



Northern Plains  
Sustainable Ag  
EDUCATION / COMMUNITY / ENVIRONMENT

# The Germinator

SUMMER 2021

VOL. 42 NO. 3

## CHEMICAL TRESPASS

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Incubator deal with spray drift

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## SEEDS FOR ORGANIC

Defining acceptable seed breeding  
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### NORTHERN PLAINS FOOD & FARMING CONFERENCE

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A robust lineup of speakers and topics is in the works for Northern Plains Sustainable Ag's 2022 winter conference, **Jan. 27-29**. We are thrilled that we can plan to gather again at the Holiday Inn in Fargo, N.D. Sessions will also be livestreamed.

Part of the schedule this year will be a collaboration with FoodTank, a national nonprofit aiming to build a global community for safe, healthy, nourished eaters.



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information in December!



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Hemp and soybeans.  
Photo courtesy  
Derrick  
Dohmann

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## Mission Statement

Northern Plains Sustainable Agriculture Society promotes sustainable food systems through education, advocacy, and research.

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## The taste of the land

The deadline for this column intersected with my vacation in Iceland, so apologies if this column turns into an epic saga. As I gaze out my window at a glacial lake in the near distance and see snow-capped peaks just beyond, I am in awe of the beauty of this unique place, and my musings, like my surroundings, are lofty and expansive. All week, my thoughts have turned to the concept of *terroir*, and how the land shapes not only the food we eat, but our culture, and indeed, our very lives. That whole concept seems a bit more raw and vivid here in the land of fire and ice.

This afternoon found me on one of the first organic farms in Iceland, Móðir Jörð, which specializes in organic barley. Barley has been grown here since the 9th century, but it was forgotten for a few centuries. The heroes of my saga, Eygló Björk and Eymundur, are playing a role in the growing use of barley in contemporary Icelandic cuisine. They have planted over one million trees on their farm to create sheltered spaces for their crops, which also include wheat, fruits, and vegetables.

I can never resist an on-farm shop and this evening, I enjoyed a byggottó. Think risotto, but with barley, an Icelandic spin on the classic Italian dish. They not only produce the grains, but also have value-added certified organic processing facilities on site. Their barley was a much smaller grain size than I'm used to seeing, but cooked very quickly and was absolutely delicious. The variety is uniquely adapted to the challenging environment they are operating in, with very short growing seasons

and endless summer days.

Back on more familiar terrain on the Northern Plains, I'm so excited that this summer NPSAS is moving forward some new cultivars that are uniquely suited to our northern climes. In addition to corn trials at Carrington Research Center, we celebrate that the FBC Dylan Wheat that was developed by the Farm Breeders Network will be available through Albert Lea Seeds.

It's important and valuable work we do together at NPSAS. I'm grateful for every one of our NPSAS members, doing their part to make the world a better and more resilient place by sustainably stewarding your piece of this amazing planet. Read on to learn more about some of the great projects NPSAS is spearheading this summer.

As always, thanks for your membership and support. Farmers, be safe during these busy days. Members, I hope to see many of you at our summer events. Skal! 🍷

## Real Wealth

To pause a moment  
to observe a sunset  
or to savor the unfolding  
drama and rich beauty  
surrounding a sunrise,

to savor the sparkling frost  
or fresh fluffy whiteness of new  
snow

or the birth of a new  
calf or lamb,  
witnessing the mothering  
that nurtures  
the little creature to life,

to pause from the weekday  
push to survive,  
encumbered by economics  
and unlimited work,

to thrill a moment  
with the many tiny gifts  
bestowed on us each day  
by a loving Creator,

to pause in reverence  
of the great beauty,  
the magnificent complexity  
and unfathomable  
interrelationships  
of the splendid diversity  
of nature  
is to live well.

We are a little richer  
for each gift,  
with a wealth  
you can only  
share.

— Terry C. Jacobson  
12/18/92

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## Organic evaluation and increase of determinate buckwheat continues

The Farm Breeding Club has been working since 2012 to evaluate a determinate variety of buckwheat called Devyatka. That work continued in 2020 with the support of funding from the Organic Crop Improvement Association. The FBC conducted an organic variety trial and two seed increases on certified organic land, producing certified organic seed of this variety.

Buckwheat is a late-planted, short-season broadleaf crop that is adapted to the North Dakota environment and is an important crop for organic farmers. Buckwheat supports several ecosystem services, including weed suppression, nutrient addition, erosion control, and tillage improvement, and also provides excellent habitat for pollinators. Most buckwheat varieties are indeterminate, meaning they will continue to flower and set seed throughout the season until the crop is terminated. The determinate variety Devyatka has an earlier, shorter flowering period along with earlier maturity.

An organic variety trial was planted at the CREC on May 25, 2020, on ground that was previously cover crop. Six currently available buckwheat varieties were planted to compare their performance to Devyatka.

Based off results from 2020's high-yielding growing season for buckwheat, it appears that planting an indeterminate variety results in higher yield and quality. We plan to continue testing and increasing this variety to determine how it will perform across varying growing seasons and environments and to produce certified organic seed of this variety available to farmers.

—From the OCIA grant report, authored by Steve Zwinger, Steve Schaubert, Owen Trangsrud, Theresa Podoll, & Verna Kragnes. Read the full report online at [www.npsas.org](http://www.npsas.org).

## Thoughts on how we can change the world

Night before last, I finished a book my sister had given me for my birthday in March. And last night I started to read it over again. That is the first time I have done that.

Normally, when I finish a good book, one that has taken on a life of its own in my heart and mind, I might return to it in thought over the following couple of days, like I savor the memory of a wonderful conversation with a friend or meaningful sermon by my pastor. I highly recommend *Kitchen Table Wisdom: Stories that Heal* by Rachel Naomi Remen, M.D. This book has been around for awhile, but somehow I missed it until it arrived nicely wrapped from my sister this spring.

What about this book is so compelling? In Rachel's words, from the preface that I returned to last night, "In the end, I write about something I know intimately: that every one of us matters. And that we have the power to befriend and strengthen the life in one another and to change the world, one heart at a time."

So much of our efforts to build a more sustainable world is focused on economics. We reference the "triple bottom line," but that frame of reference is still looking at the world through an economic lens. Nurturing health and life, whether in plants, animals or people, comes through a different way of thinking and a different way of living and relating. The courage to live differently creates a new reality in all one's relationships. I believe true sustainability is actually based in the foundation of heart relationships one has with others. It takes courage to listen with and lead with the heart, but that is, perhaps, the one area of freedom we truly have.

I believe we will not achieve a real sustainable future without taking the care and time required to focus on the social health of our organizations and our community, one person, one heart at a time. 🐾

### CENTRAL PLAINS ORGANIC FARMERS WE'RE HIRING!



#### GENERAL MANAGER

Central Plains Organic Farmers (CPOF), a 30 year old organic grain marketing cooperative, is seeking applicants for the position of General Manager. This position involves working with the board of directors to manage the overall cooperative operation and overseeing a four to six member staff. It will also involve some part time marketing. As a cooperative, CPOF represents organic grain farmers in Kansas and bordering states in marketing a wide variety of organic grains. This position requires excellent communication skills, team work, and commitment to cooperative action and organic farming. Staff currently work out of home offices. The preferred work location is in Kansas. CPOF plans to fill this position in the fall of 2021 and upon finding the right applicant.

Interested applicants can get additional information about CPOF by visiting its website at [www.centralplainsorganic.com](http://www.centralplainsorganic.com). To apply contact Edward Reznicek at 785/939-2032 or by email at [amerugi@jbntelco.com](mailto:amerugi@jbntelco.com).

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# Reaching for resilience in a time of drought

The U.S. Drought Monitor map shows Minnesota mostly covered in shades of orange (moderate or severe drought) and the Dakotas in orange, bright red (extreme drought) or even brick red (exceptional drought). Not that we need to consult a map to know this, as we can sense it in the crunch of the lawn beneath our feet, the stagnation of crops, and the challenge of watering livestock. People pray for rain in public and in private, and the relief and gratitude is visible on farmers' faces for every raindrop that does fall.

Some of those prayers might include a version of The Serenity Prayer by American theologian Reinold Niebuhr: "Father, give us courage to change what must be altered, serenity to accept what cannot be helped, and the insight to know the one from the other." (His original version from the 1930s is a bit different from the commonly quoted one.)

Farming is a constant balancing act as we search for insight into changing what must be altered and accepting what we can't change. The amount of rain we receive seems like it would belong in the "accept what cannot be helped" category. And it's certainly not like a spigot we can turn on as needed. But there are ways in which we can reduce the harms that a drought can cause.

Conventional agriculture provides some tools for resilience. Corn has been bred to be increasingly stress-tolerant, for example, which includes surviving in drought.

But in aiming for efficiency and maximized short-term profit above resilience, conventional agriculture makes the system less robust overall. Land that does not have living plants for much of the year, as often happens in a conventional corn-soybean rotation, absorbs far less rainfall than land that does. Pesticides can damage the microbiome of soil; the health of plant and soil microbial communities affects the water infiltration of the soil<sup>1</sup>. Water from snow melt or spring rainfall is not available later in the growing season because it didn't infiltrate; it instead went down the river (likely taking valuable topsoil with it).

Because the conventional agriculture system has less internal resilience, it must more often rely upon external

help (such as ground-water irrigation or federally subsidized crop insurance).

Sustainable and regenerative agriculture encourages a different mindset: What can we do to increase the resilience of the system overall, so that it can survive through changing conditions?


This means that the "good years" in sustainable agriculture might not be quite as booming as the high times in conventional agriculture, as this mindset encourages investment into the system: For example, planting cover or less profitable crops to feed the microbiome of the soil means less money in your pocket today but the likelihood of healthier harvests, even during hard times, in the future. Keeping diversity on the farm can require more time in learning how to grow different crops or raise different animals, and switching between the tasks that these different crops or animals require is less efficient—but it means that a failure in one area likely won't affect the whole farm. In a way, a diverse system is its own insurance policy.

Didi Perhouse, who spoke at the Food & Farming Conference in 2020, explains how maintaining the health of the "soil sponge" is vitally important for dealing with a changing climate. She also shared intriguing ideas about how soil health can even affect the water cycle and the amount of rain that falls.

So let us accept what cannot be helped. But let us also have the courage to do what we can—including building resilient systems equipped to survive in our increasingly challenging climate. 🐾

<sup>1</sup> "Plant and soil communities are associated with the response of soil water repellency to environmental stress," <https://www.sciencedirect.com/science/article/pii/S0048969719326130>


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## Summary of NPSAS board meetings

### Feb. 19, 2021, via Zoom conference:

- **Executive Director report:**
  - Advocacy - The Farmer to Family Food program had 192,000 boxes delivered to families in ND. How do we position applicants (our members) with the resources they need to successfully apply to be able to get their foods purchased as part of the program?
  - A materials transfer agreement has been finalized allowing for 37 breeds of NDSU corn to be bred by the Mandaamin Institute.
  - A training program is in the works for New Roots.
  - Deep Winter Conversations, a new test to have ongoing conversations regarding topics for Northern Plains Sustainable Ag, are taking place for members.
- **Financial:** No financial reports were presented due to the fact that the bookkeeper has COVID. Verna met with the auditors. She will provide some recommended guidelines that came from the audit.
- A SARE grant was obtained to support an indigenous youth program. This grant needs board approval. Information will be provided to the board members regarding the grant and its purpose. It will be discussed and voted on at the next meeting.
- **Conference:** Reviews are that people would like an in-person event, but also would like a virtual option. Food Tank is interested in collaborating with NPSAS in some way. Discussion was held regarding the theme of health, including soil health & food health.
- **Strategic Planning:** The strategic planning agenda was reviewed. The hope is to have a combination of an opportunity to dig into where we've been, where we're going and evaluate what's new and develop ideas. It was suggested to try to get member input and bring it into the fold with input on their views and expectations of NPSAS and the value of their insight.

### Feb. 9-11, 2021, electronic action and approval:

- **Action:** Motion made and approved to give approval for Verna, through Brady Martz, to submit a Form 990 for 2019.
- **Action:** Motion made and approved to change the signers on the NPSAS bank accounts to reflect the new officers elected in the January meeting. Curt Petrich and Lynn Brakke will move off the account as signers and Kaye Kirsch and Brad Wolbert will be added to the accounts as signers.

### Feb. 24-26, 2021, electronic action and approval:

- **Action:** The following motion was made and approved: The NPSAS Board gratefully accepts the NCR-SARE Youth Education Grant for the Food & Ecology Youth initiative.

### March 18, 2021, via Zoom conference:

- **Finance Committee:** A high level overview of the financial report was given by Brad W. Brad noted a bill came in from the auditor.
- **Governance:** Strategic Plan Summary letter and first draft was written by Donna Rae Scheffert, facilitator of strategic planning sessions. The next steps will be determined by the strategic planning committee.
- **Executive Director's Report**
  - Verna noted that she was pleased with the engagement from the board during the strategic planning sessions.
  - New Roots training is going well and will continue through April. Some topics covered include food safety, marketing, pest control, soil health, and cropping techniques.
  - Explorations with the City of Moorhead for additional land for use by New Roots is continuing. A site near Main Avenue, south of I-94 will be looked at.
  - Verna mentioned a possibility of New Roots Farmers having access to the new online market through Red River Harvest Cooperative. Verna noted that a membership fee is required to join. Verna also noted that NPSAS members may be interested in the online market too.

Verna will provide the board more details about the opportunity and how the process would work at the April meeting.

- Verna said a meeting will take place on March 22 with the Farm Breeding Club to talk about Quality Crop Association and Nokomis Gold Seed Company. Verna noted the Farm Breeding Club meetings are advertised through E-Sprouts.
- Verna is working on several grants over the next few weeks. Finding long-term funding for the corn research project is a high priority. The corn project will be contracted or expanded as funding allows.
- **New Business:** New Roots is interested in the purchase of a trailer to use as a produce cooler during the growing season and possible serve as winter storage for equipment. Verna will keep the board updated.
- The 2022 conference will be held at the Holiday Inn in Fargo, ND. The contract with Holiday Inn was approved.
- Verna noted that Food Tank is interested in partnering with NPSAS for the annual conference. The conference planning committee will meet with Food Tank to talk more about developing a partnership.

### April 15, 2021, via Zoom conference:

- Ronald McFall, JD, Stoel Rives LLP, gave an overview of conflicts of interest for financial interests, dualities of interest, corporate opportunity doctrine, and talked about best practices for boards of directors. Ron gave suggestions on handling potential conflict of interests if NPSAS pursues opportunities with PRAIRIE Non Profit and Farmland Conservation Partners. A potential grant funding structure for Farmland Conservation Partners was also discussed.
- **Financial:** Brad W. gave a high level overview of the budget. It was noted that Verna K. has submitted several grants so far.
- **Governance:** Kaye K. noted that the strategic planning committee continues to discuss the appropriate steps to take following the strategic planning sessions. The committee will continue to keep the board updated.





- **Executive Director Report**

- Verna K. noted that the Farm Breeding Design Committee identified Dylan wheat as essential to grow out this year. The committee identified a preference in licensing Dylan. Albert Lee Seed will produce foundation seed of Dylan Wheat with a non-exclusive license. Albert Lea Seed will produce the seed at their own cost.
- **Action: Motion made and approved to:**
  1. **Approval to develop and sign a non-exclusive license for Dylan wheat with Albert Lea Seeds.**
  2. **Approval to negotiate a release of rights from Steve Zwinger to the FBC Dylan and negotiate a royalty agreement with him as per the original description of the FBC concept by Raoul Robinson in *Return to Resistance*.**
  3. **Upon creation of Quality Crop Association (QCA) the licensees of NPSAS plant variety shall be a member of the QCA.**
- New Roots farmer training is going well. Garden plots will be staked out next week (weather dependent). Verna noted the Barry Foundation awarded New Roots a \$1,000 grant. An expanded Beginning Farmers grant will be applied for to support the replication of New Roots in Pelican Rapids. The board gave approval for Verna to apply for the grant.
- Verna noted that a Ceres Trust grant for \$60,000 a year, for two years, was awarded to NPSAS.
- Kaye K. noted a new grant tracking chart was implemented to streamline grants to allow board members to know what grants are being applied for as well as the grant status.
- Verna noted that the Minnesota Department of Agriculture has potential new opportunities for grant funding that could be accessed by NPSAS.
- Verna noted that a check for renting a piece of field equipment was received. The board asked for a list of equipment and location of said equipment for the May meeting.
- **Program Committee Report:** Krysti

- M. asked when the dates for summer tours is needed for the summer newsletter. Verna K. is working on dates with Cole and Kathy and will be meeting with them next week regarding summer tour planning.
- The next meeting with Food Tank to discuss a potential partnership for the 2022 conference will be on April 22.
  - **Personnel Committee Report:** Mike J. said job descriptions for NPSAS personnel are being worked on with a goal of making sure Verna K. is being supported by NPSAS staff.
  - **Old Business:** Verna K. spoke with Ross Lockhardt, Red River Harvest (RRH) Cooperative, and learned the following:
    1. New Roots members could be offered the option of selling through an enrollment for the New Roots in the RRH Cooperative and then the responsibility for paying individual farmers would be the responsibility of New Roots.
    2. New Roots farmers could enroll in the RRH Cooperative directly and then they have sales proceeds directly deposited in their own account.
  - Protocol for a New Roots farmer to receive a \$350 loan for the membership fee using the My Neighbor's Acre Fund is as follows:
    - Provide a letter of application from the New Roots farmer
    - Agree to the repayment terms of
      - 0% interest.
      - Payback when and if you can.
    - Require that the Farm Manager recommend the New Roots farmer to assure they have the production capacity and a plan to benefit from the membership.
  - Verna provided additional details regarding the NPSAS Buy and Sell Club becoming a member of the RRH. Verna recommended the following:
    1. Show benefits to members
      - i. Supports mission related to strengthening local food system.

- ii. Allows farms to try the idea of direct market sales without paying the \$2,000 registration fee for setting up an account.
  - iii. Helps build visibility in the region for NPSAS.
  - iv. Strengthens a local cooperative, which is values aligned and established by members of NPSAS.
2. Require farmers deliver product as directed by cooperative.
  3. Farmers would need to produce appropriate licensing for their products and carry product liability insurance.
  4. Limit sales in one year to no more than 5 or 10; beyond that for any one farm, we encourage them to get their own membership.
  5. NPSAS task would be to process payments deposited into our account by writing checks to the farmers.
  6. Red River Harvest Cooperative takes a 25% cut from all sales; prices need to be set accordingly.
  7. NPSAS increases bookkeeping tasks and also takes on a role of helping to develop web design. This will take some time, but could be a service to members. Require membership be current and to pay NPSAS a \$100 fee to register and add them to the website. All farmers under one membership are shown in one location on the website.
- **Action: Motion made and approved to provide loans to New Roots farmers using My Neighbor's Acre fund, following the protocol outlined above, and approved the NPSAS Buy and Sell Club becoming a member of the RRH Cooperative, as previously outlined above in points numbered 1-7.**
  - **New Business:** The idea of NPSAS as the fiscal agent for PRAIRIE for establishing a new non-profit was discussed. Verna K. will bring more information regarding this idea to the board during the May meeting.

# New Roots Farm hit with chemical drift

Late May frost had already dealt the farmers at NPSAS's New Roots Farm Incubator Co-op near Dilworth, Minnesota, one blow this season, when many plants that had been carefully tended in apartment windows or on patios in the winter and early spring, or that had been purchased from a local garden nursery, were lost.

But the 16 farmers in the co-op, 15 of whom are refugee immigrants, had replanted after that setback. By early June, the plants that had survived were looking lush and the replanted seedlings were growing strong, and the farmers started to hope again for a good harvest. Since the co-op, for which NPSAS provides fiscal sponsorship and technical training, was started in 2018, the farmers have shared a stand at the Red River Market, where their fresh peas are early-season favorites. Later in the season, their tables feature a colorful mix of produce: carrots, peppers, potatoes, and tomatoes, but also specialty items such as an egg-shaped, mango-sized eggplant that Simeon Bakunda, one of the farmers, has been growing and adapting to Fargo-Moorhead's northern climate for seven years.

Bakunda was the first to notice that something was amiss again on June 7. He sent an email to NPSAS Executive Director Verna Kragnes, telling her that something weird was happening to his peas and beans.

Kragnes went to see and called Randy Nelson, a University of Minnesota Extension agent and NPSAS board member, to take a look as well. They agreed that it looked like possibly the peas and beans on Bakunda's plot but also throughout the farm had been impacted by some sort of chemical spray drift. Nelson noticed that elm trees that divide the south portion of the farm from the north looked to have been affected as well.

Nelson advised them to watch and wait for a while. A few days later, Bakunda reported that an incredible number of other plants had also been damaged.

The farmers, as members of the co-op, held a meeting on June 14. Kragnes, with the help of an interpreter, explained the options that Nelson had outlined for them. The farmers elected to file a complaint with the state.

Kragnes was appointed as a representative for the farmers and filed the complaint. Mike Fick, an inspector from the Minnesota Department of Agriculture, arrived the next day and took samples of several plants to be tested for pesticide residue.

New Roots is next to a cornfield, and it appears likely that the drift happened after herbicides were applied to the corn; weeds in the corn also started showing herbicide damage between June 7 and 14. Fick contacted the landowner and learned that Roundup (glyphosate) and Capreno (thiencazabone-methyl + tembotrione) were the two products applied to that field.



Plant damage can be seen in shriveled leaves and discolored spots.

## What to do next

The New Roots farmers are learning firsthand of the many questions that farmers face as they try to move forward after a chemical trespass incident. Especially in northern Minnesota's short growing season, the clock is ticking as they try to find answers.

One question: Should they file a complaint?

Chemical trespass isn't always easy to prove, fines from state departments of agriculture for chemical trespass are often low, and the end result might not include restitution for the crop that was lost.

The process takes time, and after filing the complaint, Kragnes received a letter from the Minnesota Department of Agriculture issuing an order that "prohibits the introduction into commerce, use, or destruction of the crops until the MDA has informed you in writing that the crops are released."

After Kragnes asked, she was told that testing could take four to five weeks. Did this mean that farmers couldn't harvest from the plants that had survived, or replant for the plants that were damaged?

What she eventually learned was that they could replant, but they are not supposed to eat or sell anything they harvest until the all-clear has been given. They do not know when that would be.

Many farmers have already replanted, though finding plants was not easy. This was the tail end of the greenhouse season, and they were looking for big quantities—Bakunda alone needed to replace 190 tomato plants.

Filing an insurance claim instead of a complaint was another option. The liability insurance of the farmer that applied the pesticides might pay for the damage, but



those agreements sometimes require that the farmer not speak about the incident to receive the funds. Once a complaint has been filed, insurance companies won't do anything until the complaint is resolved.

**Impact**

The extent of the effects of this chemical trespass incident are not yet known, but it has the potential to affect the farmers in a variety of ways.

The food was being grown to sell, so there's a potential loss of income, as well as to feed their families, so there's a potential loss of quality food for their families of which they know the source. Some of the culturally valuable food they grow is otherwise unavailable locally.

Many of these farmers are working to establish their business track record by filing a Schedule F with their taxes next year, a benchmark of achievement that leads them to qualify for many programs, and a setback this year might disrupt that process.

They have, however, already received a good deal of help. The Minnesota Department of Agriculture has so far been very responsive. A GoFundMe page has been set up for the farmers (<https://ca.gofundme.com/f/n3qqnv-stand-with-the-farmers-of-new-roots>).

And the farmers themselves are working hard to move forward. They hope to have their plots looking good for the NPSAS tour on July 14.



Simeon Bakunda is pictured here with some of the damaged plants he removed from his plot.



Several of the farmers are on the New Roots board, pictured here.



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# 2021

Northern Plains  
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# Summer Events

Moorhead, MN • Carrington, ND • Osage, MN • Hatton, ND • Willow Lake, SD • Mission, SD



Mukti Siwakoti is growing a variety of Nepalese pumpkin in raised beds at the New Roots Farm Incubator. The vines are eaten, not the fruit.

WEDNESDAY, JULY 14

## *New Roots Farm Incubator & Thomas Farm Tours*

**Moorhead, MN**

The afternoon begins with a look at the New Roots Farm Incubator, an innovative project sponsored by NPSAS that gives beginning farmers, many of whom are immigrants, the resources and land to start farming on a small scale. The day's events continue at the Lee and Noreen Thomas Farm, where soil health, cover crops, and perennial flax and sunflowers will be discussed.

**2-4 PM:** Tour of New Roots, 5119 40th St. N., Moorhead, MN. *Directions: From I-94, take exit 2B. Turn right (north) onto 34th Street/I-94 Business Loop. Go about 4 miles. Turn right (east) onto County Road 31 and go half a mile. Turn left (north) onto 40th Street almost 2 miles; New Roots will be on the left.*

**6-8 PM:** Tour of Lee & Noreen Thomas Farm, 12506 20th St. N., Moorhead, MN. *Directions: Take US 75 North out of Moorhead about 7 miles. Just past Kragnes, turn right (then veer left) onto County Road 96 and go 2.5 miles north.*

## See diverse cultural methods, crops at New Roots Incubator

The tour of the New Roots Farm Incubator will share a number of things that farmers had prepared to showcase, as well as one unfortunate, unexpected topic of interest.

“We will be describing the impact of a recent chemical trespass experience” at the farm, explained NPSAS Executive Director Verna Kragnes.

Farmers have been working hard to replant since then, and not all plants were affected, so there will still be plenty of other crops to see.

Sixteen farmers have plots at New Roots this year. Fifteen are refugee immigrants from Burundi, Congo, and Bhutan. The 16th farmer is a local woman.

“Some of the farmers are growing foods that are unique to their culture and using methods they have brought with them from their experience in farming in other countries,” Kragnes said. “This tour might be of interest for others wanting to learn more from other culturally based farming experiences.”

Some of the unusual crops growing at New Roots are Nepalese cucumbers, gourds, and pumpkin.

“They don’t harvest the pumpkin. What is eaten are the vines,” Kragnes said. “They’ve set up field production for maximum ease in harvesting the vines,” which includes building raised beds.

Some of the vegetables are being grown from seeds they save from year to year, and some were brought with them from their own countries.

The structure of the farm incubator will also be discussed—how it’s organized, and how it works for the farmers.

Kragnes hopes for a good turnout of visitors interested in learning from these hardworking farmers.

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# Tour has info for small- and large-scale farmers

Soil health and cover crops will be the main topics of discussion at a field day at the Lee and Noreen Thomas farm near Moorhead, Minnesota, on July 14.

Participants can see fields with cover crops and take a look at the effect that cover crops and other practices can have on soil health.

Hava Blair, a Ph.D. candidate in the Department of Soil Water, and Climate at the University of Minnesota, and Zach Paige of North Circle Seeds and the Sustainable Farming Association's Lake Agassiz Chapter, are two of the presenters at the field day. They will present hands-on soil profile observations, updates on statewide soil health metrics research, and take-home materials from the University of Minnesota Extension.

Brent Hulke, a research geneticist from the U.S. Department of Agriculture's Agricultural Research Service, will present on perennial flax and perennial sunflowers.

Noreen will provide information on Natural Resources Conservation Service programs supporting soil health. Participating in these programs can have a positive impact on your farm, but there are also some down sides, she said. "It's a federal contract—you can't just do it one year and not the next," she said. "Penalties are sharp."

Lee and Noreen have three beginning farmers working on their 1,200-acre farm, a process they started last year. One of these new farmers is their daughter-in-law, Melany Thomas.

Noreen said they farm the way they do in order to provide nutrient-dense food for families that they can feel good about—food that's good for health, good for the environment, and that tastes really good.

She encourages people coming to the tour to wear good shoes and to bring a water bottle. The event will take place rain or shine.



2020©Alice McCabe

Noreen and Lee Thomas.  
The Thomas family is pictured below.



## Going on the Moorhead tours July 14?

If you want to enjoy a meal at a local restaurant in Moorhead for a meal between tours, consider:

- **Rustica Eatery and Tavern**, 315 Main Ave., <https://www.dinerustica.com/>
- **Usher's House Restaurant**, 801 Main Ave. S.E., <https://www.opentable.com/r/ushers-house-moorhead>
- **Sol Avenue Kitchen**, 1408 1st Ave. N., <https://solavekitchen.com>
- Next door to **Junkyard Brewing Company**, 1416 1st Ave. N., <https://www.junkyardbeer.com>

All of these venues purchase local/support local foods.

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TUESDAY, JULY 20

### Carrington Research Extension Center Annual Field Day & Cows & Co. Creamery Tours Carrington, ND

Review research work underway at the CREC, including plots of nitrogen-fixing corn that are part of NPSAS's work with the Mandaamin Institute. Then stop by Cows & Co. Creamery, the source of Duchessa Gelato, to hear about this woman-led value-added venture. Tour includes gelato and cheese tasting (\$5/person).

**9 AM-NOON:** Tour of Carrington Research Center, 663 Hwy 281 N., Carrington, ND. *Directions: 3.5 miles north of Carrington, ND, on Hwy 281. West side. Watch for signs.*

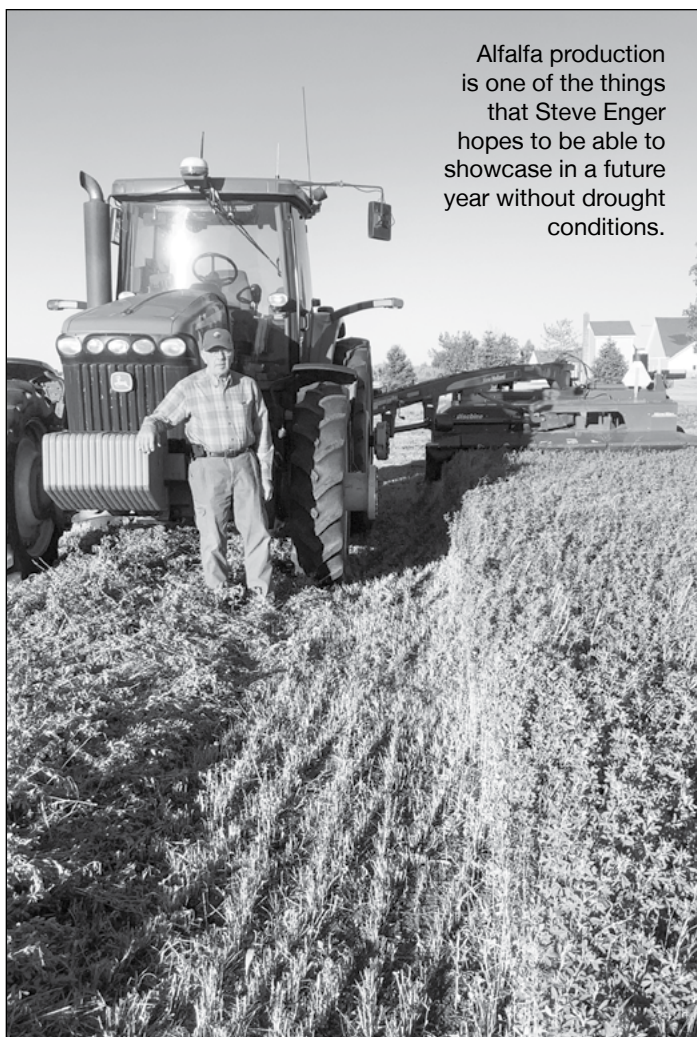
**1 PM:** Tour of Cows & Co. Creamery, 7321 1st Street NE, Carrington, ND. *Directions: From U.S. Hwy 281, go east on Hwy 200 for 7 miles. Go south on 74th Avenue for 2 miles. Turn right (west) onto 1st Street NE.*



ABOVE: Trials of buckwheat were underway at the Carrington Research Extension Center in 2020. You can read a summary of those trials on page 6.



LEFT: Production of Duchessa Gelato starts with fresh milk from a family dairy farm in Carrington.



Alfalfa production is one of the things that Steve Enger hopes to be able to showcase in a future year without drought conditions.

**NOTICE:** This tour has unfortunately been canceled due to drought conditions. We hope to be able to provide this tour in a future year.

THURSDAY, JULY 29

### Steve Enger Farms Tour Hatton, ND

Highlights of this tour hosted by Steve and Dorothy Enger will include organic strip-till corn in alfalfa, a composting operation, and full-season cover crops as a transition to organic certification. The Engers are experimenting with strip-till corn in alfalfa to minimize soil disturbance, cycle nitrogen, and provide weed management, a study that is funded by a NCR SARE grant. Hal Weiser of NRCS will also present.

**1-4 PM:** Tour of Steve Enger Farms, 1580 140th Ave. NE, Hatton, ND, Hatton, ND. *Directions: 5 miles west of Hatton on County Rd #23 (paved), 3/4 mile north on County Road #12 (gravel) past Goose River Lutheran Church, and 1/4 mile east.*

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# Building the hemp economy is tour's focus



Winona LaDuke is “working to find ways to process our hemp to make clothes that is sustainable and kind to the Earth,” according to her website.

DATE TBD, LATE JULY

## *Winona's Hemp & Heritage Farm & Anishinaabe Agriculture Institute Tour* Osage, MN

Winona's Hemp Farm is growing hope and the next economy. The farm and the Anishinaabe Agriculture Institute are restoring foodways, rematriating seeds, and making a new economy—one based on local food, energy, and fiber. In the future we will grow hemp, we will have a hemp thread mill and one day we will have a fabric mill. We see the path ahead—it is green and full of life. Join us to learn about the exciting projects on this farm.

**DATE AND TIME TBD:** Tour of Winona's Hemp Farm, 46064 Co Hwy 39, Osage, MN. *Directions:* From Detroit Lakes, go 21 miles east on MN-34 E. Turn left (north) onto Hwy 39 and go 4 miles.

Participants of this late July tour will learn about building the hemp economy through the two different organizational structures that Winona LaDuke and her staff are using to improve the world through agriculture.

On one side of the road is Winona's Hemp & Heritage Farm, which is structured as a limited liability company. It grows heritage varieties of corn, beans, and squash, along with hemp. The hemp is grown for fiber as well as for CBD hemp.

On the other side of the road is the Anishinaabe Agriculture Institute, which is a nonprofit. Its focus is on education and training through agriculture. Heritage varieties of corn, beans, and squash are also grown there in part as a means to engage indigenous youth. It has a Horse Nations program that also engages youth from the local community of Pine Point, as well as youth from other tribes. It's also focused on building the hemp economy and the local food system.

Each of the properties is its own entity, but they collaborate and share resources as makes sense, according to Brianna Crowley, farm manager at the institute.

The products grown on the farm are sold in the market on the farm, as well as marketed in other ways.

“A lot of the draw is from people who are interested in the sustainable mission—people who want to use things made out

of hemp, to support indigenous businesses, or women in general,” Crowley said. “People who are buying the products are the ones who want to put their money where their community is.”

The many versatile uses of hemp will be part of the tour. Participants can see the progress made during a workshop this spring when about 50 people gathered at the institute for a demonstration of hemp construction materials, including on a new structure that includes the use of hempcrete.



Winona LaDuke and her granddaughter work on a new hempcrete structure at the Anishinaabe Agriculture Institute. Photo courtesy Winona LaDuke

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Hemp, right, grows next to a wheat field.  
Photos courtesy Derrick Dohmann

## Get introduced to hemp

The Horizon Hemp Seeds Tour will go over the basics of hemp, a crop that hasn't been grown regularly in South Dakota since the World War II era.

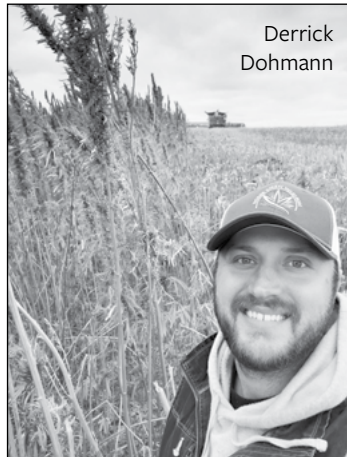
Experts will present on different facets of the industry before the field tour, according to Derrick Dohmann. Dohmann, Trav Bratland, and Tim Bratland are the people behind Horizon Hemp Seeds.

These three started the business after they saw that hemp could be a promising crop possibility in the U.S. in the next few years.

Right now they are growing hemp for the oil that can be pressed from its seeds. That oil can be made into food or beauty products. They hope to get into growing hemp for fiber production soon.

"The fiber side, that's going to take over 2-3 years from now," Dohmann said. Hemp fiber can be used in many products: Levi's jeans, car door panels, and building materials, for example.

Hemp also has environmental benefits. "If you have ground that has toxicity, it will remediate the ground," he said. He added that hemp has the potential to be quite profitable, since it has no additional input costs between planting and harvesting.



Derrick Dohmann

TUESDAY, AUGUST 10

### Horizon Hemp Seeds Tour Willow Lake, SD

Enjoy a tour of Horizon Hemp Seeds' 200+ acre personal Certified Hemp Seed Fields. This day will include presentations from individuals in the field along with opportunities to walk fields and get hands on with the plants. It is highly recommended for anyone looking to get into the industry and also for folks that want to start to learn about the crop. We will also discuss markets along with the planting and harvest of the crop.

**10 AM:** Tour starts at the Bratland farm. *Directions: From Willow Lake, go 3 miles east on Hwy 28.*

SATURDAY, AUGUST 28

### Keya Wakpala Gardens Farm Tour Mission, SD

Our goal is to make connections by increasing our outreach to the SD Farmer Network and other food-based organizations across the region. The morning session, 10 am-noon, will consist of a farm tour and a working session activity (TBA). 1-4 pm will be our open house/tour. We ask that everyone wear a mask and practice social distancing.

**10 AM-4 PM:** Tour of Keya Wakpala Gardens, Mission, SD. *Directions: 1/4 mile west of Mission, SD, on HWY 18. Behind Turtle Crossing Superfoods.*



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## OTHER SUMMER EVENTS OF INTEREST

*For these events, please visit websites listed below to register.*

July 7: Johnson Farms Field Day, Frankfort, SD; <https://www.tinyurl.com/JohnsonTour2021>

July 8: Kernza Field Day, Carmen Fernholz's A-Frame Farm, Madison, MN; <https://www.eventbrite.com/e/kernza-field-day-a-frame-farm-tickets-156553282081>

July 8: DGA Pasture Walk, St. Cloud, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 10: Youth Water Health and Conservation Day, Butte/Lawrence County Fairgrounds, Nisland, SD; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 11: East Central SFA Chapter farm tour - Cultivating the Commons Seed Farm; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 13-16: Ranch Management School for Young Adults, Edgemont, SD; [www.sdgrass.org](http://www.sdgrass.org) (click on "events")

July 13: Hollister Farm Bale Grazing Follow-up Tour, Brainerd, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 15: Soil Health Field Day - Lamberton & Redwood Falls, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 15: Seven Pines Bale Grazing Followup Tour, Verndale, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 21: Silvopasture Field Day, Red Lake Falls, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 28: Silvopasture Field Day, Faribault, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 28: Soil Health Field Day, Goodhue, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 29: Silvopasture Field Day, Sauk Centre, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

August 3-5: Increasing Profitability Through Cropping System Management, Attica, IN; <https://soilhealthacademy.org/schools/increasing-profitability-through-cropping-system-management/>

August 4: Silvopasture and Conservation Easement Field Day, Cannon Falls, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

July 13-16: Ranch Management School for Young Adults, Edgemont, SD; [www.sdgrass.org](http://www.sdgrass.org) (click on "events")

July 27-29: Grassland Management School; [www.sdgrass.org](http://www.sdgrass.org) (click on "events")

August 10: Pasture Walk - Cooper Gordon Ranch, Tulare, SD; [www.sdgrass.org](http://www.sdgrass.org) (click on "events")

August 11-13: East River Grazing School, Marvin, SD; [www.sdgrass.org](http://www.sdgrass.org) (click on "events")



THURSDAY, JULY 22

### *Johnson Farms Tour* Sponsored by MOSES Madison, SD

NPSAS members Charlie, Allan, Kevin, Jordan, and Aaron Johnson will share insights from their 45 years of organic grain farming. Melanie Caffe will review SDSU's organic oats variety trials underway at Johnson Farms. Tracy Rosenberg, who custom grazes cow-calf pairs near Marvin, SD, will speak about grassland restoration. Learn more and register: <http://bit.ly/JohnsonFarmsTour2021>

**8:30 AM-1 PM:** Presentations begin at St. Peter on the Prairie, 24311 452nd Ave. *Directions: From US Hwy 81 in Madison: Go south on SD-34. In one mile, it becomes Hwy 35. Continue south for 7 more miles. Turn right (west) onto Hwy 52. Go 2 miles. Turn left (south) onto Hwy 39. In 2 miles, St. Peter will be on the left.*

August 12: Pasture Walk, Pat Guptill Ranch - Wall, SD; [www.sdgrass.org](http://www.sdgrass.org) (click on "events")

August 14: Youth Soil Health and Management Day, Butte/Lawrence County Fairgrounds, Nisland, SD; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

August 17: Pasture Walk, Dugan Bad Warrior Ranch - Dupree, SD; [www.sdgrass.org](http://www.sdgrass.org) (click on "events")

August 24: DGA Pasture Walk, Verndale, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

Sept. 9: DGA Pasture Walk, Brandon, MN; [www.sfa-mn.org](http://www.sfa-mn.org) (click on "events")

Sept. 14-16: Chamberlain Grazing School; [www.sdgrass.org](http://www.sdgrass.org) (click on "events")

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# Which genetic tools can be ‘organic’?



Which seed breeding methods should be allowed under the organic label?

It is generally agreed in the organic community that food labeled as organic is “to be produced without the use of genetic manipulation,” as described in a National Organic Standards Board document from February 2021.

But as new genetic technologies emerge, and as the developments come at a faster pace, this is an increasingly complicated question to answer. It’s the subject of ongoing debate at the national level (at the National Organic Standards Board) and at the international level (through the International Federation of Organic Agriculture Movements, or IFOAM), and it’s come up during NPSAS conversations as well.

Even in conventional agriculture, the development of genetic technologies is moving faster than regulation of it. “(T)he biotech community is rapidly outpacing any regulatory structure,” according to the NOSB discussion document. “The U.S. Department of Agriculture has already ruled that certain plants produced with novel approaches to genetic manipulation will not be regulated in the United States as genetically modified organisms. It is more imperative than ever that the organic community be very clear about where the line is drawn regarding genetic engineering.”

Drawing that line between “allowed” and “excluded” methods is easier said than done, however.

## The principles

When new developments present a challenge and difficult decisions for a community, it’s sometimes helpful to return to first principles. With that in mind, these principles developed by IFOAM were put forward by the National Organic Standards Board as guidance as they work on developing a position on new genetic technology.

- **Principle of Health:** Organic Agriculture should sustain

and enhance the health of soil, plant, animal, human, and planet as one and indivisible.

- **Principle of Ecology:** Organic Agriculture should be based on living ecological systems and cycles, work with them, emulate them, and help sustain them.
- **Principle of Fairness:** Organic Agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.
- **Principle of Care:** Organic Agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.

From these principles, the NOSB developed these criteria to determine if a method should be allowed under the organic label.

1. The genome is respected as an indivisible entity and technical/physical insertion, deletions, or rearrangements in the genome is refrained from (e.g., through transmission of isolated DNA, RNA, or proteins). ...
2. The ability of a variety to reproduce in species-specific manner has to be maintained and genetic use restriction technologies are refrained from (e.g., Terminator technology).
3. Novel proteins and other molecules produced from modern biotechnology must be prevented from being introduced into the agro-ecosystem and into the organic food supply.
4. The exchange of genetic resources is encouraged. In order to ensure farmers have a legal avenue to save seed and plant breeders have access to germplasm for research and developing new varieties, the application of restrictive intellectual property protection (e.g., utility patents and licensing agreements that restrict such uses to living organisms, their metabolites, gene sequences or breeding processes) are refrained from.

In a 2016 document, the NOSB listed six methods that the board had voted to exclude and two methods that were allowed under these criteria. The evolution of this



document shows how fast the technology is changing: Just five years later, NOSB has now voted to exclude 11 methods, is allowing five methods, and has six more that it is still researching.

The 11 methods that NOSB has voted to exclude, as of February 2021, are targeted genetic modification, gene silencing, accelerated plant breeding techniques, synthetic biology, cloned animals and offspring, plastid transformation, cisgenesis, intragenesis, agro-infiltration, transposons developed via use of in vitro nucleic acid techniques, and induced mutagenesis. (Several of these also go by other names; you can read the full chart with more information about them starting on page 156 of this link: <https://www.ams.usda.gov/sites/default/files/media/NOSBProposalPacketApril2021.pdf>.)

The five methods that NOSB found to be acceptable are marker assisted selection, transduction, embryo rescue in plants, embryo transfer or embryo rescue in animals, and transposons developed through environmental stress.

The six methods that “will continue to be researched in future NOSB proposals” are protoplast fusion; cell fusion within plant family; TILLING (targeted induced local lesions in genomes); doubled haploid technology; induced mutagenesis; and transposons produced from chemicals, ultraviolet radiation, or other synthetic activities.

Two of these methods have come up in recent stories we’ve published in *The Germinator*: marker assisted selection, which the NOSB has voted to allow, and doubled haploid technology, which the NOSB is continuing to research.

## Marker assisted selection

Using classical breeding techniques, plant breeders have to grow out a plant to determine if it has the trait that the breeders are after. Sometimes it does; sometimes it doesn’t. It is a long process of trial and error. With marker assisted selection, breeders can create a cross and look at the genetics of the seed to determine whether the trait is present without having to grow the plant. The only plants that are then grown out are the ones with the desired trait, which speeds up the breeding process considerably.

In a story in the Winter 2020 issue of *The Germinator*, University of Minnesota professor Dr. Don Wyse, who spoke at the 2020 Food & Farming Conference, described the use of marker assisted selection in developing new crops as part of the Forever Green Initiative:

This kind of crop development could not have happened until recently.

“Historically, the idea of domesticating 12 new crops was a joke,” Wyse said. “But we now have the new tools—the genomic tools—to actually make great advances in the domestication of new crops.”

Wyse gave an example of the previous pace of development: Canadians developed canola from rape

## WHY DOES IT MATTER IF ORGANIC FARMERS HAVE ORGANIC SEED?

Micaela Colley, program director at the Organic Seed Alliance, gave four main reasons why it’s important for farmers growing crops that are certified organic have access to organic seeds.

1. **A lighter environmental footprint:** “Conventional seed production can be pretty chemical intensive. There are higher levels of pesticides and herbicides allowed in seed than there are in conventional food crops. So when you buy a conventional seed, your carbon footprint or your environmental footprint is higher than if you were to buy an organic seed to input on your farm.”
2. **Varieties with qualities that are beneficial to organic systems:** “You could definitely argue that conventional farmers also want fewer weeds and fewer pesticides and more disease resistance. But because conventional producers have the ability to use crop protection chemicals, often those qualities are less of a priority in the breeding process. So for an organic producer, when you don’t have access to those tools of using plant protection chemicals, having the right variety can make the difference between being able to get a crop or not.” Some of the qualities organic farmers are looking for are addressing challenges with weed competition, disease resistance, and good vigor.
3. **Appeal to organic market:** “Organic consumers also want healthy, nutritious, tasty, beautiful food, which are also some of the qualities that organic breeders are focusing on or emphasizing more than often what a breeder focused on a larger industrial processing market would be focusing on.”
4. **Access to more varieties:** “Organic farming systems have followed the local food movement. And so we have this cropping system with a goal of providing more diversity in food access on a regional basis. But that means that when you’re trying to grow a greater diversity of crops within any given microclimate, you need more options, more diversity of varieties, in order to have varieties that are adapted to those different environmental conditions.”

The Organic Seed Alliance is a nonprofit organization with research, education, and advocacy programs that are focused on building robust, decentralized seed systems. They primarily work with organic farmers, but they work to build ecological seed systems whether they are certified organic or not. They will release their third State of Organic Seed report later this year. Learn more about the organization at <https://seedalliance.org/>.



seed over 24 years. “It took a long time to do it using classical breeding,” he said. Scientists at the U of M have gone through a similar process with pennycress, which has the same type of oil complex as rape seed, but “because of genomics technology, we were able to domesticate it in seven years rather than 24 years.”

They got a boost in that process because pennycress is a relative of Arabidopsis, which Wyse described as “the white mouse of plants”—much of the basic discovery of plants has been done with Arabidopsis. “So when we sequenced the genome of pennycress, we matched it up with Arabidopsis, and within three months, we knew all the key genes controlling all of the domestication traits in pennycress,” Wyse said. “That’s an example of the rapid progress that can be made in the development of new crops. That opportunity never existed before.”

Wyse explained that this isn’t genetic modification—it’s using genetic tools to find natural mutations. He said genetic modification hasn’t been needed for this work, since they have found enough naturally occurring genetic mutations to make the progress they want to make.

Micaela Colley, program director at the Organic Seed Alliance, explained in an interview that this is an example of the kind of genetics technology that’s allowed under organic standards because the tools don’t change the genome—they are instead essentially “reading” the genome.

“The fundamental principle in organic is that the integrity of the genetic makeup of that organism is not altered,” she said.

The Organic Seed Alliance does not do genetic marker testing in their own program, but they do collaborate with those who do. “It can be a very useful tool,” Colley said.

She did caution, however, that the tool has its limits: It’s only looking at one gene, one trait. Developing seeds for organic systems requires the balancing of many traits to address many needs—traits that are often in relationship with one another.

There’s nothing like the human eye for making good plant selections, she said. That’s why they partner with farmers in their breeding program.

“Farmers often have this insightful eye when they look at a plant, and they know their own farming system,” Colley said. “They know that crop like a samurai warrior. They can walk through that field and say, *that’s* what I want ... they may not be able to describe specifically all of the reasons why, but there’s this sort of holistic Gestalt of decision-making that happens as a breeder, with a breeder’s eye, picks which plants move forward in a breeding program and which ones don’t.”

## Double haploid breeding

Double haploid breeding is used frequently in corn breeding today.

“The fundamental principle in organic is that the integrity of the genetic makeup of that organism is not altered.”

—Micaela Colley of the Organic Seed Alliance

Corn, like many organisms, is typically *diploid*—it has two copies of every chromosome in every cell. One chromosome of each pair comes from each parent.

A *haploid* cell contains only one copy of every chromosome. Normally what happens in reproduction is a parent creates a haploid cell (a pollen cell, for example), which joins with a haploid cell (an egg cell) of a different parent to create a new organism with diploid cells.

But a plant with doubled haploids in which only the mother’s chromosomes are present also sometimes happens naturally in corn, as an Iowa State plant breeder, Sherret Chase, discovered in the 1950s.

These doubled haploids can speed up the breeding process considerably, but since this natural anomaly only happens in small fraction of plants, scientists have been trying to figure how to make it happen more often.

One way to do this is with a chemical process. Syngenta is one of the companies doing double haploid breeding, and scientist Michiel van Lookeren Campagne, head of Syngenta Seeds Research, describes the process in an article Syngenta’s website (<https://www.syngenta-us.com/thrive/research/double-haploid-induction.html>):

“It speeds up parent line development for hybrid crops by several years ... The way we do this is by regenerating new plants out of pollen or egg cells, which each have only one set of chromosomes, and then doubling the chromosomes of these plants through a chemical treatment. The end result of this process is a doubled-haploid plant.”

The most efficient way to produce doubled haploids in corn is through haploid induction, he adds. “It can be done cheaply in the field and is broadly applicable across all genetic starting material.”

Haploid induction requires taking pollen from a haploid-inducer plant and putting it on any female ear of corn. The result will be an odd-looking ear that’s populated with about 13 percent haploid kernels.

A professor from Iowa State University is working on ways to create more double haploids without the use of chemicals. The work of Thomas Lübberstedt is described in an article on the Iowa State website (<https://stories.cals.iastate.edu/2020/01/advancing-plant-breeding-through-innovation-collaboration/>):

Lübberstedt has recently identified germplasm with a higher rate of spontaneous haploid genome



doubling. Backcrossing this germplasm into breeding lines can significantly increase doubled haploids via a process that avoids using a common tool, the toxic chemical colchicine.

"This was a lucky find," says Lübberstedt. "There are still many steps to bring this into wider use, but it has a lot of potential benefits."

One of the benefits of creating doubled haploids without the use of colchicine is to improve breeding systems for organically grown corn, a goal of a multi-partner U.S. Department of Agriculture Organic Research and Extension Initiative grant Lübberstedt is leading. Another goal of that research is to create a mechanism for organically grown corn to resist pollination by transgenic pollen floating in from conventional fields, a problem that may result in huge losses for organic farmers.

Dr. Walter Goldstein described his concerns about doubled haploid breeding in his keynote presentation during the 2021 Food & Farming Conference. Here is how that was summarized in an article in the spring issue of *The Germinator*:

In contrast to most commercial breeding programs today, which aim to fix traits, breeding for plants that are more adaptable is a better goal for farmers that need to grow crops in changing conditions—especially for organic farmers that don't use chemical "fixes" for the problems they face.

Methods such as double haploid breeding, in which a plant is tricked into believing it has formed a pollinated seed, create a plant that is genetically fixed. The speed of developing these crops fascinates people, Goldstein said, but it's a shortcut that yields a less resilient plant. "They haven't been developing themselves in relationship to an environment," he said. "We actually need to enhance the adaptation process, and the ability to respond to variable conditions and the ability to interact with microorganisms—all of which develop in time."

You can perhaps understand, from this brief overview, why the conversation about whether double haploid breeding should be allowed in organic systems is still ongoing.

If you are interested in learning more, the Organic Seed Alliance, the National Center for Appropriate Technology, and the Society of Organic Seed Professionals put together a listening session in December to hear from farmers, seed growers, plant breeders, and other stakeholders on the issue of excluded methods in organic production. The methods that NOSB has not yet voted on are discussed—including double haploid technology. You can watch the 1.5-hour session here: <https://www.youtube.com/watch?v=tK4RVwQxY1E&t=73s>

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# Real Organic Project meets with Vilsack

*Leaders of the Real Organic Project met with U.S. Agriculture Secretary Tom Vilsack in May. This is the summary of that conversation, which the Real Organic Project sent out in their email newsletter. It has been edited for length.*

It was a big deal that the Secretary of Agriculture would take the time to discuss the “organic problem” with a bunch of farmers for 45 minutes.

He is a very busy man, running the USDA, with an annual budget of \$146 billion and nearly 100,000 employees. It is a hefty responsibility, with a budget exceeding that of most countries. So Mr. Vilsack has a lot of things cooking on the stove. Nonetheless, it was clear that he was very well informed about the issues challenging the organic community.

The meeting came as a result of a letter that we helped to write and organize. 43 former members of the NOSB (National Organic Standards Board) signed a call to action addressed to the US Government. They were all chosen by a Secretary of Agriculture to represent us in the complicated process of protecting organic. The NOSB is intended to represent a broad spectrum of interest groups, from farmers to scientists, to consumers, to stores, to processors, to environmentalists.

The majority of the former NOSB members added their voices to a call for action. We stress this because we are facing a true failure of the National Organic Program.

This short letter calls out the most egregious failures of the USDA: Certification of hydroponics, CAFOs, and fraudulently certified grain. All of these failings have been addressed by NOSB recommendations passed since 2010. None of these recommendations have been acted on by the National Organic Program. Or, if they have been acted on, the final rule change has been ultimately rejected or has gone unenforced. So

perhaps the worst failing from the point of view of democracy is the failure of the USDA to follow the law that defines organic.

Talking about standards and policies is very dry work, and we all quickly wander off to our happy place. But the workings of government have a huge impact on our lives, often unseen. So when we wonder why Americans eat poorly or put on so much weight, we can look to the government policies that directly build that reality. Even though the answer is clearly there, it is not a simple thing to change. All of those policies are the result of massive lobbying by Big Food and Big Ag. Remember that more money is spent lobbying lawmakers by Big Food than is spent lobbying by the military-industrial complex. Maybe we can shorten Big Retail, Big Food, Big Ag, and Big Organic, and just call it Big Money. It is not the elephant in the room. It is bigger than that.

Seven farmers were at that meeting: Francis Thicke, Dave Chapman, Jennifer Taylor, Michael Sligh, Harriet Behar, Jim Riddle, and Bob Quinn. All but Dave are former NOSB members. Three are former chairpeople. All of them are board members of the Real Organic Project. Together they spent 30 years of their lives discussing and arguing over those “boring” standards in endless soul-deadening meetings. They are highly competent and deeply committed. And they grieve to see so much of their work pushed aside by the USDA.

The comments that Francis Thicke made are in the box at right. The other six spoke eloquently on the issues laid out in the letter. Jennifer Taylor also spoke about the failings of the USDA in serving BIPOC farmers, which was not part of the letter.

We found Tom Vilsack to be courteous, respectful, intelligent, and very well-informed. We agreed on many things. He is a thoughtful person.

By the end of the meeting, it was clear to us that those at the Real Organic Project shouldn’t quit their day jobs.

We saw that the Secretary actually could not or would not solve these problems. It wasn’t personal. It wasn’t a question of getting a “better” person in the job. We were not dealing with a person who lacked the courage to get it done. We were dealing with a system that was operating exactly as it was designed to operate. We were dealing with powerful forces like the lobbyists. Like the National Pork Producers Council. Like the Office of Budget and Management (OMB). Vilsack made clear that no matter what the USDA signed off on, nothing would happen without OMB support as well. Vilsack also has to assuage powerful senators (of both parties) some of whom support CAFO (confinement) poultry being certified as organic. He has to deal with powerful industry lobbies that, with the support of the government, are redefining “organic.”

So a very brief report:

1. **After twenty years in the making, the animal welfare reform known as OLPP will NOT be enacted anytime soon.** The OLPP was intended to stop the certification of large confinement chicken operations. These chicken CAFOs (concentrated animal feeding operations) are flooding the market for certified organic eggs and poultry. Pastured poultry cannot compete. The CAFOs are opposed by everyone in the organic community except for the large CAFOs, the lobbyists and the politicians that support them. Vilsack said, “We have to start essentially at square one.” This was the most disappointing news from the meeting. He said that problems with their economic analysis need to be addressed. Once again the USDA steps back from action.
2. **Vilsack said that the USDA will investigate if the assertions of the *Washington Post* and the**





## FRANCIS THICKE:

We want to talk to you today because we believe the National Organic Program is in serious trouble because of the failure of the USDA to uphold the integrity of the Organic Standards.

Actually, many of us doubt that it will be possible to restore the integrity of the National Organic Program... But we would love to have you prove us wrong!

Because we are concerned about the erosion of the organic standards, we have already begun taking steps to restore that integrity,

independent of USDA. With broad support from the organic community, we have created the Real Organic Project, an add-on certification that restores the integrity of the organic standards.

Now each of us would like to speak briefly about a specific issue.

**PASTURE RULE:** Quite a bit of national attention has been given to the lack of consistent enforcement of the grazing standard—including an expose' by the Washington Post a few years ago. Some of the large confinement organic dairy farms appear to be meeting the grazing standard only in their record books,

and not in their pastures.

This is causing a rapid growth of large confinement organic dairy farms, which is pushing small and medium-sized organic dairy farms—that are following the rule—out of business in record numbers. This has created a crisis for the organic dairy community.

This is a problem that could be easily fixed. We would be happy to work with the NOP to fix it. For example, the Real Organic Project is developing GPS technology to be able to verify in real-time if dairy cows are, or have been, in the pastures at the times the record books indicate.

### organic community are accurate regarding lack of enforcement for the "Pasture Rule."

Are organic dairy cows living in CAFOs? This response was also not promising.

3. He clearly said that **hydroponics is not a settled issue.** "No final decision has been made on that." This was surprisingly good news and is a very different tone from the Trump administration. They are continuing to work on it.
4. The "**Origin of Livestock,**" worked on for many years and mandated by Congress, **is due for a final rule by Spring 2022.**
5. **The imported grain fraud scandal** that outraged Congress after being covered by the Washington Post **is being addressed by a new enforcement program in Spring 2022.** (It is entirely uncertain that the new program will actually stop the fraud, or will just create more sophisticated paper trails.)
6. The issue of race wasn't raised in the letter to Vilsack, but Jennifer Taylor brought it up in her comments. **Vilsack made clear that this is a new day for the USDA around race.**

Secretary Vilsack did comment on the Real Organic Project.

"The reality is I get what you are doing with the Real Organic certification process that you put in place. But in reality, that buys you time, but it doesn't solve the problem because somebody's going to come along at some point and say, 'Well, that's really not organic enough, or the certification process or the enforcement process isn't strong enough. We need a Real Real Organic.' I mean, the idea here, and you're absolutely right about this, there needs to be ONE BRAND, and that brand needs to be protected."

This statement acknowledges the reason for the creation of the Real Organic Project. And most of all, it is a call to arms to protect the BRAND.

Perhaps surprisingly, that is not our goal. The problem with protecting "the brand" is that challenging "the brand" can somehow be presented as attacking organic. When we look at the multinational feeding frenzy on the "organic brand," we see "organic"

turning into something quite different from what it means to us.

And so we are focused on protecting the MEANING of organic rather than the organic BRAND. This is a movement for the benefit of farmers AND eaters. If we can protect the meaning, then the brand will take care of itself. But if we are only focused on protecting "the brand," then it becomes a marketing tool rather than a mission statement, and it soon loses its meaning.

The Real Organic Project will continue to work hard. A friend asked me if we don't get tired of fighting, and I replied that we seldom fight. We are mostly in conversation with both old and new friends who agree with what we are saying, and together we keep growing those conversations. Please join us.

—Dave Chapman & Francis Thicke

*For more information about the Real Organic Project and to sign up for its newsletter, go to [www.realorganicproject.org](http://www.realorganicproject.org).*

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# How to raise climate-resilient kids

Climate-related disasters are on the rise, and carbon emissions are soaring. Parents today face the unprecedented challenge of raising children somehow prepared for a planetary emergency that may last their lifetimes. Few guidebooks are on the shelves for this one, yet, but experts do have advice. And in a bit of happy news, it includes strategies already widely recognized as good for kids.

First, consider that a child born today enters a world growing progressively hotter, where recent weather extremes have displaced tens of millions of people. Scientists say displacement may swell into the hundreds of millions in the years ahead, as the rapid melting of glaciers now underway drives sea levels upward. The resulting migrations will likely trigger conflict, hunger, and political instability. As we already see in the children pressed against the U.S.-Mexico border, many of them fleeing drought in Central America, migrations may also lead to hardened borders and xenophobic or racist impulses. All this causes military analysts to call climate change a “threat multiplier” that can exacerbate existing social problems.

Parents today must brace kids for both the direct physical impacts of climate change and the humanitarian crises they will trigger, which may be worsened by human behaviors. Whether kids experience the events personally or in the context of world news, experts say kids will need strong foundations in resilience, positive thinking, compassion, and other skills to maintain mental health and inform their responses.

“It’s a lot for parents to think about,” says Tracey Wiese, an advanced nurse practitioner who specializes in family practice and psychiatric mental health in Alaska. As warming brings transformative change to Alaska, upending landscapes, cultural norms, and

nutritional resources, Wiese sees growing anxiety among parents.

“I hear about it every week now,” she says from her office in Anchorage. “Parents are worried about existential stuff, like clean water, a livable planet for their kids, even catastrophic environmental events.”

Wiese says parents can use a range of strategies to help children, but that kids first require a supportive relationship with one or more caregivers.

“That connection is vital for helping children develop skills such as resilience,” she says.

## Positive Stress and Strong Support Networks

Wiese defines resilience as the ability to manage stress and adapt to change. Her words are backed by a 2017 American Psychological Association report on the mental health impacts of climate change, which also emphasizes strong caregiver support and the value of resilience. For parents, the report’s authors recommend cultivating belief in a child’s own resilience, fostering optimism, and teaching children to control emotional responses to change. These are common tenets of modern parenting the report says are made especially important by climate change.

Psychologists also describe the value of “positive stress,” which may include public speaking, making new friends, and other experiences that can briefly increase

heart rates but that help wire young minds to adapt to change. Parents who provide supportive coaching through these normal life experiences help kids develop resilience.

“Parents also need to model positive and appropriate responses to stress,” Wiese says.

Strong social support networks give children a better foundation in resilience.

Like many things, what happens earliest in life matters most, but teens and even adults can still improve resilience. The APA offers an online guide with age-appropriate strategies for parents.

In contrast, stress related to poverty, malnutrition, violence, or abuse can weaken a child’s resilience, acting as “threat multipliers” of their own for children born into the climate change era. In such cases, climate can compound existing stress, potentially increasing odds for substance abuse, anxiety, or depression, according to the authors of the APA report.

Especially where caregiver support is lacking, coaches, teachers, and other mentors can help young people manage these negative stressors. It’s a reminder that entire communities, not just parents, will have a hand in raising climate-resilient children.

That community focus is an important factor according to Susan Clayton, a psychologist at Wooster College in Ohio and co-editor of *Psychology and Climate Change: Human Perceptions, Impacts, and Responses*, which summarizes psychological research tied to climate change.

“Strong social support networks give children a better foundation in resilience,” Clayton says. She lists teachers, clubs, and faith communities as good examples of social networks that become “sources of meaning” for kids.



## Connection to the Outdoors

Connecting youths to the outdoors is also important when it comes to climate change. Research shows time outdoors, especially at an early age, can reduce childhood stress and anxiety, while strengthening confidence, imagination, and physical health—all characteristics that will help tomorrow's adults adapt to a changing world.

"Nature-based education [and] therapy are real sources of strength and resilience for young people," Clayton says.

Rural and farm kids have an advantage here. But not everyone grows up with access to the outdoors, and both climate change and population growth are driving greater movement to urban areas worldwide. It means more kids live in developed areas with limited time in nature.

Nature-based education is good for older kids, too, and can spark interest in science and other fields that will be crucial in the decades ahead.

Fortunately, concern over how much time kids spend hitched to phones and computers has already sparked a revival in nature-based education. Parents and teachers today can access a growing network of tested programs. Some, such as Project Learning Tree and the National Environmental Education Foundation, are active across the country, but an expanding galaxy of others function at the local level. At the movement's cutting edge is a growing number of outdoor-focused preschools and kindergartens that provide formative experiences in natural settings, including within urban areas.

Proponents say nature-based education is good for older kids, too, and can spark interest in science and other fields that will be crucial in the decades ahead, as people engineer solutions to climate-related



challenges. Such programs may steer teens toward promising careers. But in the short term, learning about science and nature can instill optimism in the face of discouraging climate news.

## Discuss and Model Solutions

But what about day-to-day actions in the home? Experts agree that discussing climate change and modeling behaviors that reflect climate solutions are important, too. Discussions need to be age-appropriate to protect young children from unnecessary stress and anxiety. But exhibiting climate-positive behaviors such as energy conservation and avoiding single-use plastics carries value at all ages. According to Wiese, it shows kids that parents are engaged in trying to better the world, and it fosters resilience by channeling energy toward tangible action.

Mary DeMocker, author of *The Parents' Guide to Climate Revolution*, agrees. As the mother of two young adults, DeMocker spent more than two decades raising kids with climate change in mind, and she believes in empowering young people to create solutions.

"Anything that gives kids a sense

of agency is important," she says. "Maybe they help put together the family's emergency plan or evacuation kit. For older kids, it might mean writing letters to Congress."

Teaching kids to think critically about the issue helps them avoid despair and instead empowers them to create change.

DeMocker's book contains 100 short, action-oriented chapters with ideas on greener lifestyles, getting kids outdoors, and promoting solutions to the climate crisis. She is attentive to the science of climate change and the urgent need for a swift transition to clean energy. That drives her belief that children growing up today must feel empowered to create change. In addition to strong support networks, time outdoors, and positive thinking habits, she says, empowerment comes from solid foundations in both civics and climate science.

"I encourage parents to push for climate literacy in schools," she says. "Climate change is the biggest thing that's going to affect their

*Continued on page 28*



KIDS continued from page 27

children's future. Kids need to know the science and causes but also the solutions. And it needs to be taught free from the constraints of political interests."

DeMocker says young people should not be told "what to think about climate, but how to think about it." She believes teaching kids to think critically about the issue, including in geopolitical terms, helps them avoid despair and instead empowers them to create change. A grounding in civics and democracy then informs kids how change can occur.

### Foster Compassion

Compassion is also a theme in DeMocker's work. She says it's an important emotional response for parents to exercise while listening to a child's fears about climate change, which may include concerns about wildlife, natural disasters, or the

well-being of friends, family, and even pets.

In Alaska, Wiese also sees the importance of compassion. She says parents foster compassion when they provide a safe emotional place for kids to express their feelings and where feelings are respected. For younger children, she also sees value in compassion-based play.

Exercising compassion models behaviors young people will need in the future, too, as they emerge as adults into a world undergoing significant physical and societal change. Global experts predict low- and middle-income people—and especially children—will continue feeling the brunt of weather extremes, food shortages, and other climate-related events. Tomorrow's adults will need to know the value of compassion to promote responses that alleviate suffering, foster social justice, and decarbonize the economy. That provides a check against intolerance,

nationalism, and other negative reactions that can compound suffering and civil unrest. Practicing compassion also carries mental health benefits that can help tomorrow's adults weather the climate disruption they will experience.

Like climate change itself, the prospect of raising children on a warming planet is daunting. When it becomes overwhelming, Wiese says, parents should focus on what they can control: Practice self-care. Provide kids with safety and support. Teach resilience and compassion. And model planet-healthy choices that orient children away from anxiety and toward solutions.

*TIM LYDON has worked on public lands issues for many years and is a founding member of the Prince William Sound Stewardship Foundation. His writing has appeared in Hakai Magazine, The Revelator, The Hill, Terrain.org, and elsewhere.*



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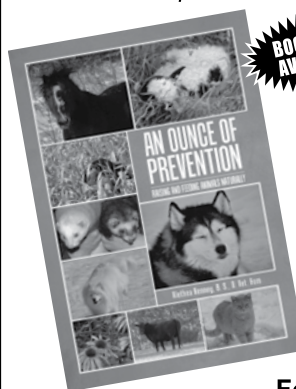
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# Oversized goals are blowing in the wind

Back in 2018, General Mills announced the company had negotiated a “strategic sourcing Agreement” with Gunsmoke Farms LLC that the 34,000-acre farm would be converted entirely to organic wheat, oats, and other grain production by 2020.

The huge Minnesota based corporation owns Annie’s, Cascadian Farms, EPIC, Food Should Taste Good, Immaculate Baking, Larabar, Liberté, Mountain High and Muir Glen, as well as Cheerios and nearly 100 other brands. Neighboring farmers and soil scientists were skeptical about the food giant’s foray into organic agriculture on such a scale. They were not the only ones. Long-time organic producers also shook their heads.

Gunsmoke Farms was purchased four years earlier by Ron D. Offutt from the Haskins, a South Dakota family who had owned and farmed it since the 1970s. In 2018 Offutt Farms sold the Gunsmoke Farms, all 54 square miles of it, to a global investment company, 6th Street Partners, for a reported \$40 million.

According to press release from General Mills, soil health is the foundation of their sustainability efforts. The principles outlined in their regenerative farming principles are quite impressive. The pictures are pretty and they say all the right things. The farm was planted into alfalfa and cover crops for three years to meet USDA Organic Certification transition requirements. Gunsmoke Farms was certified as organic in the fall of 2020, and substantial acres were planted to winter wheat.

None of the 6th Street Partners are farmers. They are investors and business people. They contracted with Midwest BioAg and consultants with the NRCS and others to develop organic farming, soil conservation and soil building plans required by USDA Organic Certification regulations. These folks were all pretty excited. This was going to be a giant step forward for scaling up organic production and meeting the needs of growing demand. General Mills have plans to make Gunsmoke Farms an example and learning center for teaching farmers regenerative agriculture.

What could possibly go wrong?

Recently National Public Radio reported that neighbors of the giant farm were complaining that top soil was blowing off the failed organic winter wheat fields and filling the roadside ditches with drift dirt. Those who had expressed skepticism about the whole deal felt justified in their naysaying. Soil scientists from the state university pointed out that the fragile soils of the short grass prairie should never have been tilled and again stated that organic farmers use a lot of tilling to kill weeds because they can’t use herbicides. Neither they nor the news media mention that the land has been in cultivation since the 1970s when the Haskin family

broke up the native grasses. The prairie wasn’t plowed to begin organic production. One should also note that neighboring conventional farmers are experiencing wind erosion and failed plantings as well because of this spring’s severe drought.

From an organic point of view, such an oversized project had numerous problems from the inception. The word “hubris” (excessive pride or self-confidence; arrogance) comes to mind. Apparently if you have enough money, do things on a large enough scale, hire enough experts, and get everything to balance on a spread sheet, anything is possible. Maybe you can design a factory to make breakfast food that way. A farm, however, is not a factory. It is a biological system, a living thing. What takes a short time to destroy may take decades to repair.

This farm had been tilled and planted to small grains, predominantly wheat, for nearly 50 years and soil

*Continued on page 30*



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*SUSTAINING continued from page 29*

quality was in decline. Who thought you could successfully regenerate a depleted “gumbo” soil into a healthy organic farm simply by planting alfalfa for three years? Apparently, in the rush to recover some of their investment, the farm managers hired by 6th Street Partners had never gotten around to planting the permanent pollinator strips, cover crops or to implement other soil building recommendations by the consultants they hired.

For General Mills it seems to make sense to have control of a large farm dedicated to providing raw commodities for making your cereals. That, however, is a financial decision, not an agricultural one. For the communities of smaller scale farmers who might be looking for a market for their organic oats and wheat, it was not a good economic decision. There are limits to economies of scale. Bigger is not always better. If a farm covers 54 square miles, no one working it can know every field. Such a large tract encompasses different micro climates, different biomes, varied topography, a range of soil types, and different wildlife. What works on one side of the farm might be a disaster on the other. To farm organically, a farmer needs to have a vision for the long term and at the same time be able to change plans quickly as

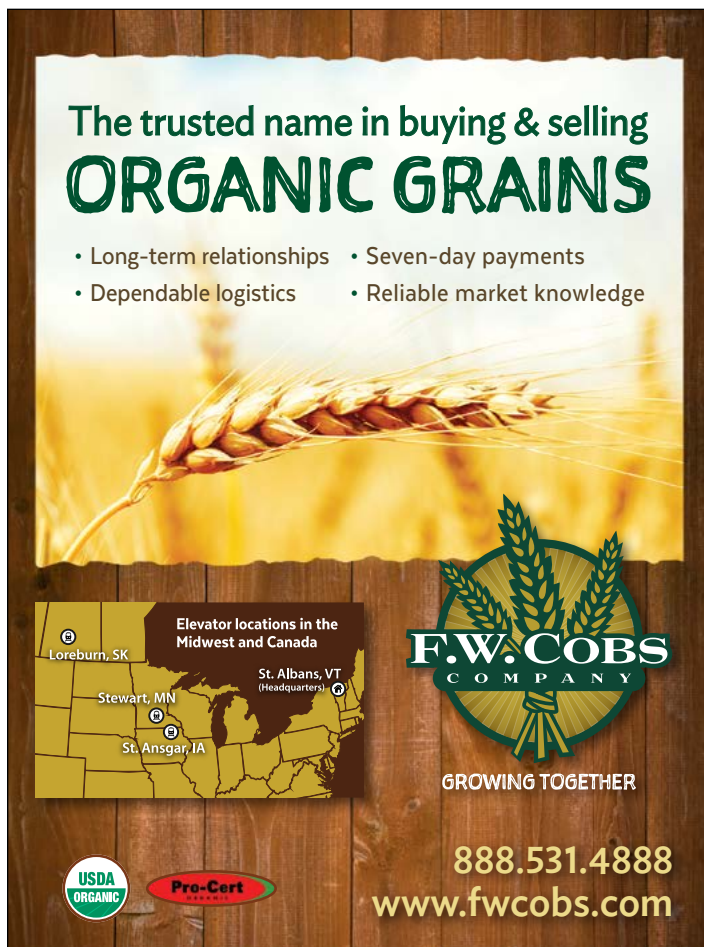
markets and weather change. Economies of scale decrease at some point. Size can become a negative. Smaller organisms are more agile and can change direction more quickly. Which turns faster, a whale or a school of sardines of the same total mass?

What has the sale of this large farm to a global investment firm done to the local land prices? How has it affected the neighbors? Since the land is not locally owned, how does the exodus of the farm’s profits out of the community affect the local businesses? What effect will GM’s growing their own oats and wheat have on organic commodity prices?

The bad press resulting from dirt storms blowing off the nation’s largest organic farm does nothing for organic agriculture. I would think it has left a bad taste with the experts who were so excited to partner on this “largest” project. General Mills says all the right things in the well-designed, glossy marketing materials. They assure customers that this is a journey. Their primary goal, however, is securing an ever growing market share and raising their stockholders return on investment. It would seem that the journey has headed down the wrong road.

In the end, all their fine words are gone with the wind. 🌬️

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