The Perils of Saturated Soils

Sow Much Water, Sow Little Time

Well folks, it's been a very wet year, from January to April we have already received 396mm of precipitation, while in an average year we receive between 65mm and 87mm! Beyond the rain gauge we continue to see phenomenal rain related events, like the tundra swan wading in the large ponds now in our fields. The vast amount of ponding that we are seeing in our community is telling us that our soils are fully saturated with water and is the next step from soil saturation. Surface ponding is problematic, but do not forget about the potential problems occurring beneath the surface.

IMPACT ON SOIL HEALTH AND STRUCTURE DAMAGE

We know what soil is: Minerals (sand, silt, clay), water, air, and organic matter; when it rains the water infiltrates through and fills the air space. Water then acts as a lubricant between soil particles making it easily susceptible to: movement under pressure (tractor and implement weight and pressure on soil surface), soil structure damage, and compaction. During a high level of saturation, the soil is highly susceptible to *Erosion* from further rain and/or wind, *Runoff* carrying the eroded soil particles, and N*utrient Loss* (bound to the eroded soil particles). Lastly, the problems continue into the drying period of these soils, they often form a hard crust on the soil surface, which is problematic if the field has already been planted as this crust can prevent seedlings from emerging.

IMPACT ON CROP GROWTH AND HEALTH

Plants are impacted by highly wet conditions at every stage of growth, which overall impacts the quantity and quality of harvested material (grain, vegetative matter). During wet conditions plants experience: *Oxygen Starvation*, oxygen is required to create energy for nutrient absorption, water uptake and growth, *Increased Disease*, soil-borne fungal diseases thrive in wet environments and will likely require fungicide application, *Nutrient Losses*, soil bound nutrients have greater opportunity for runoff, and nitrogen specifically can be lost to the atmosphere via denitrification, and *Reduced Yield*, due to loss of planted seeds or largely delayed planting (shifting pivotal growth/development periods to a more strenuous time of year i.e. pollination during drought/high temperatures).

IMPACTS ON FARM OPERATIONS

We have talked about the soil and plants, but how do these wet conditions affect the farmer and their business? It will *Delay Planting/Harvest* – This could mean finding a different variety with a shorter growing season or moving to an entirely different crop that also has a shorter growing season. This can also impact their longer term operation plans (crop rotation). *Replanting* may be required – Replanting areas/whole fields that have died out or are too stunted to continue successful growth. *Field Damage* – Soil compaction can occur when heavy equipment right down to livestock is sent out to the field.

Compaction can be a difficult issue to rectify and will take more than 1 pass with tillage equipment, it could take months to years to bring your soil back to its previous condition.

When is a field too wet to be planted?

A simple and easy way to check if the field is too wet to be planted is to take a handful of soil, does it stick together and/or drip water when squeezed? Or does it crumble? Find all the details for this soil test here: https://www.pioneer.com/content/dam/dpagco/pioneer/na/ca/en/files/articles/DF-Soil-Fitness-NA_CA_EN_V1.pdf)