

April 17, 2015

THE CARBON BLANKET

Crop residue is important today as a natural carbon blanket on our fields. It may not be raining very much now, but we all know there will be those times of more intense thunderstorms and rain events. Our natural carbon blanket reduces soil erosion, increases time for rain to infiltrate our low infiltration soils, slowly increases organic matter levels and improves soil structure and soil health.

Farmers that maintain a 30 percent crop residue cover after planting the crop can reduce soil erosion levels in the field by 60 percent. The reduced erosion in our fields and slowly increasing carbon in our soils is good for agricultural gains in the future compared to erosion losses and oxidation of soil carbon by tillage operations.

Last week I was looking at some soil residual nitrate data from a farm where part used to be pasture. The organic matter of the soil under part of the pivot was over 4.3%. The farm is tilled every year conventionally and tillage can mineralize a lot of nitrogen from the soil organic matter. This field is on an organic matter decline until it reaches a new equilibrium. The soil will not sustain itself at 4% organic matter under an irrigated corn-soybean rotation with conventional tillage every year.

The field had enough leftover nitrogen in the top three feet of soil that spring application of anhydrous ammonia could have been credited by 100 pounds per acre. Environmentally there is extra nitrogen in the soil profile subject to leaching to groundwater. Profitability could be enhanced with the nitrogen savings by utilizing the soil sample data.

Your goal should be always 30 percent cover after planting. You would think it's easy but it isn't and requires planning. Dryland corn will have about 75-80 percent residue cover after harvest. Irrigated grain crops will typically be about 90 percent post-harvest residue cover. Soybeans can vary widely from 30 percent in a poor harvest year to 70 percent after a good irrigated crop.

Grazing stalks for 30 days, with a stocking rate of 0.75 cows per acre, will reduce residue cover by 50 percent. Weathering during the winter and spring will reduce cover by 10 to 30 percent depending on the given year's weather. Anhydrous ammonia application with a slim line straight knife (not a flex knife) will reduce residue corn residue by 15 percent and soybean residue by 25 percent. The planter reduces residue by 10 percent and 15 percent from a no-till drill. Tandem disks will reduce surface residue cover by 50-60 percent. Field cultivators are a bit less harsh and with wider sweeps (12-20 inches) will cover half the residue compared to a disk. Narrower sweeps (6-12 inches) will be closer to a disk.

Have you ever noticed looking close, how much residue is left from past years? These slowly decaying remnants of cob, stem joints, main stem pieces, etc. add to the cover in the field but soil organisms make quick work to continue the decay process. If you start adding up the losses, you might start saying even if I no-till I'm going to be short of the 30 percent post-planting target. I was proud of the fact a long-time dryland corn-soybean no-tiller in the middle of Saline County this year used some wheat to protect some erodible ground and put in some sediment basins. Another strategy to gain the 30 percent residue goal is an occasional corn on corn.



It becomes quite evident any tillage at all on dryland fields in our area, is going to reduce soil residue cover in dryland fields below the target 30 percent and even on our irrigated ground, any tillage operations would have to be restricted to corn stalks.

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