Written Testimony for the United States Senate Committee on the Budget

Hearing: Climate-related costs of the Agriculture Sector

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Testimony of:

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Thank you, Chairman Whitehouse, Ranking Member Grassley and members of the committee, for the invitation to speak with you today.

The Larsen family has been farming near Byron in southeast Minnesota for five generations. Parts of the farm have been in continuous ownership of my family for seven generations, my son will be the eighth. In addition to corn and soybeans, we raise food grade oats, barley, and forestry - including a sawmill. I also work off the farm for the Olmsted County Soil and Water Conservation District (SWCD.) I was raised as many farm kids are, and I started helping with fieldwork when I was 13. I worked on the farm after high school and put in "sweat equity." In 2010, I officially filed my first schedule F. I took on a decision-making role at that time as well. My father and uncle began phasing out and handing more responsibility to me.

Experiences

My first alarming weather experience was the endless rain and record flooding of August 18 and 19th of 2007 when the small nearby community of Hokah received 15.1 inches. At home, I received just under 7 inches. The Minnesota Department of Natural Resources (DNR) has titled these rain events "mega-rains." According to the DNR, Minnesota has experienced 16 mega rains from the years 1973 to 2021. However, 11 of these 16 events have been in the most recent 22 years, compared to just 5 in the 27 years prior.

Our region is getting wetter outside of these mega-rain events. Historically, my area of the state typically has received a little over 30 inches of rain a year. In some years, recently we have been receiving nearly twice that. In 2018, the community of Harmony officially set a precipitation record of 60.21 inches. In 2019, I received over 50 inches of rain during the growing season. But also, the rain isn't coming in nice, gentle showers: we are experiencing short duration – high intensity

Figure 1 2019 Storm Clouds Over Larsen Farms

rainfalls. It is common to receive 2 inches or more in less than an hour. Many times, in less than 20 minutes. This high-intensity rain is too much for most soils to handle, and it is common for large amounts of water to run off the land during these rainstorms, increasing erosion and flash flooding.

In early May of 2013, a historic snowfall took place in southern Minnesota. Much of southeast Minnesota received 14 inches of snow. At that time of year, we should have been planting corn, instead we were shoveling roofs to avoid collapse, rescuing new calves, and plowing out neighbors. This was our first widespread experience with accessing the prevented planting coverage within USDA's Risk Management Agency (RMA) crop insurance. Saturated soils prevented many farmers from planting their intended crops—such acres are referred to as "prevent plant (PPL)" acres. For corn, farmers may access indemnity payments if they are not able to plant due to field conditions by May 31. For soybeans, the final planting date is June 10 in this region. Almost half of the region's crops were never planted. National corn prevent plant acres in 2013 were 3.5 million.

Finally, in December 2021 (the same year my farm took a direct hit from a tornado) there was a historic December 15 tornado outbreak. It was titled a "winter derecho." According to the national weather service, Minnesota reported a total of 57 "significant severe" wind gusts (75+ mph), breaking the daily record of 53 set on August 10, 2020. There were nearly 30 tornadoes reported. Minnesota had never recorded a tornado in December prior to 2021.

There are many other events that should be included. Many are officially recorded in weather data. Farmers love to talk about the weather – our livelihoods depend on it. There is wide-spread agreement that "things aren't the way they used to be."

Costs

Farmers have a phrase called "a million-dollar rain." That is, when a gentle, timely rain falls it makes (farmers) money. A rain can make a farmer sleep easy at night. However, in each of the events I've just mentioned, I've experienced the stress, concern, and costs to the farmers in my community firsthand. We are experiencing more extremes and less certainty, and the costs are apparent.

There are costs to our infrastructure. In December of 2021, many farmers had livestock buildings, machinery storage buildings and grain bins damaged or destroyed by wind. In 2019, many farm buildings collapsed during a record blizzard. Later that year, the Zumbro River crested nearly two feet above record flood stage – sweeping away cattle during the night.

Figure 2 Damage to Agricultural Infrastructure in Grand Meadow, MN from the December 21, 2021, derecho

There are costs to our agricultural production. In 2019, many farmers had a 50% reduction of yield in Olmsted County. Wildfire and Hurricane Indemnity Program Plus (WHIP+) as well as large crop insurance indemnities were accessed so that we could bridge the enormous loss of production. Prevent Plantings also set a record nationally at 20 million acres in 2019. The previous prevent planting record was in 2011, just shy of 10 million acres. RMA reported that total prevented planting indemnity payments in 2019 were over $4.2 billion.

Figure 3 A July 2019 Aerial photo showing crop stress in southeast Minnesota

There are costs to our soils. Due to the increased runoff events, soil erosion has increased exponentially. The continued loss of fertile soil from farmland will decrease its future productivity, and unfortunately make the land less able to soak up the increasing amounts of heavy rains. Short duration, intense rainstorms may move tons of soil per acre during one storm event. These erosion events may lead to a significant cost to communities that may need to remove eroded soil from rural road ditches and neighboring properties or increase dredging of navigable and recreational water bodies.

Figure 4 A Runoff and erosion from a 1.8" Rain on May 29, 2018.

Most importantly, there are costs to our mental health. Rural mental health declined during these events and may induce stress for years to follow. In 2019, I spoke with a neighboring farmer following the collapse of his dairy freestall barn to snow. The stress of moving the cattle to new housing, cleaning up the building and negotiating with his insurance company took its toll. Because farmers are intimately connected with their farms, many are deeply affected by crop failures and destruction of their farms.

Figure 5 A Dairy Freestall Barn Collapsed due to excessive snow in 2019 in Olmsted County, MN.

Climate Resiliency

My experiences have changed the way I farm. My perception has changed. Climate resiliency is now something I manage and plan for. Since 2013, I have integrated several different farming practices to battle extreme weather. In between cash crops, I plant cover crops like cereal rye during the late fall and winter months to protect the soil and improve water quality. I don't till anymore for the same reason. Finally, in our region, and across most of the country, it's common to just plant a couple cash crops – in my region it's corn and soybeans. I've been adding additional crops like oats and barley, to spread out my risk and build my soil health. All these practices help improve soil health, prevent crop failures, and hopefully improve my long-term profitability. But, short-term, there are learning curves and challenges.

Figure 6 Rudy Larsen Scouting a food grade oat crop in 2021

In 2015, farmers in the Byron area began to meet and talk about their experiences and changes we were making to our farms. We knew that farmers learn best from other farmers. At first, the numbers were small, and experiences were limited. As the group grew, so did the knowledge and the ability to share with a larger audience what we were experiencing. Currently, up to 75 farmers meet at various events and field days. Discussions include no-till, cover crops, diversifying our crops, nitrate, water quality and carbon sequestration. We are a network and share resources, including the machinery necessary to implement soil health practices.

Figure 7 Byron Area Farmers Meeting in June, 2022

Through my work at the Olmsted County SWCD, my colleagues and I research soil health practices which are vital for farmers to protect their farms from adverse climate and weather. In 2016, my coworkers and I started a soil health farm, which includes 40 acres of demonstration and research plots. In addition, farmers participate in contributing data. Farmers contribute water samples, on-farm trials and "real world" experiences. Our research includes feasibility of implementation, profitability and environmental benefits of the soil health practices. Environmental measurements include nitrate reductions to groundwater, soil loss, pollutant loss to surface water, carbon sequestration and many other metrics. As a result of this work, in 2022, Olmsted County Board of Commissioners voted to approve $3,000,000 of funding for soil health practices, which reduce nitrate in groundwater. Many farmers access cost share programs to help mitigate the real and perceived risk of making substantial

changes to their farming systems. These programs are supported by federal, state, and local funding. Programs that help farmers make their working lands more resilient, such as the Environmental Quality Incentives Program – EQIP, and the Conservation Stewardship Program – CSP are imperative to building more resilient rural communities.

Conclusion

Weather extremes will increase risks for farmers and there will be increased costs associated with reduced crop production, crop insurance indemnities and infrastructure damage.

Figure 8 Sunset over Larsen Farms

We know that broadly, cropping diversity mitigates risk in our farming systems. Our federal programs should support farmers in building more diverse farming operations that help make their soils and farms more resilient. Cover crops and crop rotations that include many different crops in succession build the soil, allowing it to soak in more rain when it rains a lot and hold on to more rain when it doesn't rain enough. Healthier soils cost the federal government less money not only because they allow farmers to better ride out extreme weather, but because they stay in place, out of our public roads and waterways. Diversified farms are less risky to insurance providers and the federal government that provides subsidies to farmers for insurance: if farmers have more enterprises, any given one is going to be less susceptible to disaster. Generally, we need a federal crop insurance program that supports farmers in diversifying.