

April 8, 2019

Wisconsin Water Quality Task Force
c/o Representative Todd Novak, Chair

Mr. Chairman,

Thank you for the opportunity to talk with you today about the work that the Soil Health Partnership – an initiative of the National Corn Growers Association (NCGA), in partnership with state corn growers associations such as the Wisconsin Corn Growers Association – is doing to help bring valuable information to assist farmers in adapting their soil health practices. To be clear, at Soil Health Partnership we do not perform direct research on water quality, but rather work with farmers to research implementation of soil health systems and the effect they have for the grower, their soils and their bottom line. We will not be making recommendations to the committee today, but rather want to highlight the work that farmers are already implementing and the challenges they face in adopting these practices.

Soil health can be defined as a living ecosystem that sustains plants, animals and humans. But more specifically for our organization, soil health looks at how we can change a soil through the management practices we apply. It is separate from the inherent quality of a soil; it based on what we can change with management. When we talk about soil health, we will discuss things such as organic matter, aggregate stability and available water holding capacity.

I will use the term “soil health practices” in this talk, this will refer primarily to reduced tillage practices, implementing cover crops and nutrient management systems.

Soil health is important when we discuss environmental issues, such as water quality, because healthy soils can have many positive attributes related to these issues. A healthy soil will hold together well under a rain event, allowing more water to infiltrate and generate less runoff. Practices such as cover crops can be very effective in improving water quality both by providing protection for the soil during rain events, and by providing a living root in the soil that takes up forms of fertilizer that would otherwise be free to move with water off the field. Nitrates are a difficult problem to address due to the ability of the soil to produce nitrates throughout the year. By framing the discussion in terms of soil health, we can make these practices and outcomes relevant to a farmer in the field within their agronomic systems. Research into soil health and the practices that promote soil health still has a long way to go and success will vary based upon different soil types, cropping systems and climate.

Programs such as the Soil Health Partnership are important to this endeavor. We are a farmer-led initiative that looks to collect on-farm data over time. Our full-partner farmers sign on for a 5-year commitment to our program and commit a 20- to 80-acre field to conduct strip trials on. Due to the long-term nature of our program, we can look at the compounded effect over time that practices have on soil health, as well as the short-term impacts on the agronomics that practices such as cover crops and reduced tillage may have.

Why do we need this research?

As I have stated, practices such as cover crops, reduced tillage and nutrient management have shown to improve environmental outcomes. Questions remain as to what are the costs to the growers in implementation, as well as what the production risks are. Every decision a farmer makes impacts many other parts of their operation. For example, a cover crop in the spring can

tie up too much nitrogen, making it unavailable for plants to get a healthy start. At Soil Health Partnership, we do research into three primary areas: cover crops, reduced tillage and nutrient management.

Soil Health Partnership began in 2014 as an initiative of the NCGA partnering with Monsanto and The Nature Conservancy, with the goal of enrolling 100 farms over a 5-year period to conduct demonstration, research and outreach on soil health practices.

While our initial focus was on Iowa, Illinois and Indiana, we have continued to expand our program into other states, and now thanks to our funders, we currently have around 120 full partnership sites. We have expanded into an associate program and are working in 15 states.

We currently have seven full partnership sites in Wisconsin and are starting the pilot phase of the associate program in Wisconsin this year.

We have a strong partnership with several organizations with Bayer Crop Sciences being a continuing partner, as well as environmental groups such as The Nature Conservancy and the Environmental Defense Fund. The Midwest Row Crop Collaborative has also been a strong supporter and most recently the National Wheat Foundation has joined as well. We have tremendous support from several other organizations that we partner with including companies that buy products from farmers, those that sell products to farmers and environmental groups. The support and participation of state corn growers associations, such as the Wisconsin Corn Growers Association, as well as the farmers in the program themselves, can't be overstated. **We are here because farmers want to see this research and want answers to questions on soil health systems.**

We work with farmers throughout the year. As mentioned, these are comparative strip trials so when a farmer enrolls, we set up four replications of a soil health practice versus a control representing what the farmers current system is. The soil health practice can include reduced tillage, cover crops and nutrient management systems. The farmers take the initiative on what they want to research within these options and what type of cover crop or seeding methods. We do extensive soil testing, looking at both conventional soils testing as well as soil health assessments. We do aerial imaging in the summer to assess crop health and detect any issues from the treatments and we ultimately collect geospatial yield files from the growers to compare the effects of the soil health treatments. At the end of the year we collect the economic data in terms of what inputs the farmers use on the different treatments to make an economic comparison of the different systems.

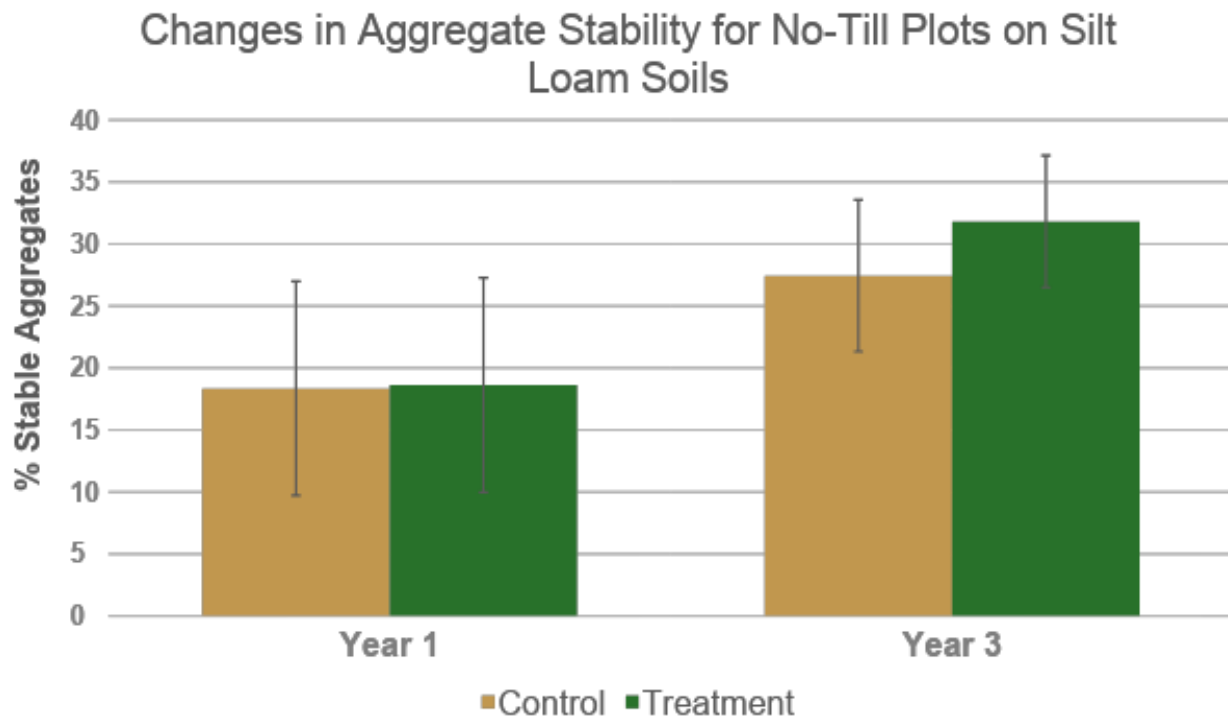
Many farmers are already taking on the challenge of adoption on their own and we have a lot of interest in their joining the partnership to help quantify their data. So as an expansion of our program, we are continuing a second pilot year of our associate program. Our goal here is to get more farmers engaged in soil health, making comparisons on their own farms. Growers in this program take a more simplified approach with only one replication and simplified soil test. However, this will allow growers in the program to compare their data with our overall data set and allow better understanding by more growers of soil health systems.

As we move ahead with our research priorities for 2019, we are beginning to take more direct look at the agronomics. Thanks to a strip trial setup we can really look at what effect the practices are having. For example, in most fields it is difficult to determine if a certain affect, whether positive or negative, is a result of a specific practice or not. With these practices, we

know in the long-term that soil health will improve, but what is the short-term implications on agronomics?

We will also continue to assess these soil health indicators. It is important to offer objective measurements of soil health and we will also continue to go in-depth on the economics of these practices.

I want to take a moment to zero-in on one attribute of soils that can affect water quality. Aggregate stability is the ability of a soil to hold its structure under a rain event, and this is important because it directly effects the amount of water a soil will take in as well as whether soil will leave with the water in runoff. This chart shows information from our trial on one soil type. We can see we are just beginning to influence this attribute with a few years of soil health treatments. But the results will vary across soil types. We still need to do a lot of research to determine what management is necessary to achieve these goals as well as how well these tests work to provide objective measurements across farms and environments.



Obviously, the effect that these practices have on yield is a big question. Across our program, we have not seen a significant difference on yield. But this is an average across the program. The experience of individual growers will vary. The next step is to look at the individual management practices farmers are using and look at the effect on yield from those specific practices. This can include what type of cover crop is used, termination methods or seeding methods. They can all influence the soil and the agronomics of the system.

At the present time, cover crops are still a new practice for most farmers; a practice that has many agronomic implications. Yes, in the long-term we can improve soil health, but there are many short-term implications that must be dealt with.

There are costs that are known, such as the cost to modify equipment or pay for seed. Some costs are still unknown, such as possible negative impacts on yield. Unfortunately, most of the direct benefits to the farmer are not entirely understood at this time. Long-term benefits, such as erosion control and improved soil structure can be difficult to quantify directly for the farmer. But if in the end there is not significant yield increases or reduced input costs for growers, something will need to justify the cost for the grower.

Farmers will be willing to adopt practices for the benefit of the environment more willingly when we have a better idea what the overall risks in production are. That's why programs such as Soil Health Partnership, along with sound science from university trials, ag retailers and farmer ingenuity, need to be supported to resolve these issues.

Thank you for allowing my testimony today.

Sincerely,

Jim Isermann
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Illinois / Wisconsin