

October 22, 2019

**Testimony of Mr. Dustin Madison**

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House Agriculture Subcommittee on Conservation and Forestry  
“Realizing the Conservation Benefits of Precision Agriculture”

Good morning, Chairwoman Spanberger, Ranking Member LaMalfa and members of the subcommittee. Thank you for the opportunity to testify on the important topic of precision agriculture in conservation. My name is Dustin Madison, and along with operating 100 acres of my own farmland in Louisa County, Virginia, I manage agronomy and conservation initiatives on Engel Family Farms. We raise corn, soybeans, wheat and other crops on 20,000 acres across the commonwealth, spread out over 17 counties.

**Conservation + Agriculture**

To understand the conservation benefits of precision agriculture, I would like to first pull the precision piece out, and just look at the history of conservation and agriculture. Conservation and agriculture have a different relationship than they did 40, 30, or even 10 years ago. My impression of “conservation” in the 1990s was that it was all about rainbows and unicorns living in lush green fields, contrasting the *industrial* world. We recycled aluminum and cut the plastic rings when you bought a six-pack to protect the fish and birds, but agriculture didn’t really fit into the picture. Farm work was always messy; too muddy or too dusty. It came with the territory.

Day after fall day, I would till fields until 9 or 10 at night, then go home and eat the dinner my mom had left in the refrigerator. If it rained the next day, all that nutrient-rich top soil washed down the hill, into a creek, and eventually into the Chesapeake Bay. That’s just the way things were. We certainly didn’t want to see our hard work and money get washed out of the fields that we were betting our whole year’s income on. We did our work the same way it had always been done and essentially rolled the dice. Conservation practices address a lot of these issues now, but back then, we just didn’t put it together. Conservation was one thing and agriculture was another.

Fast forward into the early 21<sup>st</sup> Century, and we have the early adopters of precision agriculture. Using computers onboard our tractors, harvesters and other equipment, we found a reliable method of collecting millions of data points every time we crossed a field. As these layers of data accumulated, it became easier to pick out trends and patterns in our fields that we could only get before from memory, gut feelings and countless notes scribbled down and lost amongst the “file cabinet” that was the dashboard of our pickup trucks.

Now, what we call conservation practices are some of the most profitable management decisions we can make, in a large part because of precision ag. What’s even better is that we can further

utilize the components of precision ag at year's end to measure and verify the financial impacts of those decisions.

For example, we can easily look at trends of poor yields and trace the causes back to poor soil types that leach fertilizers rather than hold them in a root zone for a productive crop. Then, we can identify the specific areas that aren't working and stop farming them. A field may go from 25 acres down to 23 acres using this method, but overall farm profitability can often rise in these situations.

**The message here was very simple: Don't invest your input dollars into a part of your business that won't produce a financial return. Make a better decision, save that money, and use it somewhere that creates value for your business. Conservation practices are those better decisions, and precision ag is the tool that allows you to quantify them.**

Because of a pretty rudimentary function of precision ag, we in agriculture made a historically complex problem into a straightforward business decision, while also taking away many of the variables that easily cloud judgment. I know of countless examples of situations like this, all supporting the notion that conservation in ag, through precision ag as a foundation, can create positive environmental change, while at the same time increasing farm profitability (which is, selfishly, of more benefit to producers everywhere).

There are better people than me for describing the inner workings of computers, data processing and in-field equipment integration, which are the backbone of precision agriculture. But as a farmer, whose livelihood depends on producing commodities, I can talk all day about the importance of finding ways to make better, profitable decisions so we can remain in business. If there is a way to do what we do better for the environment and, in turn, for our bank accounts, farmers will respond. We don't have the option not to.

## **Barriers**

For all the benefits to integrating precision ag onto every farm, there are significant barriers to entry for many producers.

1. Technology is expensive. We have reached a time when some ag technology has been around long enough that there are more economical ways to achieve precision goals, but more economical doesn't necessarily mean affordable for everyone. The larger farmers can buy in easier simply because of scale. Smaller farmers are more limited.
2. I could show you all kinds of cool technology that can provide valuable data and perform actions that really add to the bottom line. However, tech can fail at any moment for 1,000 reasons: No Internet connectivity, bugs in the software, satellite interference, human frustration or even problems off the farm: If a service provider's software is down, we can do everything right and still have problems with our data.

3. Farmers need to understand the benefits of conservation through precision agriculture, and outreach and communication of available resources are needed to have more widespread adoption. This dialogue between farmers and local technical experts needs to be ongoing so producers can adopt greater levels of conservation and be aware of emerging technologies and solutions. Most years, local Soil and Water Conservation Districts and the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) are not able to meet the demand from farmers for these practices because of either a lack of enough funding, not having enough technical staff to certify the practice or review the purchase of equipment, or not having enough technical staff to help farmers better understand the benefits of utilizing these practices or equipment.

## **Solutions**

I do think the continued efforts by our Soil and Water Conservation District and NRCS staff have helped us tremendously in getting to where we are today in our ag conservation efforts in a relatively short period of time. However, going any further will take continued work, as well as recognition that old methods of communicating and incentivizing our farmers may need updating.

1. The average age of an American farmer is 58 years old. Most of those farmers learned about agriculture from the generation before them and will probably teach the next generation down. The people on the higher end of the age spectrum didn't get into conservation work too heavily, and they certainly didn't get into precision ag. So, while they are passing down years of practical experience and intuition, there is a large group of beginning farmers who will have to do all the heavy lifting in adopting these parts of the industry. Education and outreach focusing on farmers under the average age will help close that gap.
2. We need to make sure financial incentives are there for farmers who put conservation practices in place, especially those who are putting precision ag to work. State and federal cost share dollars mean more than most can imagine when making the large upfront purchases required to make precision ag work. As mentioned before, the overarching value of precision ag is that it provides a data-driven, informational foundation that so many conservation practices can be built upon. Especially as future farmers are expected to be better financial managers, they will be more receptive to tools that can affect their profitability.
3. We need to remember that partnerships are integral in making something as big as conservation in agriculture happen when there are so many independent stakeholders. I've participated in grants from NGOs that were able to get significant work done in the Chesapeake Bay Watershed. I've received active Environmental Quality Incentives Program (EQIP) contracts through NRCS. But, most interestingly to me, is that NRCS already has a program that combines federal incentives administered through NRCS with private conservation planning and installation. Private individuals can become Technical

Service Providers (TSPs) for NRCS and take some of the workload off of existing staff on an as-needed basis. This is a highly under-utilized program that receives little attention from the agency or farmers. Most on both sides don't even know it exists. I know this because I have been one of only two registered TSPs in Virginia for nearly five years. I could have an impact on both precision ag use and conservation planning, yet I have been asked to write a total of **three** conservation plans statewide. The spirit of this program is exactly what gets things done on the ground: Federal help for farmers, managed through local offices and assisted by qualified private service providers when NRCS staff is overloaded with work.

Farming has evolved a great deal from both a conservation and precision agriculture perspective in just the last 30 years, and will continue to do so, especially here in the Chesapeake Bay Watershed, where we symbolize so much on a national scale. If we as producers continue to be innovative and earn the support from the non-farming community that we so badly need, there is no limit to what we can accomplish in the years to come.

I appreciate the invitation to speak before the Subcommittee this morning on this important topic and look forward to answering any questions you might have.