Fertility Planning on Fields with Crop Residue Removal

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The 2020 growing season has been a good one for much of Wisconsin. The weather this fall has favored timely crop harvest with early corn drydown and favorable soil conditions. Forage and bedding stocks across the state were at an all-time low in 2019, according to the USDA National Agriculture Statistics Service for Wisconsin, putting pressure on farms to rebuild some reserves. Many farms have been observed doing just that, harvesting corn stover/residue into bales for bedding.

While these stover bales can definitely be an asset to the livestock side of the farm, what should we be thinking about as we go into our winter planning for fertility of our fields with crop residue removed for the coming year?

Soil organic carbon is generated by decomposing animal and plant tissues and microbes that are decomposers. When we remove the stover for bedding material, we are also removing carbon from our soil ecosystem, which can lead to a reduction in soil organic carbon levels and productivity.

This reduction of productivity is due to several things. Soil organic matter serves as a slow-release nutrient base in your soil. Organic matter also improves water infiltration and may increase water-holding capacity. Increased erosion due to the decrease in soil cover/ residue is another factor in the reduction of productivity.

A lack of crop residue on your soil means that you may need to avoid driving on any sloped parts of a field, especially during wet portions of the fall and winter. The slopes will be less protected and more prone to soil disturbance or erosion. These may be areas that you want to get into a more permanent forage cover crop to protect the soil.

One of the best ways to plan for your future production is to make sure you are keeping up on your soil testing. Your soil test should be one that was taken in the last four years. If it has been more than four years since your last soil test, you will want to get that completed prior to any planting or soil amending for the coming season. You don't know where you are headed if you don't know where you have been. Soil testing will give you tailored recommendations for your planned rotations with minimal cost involved and recommendations that are based on the soil type. It will help take much of the "guesswork" out of soil fertility planning.

Sometimes, as part of our nutrient management planning for our fields, we are looking to draw down nutrient levels that may have been applied in excess in the past. Maybe the soil test indicated "excessive" or "very high" in a particular nutrient, in which case, drawing down the level is okay, perhaps even desirable. This is an important point to recognize as we are planning for fertilizer needs in the coming season.

Each ton of corn stover removed from the field is removing five pounds of P2O5 and 32 lbs of K2O from your soil. Of course, this number varies based on a variety of factors, but will provide a framework for thinking about what you may need to replenish when you are planning for your next crop.

We also may need to think about what kinds of impacts the types of fertilizer have on the field. Commercial fertilizer can make it easy to customize a blend to your field needs. Using manure from a dairy may require a bit of legwork ahead of time to get the best blend of getting manure applied in a timely fashion, but also where it will do the most good. Manure can be trickier to utilize because there is more variability in nutrient composition compared to a commercial blend. Having your manure tested to determine the actual nutrient content will yield the best results when planning for field fertility. It is important to know how much of each nutrient you are actually applying so that you can make adjustments tailored to the needs of the crop planted in the field. If you are unable to test the manure, the "book values" from the fast facts factsheet can be a starting point for your planning purposes.

Depending on the next crop that will be planted on the field, cover crops may be an option to protect the soil. An early spring-seeded cover crop of oats, barley, wheat, or triticale may help protect soil health as a "nurse" crop for establishment of a legume crop or mixed legume/grass crop. Or spring-seeded cover crops such as crimson or berseem clover can help protect soil until an early summer planting of corn or wheat can be established.

Planning for fertility during the winter season, on fields that have crop residue removed, will allow you to get the most out of your fields while protecting the soil health.

Manure information to help with your field fertility planning available at https://ipcm.wisc.edu/download/pubsNM/NutrientManagementFastFacts.pdf.