




ecdysis



· BLUE DASHER ·
FARM

2024
ANNUAL REPORT



CONTENTS

STORIES

- 2 Who We Are & What We Do
- 4 Jonathan Lundgren
- 6 Ryan Schmid
- 7 Kelton Welch
- 8 KC Jensen
- 9 Kristianna Gehant Siddens
- 10 Tommy Fenster
- 11 Dan Pecenka
- 20 Christina Lind & Blue Dasher Farm

REPORTS

- 12 1000 Farms Initiative
- 14 1000 Farms: A New Dawn
- 16 Galleries
- 23 BugBox
- 25 Data Results: HOT Topic
- 27 Publications and Presentations
- 28 Ecdysis People
- 29 Thank You to Our Supporters





BLUE DASHER
FARM

Ecdysis Foundation is all about grower-focused research to transform agriculture with regenerative principles. Agricultural science is typically conducted and communicated to other scientists, rather than the farming community. At Ecdysis, we flip those priorities. Ecdysis has a strong emphasis on farmer-, rancher-, and beekeeper-driven research questions, and empowers growers by involving them in the actual research projects themselves. Funded by grants and donations, all of our research is provided back to farmers at no cost, with no strings attached. We host field days around

the country to help others understand our findings, connect growers with each other, and make friends along the way.

To make this mission a reality, we started the largest agricultural research project North America has ever seen, the *1000 Farms Initiative*. Throughout this year's review you'll find out where we've been, what we've accomplished with the *1000 Farms Initiative* so far, and hear some of our staff's favorite stories from the front lines of this history-making project!

Blue Dasher is the regenerative farm where Ecdysis' headquarters is located. We believe that if we're going to be researchers for farmers and ranchers, we better be farmers and ranchers ourselves. On any given day, staff can be found moving sheep, mucking barns, starting seeds, or checking on bees. Blue Dasher roots us and gives us a place to connect with the communities and

people around us. It allows us to connect with many of the obstacles that farmers face. Bettering our food system and engaging our communities go hand-in-hand, and we want to be a part of that.

For more information on what the farm has been up to this year, check out Farm Manager Christina's reflection on page 20.

Who are we?

and what do we do?





Dr. JONATHAN LUNDGREN

Founder, Ecdysis Foundation

Entomologist/Agroecologist/Beekeeper/Rancher

In late July, our 1000 Farms team visited a pristine, u-pick, organic blueberry operation, run by an elderly gentleman. Manicured rows of berries were nestled around a small pond, surrounded by the temperate rainforest of North Carolina. "I have two questions for you!" He began. "Does this project have anything to do with Democrats?" (Oh boy...) No politics at all, sir. "Does it have anything to do with organic agriculture?" Yes, partially. We are interested in working with farmers from all walks of life and experiences. "Well, that is good. Because we ARE organic."

It was a Sunday, he explained that the farm was closed. But a gentleman was picking berries. The old farmer let this man come out to do that. By the end of our sampling, the parking lot was filled with cars, families picking berries together, as they did every year. The farm's schedule didn't matter. Being a part of these people's lives was why the farm existed.

I had been digging soil probes for an hour, and I was hot and tired. I approached the old farmer, sitting with his cap on, gently rocking in his chair on the front porch of the immaculately restored farm buildings. He watched the show of those families coming to his farm to pick berries. "Jon, let me tell you something." I leaned closer. "It isn't about the money. Take care of people. Your community. The money'll come".

We get to choose what we want our food system to look like.

"It isn't about the money. Take care of people. Your community. The money'll come."

Science is a huge responsibility. I am regularly asked by those close to me to explain how research is supposed to change the world. When done correctly, science is driven by the heart, but is self-assessing, logical, and trustworthy. It is meant to be based on data... observations of the world around us.



Jon having long conversations and connecting with farmer. Opposite (l to r): Jon speaks at Field Day 2024 and the Ecdysis team listens to a farmer while on a sampling trip.

Observation leads to hypotheses. Opinions that are scrutinized.

The problem is that a lot of opinions aren't based on observations of real people or events. They are based on other people's opinions. And we are absolutely saturated with a wave of other people's opinions.

I too frequently have the misfortune of listening to a television or on-line streams that spew hatred and say awful things about other groups of people. These aren't news, but they are marketed as such. Other people's opinions are the sole interface that many have with the world around them.

Far too often, I hear people that I care about use these words. They echo hatred and unacceptance. They choose to accept a concocted reality. But this isn't who they are. Because within their small community, they are generous and caring and kind. If they see a real person in need, they help them.

I have only seen *Saving Private Ryan* once (some things can only be seen once). In World War II, an entire group of soldiers gave their life to save one young man. At the

end of the film, that man, now elderly, stood in an army cemetery where lay those soldiers. Surrounded by his living family and with tears in his eyes, he had to know... He pleaded to know... whether his life was worth such a gift. Was he a good man?

So many have given so much to me. Fortunes have supported Ecdysis Foundation. Lives have been devoted in so many ways to accomplish a mission. All of this to support a glimmer of hope amidst a world that seems in collapse.

I hope, at the end of my life, that people will say that I deserved such faith and friendship as I received. Such honor to be able to lead such a team on such a voyage. Such strength and patience from my family without whom I couldn't stand. From a life chosen, driven by values, I hope that this world is better because I was in it.





Dr. RYAN SCHMID

Research Scientist/Agroecologist

This year has been a busy one for me. On top of my usual duties at Ecdysis that have me travelling the country, analyzing data, and writing papers, I also began construction on a house back home on my family's farm. While it has always been my dream to return home, this dream has come with plenty of anxiety too. A move like this has many costs. Some can be measured monetarily, e.g., spending my life savings. Whereas others extract a mental toll, e.g., concerns about uprooting my family from everything and everyone they have ever known. I must admit, these fears have caused me to lose sleep. And rightfully so, as the consequences of these decisions can have lasting impacts on both myself and my family for generations. As these thoughts were swirling around my head one night, I remembered an important lesson taught to me by my regenerative colleagues that has brought me comfort during this uncertain time in my life. A peaceful life does not come by escaping from our problems; rather, by engaging with our fears we gain the skills and wisdom to live a life we are at peace with.

Something I have always admired, but never fully appreciated until now is how regenerative farmers and ranchers continually practice this discipline in their own lives. Enacting a paradigm shift that upheaves generational farming practices can be a scary thing, as there is no script to accomplish this goal. However, I now better appreciate how regenerative folks identify what they want from life, and actively build toward it. They are not satisfied to sit back and passively receive the hand dealt them. Instead, they create their own destiny by building the community they desire, the markets they need to support their family, and transform their land into something they are proud to pass down to the next generation. And they are happier for it!

No doubt, many in the regenerative community will say that they have not always made the right decision along their journey. But yet they are happy anyway. Because they know they are getting closer to their goals, even if they made a wrong decision. I think a quote accredited to Theodore Roosevelt (although it has never been confirmed he said it) sums this philosophy nicely, "In any moment of decision, the best thing you can do is



Ryan and Will sampling in the field.

the right thing, the next best thing is the wrong thing, and the worst thing you can do is nothing".

This wisdom tapped into by the regenerative community now provides solace in my own life. I will continue to build the life I want for myself and my family. I might not always make the right decision, but I am headed in the right direction. And that is better than letting fear of making the wrong decision lead me to do nothing. This is not to say that I do not still have anxiety over the future, but it is much regressed. I feel happy to be living life rather than having life handed to me. Which reminds me of another famous quote by Henry David Thoreau, "The mass of men lead lives of quiet desperation." I am happy knowing that like my regenerative counterparts, I am not leading a life of quiet desperation, but pursuing my dreams... even if it can be scary at times.



Family watches their homesite being prepared.



Dr. KELTON WELCH

Research Entomologist & Collections Manager

Every year as the field season winds down, things begin winding up in the lab barn at Blue Dasher Farm. So in some ways, it feels like my year's only just beginning, but yet I'm writing an annual review now!

We collected thousands of samples this year, and now we're buckling in to process those samples. We have hundreds of thousands of insects, spiders, millipedes and other bugs to photograph, and we're already well on our way to processing this year's new samples. This year, we've photographed more than 220,000 new bugs, to add to the 230,000 photos we already had. And all of those photos have been classified to species by the BugBox AI. For comparison, I've been able to review and identify only about 100,000 of those bugs myself. So, using AI on our BugBox platform has allowed us to reach four times as far as we could have without it. And we're really just getting started.

We've started to use a new, updated version of our BugBox software platform, hosted on web and we're working on updating other aspects of our pipeline. Our AI model is now trained to recognize over 700 species of bugs from across the USA and Canada. (I'm not bragging or anything, but I can recognize over 4,000 species — just thought I'd throw that out there.)



Kelton examines one of the one million+ bugs he's worked to ID.

We've also started reaching out into the entomological community, recruiting other teams to start collaborating on the BugBox platform and developing new tools to improve our efficiency. I've started writing scientific

publications, getting the word out about the BugBox software and what it can offer for the science of biodiversity and agriculture.

But my focus is still on the primary reasons why we're doing this. It's not really about the bugs. It's about the people we're trying to serve and the world we're trying to benefit. I hope the entomology community can understand this. BugBox is still just an amateur at identifying bugs, and it's going to take time to get its proficiency up. But perfecting the technology isn't the point of what we're doing, and we don't want the perfect to become the enemy of the good. The real story isn't about the identity of every individual bug



Horsin' around on the veldt.

that lives in your field or orchard or pasture. The real story is the broad story of life on your farms, and life in our world. Life is so central to agriculture: if you grow more life, your land will be healthier, the world will be healthier, and we will be healthier. The data we collect is just a small sample, a snapshot of that life, designed to provide a useful indicator of the health of the land, along with all the other data points we're collecting. And we can make a difference by collecting it now, and not waiting for five or ten years while a perfect product is put together.

I really love being a part of the work we're doing at Ecdysis!





Dr. KC JENSEN

Research Scientist/Avian Biologist

Birds in the Balance: Reflections of Avian Connection within Agricultural Landscapes

From Maine to Washington and Florida to California, the 1000 Farm Initiative crews from Ecdysis visited hundreds of farms in 2024. Our field sampling protocols collected information on nearly every component of the ag-ecosystems including data of soils, hydrology, microbes, plants and of course birds.

From our data over the past seasons we know that systems that employ multiple regenerative practices within their operations reap the benefits of higher soil fertility, increased water capacity and efficiency and increased diversity of both plant and insect communities. The bird community response is a reflection of these increases in plant and insect abundance and diversity. Bird abundance is greater and species diversity is generally greater as well. Birds respond to both the increased structural diversity provided by plants in the system, and the increased availability of insects to provide vital nutrition needs during the nesting season. Making eggs, feeding nestlings, and then growing new feathers (molting) before the onset of fall migration requires enormous amounts of protein; and they meet that need by foraging on insects. Agricultural practices that reduce the use of pesticides and herbicides are generally very bird friendly. It is a pretty simple equation.



KC is camera-ready with his wing-man (Jay) on a site visit.

During the 2024 field season I visited 9 different states. I walked approximately 1-mile transects in 181 different fields that represented an expansive view of food production systems and land management practices across the United States.

My take-home observation that has impacted me most profoundly has not been found in the raw numbers of the



An eastern bluebird sits atop a flower sign.

data. Instead, I've come to realize that when working in ag systems that employ multiple regenerative practices, not only are the bird communities more robust but the human response in those landscapes was remarkable.

There was more joy; it was palpable. The sampling crews were happier, I could hear them singing and joking in the distance as I walked my transects. The landowners seemed less tense and stressed, and genuinely happy and content in their efforts to create a healthy and nutritious food product. Every field and system posed challenges to the producers, as every human endeavor does. But to me these great people were anxious to learn, experiment, and change to meet those challenges. It was remarkable. In short, my take-home lesson of the year was that farming in ways that respect and enrich the life-giving capacity of the soil-water-plant-animal web makes for stronger and more diverse bird communities. But perhaps more importantly, it fosters deeper connections and understanding within the human communities as well.



KRISTIANNA GEHANT SIDDENS

Lab Manager

This year has been a pretty dramatic change for me, but a rejuvenating and inspiring one. I've been farming (among other pursuits) for the last 20+ years, and joined Ecdysis in January of 2024. "Scientists have to be farmers" is a frequently repeated adage around here, but in my case, I'm a farmer applying my skills at the nexus of scientific research and food production. In doing so, I'm privileged to work with a diverse crew of energetic and talented people passionate about science and agriculture. This focus on the bigger picture is a satisfying contrast to the hyper local work on my farm. I'm delighted to play a critical role in this audacious, but vital project to understand and promote the practices that will help save our farms, farmers, and food system.

During our field season this year, we had two rotating teams of nine traveling on sampling trips for most of February-August. That's a lot of equipment, vehicles, samples, and people moving in many directions at all times. I'm pleased to report, in spite of a couple equipment malfunctions, we achieved a successful



Kristianna and Cassandra pose for a selfie out in the field.

field season, sampling nearly 550 farms! We improved our vehicle safety record, procured new ergonomic tools, and continued refining our sample processing and storage systems. In addition, we produced a set of training videos to guide our staff (and in the near future, farmers) in accurate sample collection methods.

Lucky for me, my job encompasses a variety of duties from ordering equipment to collecting soil cores, and

running lab meetings to processing samples. Whether I'm working on a database or sending out grain for nutrient testing, at the forefront of my mind are the folks who've generously welcomed us to their farms and ranches to gather this critical data. As we process and analyze samples, we observe varying patterns of biodiversity from sites using different management techniques. Numbers on spreadsheets tell the story of how easily rainwater seeps into soils or which species of birds call a farm home. Seeing the results of nutrient testing, insect counts, and water infiltration numbers connects us here in the lab with what's happening out there in the fields, pastures, and orchards across the country.



Kristianna in the lab office back at headquarters.

All these bits of data about our nation's agricultural production reveal that *the methods we choose for raising crops and animals are crucial for preserving and encouraging life on our farms* and, indeed, for how well we feed our people. Determining which of those support the most life and yield the most nutritious food depends on our ability to accurately collect the data. My mission is to equip our teams with the tools to effectively measure the many data points at each farm, shepherd the samples of soils, plants, and food through the various means of analysis, and keep our operations running smoothly so we can continue to tell the science-based story of how to rebuild our food system through a truly regenerative agriculture.





TOMMY FENSTER

Pursuing PhD, Regenerative Cropping

2024 was the third and final field season for my PhD project examining the effect of grazing and regenerative management on vineyard soil health, biodiversity, and input usage. This project is a collaboration between the Ecdysis Foundation and the Gaudin Agroecology Lab at UC Davis. Over three years, we sampled 49 vineyards at budbreak, at 50% veraison (when the grapes start to change color), and at harvest between Mendocino and San Benito counties in California.

Preliminary data analysis shows grazing as a key-stone management practice for enhancing soil carbon (C) and nitrogen (N) dynamics and biodiversity metrics. The number of years under grazing is positively and significantly correlated with soil C and N accumulation in both organic and conventional systems. When grazing is combined with other regenerative practices, these metrics improve further.

Grazing vineyards have significantly higher total N, similar amounts of inorganic N, and significantly higher organic N than non-grazing vineyards. Of the organic N, the grazing vineyards have significantly more water-extractable organic nitrogen. Grazing vineyards have increased levels of C and N, but similar ratios of SOC:TSN (11:1) and WEOC: WEON (12:1) compared to non-grazing vineyards, suggesting that neither system immobilizes N. These results are summarized by the higher Haney scores of grazing vineyards.

Grazing did not increase physical soil parameters like bulk density or compaction, or decrease water infiltration. Vine fertility, yield, and grape-quality metrics, were not affected by grazing, although grazing sites reduced their number of tractor passes by 1-5 passes and decreased their synthetic fertilizer use over the growing season. Overall, the data suggest that grazing vineyards improves C and N dynamics and reduces inputs without negatively affecting soil physical properties or important yield and grape-quality metrics.

2024 also brought loss. In July, my best friend and team mate Max Carpenter died. Max and I worked together every year on this project, even making wine together with the left-over yield samples. Max worked hard and



Max Carpenter in the foreground with the 2024 budbreak sampling crew in the background. From right to left: Josh Estes, Gordan Gallant, Will Hillery, Morgan Pederson, Cassandra Koel, Liv Torbert, and Tommy Fenster.

had the gift of becoming instant best friends with folks he had just met.

Working in agriculture has given me an acute awareness of the seasons which I associate with folks I've worked with, making Max's absence during harvest visceral and surreal. Yet it was comforting to realize that I will always associate this time of year with him. When I drink one of our bottles of wine 20 years from now, I will remember working with Max on mountain-side vineyards at sunrise, singing to country radio in the van as we wound along Highway 16, stomping on grapes, and banging our heads on the beams of my house as we moved carboys of wine into the 3-ft-tall crawl space underneath. I will remember how lucky I was to have a best friend who always had my back and who made me look forward to any task, however mundane.

Max used to say that the "vibes were simply better" in regenerative fields. Regenerative agriculture is about building connections between people, land, and all the forms of life on that land. When we build life on our farms, yards, community gardens, or even flower pots on a back stoop, we also build community and make deeper connections with the folks around us. On that note, I propose a toast to all the "Max's" in people's lives and to building life and community.

Your friends and colleagues at Ecdysis and Blue Dasher Farm extend sincere condolences on the loss of Max Carpenter.



DAN PECENKA

Pursuing Master's Degree, Focus on Perennial Wheat

RING, RING, RING THE BELL! My 5th year at Ecdysis was an exciting year. I got married, bought a house, and moved across the state since the last annual report. I had another exciting field season of traveling coast to coast.

My second trip of 2024 was in late May for year 3 of Washington sampling. We met new folks and were able to visit with previous 1,000 Farm participants. During this trip, we had the phenomenal opportunity to run an impromptu field day with one of our growers and a local high school group. I was so excited for this opportunity because most of our staff members on this trip never participated in a field day before. Even with the hardest critics, high schoolers, our staff rose to the occasion and knocked the field day out of the park

My field season ended in New York looking at apple production. This was the furthest East I had traveled this season. What was neat about this trip was comparing it to my apple trips in Washington and Oregon. Seeing large scale apple production of the west vs the smaller "pick your own apples" operations of the east was something really intriguing and a neat way to close the season.

As previously mentioned, I got married! The big day was on September 28th, a month or so after our field season ended. I did what any good fiancé does and was on work trips while my future wife planned the most important day of my life. It was a surreal day with my best friend by my side. It was the perfect day. Multiple times throughout the night the word "community" kept coming up. The idea of community is often talked about in the Regenerative Ag movement, but not always felt. That day we felt love from our Ecdysis community. I shared my special day with many from Ecdysis. Line dancing with the groomsman Jay and the Louisiana man himself. Will was the best.



Congratulations Dan and Breanna!

Something happened this field season that really opened my eyes on what growers must face when transitioning to a more holistic form of management. During our Oklahoma trip, a really important day happened for my wife - Taylor Swift's album "The Tortured Poets Department" was released. My wife being a huge Swifty asked me to wait on listening to the album so she could listen to it first. She wanted to avoid any spoilers. I obviously said yes; happy wife, happy life. While driving to the field sites someone asked if we could listen to the new album. I explained that I couldn't because I made a promise.

The response: "Well how would she know you listened? She won't know unless you tell her."

But I would know. And then it hit me. All these growers across the US, growing food in a more holistic management system, face similar issues as I was. Managing a herd of 1,000 lb.-plus animals or planting several different heirloom wheat varieties is a little bit different than not listening to Taylor Swift the day

it came out, but we were all under a social pressure. I have heard countless stories from growers about changing their practices because of the principle of it. They might not make as much money, or they might be getting made fun of at the coffee shop, but they are doing something because they believe it is right. But it was the principle of the thing that mattered. Many growers have told me to not think about what others have to say and do what you think is right.

*"Hold on to the memories,
they will hold on to you"*
-Taylor Swift

See you all next year!



“The most ambitious agroecology research ever conducted...

3rd YEAR!



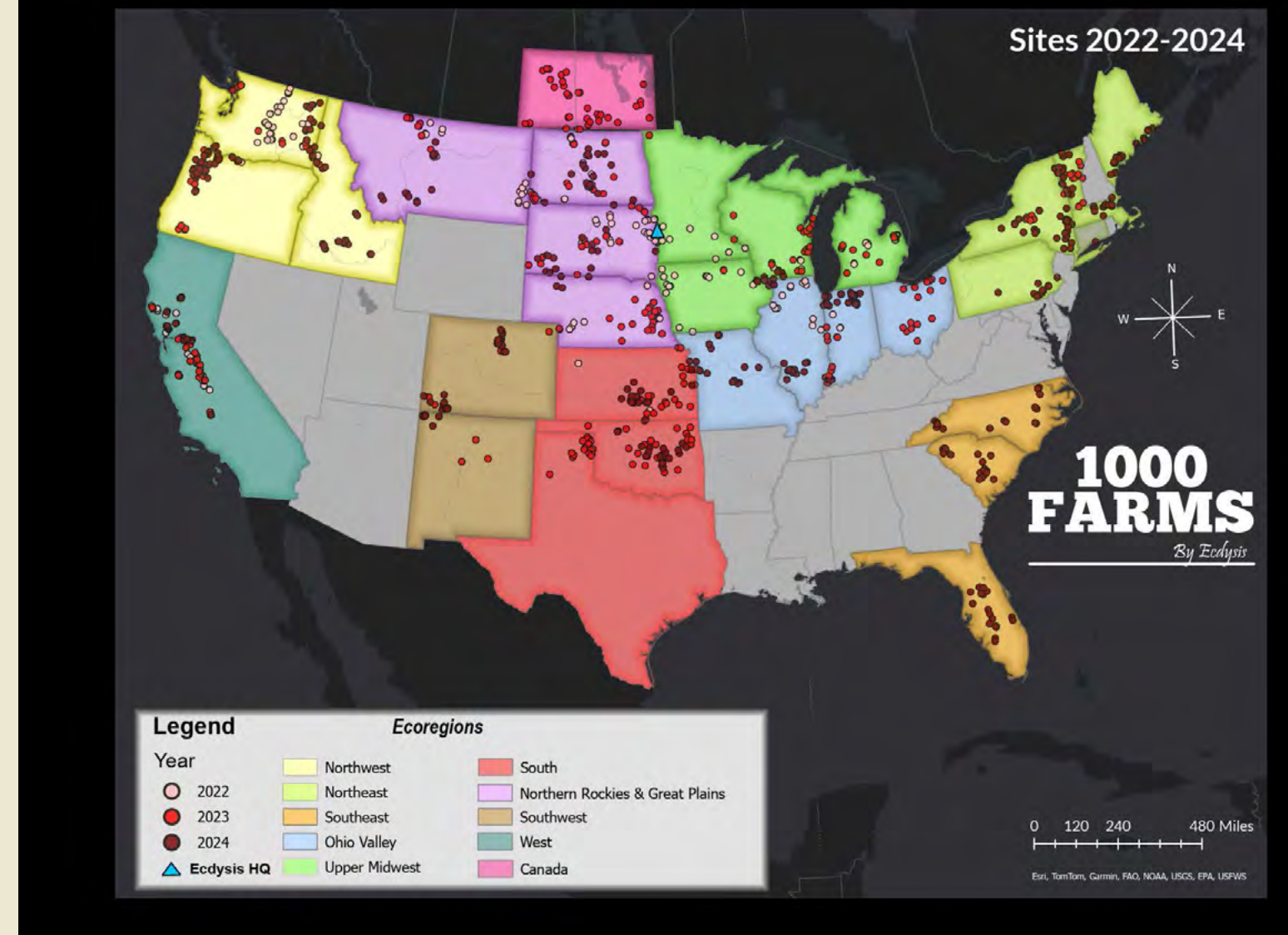
ECDYSIS CLEARED 1,000 FARMS in the study!!

Research papers are in line, the next chapters of the study are unfolding, and we can't wait for the next 1,000 farms! Totals from the first three field seasons of the 1000 Farms Initiative:

1,284
full system assessments
on farms across North America

ECDYSIS FOUNDATION DOUBLED DOWN IN 2024, increasing our farms per year to 547, and processing the samples back at the lab faster than we ever have - with a quarter million individual insect specimens photographed in 2024 alone. We've also been busy processing other samples like yields, soils, and eco-acoustics. Although the major milestone of the 1,000 Farms Initiative was passed, the work is far from finished. Now, we are busy crunching data and prioritizing scientific papers from all of the incredible data rolling in.

WE'VE ALSO BEEN ABLE TO IDENTIFY the systems and regions that *haven't yet been covered* or need more study to understand: for example the arid and semi-arid west, and the southeast. Lastly, we've identified systems that show incredible promise for the future of our food system to further study and help remove the barriers of adoption for producers.



2024 STATS:

- 249,854 individual specimens photographed from insect samples
- 4,421 insect samples processed
- 83% BugBox accuracy
- 25 sample clusters around the country
- 547 farms with full systems assessments
- 603 grain, nut, milk, and meat yield samples processed
- 10 major food systems represented in crop yield samples
- 800 eco-acoustic files inputted
- 462 bulk density samples calculated
- 6 papers published
- 7 papers in preparation
- 40+ public appearances for education and communicating our findings

We can't wait for the NEXT 1,000 farms!

1000 FARMS

by Ecdysis

A NEW DAWN

The first three years of the *1000 Farms Initiative* has exceeded all of our expectations.

Through intimately studying 1,284 farms across North America, we learned all about the current state and trajectory of our continent's food system.



SO, WHAT HAPPENS NOW?

Ecdysis is plotting a new course for the next five years of the *1000 Farms Initiative!*

Project:

IGNITE!

SCIENCE CAN BE THE SPARK THAT LIGHTS THE FLAME for the future of regenerative food. **PROJECT IGNITE** is the continuation of our world-class scientific research into the areas in which we see the most potential for feeding people and rebuilding natural resources.

In *Project Ignite*, the Ecdysis Foundation will keep gathering primary data just like in previous years, while focusing our studies on the regenerative potential in key food systems, and measuring how agriculture may change under more extreme climatological conditions.

Some key food systems we are focusing on this year include:

- ✓ No-till organic farming
- ✓ Local fruit and vegetable production systems
- ✓ Transition of croplands into grazing land
- ✓ Silvopasture (integrating trees into grazing land)
- ✓ Heritage livestock breeds and heirloom produce varieties
- ✓ Perennial cropping systems
- ✓ Pastured Livestock Production

PROJECT IGNITE will take the *1000 Farms Initiative* into the future, testing the limits of regenerative practices and facilitating the implementation of our approach as we globalize the mission.



Project:

AVALANCHE

ONE PEBBLE CAN START AN AVALANCHE OF CHANGE - and Ecdysis is about to cast a truckload (minivan-load?) of pebbles down the mountainside! In order to extend the reach of the *1000 Farms Initiative* further than ever before, we are enabling farmers across North America to take science into their own hands.

Participating farmers will receive a kit (hopefully for free) with all the tools, protocols, and support needed for them to collect scientific data on their own fields. These kits are designed to measure the same features that Ecdysis has studied on over a thousand farms, allowing participants' data to be directly compared and contributed to the pool of data already accumulated through the *1000 Farms Initiative*.

PROJECT AVALANCHE will allow more farmers than ever to receive specific data on their land in the context of their unique local environment. This expanded pool of data will give scientists and farmers alike greater confidence in the effectiveness of promising new ways of producing food, and it will offer the Ecdysis Foundation a greater empirical basis for comparing practices, systems, and ecoregions. This information can aid in Ecdysis' goals to grow our research internationally and will be critical for guiding policy development and direction of change in our food system.



Where we've been...

On our journeys across the country, our team has witnessed and listened to farmers describe the many challenges that are facing them. We drove past miles of dead, struggling or dying citrus orchards as the farmers fought to keep their trees alive. We've lost three farm clusters to fire and hurricane flooding. We've had a team hunkered down for an unprecedented tornado on the California coast, smoke from raging fires, and had multiple teams across the country struck by dust storms in farm land. These shared experiences unite us and drive us to work long hours in poor conditions for much needed change.



Where we're going!

During these journeys, we also saw what our food system CAN be. We saw examples of vibrant soil, abundant life, nutritious food, and communities coming together. The path no longer just follows dreams and aspirations, but we see a future that is possible and fills us with hope.





AMONG THE GRANDER HOPES FOR THE REGENERATIVE MOVEMENT are the bonds that are made within farming communities. A strong community among regenerative farmers fosters collaboration, knowledge-sharing, and mutual support, empowering individuals to adopt sustainable practices and overcome challenges together. By building connections, farmers can amplify their impact, creating healthier ecosystems, thriving farms, and a more resilient food system for future generations.





CHRISTINA LIND

Blue Dasher Farm Manager & Communications Specialist

“Community”

This word has come up over and over again this year. It has become a common theme throughout our work, and a central core of our mission as we discover just how important it is. During our travels, our staff often notes the farms that stuck with them, or that they hope to see in the future of farming. They are universally farms that support and involve their community.

While the world around us has built a system of isolation and hyper independence, I have come around to appreciating what a community of people can do together. Through the years, many of us have gone through a journey. One that became so reliant on a system that many of us forgot basic skills, which felt unneeded. Nearly all the elements of being a living creature in the world – constructing and shaping shelter, finding/planning and preparing food, preserving food, could all be taken care of by machines and someone else. Many of us even lost the uniquely human skills that have evolved over time like creating



Christina in the newly refit market trailer. Liza takes a turn painting it.

and mending clothing, building and repairing tools and equipment, growing crops and caring for livestock. But we didn't only lose those tangible skills, we lost the need for in person, human interaction. It became a world where nearly all of what we learn to do is reliant on advanced technology and a virtual world instead of a physical one. A world that feels fragile,



and a little alien sometimes, where we don't need face to face contact or the skills of one-on-one physical communication that we've developed as a species.

Perhaps as a reaction to this shift in society, there's been a movement of going back to the land and learning “homesteading” skills, which encompass many of those self-sufficient skills. Complex changes have led to this desire to live independently, frugally and sustainably, and I am one of those that is drawn to this lifestyle. It's extremely rewarding to be able to do many of the lost skills for ourselves, to feel capable and a bit self-reliant. Sometimes though, it feels isolating. And while a homestead lifestyle is rewarding and more physically healthy, socially speaking it can become not so very different than sitting in a lonely apartment ordering take-out online. In either case, we'd still be isolated in our own little silos, not needing human interaction. Losing the skills of working together, of conflict resolution, adapting to social situations, managing emotional tone, actively listening, expression and interpretation of both verbal and nonverbal communication. We lose empathy. For me, it is much more natural to feel *inter*-reliant instead of *self*-reliant or reliant, interdependent instead of dependent or independent. To not only contribute to our own well-being, but also for others outside of immediate family. We don't have to each individually do it all and have it all, alone, and neither do others in our community. **We have each other, and we are stronger together.**



Just this year, we had friends lend us their skid steer drill for putting in fence, and other friends lend us their chicken plucker. Our friends at Good Roots provided us with an old 2-horse trailer for a market stand to sell our goods, which has become a major highlight of the farm landscape and part of our identity already. Friends and family like Katya Busenitz and my dad Bill spent countless hours repairing the trailer for use, and then nearly all of the staff contributed to a mural painted on the side. We can't wait to use the trailer for market sales! These types of things are what the farming community is all about.

Blue Dasher Farm is stronger because of our friends and other local farmers. We lift each other up and we help each other. What one might provide, the other might not and vice-versa. We wouldn't be here without this community, and we are always better for them. While Ecdysis' mission is to gather information to provide big picture answers to a national and even a global community, Blue Dasher can invest in their local community – be a part of somewhere instead of everywhere.

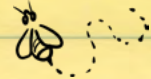
But Blue Dasher is not just me and Jon and our kids, or even our extended family and staff. It is many of us. It is our neighbors up the road, it's those that have donated or lent us equipment, seed, animals, feed, labor or advice, it's those that have joined us for meals from the farm. It's those that lift us with their words and kindness. If you're reading this, it's you too. And we will work hard to do our part in this community that makes us who we are.

Alpacas, sheep, pigs, and ducklings are only a few of the critters in the cuteness menagerie of animals on the farm. Above: Cat bottle feeds a lamb and Jay with piggies. Opposite: The motley crew at the fence.



2024 FARM STATS.

BEEES



- 2nd swarm of bees chose BDF (they know a good farm when they see it!)
- Practiced our queen grafting skills and increased "Blue Dasher South Dakota Hardy Queen Stock"
- 645 lbs of honey harvested
- Bobbie instructed several local beekeeping classes
- USDA reports that this was one of the most challenging years in beekeeping history, with Varroa mites a top problem. We are incredibly fortunate to be heading into winter without loss

ALPACAS



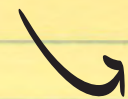
- 1 heartbreaking cria loss has taught us a lot, and made us appreciate our alpacas even more
- 48 skeins of alpaca yarn created from their fleece, many sold or utilized with Christina's crochet projects

EQUINE



- A miniature horse and pony added to the motley crew of animals
- Learning and practice with unique equine care
 - 1 nursing home visit
 - Practiced driving at local clinics to work on their training

cute lil' stinkers



SHEEP



- Bale-fed on pasture all winter - those pastures never looked so good!
- 92% survival with spring pasture births
- 61 lambs from 35 ewes
- East field fenced for additional winter pasture and summer cross fencing
- Continued our breeding program of sheep adapted to our farm and region

POULTRY



- 3 peachicks hatched, all kept
- 4 goslings hatched, 2 sold and 2 kept
- 14 turkeys harvested
- 30 freedom ranger chickens harvested
- Hatched our own new layer hens

PIGS



- 5 piglets welcomed and sold, and introduced an Idaho Pasture Pig cross gilt and a registered boar to diversify our breeding program
- 1 piglet rescued from a fencepost hole during a fencing project

PLANTS



- 3 rows of the miniature vineyard planted and posted (30 plants)
 - Buckets of apples harvested from our adolescent apple orchard and used by family and staff for fresh snacks, fruit leather and more
 - Generous spring rains energized the farm and led to flushes of growth on our young trees
 - Cut flowers successful and became a highlight of the farm:
 - Farmer's Market visits
 - Market trailer refurbished and painted
 - Supplying local florists
 - Bringing life to the farm
 - 3 new flower beds established for next season
- WE CAN'T WAIT!!

Little Bugs, BIG Numbers!

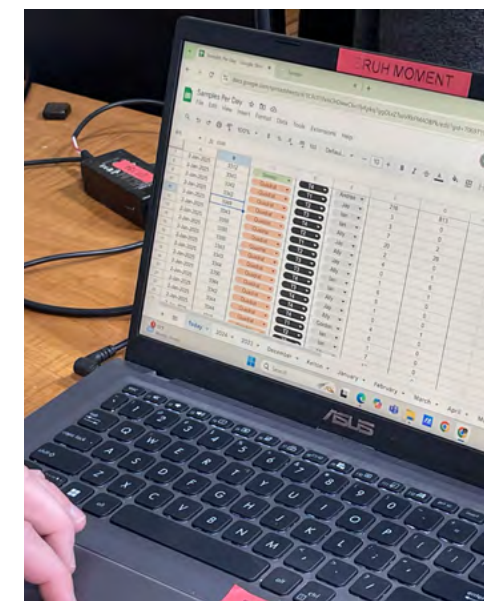
TALES FROM THE BUGBOX



WHEN WE VISIT OVER 1000 FARMS TO COLLECT SOILS AND BUGS, that field work is only the beginning of the process. All those samples have to be processed in the lab before they can be turned into the impactful science that we're doing at Ecdysis. For the bugs, "processing" means taking lots of photographs. Our team photographs every bug we collect, one at a time, and uploads those photographs onto BugBox, our software platform that identifies the bugs with artificial intelligence.

As of January 2, 2025, we have reached a pretty significant milestone:
500,000 INDIVIDUAL BUGS HAVE BEEN UPLOADED INTO BUGBOX!

That means we have collected and photographed HALF A MILLION specimens in just the two-and-a-half years we've been doing the 1000 Farms Initiative! These are bugs from farms, ranches, and orchards all over the country. This is an incredible collection effort, and it's just one facet of the work we're doing at Ecdysis. We're changing the world, one bug at a time!

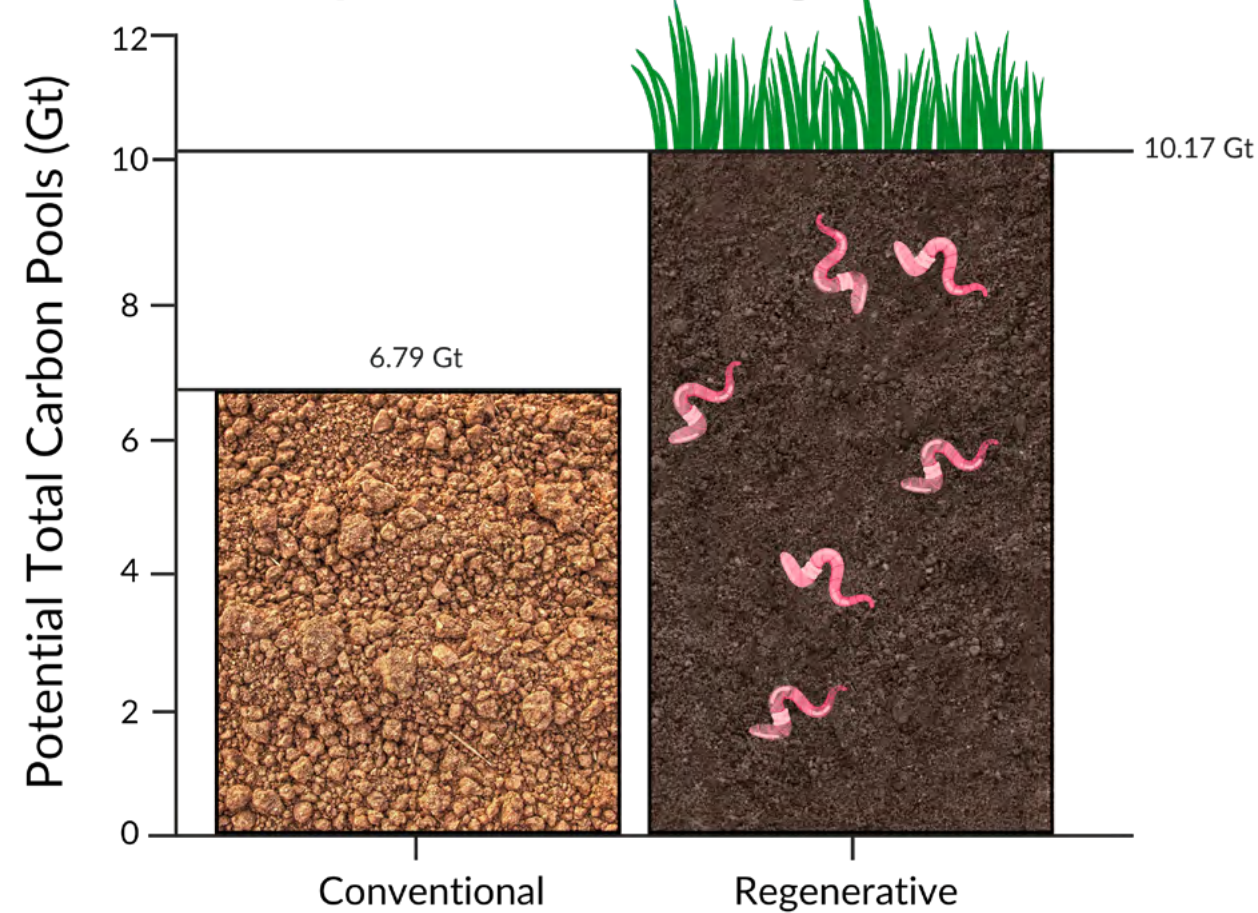


Carbon is a

Here's what our data says...

Soils in regenerative row crops fields capture and store 46% more carbon, than soils in conventional fields.

Soil Carbon Storage of U.S. row crops in top 2 feet of soil- Gigatons (Gt)



Inspiring Insights

Switching all conventional row crops to regenerative farming could **store nearly twice** the amount of carbon the **U.S. emits** in a year!



HOT topic

Bring life back to your farm, and carbon will take care of itself.



	Fungal Biomass (ng/g)	Microbial Biomass (ng/g)	Plant Species	Insects	Bird Species
Conventional	81	1787	0.17	22	2.7
Regenerative	132	2500	3.28	99	5.8

We're actively releasing scientific papers on our findings. This data shows just a sneak peak of what's to come. Find newly released papers on our website, and watch for more in the making!



ECDYSIS STAFF ACCOMPLISHMENTS

SCIENTIFIC PAPERS

- Welch, K. D. and J. G. Lundgren. 2024. Introducing BugBox: a platform for AI-assisted bioinventories of arthropods. *American Entomologist* 70(3): 31-33.
- Rydhmer, K., J. O. Eckberg, J. G. Lundgren, S. Jansson, L. Still, J. E. Quinn, R. Washington Jr, J. Lemmich, T. Nikolajen, N. Sheller, A. M. Michels, M. M. Bredeson, S. T. Rosensweig, E. N. Byck. 2024. Automating an insect biodiversity metric using distributed optical sensors: an evaluation across Kansas, USA cropping systems. *eLIFE* 13: RP92227
- Hatt, S., I. Armbrecht, J. G. Lundgren, K. A. G. Wyckhuys. 2024. Breathing new life into farming: Illuminating the socio-ecological benefits of regenerative agriculture. *Frontiers in Sustainable Food Systems* in press
- Prairie, A., S. Rozensweig, J. G. Lundgren, M. M. Bredeson, K. D. Welch, D. Kane, M. F. Cotrufo. Integrating regenerative agriculture: effects on soil arthropod biodiversity and soil organic matter dynamics. Submitted to *Soil and Tillage Research*.
- Schmid, R. B., K. D. Welch, J. G. Lundgren. Regenerative grazing effects on dung arthropod communities and ecosystem services. *Frontiers in Sustainable Resource Management*, accepted pending revision
- Welch, K. D., M. E. Wilson, and J. G. Lundgren. Evaluation of BugBox, a platform for AI-assisted bioinventories of arthropods. Submitted to *Journal of Animal Ecology*.
- Jensen, W. F., C. Bahnson, S. A. Tucker, S. Cortney, J. A. Jenks, J. G. Lundgren, J. Zyskowski, E. S. Michel. Widespread exposure to neonicotinoid insecticide in bobcats (*Lynx rufus*), fisher (*Pekania pennanti*) and river otter (*Lontra canadensis*) in North Dakota. Submitted to *Ecotoxicology*.
- Lundgren, J. G., K. D. Welch, M. M. Bredeson, K. Busenitz, R. Buterbaugh, T. L. D. Fenster, K. C. Jensen, D. Pecenka, R. B. Schmid. Regenerative agriculture: connecting soil carbon storage, biodiversity, and profit. Submitted to *Nature*.
- Busenitz, K., R. B. Schmid, and J. G. Lundgren. Regenerative rangeland management increases honey bee performance. Submitted to *Frontiers in Sustainable Food Systems*.
- *5 more in preparation for 2025*

PRESENTATIONS & HOSTED EVENTS

- Northern Plains Sustainable Ag Society
- Burroughs Regenerative Almond Field Day
- Screening for Common Ground
- Rural Coalition Annual Meeting
- Montana Soil Health Symposium
- Montana Peer-to-Peer Group
- St. Cloud State University Lecture
- Napa Green Grazing in Vineyards Workshop
- Regenerative Wine Growing Immersion
- Oklahoma Black Historical Research Project Inc.'s Rural Economic Development Conference
- UC-Davis Workshop
- Giving Pledge Field Day
- Mini Field Day WA Schools
- Master Beekeepers in Nebraska Lecture
- Jako Farm Field Day
- Oak Lake Field Station Field Day
- South Dakota Grasslands Coalition Grazing School
- Fields of Sinsinawa Field Day
- Blue Dasher Farm Field Day
- Cut Flower Field Day
- 1000 Farms Pasture Walk
- Insect Festival
- Dakota Community Market Food Coop Introduction to Beekeeping
- Grazing the Aransas
- St. Cloud Department of Biology & Chemistry Seminar
- Audubon monthly meeting
- SD Women in Agriculture Conference
- Prairie Play: Bugs & Birds Festival
- Fresh Rx Grower Meeting
- REGENERATE Grower Meeting
- South Dakota Local Foods Conference
- Entomological Society of America Annual Meeting
- KS Governor's Conference on the Future of Water
- SDSU Local Food Guest Speaking
- Sustainable Food Policy Guest Lecture

IN THE MEDIA: WEB, RADIO, PODCAST, & FILM

- Food EDU video: "Data Driven Solutions: Building Evidence for a Regenerative Farming Revolution"
- "Build Your Own Roller-Crimper" video series
- USDA NRCS South Dakota video: "Our Amazing Grasslands"
- TEDx video: "The most important tool for measuring regenerative agriculture"
- Partners on the Prairie Podcast: Ecdysis and Blue Dasher Farm
- Down to Earth: The Planet to Plate Podcast: "1000 Farms Initiative: A new paradigm of science in service of farmers"
- Brookings Register: "Children, parents enjoy bugfest at McCrory Gardens"
- Grape and Wine Magazine: "What's Old is New: Growers look to wooly weed eters to help economically and ecologically augment vineyard management"
- St. Helena Star: "Napa Valley growers deploy sheep to produce healthier vineyards"

THANK YOU TO OUR SUPPORTERS

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Rural Coalition

INDIVIDUALS

Amy Divine
Andrew McCue
Brian Hicks
Cody Oreck
Damien Faure
Dan Rasure
David Kadas
Douglas Garrison
Geoff Mamlet
Hillary Noonan
Jay Wells
Jeff Dinsmore
Lynnette Miller
Mark Gifford
Mikl Brawner
Patti Armbrister
Paul Ackley
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LOCAL, STATE, OR FEDERAL GOVERNMENT

Boulder County Open Space
Montana Association of Conservation Districts
Spokane Conservation District
Western SARE



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Dr. Jonathan Lundgren



Dr. Ryan Schmid



Dr. Kelton Welch

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Katya Busenitz

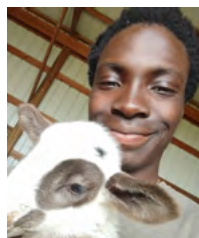


Tommy Fenster

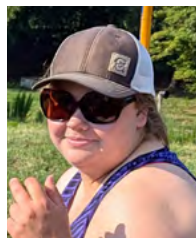


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CORE STAFF



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Gabe Boyer



Roger Brown



Liza Chang



Kelly Clinton



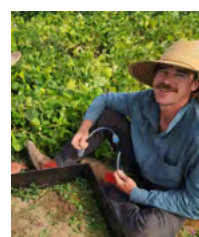
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Nora D'Antuono



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Yam Gautam

ECDYSIS PEOPLE

CORE STAFF CONT'D



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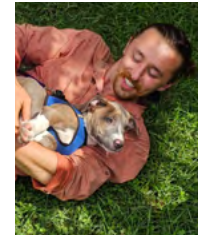
Cable Hardin



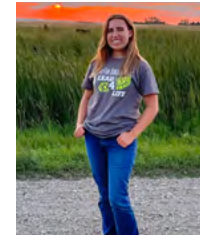
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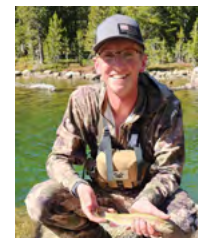
Lynette Miller



Morgan Pederson



Thomas Schmitt



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Adam Tess



Kayli Tolk



Olivia Torbert



Andres Torres-Moya



Cat Wagner



Mia Werger



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Mikayla Wilson



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