

It's Not You, It's the Climate

The Human Element of Building Resilience on the Farm

By Brian DeVore

There's little doubt Rodrigo Cala has the skills to grow good vegetables on his certified organic operation near Turtle Lake in western Wisconsin. "I have 20 years of experience growing brassicas, so I know what I'm doing," he says confidently.

He especially likes growing broccoli — there's a good market for it and it's satisfying to take in a bumper harvest. But a few years ago, he noticed weather problems caused the crop to repeatedly succumb to disease pressure. Cala tried adjusting the way he managed the soil and even the way irrigation was done, but the broccoli was still not producing at the level he was used to, and he lost money on it three years in a row, at one point tossing 70% of the crop. Today, broccoli is no longer grown on Cala's farm.

"Numbers don't lie, even if we think we are the greatest grower," says the farmer with a hint of resignation in his voice.

He's not alone — extreme weather brought on by climate change is making it difficult for farmers across the country to conduct business as usual. There's nothing like a thousand-year storm in September, a devastating drought in August, or a killing frost in June to expose the vulnerabilities of a farming operation. And it's not just the direct impact of extreme weather that plays havoc — excess moisture or droughty conditions can have interrelated side effects, such as creating a more hospitable environment for insect and weed pests, as well as diseases. Unfortunately, as climate change makes itself more evident, farmers of all types are grappling with weather-related calamities that test the very survival of their operations.

And climate change's negative impacts on farming only promise to worsen. By the middle of this century, Minnesota will be having twice as many 90-degree days and

three-to-four times as many nights above 70 degrees. There may be more precipitation in the state by that time, but not during the summer.

"The thing that concerns me the most is we will be getting more moisture in the spring and struggling with maintaining that moisture in the soil throughout the summer, which can really stress plants," says Greg Klinger, a University of Minnesota Extension educator who works on water quality and nutrient management issues.



Vegetable farmers are becoming increasingly dependent on protective shelters and irrigation systems to deal with weather extremes. (LSP Photo)

If greenhouse gases continue their rapid rise, at least 30% of corn and wheat acres will face "adverse changes" in growing conditions by 2040, according to a study by the American Farmland Trust. This spring, University of Oklahoma researchers estimated that the risk of "flash droughts" — brief periods where high temperatures and lack of rain combine to suck moisture out of the soil rapidly — will increase in every major agricultural region in the world. In North America, cropland that had a 32% annual chance of a flash drought a few years ago could have as much as a 53% chance by the final decades of this century.

For much of Minnesota and other spots in the Midwest, the 2022 growing season, as well as the beginning of the 2023 season, could be harbingers of what's to come:

extremely hot, dry summers.

"Farming will only get harder," says Natalie Hoidal, who works on vegetable crops and local foods for U of M Extension.

Extreme weather can be particularly hard on farmers who raise specialty crops such as fruits and vegetables. Timing can be everything with such crops, and an adverse weather event can cause a farmer to miss a key marketing window. In addition, government subsidized crop insurance programs are geared mostly to benefit farmers who raise major commodity crops such as corn, soybeans, and wheat.

Rodrigo Cala's failure to raise a profitable broccoli crop is a prime example of why today's farmers need to develop a climate resilience plan, says regenerative agriculture expert Laura Lengnick. All too often farmers see themselves as the weak link when a weather disaster strikes. That involves a lot of self-blame. Maybe if I just

worked even harder, I can muscle through this immediate situation, goes the thinking. But the author of *Resilient Agriculture: Cultivating Food Systems for a Changing Climate* says such a narrow approach does not build the kind of long-term agronomic, economic, and ecological sustainability successful farming operations need. Worse, it ignores the fact that the mental and physical wellbeing of the humans raising that food is just as important as the health of the soil it's being raised in.

Lengnick is the director of agriculture at the Glynwood Center for Regional Food and Farming, as well as the owner of a company called Cultivating Resilience. She's worked with farmers across the country to help them develop climate resilience plans.

During the past few years, the Land Stewardship Project has partnered with U of M Extension to help specialty crop producers develop more resilient operations in the face of climate instability. LSP and Extension are using as their guide Lengnick's book and other resources she and others have developed.

Farmers need to take a holistic approach which gives as much emphasis to a farmer's wellbeing as it does to the ecological health of the farm and the operation's productivity and profitability, says Lengnick, whose background is in vegetable production. And the farmers' values and the role their operations play in the health of the community must also be taken into account. Lengnick

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recommends taking an approach that allows farmers to assess their strengths, weaknesses, opportunities, and threats (something she calls SWOT for short), and to develop a plan that not only allows their farm, but themselves, to be more resilient.

Soil health provides a perfect foundation for putting a SWOT strategy into place. Soil can represent a weakness when it's being eroded by too much precipitation, which represents a threat. Strengths may be rooted in a type of soil that is naturally fertile, and opportunities can be in the form of planting cover crops to protect it.

Lengnick has a couple of caveats when it comes to resilience planning. For one, be patient. With conventional agriculture, we tend to go for a short-term fix when confronted with a problem, which may address the symptoms, but doesn't get at the root cause.

"One thing whole farm planning does is really help farmers find those longer-term solutions that are getting closer to the root causes of why the farm isn't performing as well as it used to," she says. Having a crop wiped out by a pest infestation may be better resolved with a long-term rotation change, rather than a quick fix like spraying.

Farmers also need to have the ability to let go and cut their losses. As Rodrigo Cala discovered, changing management may not be enough.

"We have to learn how to deal with loss. We may have to give up some of those things we love to do in order to maintain quality of life and balance," says Lengnick, adding that such a decision can be difficult. "We tend to grow things that we have a feeling for, or some kind of relationship with. It's not that farmers have to get out of farming, but they may shift the species that they're caring for. It's less about being a good or bad farmer, and more about adjusting to the situation."

In Cala's case, after he dropped broccoli he focused more on other vegetables and diversified into chickens. He's one of the farmers taking part in LSP's most recent climate resilience cohort, which gets together periodically to share ideas and resources.

Wrangling Resiliency

On a bitterly cold day in January, LSP held a climate resilience retreat at a YMCA camp overlooking the Saint Croix River in western Wisconsin. It brought together an

existing cohort of farmers who had spent the previous year developing climate resilience plans, and a new cohort that was just starting on that journey. Around three dozen farmers from Minnesota and Wisconsin, representing everything from wholesale and Community Supported Agriculture vegetable production to fruit and specialty crop enterprises, were present. They shared how climate change is already impacting them: flash droughts and extended droughts at times of the year they normally don't occur, flooding, extreme winds, pollution caused by wildfires, unsafe conditions for workers, a late spring killing frost or an early autumn freeze-up. The impacts can literally be measured by a few degrees — one vegetable farmer pointed out that a slight change in temperature overnight can reduce the window available for treating potato beetles from 12 hours to six.

Farmers who have been working on resiliency plans shared some of what they've adopted in the past year or so: adding livestock to a vegetable operation to increase the value of soil-building cover crops, improving irrigation systems ("For us, it was truly life-changing," says one farmer of the new irrigation management plan they have put in place.), digging new wells, adjusting field work times to avoid the heat of the day, installing solar panels to provide an electricity back-up during storm-caused blackouts, installation of moisture sensors, use of hoop houses and row covers, and, regrettably, dropping crops or enterprises completely. The farmers also talked about ways they are trying to develop "self-resiliency" as they struggle with the stress of climate change by doing such things as practicing regular physical therapy and getting together with other farmers to compare notes and network.

Lengnick, who was present at the workshop, says that self-resiliency is particularly important, but often overlooked.

"It concerns me the amount of discussion going on these days around regenerative agriculture, and how much of it is just focusing on the health of the environment," she says. "Because people farm, it's people that are managing the landscape."

One adaptation strategy the farmers discussed was taking advantage of the "shoulder seasons" that have been made longer by climate change. For example, warmer summers can morph into longer autumn periods when there's no killing frost. That means vegetable farmers, for example, can sometimes access late-season markets with another succession of plantings. Lengnick says she knows of several farmers across the country who have taken advantage of these shoulder seasons to great effect, putting the "opportunity" aspect of SWOT into action. But, she cautions, such opportunities can

come at a cost as the farm moves into a more risky time of year. That's where investments in protected growing spaces such as hoop houses can be invaluable.

A Public Good

Building climate resiliency can be expensive. High steel prices recently made erecting a simple hoop house a major investment. During the retreat, one farmer pointed out that the cost of putting in a retention pond for water management was between \$30,000 and \$40,000 for the liner alone; that cost didn't even include excavation. Some of the farmers at the retreat talked about the financial and technical support they received through the USDA's Natural Resources Conservation Service to erect hoop houses or put in better water management systems. One vegetable farmer reported that the USDA's Whole Farm Revenue Protection Program was a useful way to protect their farm from being decimated by a weather disaster. On the other hand, a fruit producer said applying to the program was a "very painful process" and so they didn't enroll in it during 2022. (The USDA has recently made more funds available to farmers who want to invest in climate-smart agriculture.)

The consensus at the climate retreat? Farmers are willing to adapt in order to make their operations more resilient, but there's a limit to what they can do on their own. If the public wants to ensure food can be raised in a regenerative manner long into the future, then it needs to step up and support attempts by farmers raising more than just corn and soybeans to make their operations more resilient. Lengnick says that public support links directly back to good holistic planning, which recognizes that farmland should be managed in context of community — in terms of how it can benefit that community through healthier food, cleaner water, and more resiliency, as well as what the community itself can do to support that kind of public good.

"The science tells us that there are things farmers can do on the farm to enhance resilience," she says. "But there are things that society needs to do to create space for farmers to adapt to climate change." □

Give it a Listen

On *Ear to the Ground* podcast episode 299, Laura Lengnick tells why, if farms are to survive (and thrive) in the age of climate change, we need to remember it's not just about soil and water — it's also about people: landstewardshipproject.org/podcast/ear-to-the-ground-299-road-to-resilience.