pores. Soils with lots of moisture in them are by far the most susceptible to this happening. Below is an illustration of what I mean.



The most common form of compaction that we often see after seeding into a wet field is a lumpy and inconsistent seedbed. When soils are too wet when we seed, the soil doesn't "flow" normally around the seeding tool and the structure of the soil can be compromised, leaving large aggregates of hard soil.

When you get a pounding rain on a seedbed like this, these aggregates are further broken down and soil will move with the water. When the water evaporates it leaves a crust that crops can struggle to emerge through.

In many cases, they won't make it through at all

I'm sure these pictures look very familiar to everybody who seeded a crop this spring and crusting is a short term problem that is unlikely to repeat itself next year under direct seeding systems. But take careful note of the fields where you feel you "mudded in" the crop this year. There can be long term impacts that may affect your production for years to come.

You see, in addition to the surface compaction, you may also have caused subsurface compaction. If you look back to the illustration of what compaction is, you will notice that the spaces between the soil particles all became smaller. This has long term implications for the ability of soil to hold water and air and the ability of water and therefore nutrients to infiltrate deeper into the soil. If water and air are limited in the soil, it impacts the environment for soil microorganisms that help cycle nutrients. It also physically impedes root growth, so the root system cannot explore the soil as effectively as it normally would – making the crop less able to pick up the necessary water and nutrients from the soil. Plants in compacted soils are more likely to show stress and will not be as healthy or produce as well as those in soils with a better structure.

COMPACTION CHECKLIST

Now there can be many reasons that some parts of the field grow better crops than others, and compaction often gets the blame, but Dr Ross MacKenzie, former Alberta Agriculture Research Scientist developed a short checklist that can help you determine if subsurface compaction is an issue.

- Is there poor crop growth in all years, with all crop types in the same area of the field

- Is there a special pattern to the crop growth (associated with wheel tracks, windrows, equipment width)?
- If you scrape away the surface soil with a trowel, can you see dense layers and/or horizontal root growth?
- Does the soil surface appear smooth and crusted?
- Has there been a change in equipment size, weight or operations?

Because of the wet spring and the high risk of soil compaction, this seemed like a good time to bring this reminder to everybody's attention. But remember that some level of compaction occurs every time we drive across a field regardless of the moisture conditions. If you suspect that compaction is affecting yield in otherwise productive soils on your farm, I suggest you follow Dr Mackenzie's guidelines to see if your problem is compaction or something else. Once you have identified the problem as compaction, there are thing you can do to reduce its impact and even reverse the process in your fields. Proper identification of "why" parts of the field don't produce the way they should or they used to is key to correcting the problem.

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