

Proceedings of the 12th Organic Seed Growers Conference

February 28th - March 1st, 2025 | Corvallis, Oregon & Virtual



Organic Seed Alliance • P.O. Box 772 Port Townsend, WA 98368
360-385-7192 • www.seedalliance.org • info@seedalliance.org

Citation: Lordon, M. (editor). 2025. Organic Seed Growers Conference Proceedings. February 28 - March 1, 2025, Corvallis, Oregon. Organic Seed Alliance, Port Townsend, WA. 110 pp.

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Many thanks to the conference planning committee:

Bonnetta Adeb, Steam Onward Inc / Ujamaa Cooperative Farming Alliance
Dan Brisebois, Tourne-Sol co-operative farm / the Seed Growers Podcast
Georgina Catacora-Vargas, Academic Peasant Unit “Tiahuanacu” –UCB / AGRUCO-UMSS
Dan Cornelius, Indigenous Seed Keepers Network (ISKN)
Jim Embry, Sustainable Communities Network; Atrus Ballew Farms
Nora Frank-Buckner, Tahoma Peak Solutions
Edward Johnson III, Oregon Tilth / Organic Seed Alliance Board
Nate Kleinman, Experimental Farm Network
Brigid Meints, Oregon State University
Amirah Mitchell, Sistah Seeds
Nereida Sanchez, Semillas Colibrí
Lane Selman, Oregon State University / Culinary Breeding Network
Chris Smith, Utopian Seed Project
Gayle Volk, USDA-Agricultural Research Service
Alexis Yamashita, Ujamaa Cooperative Farming Alliance / University of Vermont

Very special thanks to conference co-chairs, Cathleen McCluskey and Laurajean Lewis, and all Organic Seed Alliance staff and board members.

Our mission

Organic Seed Alliance puts the power of seed into the hands of growers.

Our vision

Seed grows an equitable, abundant, and resilient future of food.

Our work

Organic Seed Alliance is a 501(c)(3) nonprofit that puts the power of seed into the hands of growers. Our work promotes an abundant and diverse supply of organic seed, tended in perpetuity by skilled, diverse, and interconnected communities of seed stewards.

To advance this mission, we serve growers working with seed across the U.S. through three program areas: 1) collaborative research on crop improvement and seed production for organic systems, 2) education on the agronomic, economic, and socio-political elements of seed work, and 3) legal and cultural advocacy toward policies that support organic agriculture and farmers' rights to save seed. Our approach emphasizes relationship building and network development across program areas.

We prioritize partnerships with organizations and individuals aligned with our values, and we convene spaces where divergent viewpoints can be expressed and explored. In all our work, we ally ourselves with and embrace opportunities to amplify movements for community sovereignty, racial equity, and social justice. OSA's programs are woven of technical expertise, rigorous methods, practical experience, and deep reverence for seed work. We are in awe of the processes of life, and root our organizational systems in the wisdom of ecology. We continually seek input from growers working with seed, ensuring that we are directed by, and accountable to, the people we serve.

Each year, OSA educates thousands of farmers and other agricultural community members through on-farm and online events and resources. Our research program involves organic plant breeding and seed production research, and our advocacy efforts focus on policies that strengthen organic seed systems. Our most recent State of Organic Seed report (2022) is part of an ongoing project to monitor the status of organic seed nationally and provides a roadmap for increasing the diversity, quality, and integrity of organic seed available to US farmers.

Conference Supporters

The Organic Seed Growers Conference is presented by Organic Seed Alliance with support from the OSU Organic Agriculture Program (a part of the Center for Resilient Agriculture and Food Systems in the College of Agricultural Sciences), Organic Agriculture Research and Extension Initiative (OREI), Organic Valley Farmers Advocating for Organics, Northwest Transition to Organic Partnership Program (NW TOPP), Blooming Prairie Foundation, Clif Family Foundation, and eOrganic.

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Special thanks to Ashland Food Cooperative

Friday February 28th Agenda

Registration & Breakfast

Session One

Session Two

Lunch (featuring research poster presentations)

Synergy Spaces

Vivien Sansour Keynote

Happy Hour & Mini Variety Showcase: Curated by the Culinary Breeding Network

Dinner

Synergy Spaces

Farming While Black Screening

Saturday March 1st Agenda

Dance in the Garden: Using Dance to Reconnect to Land and Spirit with Tomia MacQueen

Synergy Spaces

Registration, Breakfast, & Welcome Address

Session Four

A Seedy Pecha Kucha Keynote

Lunch

Synergy Spaces

Session Five

Session Six

Seed Swap & Happy Hour

Dinner & Closing Address

Seed Celebration with Mazigazi Band

Welcome, Bienvenido!

We are honored to have you joining us for the 12th Organic Seed Growers Conference this February 26th to March 1st, 2025. It has been three long years since we convened and five years since we were able to gather in person. This year's conference is a hybrid event, with in-person and virtual programming, blending old and new technologies to support, cultivate, and transform our seed community. Together, we can weave a stronger movement, tightening our bonds through the threads that connect us.

The Conference program includes over 120 presenters and 30 sessions, including 12 fully virtual blocks, on a range of topics covering organic seed production, plant breeding for organic systems, seed policy, and seed stories. Presenters and participants represent the organic seed movement from across the globe, demonstrating the diversity and depth of knowledge and experiences woven into the organic seed and food system. We welcome back Vivien Sansour, founder of the Palestine Heirloom Seed Library, as our opening day keynote speaker, and an incredible panel of organic seed producers who will share their experiences as stewards of regional biodiversity, facilitated by Chris Smith of The Utopian Seed Project on Saturday. In addition to our primary program, we are hosting three pre-conference events: Farm Tour of the Willamette Valley, Intellectual Property Rights on Seed Symposium, and Agricultura Orgánica y Producción de Semillas. The virtual portion of the conference is being held on Organic Seed Commons, an online networking platform where participants interact and build community beyond the event.

We're proud to partner with Oregon State University's Center for Resilient Agriculture & Food Systems to present this year's Conference. In addition to our host partner, we're grateful to our planning committee for the incredible care and thoughtfulness they've put into co-creating this gathering.

Thank you for the important work you do and being a part of this year's Conference. Together we are weaving visions of organic seed communities.

With gratitude,



Laurajean Lewis,
Executive Director and
Conference Co-chair



Cathleen McCluskey,
Policy & Advocacy Director
and Conference Co-chair

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Peer-Reviewed Sessions

Proposals were evaluated and chosen by a review committee with diverse representation from organic seed communities. There are four types of sessions in this category.

Panel Discussion | 3-4 expert panelists give brief presentations on their particular perspective on a topic, then interact with participants to respond to questions and feedback.

Roundtable | Begins with ~15 minutes of presentation led by a small group of facilitators, then followed by a participatory and interactive live discussion with session participants that's led by pre-determined questions from facilitators.

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Building Knowledge Between Organic Seed Producers and Certifiers

Speakers: Katie Jagger, Saltwater Seeds; Connie Karr, Accredited Certifiers Association

Facilitator: Jared Zystro, Organic Seed Alliance

Building on the 2024 organic seed producer certifier listening session, this interactive session will allow producers and certifiers to share issues around certification and identify the priority areas where educational materials can be created both to educate certifiers and inspectors about the organic seed production and handling process, and to educate seed producers about the certification process. Attendees will contribute to shaping materials that improve understanding and streamline the process for organic seed certification.

Challenging Monopoly Control of our Food and Agriculture System

Speakers: Sarah Carden, Farm Action; Kiki Hubbard, University of Wisconsin-Madison; Cathleen McCluskey, Organic Seed Alliance; Basel Musharbash, Antimonopoly Counsel

Facilitator: Sarah Carden, Farm Action

The Corporate Takeover of America's Food System: How Monopolies are Undermining Agriculture and Food Security

Sarah Carden, Farm Action

Basel Musharbash, Antimonopoly Counsel

A handful of large corporations have accumulated an alarming amount of power over America's food and agriculture system, with far-reaching impacts, especially in the seed sector. Roughly three dozen companies now control much of the agricultural supply chain, dictating the development and trade terms of everything from farming inputs to food distribution. In some industries, a single company has total control over key products, manipulating prices and holding the fate of its competitors in its hands. In sectors like seeds, a few dominant players share control, using their power to limit competition. Across the entire agricultural landscape, a corporate oligarchy has aggregated the power to determine who gets to farm, how they farm, and what food gets produced—all while controlling prices for consumers.

Four major corporations currently dominate the seed and pesticide markets, but this concentration of power extends beyond seeds. Single companies monopolize the markets for nitrogen, phosphorus, and potassium fertilizers. A single corporation has monopolized control over the manufacture, distribution, and repair of new farm tractors and combines. Four conglomerates share power over the export of key crops such as corn, wheat, and soybeans, as well as the processing of these crops into food and feed products. Similarly, just a few companies control the meat and poultry industries, with one or two dominating the procurement and slaughter of livestock in particular regions. Comparable concentrations of market power are pervasive across the fruit and vegetable processing industries and extend to egg production, milk

processing, and grocery retailing. Grocery sales—historically the domain of countless local and regional firms—are now primarily in the hands of just four national retailers.

These multinational corporations regularly abuse their power to maintain their control over markets—squashing competition, blocking innovation, and extracting wealth from farmers, workers, and consumers. For example, the seed and pesticide monopolies limit agricultural innovation by locking farmers into using expensive, genetically modified seeds and pesticides, of which the effectiveness is declining over time. The fertilizer corporations have engineered chronic shortages of their products to drive up prices, ensuring high profit margins for the past two decades on products they have not improved in over half a century. Farm equipment manufacturers have embedded technology into their machines that makes it impossible for farmers to repair their own equipment or use independent repair shops, forcing farmers to use—and pay for—the exorbitantly priced repair services of manufacturer-licensed dealerships instead.

The meat industry, dominated by just five companies, regularly faces accusations of price-fixing and wage-fixing, but its abuses go much deeper. The Big Five meatpackers depress the prices paid to farmers for livestock, subject plant workers to unconscionable labor conditions, and deceive consumers into paying premium prices with rampant false advertising about the origin, quality, and sustainability of their products. In the dairy sector, the major processors have raised the price of milk for consumers while keeping the price paid to dairy farmers low. In the egg industry, the dominant producers have orchestrated a chronic shortage of egg supplies relative to domestic consumption since the mid-2000s—something that until then had never happened in the history of the United States—allowing them to raise the wholesale price of eggs several times over the level it had previously maintained for four decades (in real dollars).

In the seed industry, the Big Four seed companies control the vast majority of transgenic seed patents as well as distribution channels. This has enabled them to stifle innovation by restricting the ability of breeders and researchers to create new products while preventing those independent firms that are able to overcome these barriers from reaching markets. Through aggressive tying and bundling strategies, these corporations force farmers to adopt technologies and seed varieties that they control, leaving little room for choice or competition. More recently, these firms have gained unprecedented access to farmers' data, creating a stark information asymmetry that gives them insight into farmers' operations and profitability, enhancing their power and their ability to deploy it. Ultimately, this concentration of control undermines innovation, centralizes decision-making over what food is grown in this country, and generates a significant threat to our food security.

It is important to understand, however, that this concentration of power did not happen by chance. The rise of today's agricultural monopolies is the result of a deliberate shift away from antitrust enforcement and an embrace of *laissez-faire* dogma by Democratic and Republican

administrations alike starting in the 1980s. While antitrust authorities looked the other way, today's monopolies systematically deployed mergers and acquisitions, exclusive contracts, discriminatory pricing, and deceptive business practices to eliminate competition—until they were finally entrenched.

There is cause for hope, however. History shows that the American people are not powerless in the face of corporate monopolies. In the 1930s, after decades of unchecked monopolization, the country launched the greatest trust-busting campaign in history—breaking up hundreds of monopolies and cartels across the economy. Simultaneously, a comprehensive apparatus of anti-monopoly policies and programs was implemented through Congress, state legislatures, and the courts to guard against the reconsolidation of power by corporate oligarchs. Within a decade of these efforts, farmers could—for the first time in generations—buy their supplies from competitive markets and sell their crops into competitive markets; rural communities and small cities regained control of their economic lives; and a republic of free, independent enterprise was reborn.

For the past four decades, the lessons of this earlier campaign against monopolies have been forgotten in high places. Antitrust enforcement has weakened, allowing monopolies to flourish. But today, the movement finds itself at a critical juncture, much like in the 1930s. The rise—and success—of new leadership at the Federal Trade Commission and Department of Justice, including Chair Lina Khan and Assistant Attorney General Jonathan Kanter, signaled a shift back toward strong enforcement of antitrust laws. It remains to be seen whether the new administration will continue the movement toward more vigorous antitrust enforcement. Will they allow corporate giants to control our food system, or will they also fight for competitive, fair markets that benefit farmers, workers, and consumers alike?

This paper draws from the Farm Action commissioned report, ["Kings Over the Necessaries of Life: Monopolization and the Elimination of Competition in America's Agriculture System,"](#) written by Basel Musharbash.

Collaboration Across the Grain Value Chain – Participatory Breeding and a New Variety of Winter Wheat

Speakers: Julie Dawson, UW Madison; Andrew Hutchison, Madison Sourdough; John Wepking, Meadowlark Organics

Facilitator: Laurajean Lewis, Organic Seed Alliance

In the summer of 2024, the foundation seed for a new variety of winter wheat was harvested. That doesn't sound very exciting until you hear how many people had to carry this project forward, from one student's PhD, through another's post-doctorate, a migration from Cornell University to University of Wisconsin-Madison, a group of farmers planting trials, and bake tests

performed by professionals across the Midwest and Northeast. Learn about the collaborative journey of developing a new unique wheat variety: a cross between ‘Rouge de Bordeaux’ and the Canadian modern ‘Warthog’ hard red winter wheats that was selected for disease resistance, strong straw, and baking quality, exemplifying the value of cooperation across the grain value chain. This collaboration across the grain value chain has yielded a new variety of wheat that will be valuable to farmers, bakers, and eaters alike.

Concentration of Power, Intellectual Property Rights, and Genetic Diversity in the U.S. Seed System

Speakers: Julie Dawson, University of Wisconsin-Madison; Kiki Hubbard, University of Wisconsin-Madison; Paulina Jenney, University of Wisconsin-Madison

Facilitator: Cathleen McCluskey, Organic Seed Alliance

How can we ensure that farmers have the best seed varieties to meet changing environmental, societal, and market needs? The USDA and a team of researchers from the University of Wisconsin-Madison have been examining issues of consolidated market power in the seed industry and developing strategies to increase opportunities for small, independent companies and public plant breeders and seed growers. In 2023, after a robust public comment period, the team published *More and Better Choices for Farmers: Promoting Innovation and Fair Competition in Seed and Other Agricultural Inputs*, a report focused on the intersection of intellectual property and antitrust in the seed industry and its impacts on the resilience of our food supply. This session will review findings from the 2023 report, provide updates on USDA’s work on fair and competitive markets, and share recommendations toward a more diversified seed system.

Expanding Participatory Plant Breeding Education: A Listening Session to Discuss Successes and Opportunities

Speakers: Charlie Brummer, University of California, Davis; Emily Fratz, Cornell University; Solveig Hanson, Cornell University / Cover Crop Breeding Network; William Hazzard, University of California, Davis; Virginia Moore, Cornell University; Laura Roser, University of California, Davis

Facilitator: Brigid Meints, Oregon State University

Summary

Participatory plant breeding (PPB) is an effective seed improvement strategy for creating resilient varieties adapted to farm conditions with characteristics important to both farmers and eaters. Despite the importance of PPB methods globally, and their increasing use in the U.S., very few academic plant breeding programs offer any formal opportunities to learn methods and

skills in this research method. This panel discussion with researchers from Cornell University, Oregon State University, and University of California Davis invites farmers, seed growers, educators, and other researchers to learn both about the successes, but also to explore gaps in PPB education, share lessons from past projects, and brainstorm opportunities to train the next generation of practitioners. Participants will engage in facilitated small group discussions and larger collaborative dialogue aimed at advancing education initiatives in this critical area. Topics covered will include skills needed to do PPB, needs and opportunities for PPB education, what has gone well and what has been difficult in past projects, and how we can prepare students to embark on PPB projects.

Introduction

Cultivar development is an important pillar of organic production. Many commercially available seeds were not developed for low-input management systems, and will potentially not have the same yield response. To alleviate this, some plant breeders have turned their focus to breeding specifically for organic markets, developing breeding lines with improved biotic and abiotic stress tolerance, while improving yield, in organic systems. In addition to these new breeding targets, the overall approach to breeding has changed as well. Rather than focusing breeding decision-making solely within the research community, many breeders have emphasized participatory plant breeding, or breeding performed by or in conjunction with the growers and eaters that will be the end users for these products. In order to expand participatory plant breeding efforts, new education programs are necessary to train the next generation of breeders in these methods, both in universities and on farms.

Participatory plant breeding (PPB) is a form of decentralized breeding grounded in the belief that farmers are the experts on their local environments and provides a useful framework for developing locally adapted, diverse, climate-resilient varieties, which will be increasingly important as we continue to experience global climate change (Ceccarelli, 1996; Colley et al., 2021; Dawson et al., 2008; Kakaei & Ebrahimi, 2023). PPB is an effective breeding strategy for creating resilient varieties with increased yields (Bruno et al., 2018; Ceccarelli et al., 2003; Gibson et al., 2011), improved adoption (Galluzzi et al., 2014), increased genetic diversity (Joshi et al., 1997), and benefits for household food security (Joshi et al., 2012). The goals of PPB often include agronomic improvement, conservation of genetic diversity, and farmers' seed sovereignty. PPB is often targeted to underserved or marginalized communities who may not benefit from conventional breeding initiatives due to resources, farm size, farm type, or farmer demographics. While more commonly used as a methodology in the Global South, PPB in North America has been especially important for developing varieties adapted to organic farms, and organic farmers and plant breeders have been leaders in bringing PPB tools to the Global North (Colley et al., 2021). Colley et al. (2021) found that breeding for organic agriculture was a priority of 84% of participatory plant breeding programs in the Global North.

There is a documented need for PPB education (GAFF, 2020). Across universities in the United States, very few programs offer participatory plant breeding (PPB) or participatory plant science courses to train future participatory plant breeding practitioners, despite the need for increased education for plant breeders on technical and social aspects necessary for successful PPB projects (Lammerts van Bueren et al., 2020). Limitations to further adoption of PPB may in part be due to this lack of formalized training in participatory plant breeding university programs (Ceccarelli & Grando, 2020). In Ceccarelli and Grando's (2020) review of 171 participatory plant breeding and participatory variety selection papers worldwide, 16 US institutions made a total of 56 contributions to PPB and participatory variety selection publications. Despite participatory plant breeding research taking place at these institutions, there are few formalized options for plant breeding education for plant breeders.

Objectives and Discussion Questions

The objective of this discussion is to promote and expand upon plant breeding education programs. The panel will discuss success and challenges when organizing and implementing PPB programs, as well as engage with the audience to brainstorm new solutions for educators, growers and seed savers.

Discussion questions include:

- What previous experience do you have with PPB projects?
- What roles have you played in PPB projects? (Farmer, researcher, other?)
- What has gone well in past PPB projects?
- What has been difficult?
- How did you learn the skills needed to do PPB and what skills do you think are needed to succeed in PPB?
- How can we prepare students to embark on PPB projects?
- What gaps do you see in current PPB education?
- What resources are needed for training future PPB practitioners?
- What other opportunities for engaging with PPB practitioners would you like to see?
- What barriers do you face to engaging in PPB?

Methods and Results

The Student Collaborative Organic Plant Breeding and Education Program (SCOPE) project was initiated on the Student Farm at UC Davis in 2015 with two primary goals: training the next generation of plant breeders using participatory plant breeding methods and cultivar development for organic systems. SCOPE is rooted in forty years of experiential learning pedagogy at the certified organic UC Davis (UCD) Student Farm.

Since the beginning of SCOPE in 2015, over 50 graduate students and 120 undergraduate students have participated in the project, with each student participating for an average of about two academic quarters, or approximately 4-5 months. Students participate in all aspects of the plant breeding programs, from making cross-pollinations, seed saving, and data collection, to field design, data analysis, and grant writing. Student responses in post-internship evaluation forms have demonstrated that SCOPE was instrumental in introducing plant breeding to many undergraduates and showing them how breeding related to their goals for sustainable food systems. It also showed that students appreciated the welcoming community formed in SCOPE and at the Student Farm, and that they found the experiential, hands-on components especially valuable to a conceptual knowledge of plant breeding and understanding the practical and human aspects of plant breeding and agriculture more generally.

As a breeding program, SCOPE has focussed primarily on common bean, lima bean, tomato, and pepper since its 2015 inception. Since 2020, SCOPE has added new breeding programs on wheat, zinnia and celtuce (aka, stem lettuce). In 2023, SCOPE added a spinach breeding program. The common bean breeding program had begun before SCOPE began, and consequently, SCOPE was able to release five cultivars of common bean in 2021. The pepper breeding program had also begun before SCOPE began, and applications to release three pepper cultivars is currently in progress with a projected release some time in the next few years. These peppers include two jalapeño types with larger cavities designed for stuffing with cheese for use as “poppers” and one bell pepper with improved sunscald tolerance. With tomatoes, five advanced inbred lines have been identified for potential cultivar release in the next 2 years. The organic wheat breeding program has focused on the evaluation of germplasm for adaptation to California organic production systems, especially for fall-planted spring wheat. The wheat breeding program has developed 29 advanced breeding lines, including blue and charcoal (dark red-brown) wheats, that are currently being evaluated for yield and whole wheat baking quality. The zinnia project began in spring 2020, and currently four promising varieties are entering on-farm trials for potential release.

Discussion

The SCOPE project has developed a model for plant breeding education and organic cultivar development, including some aspects of PPB. However, over the course of its duration, several challenges have emerged that will be points of improvement in the future. Long-term sustainability of funding for plant breeding education programs remains a significant hurdle. SCOPE, and other programs like it, have relied primarily on federal funding for staff and

resources to manage these programs. While variety releases could serve as a potential funding source, even the most successful varieties may not be sufficient to meet the needs of the program as it currently stands. Additionally, modularity of the program has also been a challenge. Efforts have been made to expand the education resources beyond university, but adaptability and promotion are still difficult. Finally, grower participation in programs could be expanded.

Current PPB programs primarily partner with growers for later trials, while more involvement could be made in the earlier parts of the project. Additionally, more education and resources could be provided to growers so that they are better equipped for data collection and other scientific inquiry, in addition to qualitative assessments.

SCOPE is funded by the USDA Organic Research and Extension Initiative (Award # 2023-51300-40963)

References

- Bruno, A., Katungi, E., Stanley, N. T., Clare, M., Maxwell, M. G., Paul, G., Patrick, R., & Richard, E. (2018). Participatory farmers' selection of common bean varieties (*Phaseolus vulgaris* L.) under different production constraints. *Plant Breeding*, 137(3), 283–289. <https://doi.org/10.1111/pbr.12594>
- Ceccarelli, S. (1996). Adaptation to low/high input cultivation. *Euphytica*, 92(1), 203–214. <https://doi.org/10.1007/BF00022846>
- Ceccarelli, S., & Grando, S. (2020). Participatory plant breeding: Who did it, who does it and where? *EXPERIMENTAL AGRICULTURE*, 56(1), 1–11. <https://doi.org/10.1017/S0014479719000127>
- Ceccarelli, S., Grando, S., Singh, M., Michael, M., Shikho, A., Al Issa, M., Al Saleh, A., Kaleonjy, G., Al Ghanem, S. M., Al Hasan, A. L., Dalla, H., Basha, S., & Basha, T. (2003). A methodological study on participatory barley breeding II. Response to selection. *Euphytica*, 133(2), 185–200. <https://doi.org/10.1023/A:1025535609828>
- Colley, M. R., Dawson, J. C., McCluskey, C., Myers, J. R., Tracy, W. F., & Lammerts Van Bueren, E. T. (2021). Exploring the emergence of participatory plant breeding in countries of the Global North – a review. *The Journal of Agricultural Science*, 159(5–6), 320–338. <https://doi.org/10.1017/S0021859621000782>
- Dawson, J. C., Murphy, K. M., & Jones, S. S. (2008). Decentralized selection and participatory approaches in plant breeding for low-input systems. *Euphytica*, 160(2), 143–154. <https://doi.org/10.1007/s10681-007-9533-0>
- GAFF (2020) Shared Action Framework for Resilient Seed Systems. Global Alliance of the Future of Food. Available at

<https://futureoffood.org/wp-content/uploads/2020/02/Resilient-Seed-Systems-Shared-Action-Framework-English.pdf>.

Galluzzi, G., Estrada, R., Apaza, V., Gamarra, M., Pérez, Á., Gamarra, G., Altamirano, A., Cáceres, G., Gonza, V., Sevilla, R., Noriega, I. L., & Jäger, M. (2014). Participatory breeding in the Peruvian highlands: Opportunities and challenges for promoting conservation and sustainable use of underutilized crops. *Renewable Agriculture and Food Systems*, 30(5), 408–417.
<https://doi.org/10.1017/S1742170514000179>

Gibson, R. W., Mpenbe, I., & Mwanga, R. O. M. (2011). Benefits of participatory plant breeding (PPB) as exemplified by the first-ever officially released PPB-bred sweet potato cultivar. *The Journal of Agricultural Science*, 149(5), 625–632.
<https://doi.org/10.1017/S0021859611000190>

Kakaei, M., & Ebrahimi, M. A. (2023). Participatory Plant Breeding in Relation to Genetic Diversity, Food Security, Plant Development and the Need to Pay Attention to Oilseed Crops. *Agrotechniques in Industrial Crops*, 3(2), 96–103.
<https://doi.org/10.22126/ATIC.2023.9176.1099>

Lammerts van Bueren, E. T., Almekinders, C., Chable, V., Bocci, R., Messmer, M., Weltzien, E., Rattunde, F., & van de Vijver, C. (2020, December). Postgraduate course (‘Train-the-trainers’) - Participatory Plant Breeding & Resilient Seed Systems: Options for Stakeholder Engagement and Benefit Sharing [Teaching resource]. <https://doi.org/10.21%20-%20Martha%20Willcox.pdf>

Exploring the Potential of Seed Source Transparency and Attribution

Speakers: Edmund Frost, Common Wealth Seed Growers and Twin Oaks Seed Farm; Sarah Kleeger, Adaptive Seeds

Facilitator: Kiki Elfendahl, Organic Seed Alliance

This presentation and discussion, convened by Seed Worker Organizing, will explore the concepts of seed source transparency and seed origin attribution as framings that can improve the functionality of our seed systems, and contribute to farmer and community empowerment.

Seed source transparency is the practice of sharing information about where seeds were grown and who grew them. Seed origin attribution adds to this by naming others who cared for, created or synthesized the varieties and strains that are being sold or shared. This could include communities as well as individual plant breeders, and those who have kept, stewarded and adapted the seedstocks.

Seed Worker Organizing (SWO, seedworkers.org) is a self-organizing group of seed growers investing in mutual aid, knowledge sharing, advocacy for fair seed prices and contracts, better seed ethics practices, and agrobiodiversity conservation. SWO got its start at the 2022 Organic Seed Alliance conference, with a workshop called “Labor in the Organic Seed Movement.”

One of SWO's main projects since then has been the creation of a "Seed Production Contract Guidelines" document, an effort that continues to evolve based on input and ideas from seed growers and seed companies. Heron Breen of SWO's Seed Contract Working Group is presenting an overview of the document at another workshop during this conference.

Edmund Frost and David Catzel, also part of the Seed Contract Working Group, are two of the presenters at this workshop. In the course of writing and visioning about seed contracts, seed source transparency and seed origin attribution came up as concepts demanding special attention and focus (even though at first glance their relation to contracts may seem indirect). Hence this second workshop. Please explore the most recent version of Seed Production Contract Guidelines at seedworkers.org/seed-production-contract-guidelines.

Following are excerpts from the document about seed source transparency:

In the interest of both fairness and quality, we strongly recommend that seed sellers and distributors of any scale take immediate efforts to become transparent regarding the sources of the seeds they sell and the origins of the varieties and seed stocks. This will improve the utility and quality of seeds for end users, and is conducive to better recognition and fairer treatment of the seed growers, farming communities, and plant breeders worldwide who are the origins of the seed supply...

In addressing these issues we take a nuanced approach of both embracing international collaboration around seeds and seed work, and challenging commodity-based models that simply seek workers who will produce seeds for less pay...

Seed Source Transparency values and supports the growth of relationships around seeds, and the quality elements that go along with these relationships. We want to help create a culture and an expectation around seed source transparency that supports this. In contrast, many current models treat seeds more like commodities, at the expense of seed system quality, grower empowerment, and mutually beneficial relationships.

The document goes on to address and advocate for seed origin attribution, wherein plant breeders, variety stewards, and communities present and past who contributed to the variety (and/or its parent varieties) are named — to the extent possible and practicable.

About the presenters at this session:

-Edmund Frost has been growing seeds and doing research and plant breeding work at Twin Oaks Seed Farm in Louisa, Virginia since 2008. In 2014 he co-founded Common Wealth Seed Growers, a retail seed company that prioritizes values of regional adaptation and research, as well as seed source transparency.

-Sarah Kleegeer is a cofounder of Adaptive Seeds, a farm-based seed company that produces more than 75% of the varieties they sell. Sarah's roles at Adaptive Seeds include management of both the fields & the finances; she also works with contract growers and sources seed for resale. Adaptive Seeds is located near Sweet Home, Oregon.

-David Catzel helps run FarmFolk CityFolk's BC Seed Security Program, is the BC representative for the Bauta Family Initiative on Canadian Seed Security, and is a producer for

and board member of BC Eco Seed Co-op, a regional seed company with over 20 farmer members contributing seed.

After initial introductions and short presentations we intend for the majority of the session to be community dialogue. Following are some of the discussion questions and topics we are envisioning:

- What are some current strategies in use for practicing seed source transparency?
- Strategies for embracing and handling challenges related to seed origin attribution, which is often more complex.
- Seed source transparency is easier for smaller seed companies that already prioritize bioregional production. What does it look like for different scales and types of seed companies to center these values?
- How can larger seed companies that often have more complex and/or international sourcing plug in?
- How to create narratives and initiatives that both celebrate (and indeed expand) international collaboration around seed, while also addressing problems and challenges posed by globalized seed sourcing — including race-to-the-bottom labor economics, a tendency towards increased opacity, and in some cases quality and stewardship issues?
- What role can customer education play?
- What are the next steps? Exploring the potential for ongoing organizing efforts among seed companies and seed growers.
- Exploring the potential of branding initiatives around these values.

Farmer-led Breeding Projects Across Canada

Speakers: Craig Boychuck, No Coast Seeds; Dan Brisebois, Tourne- Sol co-operative farm; Evalisa McIlffaterick, Root Cellar Gardens; Chris Sanford, Yonder Hill Farm; Mel Sylvestre, Grounded Acres Organic Farm

Facilitator: David Catzel, FarmFolk CityFolk

Summary:

In the absence of public vegetable breeding programs in Canada, organic and ecological farmers and seed growers are leading the development of regionally adapted vegetable varieties. Growers across the country are working to breed crops suited not only to Canada's diverse climates (e.g., early maturity for short growing seasons, cold tolerance) but also to the needs of local markets, communities, and organic systems. In this session, five farmer-breeders shared insights into their current breeding projects, detailing the regional conditions they are breeding for, along with selection methods, seed production, and commercialization.

Mel Sylvestre, a farmer turned farmer-breeder, has operated Grounded Acres Organic Farm, a queer-run farm on British Columbia's Sunshine Coast, since 2021. In 2016, Mel participated in a participatory variety trials on beets, where she then selected the best performing gold beets and separately striped beets. The next year, Mel started a mass selection population by growing out all their saved roots and saving seed from them. Mel has since been selecting for striped beets with a more golden hue than typical red-striped beets. As the line has become more stable, Mel has named the population, *Golden Chioggia*, and started selling the seeds as a breeding project to gardeners and farmers through BC Eco Seed Co-op. Golden Chioggia has already shown noticeable trends in their appearance and performance, with the diverse colors and patterns enhancing its marketability in local markets.

Chris Sanford is stewarding the seed preservation of *Tancook Island Cabbage*, a 200 year old heritage variety adapted to a Maritime island microclimate, with the goal of adapting the variety to her inland farm conditions. Historically, this crisp and flavorful cabbage was grown by a handful of family farmers for generations on Tancook Island, creating a strong sauerkraut industry that complemented the region's fishing and farming heritage. As the original stewards wanted to ensure the variety continued on after they passed, they shared seeds with Chris and other local growers to preserve. Since growing the variety in her region, she has navigated challenges in seed production, learning that the variety is not very cold or heat tolerant, vulnerable to white cabbage butterflies, and requires careful overwintering of heads to ensure viable seed. Despite these challenges, Chris has expanded her starting amount of 50 seeds to over 80 grams of seeds. Her next steps include selecting for cold hardiness, field vigor, and improved seed yields. She hopes more growers will take an interest in this variety, especially those in similar microclimates, and welcomes collaboration.

Evalisa McIlffaterick has been collaboratively breeding watermelons suited to Northern Ontario's brief summers and cool nights. She lives in hardiness zone 3A, just outside of Thunder Bay, ON, where growing delicious, fully ripened watermelons is a challenge. After learning about landrace breeding, Evalisa partnered with Manish Kushwaha of Gaia Organic Seeds, who cross-pollinated 23 watermelon varieties to start their landrace population. Manish then shared these genetically diverse seeds with Evalisa and three other growers in Ontario and Quebec. For Evalisa, while the first year of her crop faced issues like damping off and animal predation, the viable seeds she saved then planted out for the second year had noticeably fast germination and ripened a lot earlier, giving her an abundance of ripe fruit. By the third year, she harvested the best melons she'd ever grown. To maintain genetic diversity, she primarily selects for ripeness, taste, and texture while disregarding rind and flesh color, fruit shape and size, and even yield. In 2025, a grow-out of watermelons from all the breeding sites will be conducted (along with a commercial check) at the Lakehead University Agricultural Research Station.

Craig Boychuk set out to develop a bi-color zucchini as an open-pollinated (OP) alternative to the F1 Zephyr zucchini. Starting in 2020 with a mix of solid-colored green and yellow zucchinis from a grex population called Zucchini Surprise (offered through his seed company, No Coast

Seeds), he was able to hand pollinate and get seed from one bicolor plant. By 2022, he had three promising lines with varying degrees of bi-color expression and stability. Through controlled self- and cross-pollination, he found that selfed plants produced a higher proportion of bi-color fruit per line. Craig's current goal with this zucchini, now called *Double Happiness*, is to grow out more selfed lines to increase the bi-color fruit expression and better understand its inheritance patterns. He was also able to discover a new tri-colour zucchini during the breeding process that he also hopes to stabilize. Craig welcomes any insights into zucchini color genetics.

Dan Brisebois started his poppy breeding project back in 2008 as a way to have fun with breeding. For years, he has grown various poppy varieties on his farm, offering the seeds as a diverse mix through his cooperative seed company, Tourne-Sol Seeds. Over time, he observed that poppies primarily self-pollinate, allowing him to grow multiple varieties in a small space without unintended crosses. This has also allowed Dan to select for desirable traits among different flowers and cross-pollinate them to create new breeding lines. Dan has kept detailed notes and photographs of his selections and lines, while incorporating feedback from team members and the public on what he should select for. After over 10 years of working with poppies, Dan is now slowly commercializing the different poppy lines, each with unique combinations of colors, shapes, frills, and pod sizes.

These farmer-led breeding projects demonstrate the ingenuity and dedication required to develop resilient, locally adapted varieties in the absence of public breeding programs. All growers on this panel welcome opportunities for networking, knowledge sharing, and collaboration.

Acknowledgements:

This panel session was coordinated by the Bauta Initiative on Canadian Seed Security, a program of SeedChange. The Bauta Initiative aims to create and support seed systems in Canada that promote agroecology and food sovereignty, and are resilient in the face of climate change. We work with farmers and seed savers who employ agroecological farming practices and are interested in saving, producing, or developing varieties of grain and vegetable seed adapted for Canada's diverse growing regions. Learn more about us at seedsecurity.ca.

Farmer-led Seed Systems: Advocating for Policies that Advance Seed Sovereignty at Home and Abroad

Speakers: Marvin Gómez, SeedChange; Pratap Kumar Shrestha, SeedChange

Facilitator: Aabir Dey, SeedChange

Seed systems are the ways in which seeds are produced, saved, exchanged, and sold in a community and country. In most colonized countries in the world there are two types of seed systems: farmers' seed systems and formal (or institutional or colonial) seed systems. Globally, farmers' seed systems are often characterized by high levels of intraspecific and interspecific

seed diversity with seeds being produced, adapted, and developed by smallholder farmers predominantly for household, on-farm, community use, and local markets. Formal seed systems are often characterized by public and/or private research institutions that breed and maintain new crop varieties, national seed authorities that set and monitor quality standards, and commercial seed operations that participate in domestic and international markets. Formal and farmers' seed systems would ideally work together in complementary ways that allow both systems to access resources from each other to preserve, adapt, and develop seed diversity for the well-being of farmers, seed growers, and the general public.

In reality, due to the impacts of privatization and corporate consolidation in the seed sector and its resultant impacts on the formation of domestic and international seed policies and regulations, the formal seed system has marginalized farmer seed systems all over the world. Through criminalizing the distribution of peasant seeds and traditional varieties, restricting on-farm seed saving of new varieties with oppressive intellectual property mechanisms, and enabling private plant breeding at the expense of public or farmer-led variety development, the formal seed system - inadvertently or not - discriminates against organic, ecological, smallholder, and Indigenous farmers. Although global agreements like the International Treaty on Plant Genetic Resources for Food and Agriculture have been formed to help curb the erosion of agricultural biodiversity and limit the exploitation of smallholder and Indigenous farming communities, the reality is that the formal seed system continues to exploit the crop diversity preserved by farmers for the development of new varieties, often without any acknowledgement or rewards to farmers for their innovation and contributions.

SeedChange - a charitable organization that supports over 40,000 farmers in 11 countries in Africa, Asia, Mesoamerica, and in Canada - has been working to support farmers to build alternatives to this reality and advance an enabling policy landscape where farmers have freedom to save, adapt, and develop seeds that thrive in regional, agroecological farming conditions and support food sovereignty. Despite the geographic, political, cultural, and economic differences between all of the countries SeedChange works in, agroecological farmers who are trying to build resilient seed systems face many of the same policy barriers. Unsurprisingly, farmers in all of these jurisdictions are leading the way to either build alternatives outside the formal seed system or take on considerable effort and risk to work with the formal seed system to address these barriers. Many of these efforts have been well-documented in the US such as the Open Source Seed Initiative, the Seed Workers Organizing Group, and the advocacy work of the Organic Seed Alliance. However, we hope that by highlighting parallel efforts in other jurisdictions like Canada, Honduras, and Nepal we can work towards building greater solidarity to support farmer-led seed systems that advance agroecology and food sovereignty.

Canada:

In Canada, the Seeds Regulations are the primary piece of legislation that governs how seed quality and seed distribution is regulated in Canada. The regulations also provide a variety

registration system that ensures that new varieties of field crops go through a public peer review process before being released. Unfortunately this system is incredibly challenging for field crop farmers to navigate, making it virtually impossible to commercially distribute organic farmer-bred varieties of field crops or to distribute heritage field crops. SeedChange is working to change these components for organic, farmer-bred varieties without weakening the overall seed quality provisions for all farmers. We need to clearly advocate for increased public funding for farmer-led, organic variety development and for regulatory accommodations that enable farmers to grow and distribute heritage field crop varieties, while also ensuring that public oversight of seed quality and variety registration is maintained.

Honduras:

In Honduras, farmer research committees (CIALs) and their partners have developed nine varieties of maize and 11 varieties of beans through PPB over the past few decades - an incredible display of ingenuity and skill led by collaborations with farmers and research institutions. Of these, one bean and five maize varieties were released nationally through the formal system, in collaboration with research and government institutions. However, similar to Canada, the process to register these varieties is lengthy, top-down, and complex. For this reason, many new varieties resulting from PPB are released locally outside the premises of national seed laws through municipal means or other avenues to promote wider dissemination and recognition, including protection from biopiracy. However, because these varieties lack formal recognition, farmers can only sell these seeds in informal markets. As a result, many farmers' organizations are also developing mechanisms for local registration and certification of seeds. The National Bean Chain in Honduras - a platform with 160 smallholder bean producers' organizations - launched a pilot project in 2019 in four municipalities for local seed certification, also using the Bean Seed Protocol. These pilots involve technical committees composed of farmer organizations and research committees (CIALs) and non-governmental organizations, the Zamorano Pan-American Agricultural School, and state agricultural agencies.

Nepal:

Nepal offers a model for other countries to adopt formal seed systems that are more supportive of farmer seed systems. Farmers, communities, and community seed banks can register their local, traditional varieties and PPB varieties. Registration is done by the National Seed Board, but registration criteria have been adapted and relaxed, in particular with respect to uniformity and stability for local varieties. This recognizes the rich genetic diversity and plasticity of local varieties and gives credit to farmers' abilities to recognize how a variety performs in different environments and altitudes. Seed certification is also fully decentralized in Nepal, enabling farmer seed producer groups to get their seeds locally certified. The process is also simplified with a farmer-friendly certification category called Truthfully Labelled Seeds. It requires minimum seed inspection, relies on farmers' trust and makes farmer seed producers accountable for the quality of their seeds. Community-produced Truthfully Labelled Seeds now contribute

more than 40 per cent of the total certified seeds for basic food crops in Nepal (maize, rice and wheat).

Acknowledgements:

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Growing Seed Freedom in Latin America: Lessons from the Field

Speaker: Javier Carrera, Seeds Guardians Network of Ecuador

Facilitator: Laurajean Lewis, Organic Seed Alliance

Representatives from Ecuador's Network of Seed Guardians will share their experiences in advocating for seed freedom, including farmer education, public outreach, and participatory certification and advocacy. The session will also highlight similar struggles across Latin America, fostering solidarity in the global fight for seed sovereignty.

Growing Seed on a Market Garden

Speaker: Dan Brisebois, Tourne-Sol Co-operative Farm

Facilitator: Susana Cabrera-Mariz, Organic Seed Alliance

Every Market Grower Should Be A Seed Farmer

Dan Brisebois, Tourne-Sol Cooperative Farm + host of the Seed Farmer podcast

I want every market grower to be a seed farmer. This scares a lot of market growers who think about August and an already infinite to-do list. But growing seed on a market farm does not have to grow you out. Below are the general principles that we'll cover in the presentation.

A few growing differences between market crops and vegetable crops

- Seed crops are usually in the ground longer
- Seed crops don't like overhead watering
- Seed crops need to be harvested before the weather gets rainy

Start small

If it's your first year growing seed, start with 1 to 3 seed crops. No need to do more than that. You want to get a taste of what seed growing is like and you want to begin a relationship with your plants.

Look for synergies

Choose crops that you can harvest as a market crop and also get seed from. Peppers, tomatoes, and salad greens can all offer you that opportunity.

Ignore the rules

Don't worry too much about cross pollination. You can grow self pollinating crops side by side and you can grow cross pollinating crops 500 to 1000 feet apart and not see too much crossing. And if things cross a bit, they will still be edible and they will also open the door to ...

Breed New Varieties

Market farms have a unique opportunity for on farm breeding. You handle so many plants, and this gives you the opportunity to pay attention to them and choose those that stand out. You also have markets or veggie baskets where you can distribute the culls from your projects. And in the end, you can wind up with signature varieties that no one else has!

Grown by Southwest Farmers for Southwest Farmers: Trials and Pipeline for Regionally Adapted, Certified Organic Cover Crop Seed

Speakers: Samantha Hilborne-Naluai, Rodale Institute; Dan Hobbs, Pueblo Seed & Food Co.; Rich Pratt, New Mexico State University; Kristin Swoszowski-Tran, Southwest Grain Collaborative; Tim Vos, Southwest Grain Collaborative
Facilitator: Samantha Hilborne-Naluai, Rodale Institute

Over the last several years, the Southwest Grain Collaborative (SGC) and the New Mexico State University Cropping Systems Research Program (CSRP) have been working with farmers across the region to revive seed stocks of historically significant Southwest food crops including landrace corn, heirloom bean, and heritage small grain cultivars to scale production for emerging market opportunities. In 2023, with the support of a 4-year NIFA Organic Transitions grant, we expanded our research to develop varieties of regionally adapted cover crops that can be grown with limited supplemental irrigation. We have focused on summer cover crops, a mix of legumes and grasses, with an emphasis on crops that are also palatable for livestock. The following cover crops are being evaluated: cowpea, tepary bean, sunn hemp, teff, sorghum-sudangrass, and millet. We use a participatory approach, with farmers being part of the trialing and selection process from the beginning.

In our first two years of cover crop replicated field-trial research at two university locations, we found that all cultivars tested displayed some adaptability to heat and drought, with only modest supplementary irrigation. Particular cover crops provided high levels of specific ecosystem services. For example, sorghum-sudan grass and millet showed excellent canopy cover, biomass production, and weed suppression, while the legumes (sunn hemp, cowpea, tepary bean) provided excellent forage quality. Retention of soil moisture was also notable by cowpea, tepary bean and millet.

Farmer-cooperators have also conducted two years of variety trialing on their own farms, which range in elevation from 4,000 to 7,400 feet. We have focused here on the reflections of one farmer cooperator who is presenting at the 2025 conference, and is based in Ledoux, NM at 7,400 feet elevation. Timing of planting and harvesting is everything. Due to late spring and early fall frost/snow potential, optimal planting time for pearl or German millets at high elevations are either seeding in fall and overwintering, or planting very early (late March-early April) in order for the seed to mature properly in the fall. Overwintered German foxtail outperformed the intentional, broadcast June-seeded crop as it matured faster and produced a greater full seed head come fall. She has found that it's best to hand harvest some mature seed rather than none, when an early onset snow occurs. If there is no snow early on, she can harvest the seed head in entirety via hand or mechanical means. Birds, especially finches, will decimate the mature seed heads if left on the stem too long in the fall. Since finches perch on the standing stems, it is recommended to thrash some seed heads for overwintering, leaving some to birds for winter feeding if desired. Lastly, teff does well in Ledoux, and is used as a dual use crop as livestock forage and human consumption. However, lodging can be an issue and so further field trials of more suitable cultivars and varieties is warranted. She will be field-trialing more than 10 new candidates this summer from GRIN accessions, notably observing lodging behavior.

As a group of farmers and researchers, we have collectively found that there is a high level of specificity involved with matching the ideal cover crop to the particular bioregional characteristics of each farm. This is especially true in New Mexico and the greater Southwest where there is dramatic geographic variability. For example, between farm and university research sites, we cover growing zones 5 to 9. Another level of specificity is a farmer's preference for each crop on their farm. One is better suited for small grain production and has harvesting equipment for this. Another is very interested in drought-tolerant tepary beans and teff at 7,400 feet elevation, largely for the dual-purpose of the edible cover crop potential for both humans and animals. Farmers' preferred crops also heavily depend on whether it fits into their rotation neatly. These small but important differences imply that each farmer would probably want to specialize in one or two cover crops for seed production.

We are currently navigating the complexities of selecting a short list of candidates for seed increases, and eventual scaling for commercial seed production. In early 2025, we will be working with the Rocky Mountain Farmers Union Cooperative Development Center, which will conduct a feasibility study and create a business plan. Our value proposition at this point is focused on certified organic cover/forage crop seed and specialty food grade grains. Working with RMFU will help us understand the opportunities and challenges of bioregionally focused seed production operations that can be economically viable and ecologically sustainable. We're committed to developing regionally adapted cover crop seed, to be grown at scale for commercial distribution, produced by Southwest farmers for Southwest farmers.

Heritage Grains – From Seed to Table

Speakers: Steve Fry, Fry Family Farm; Brigid Meints, Oregon State University; Chris Hardy, Rogue Valley Heritage Grain Project

Facilitator: Laurajean Lewis, Organic Seed Alliance

Rogue Valley Heritage Grain Project

Chris Hardy, Hardy Seeds, Ashland, OR

Overview

Growers of the Rogue Valley have been facing historic climate extremes in recent years compounded by limited access to irrigation water. The trend has pushed many of our mainstay farms to seek out more climate appropriate crops, and in some cases move out of the region or quit farming altogether.

A glint of hope arrived in 2019 when the Rogue Valley Heritage Grain Project was formed and an effort began, trialing dry farmed ancient and heritage seeds which have shown much promise through some of the most intense heat waves and drought the region has ever experienced, giving locals hope in a conscious push toward a decentralized food system and regionally adapted seeds.

Heritage grains are in high demand for bakeries and farms across the U.S. seeking seeds that have proven their ability to increase soil carbon and overall soil health, which is directly linked to greater on-farm resilience. Increased soil carbon correlates with healthier plants and a decrease in the need for external inputs such as irrigation water, fertilizer and other inputs.

Currently, across the U.S., heritage grains are extremely difficult to source, as there is not enough seed for farmers to plant. This challenge has been accelerated due to the modernization of nearly all seeds planted over the past 100 years, leaving culturally significant seed, many varieties that have historically fed millions, all but lost. A number among these varieties have led the charge against famine over hundreds and even thousands of years; others noted in religious and ancient texts as the holy grail and salvation for entire villages and even nations.

A turning point came in 2019 when I was invited to join the Rocky Mountain Seed Alliance (RMSA) heritage grain trials to help identify and record cultural traits of nearly lost varieties that exhibited promise for healthier people and for regenerative farming systems. I enthusiastically accepted the task of putting dozens of heritage seeds to the test. The support and resources Lee-Ann Hill and Bill McDorman offered were vital to making our project what it is today.

Each year the seeds were grown without supplemental irrigation water or fertilizer and were meticulously observed and cataloged. Those that performed best under the extreme environmental stresses they experienced over the first few years were planted and the seeds

harvested were shared with local growers. They agreed to grow them out under similar conditions the following season to help increase the seed stock so other growers would be able to plant and scale up.

Since 2020, we have recruited more than thirty regional growers to assist with seed increases. One of our larger partners, Fry Family Farm, grew more than 50 acres of Certified Organic heritage grains which has been critical to getting them into local schools and bakeries. It was just a teaspoon of seed that the project started with, and within a couple of years, five small-scale growers were able to produce enough seed to help this larger established farm produce tens of thousands of pounds of historic heritage wheat from regions within Ukraine, Kazakhstan, Armenia, Palestine and others.

The project has expanded to include warm weather grains, oil seeds and legumes such as fava, chickpeas, flax, peas and lentils. Growers are asked to return 15% or more of their harvest back to help grow the seed library for those wishing to scale up.

This network of regional growers planting in a diversity of micro-climates, and in varied soil types and conditions, have given us valuable insight into the traits and merits of varieties that could be the hedge against the challenges of the future. The project has helped local schools access heritage grain seeds and supported Indigenous groups with seed increases for seed bank stock. Other efforts include providing seed and technical assistance to a local Milpa project working to connect ethnic Mexican community members to traditional seeds culturally significant to their family roots.

A tool share is available to those involved in the project and includes small-scale seeding equipment, hand harvest tools, a walk-behind grain reaper/bundler, two manual threshers (treadle and bicycle powered) and a converted dual-powered (gas/electric) belt thresher for in-field use. The Southern Oregon Seed Growers Association *Winnow Wizard* has also been helpful to clean the harvested seeds.

Access to this equipment has expedited the processing of small seed lots and the diversity many of these growers have chosen to work with. Funding for a de-huller and flour mill is being sought for future direct grower access to process their harvest for market.

We have successfully hosted two spring heritage grain day celebrations, bringing together growers, millers, food artisans and supporters from four counties within the area wishing to affirm their commitment to increasing the percentage of heritage grains grown and consumed across the region. After baking trials, artisan bread makers say these nutritionally dense ingredients in their products are far superior in flavor to modern grains they currently use, and that the baking quality and flavor are what their customers are asking for.

As of early 2025, growers are still planting with the mild winter and more than 75 acres of heritage grains are anticipated for harvest later this year. Several local bakeries are using a

significant amount of locally produced grains in their baked goods. And, perhaps as important, we have begun healing the soils of our land and bringing new hope for our community's future here in southern Oregon.

Challenges

- Lack of experience tracking and dealing with pests (squirrels, rats, gophers);
- Minimizing seed co-mingling;
- Extremely limited seed supply;
- Learning curve with equipment operation and harvest

Successes

- Selection of climate resilient varieties;
- Collaborations within the local grower community;
- Trialing poly-culture/intercropped grains, oil seeds, legumes and other crops;
- Increasing food and seed diversity;
- Helping return culturally displaced seeds back into the hands of aspiring farmers of the Indigenous Mexican community;
- Grower training and increasing community knowledge base;
- Visible increase in soil health;
- Increasing interest and amount of locally produced food staples

More info:

[Dry Farming Pictures](#)

[Raw Crop Data](#)

<https://growhardyseeds.com/pages/rogue-valley-heritage-grain-project>

www.roguevalleyheritagegrains.org

How Seed Companies Line Up Growers for Seed Contracts

Speakers: Bonnetta Adeb, Steam Onward Inc/Ujamaa Cooperative Farming Alliance; Reiley Carney, Snake River Seed Cooperative; Ken Bezilla, Southern Exposure Seed Exchange; Emily Pence, Fedco Seeds; Aaron Varadi, High Mowing Seeds

Facilitator: Dan Brisebois, Tourne-Sol Co-operative Farm

Representatives from a diversity of seed companies will discuss how they connect with seed growers and coordinate crop production. The panel will share insights into fostering successful relationships, balancing grower needs, and navigating the complexities of lining up seed contracts.

Lessons from Tomato Selection and Breeding

Speakers: Erica Kempter, Nature & Nurture Seeds; Ambar Carvallo Lopez, University of Wisconsin Madison; Marissa Nix, University of Wisconsin Madison; Keith Mueller, KC Tomato

Facilitator: Michael Lordon, Organic Seed Alliance

Additional Authors for Proceedings Paper: Nicolas Enjalbert, SeedLinked; Alice Formiga, eOrganic; Thomas Hickey, UW Madison, Julie Dawson, UW Madison

Introduction

Organic growers face significant challenges in identifying varieties that align with their farming systems and market demands. These challenges range from ensuring environmental adaptation to addressing specific market preferences. In the Midwest, small to medium organic farmers often sell their produce through direct markets, including farmers' markets, community-supported agriculture (CSA) programs, and local restaurants. For crops like tomatoes, customers prioritize fruit quality—particularly flavor—as well as unique shapes and colors. These demands drive farmers to cultivate diverse market types of tomatoes, which often require varieties that balance quality traits with agronomic resilience.

Because of the specific traits needed by organic growers, participatory research methods may help in selecting varieties adapted to these growing systems and markets. We describe two different approaches to participatory tomato breeding in this paper. The first was initiated by the Seed to Kitchen Collaborative at the University of Wisconsin-Madison after several years of participatory variety trials. This effort began with screening commercial, experimental, and heirloom tomato varieties to identify those best suited to growers' needs, focusing on flavor improvement, high yields, and disease resistance. Building on these results, we developed new breeding lines through crosses and selections conducted both at the university research station and on farmers' fields. Collaborating closely with farmers, we evaluated and selected lines that best met the dual goals of agronomic performance and market appeal.

The second approach sought to support independent breeders who are developing innovative varieties. These independent breeders are often an underappreciated but critical component of organic seed systems. Recognizing the challenges faced by small seed companies and independent breeders—such as limited resources and trialing capacity—this project built on our established network to support the development and evaluation of new tomato varieties. While larger seed companies benefit from multi-location, multi-year trials, smaller organizations often lack such robust systems. Our approach bridges this gap by organizing multi-state grower trials and opportunities for growers to participate in selection. The trials were made possible by the development of breeding tools in the SeedLinked platform. This network provided not only a mechanism to gather high-quality data from farmers' perspectives but also a sustainable framework for ongoing collaboration and evaluation.

This paper details the methods and outcomes of these participatory efforts, including how crosses were designed and implemented, the role of farmer input in the evaluation process, and the

strategies used to integrate these findings into broader breeding initiatives. Additionally, it discusses the challenges encountered in balancing farmers' input and preferences with breeders' objectives, particularly in aligning agronomic traits with market-driven goals while maintaining efficiency and scientific rigor in the selection process.

1. Selecting slicer tomato varieties adapted to the Midwest

This project adopted a participatory plant breeding approach, actively involving farmers in defining breeding goals, evaluating lines, and selecting varieties. This collaboration ensured that the resulting tomato lines addressed the specific needs of growers and their production systems.

1.1. Breeding and selection methods

To identify breeding priorities, we referred to findings from a survey conducted by Hoagland et al. (2015) among Midwest farmers, and grower feedback from facilitated roundtable discussions at multiple agricultural conferences. These efforts highlighted the challenge of finding tomato varieties that combined disease resistance and high fruit quality with high yields. Consequently, these traits became the primary breeding objectives for this project.

For disease resistance, the targeted pathogens differed by production system. In open-field systems, Septoria leaf spot (*Septoria lycopersici*) and early blight (*Alternaria solani*) were prioritized, while in high-tunnel systems, leaf mold (*Passalora fulva*) and powdery mildew (*Oidium neolyopersici*) were identified as the most significant threats.

Regarding fruit quality, sweetness and acidity were identified as key contributors to overall flavor perception. Therefore, sugar content as measured by °Brix and titratable acidity, as citric acid, were used for evaluation. As the project progressed, formal flavor evaluations were incorporated, expanding the focus to include additional attributes such as flavor intensity and umami.

We conducted organic variety trials in the field and in a high tunnel at the West Madison Agricultural Research Station (WMARS, Verona, WI) in 2015 and 2016. Based on these trials, varieties with good performance for production, disease tolerance and flavor were identified as potential parents for new crosses. Varieties also represented different fruit types (slicer, beefsteak) and colors (yellow, orange, red), aligning with farmer priorities. In the summers of 2017 and 2018, over 30 different crosses were made. The resulting progeny were planted at WMARS in organic trials, where yield, disease resistance, and fruit quality were evaluated.

For fruit quality, informal tastings were conducted because logistical constraints made it impractical to establish trained tasting panels for more than 200 plants. Farmers and chefs were invited to field days, where they provided valuable feedback on agronomic traits and fruit quality. The most promising lines were selected for further seed advancement and evaluation.

F₂ seeds from these selections were planted in a greenhouse for seed multiplication, and the resulting F₃ seeds were planted the following year. Additionally, F₃ seeds were distributed to participating farmers for on-farm selection and evaluation. Farmers returned seeds from individual plants they selected, and these were included the following year in on-station trials.

This iterative process of on-station and on-farm trials enabled selection of key traits within the target environments, recognizing that organic farming systems often exhibit greater variability than conventional systems. On-farm selection also provided insights into farmers' preferences, which sometimes diverged from on-station selections. For instance, within the same variety families, farmer-selected plants showed differences in fruit color and size. These differences contributed to maintaining genetic diversity within the breeding program.

Consecutive selection-evaluation seasons resulted in six breeding lines with high potential to benefit organic farmers in the Midwest. These lines were further trialed both on-farm and on-station, with quantitative data collected on yield, disease resistance, and fruit quality. Results indicated that two medium slicer-type lines were highly rated by farmers and stood out for high yields and excellent fruit quality. These two lines are now undergoing the variety release process, with the goal of making them available to farmers for the 2026 growing season.

1.2. Results

This project highlights the importance of farmer collaboration in developing tomato varieties tailored to organic systems and diverse market needs. By integrating on-station trials with on-farm selection, we successfully identified breeding families with the potential to address the dual challenges of agronomic resilience and fruit quality. The iterative nature of this process ensured that the selected lines aligned with both farmers' practical requirements and consumer preferences, fostering a stronger connection between breeding goals and market-driven demands.

The project also emphasized the value of participatory networks in supporting organic agriculture, particularly for small-scale farmers and seed companies. By involving multiple stakeholders, including chefs and farmers from diverse regions, we gained insights that enriched the selection process and contributed to broader breeding initiatives. Detailed results were also published in *HortScience* (Carvallo Lopez et al., 2024) to reach a broader audience.

As we prepare for the release of two promising medium slicer varieties, we remain committed to advancing participatory approaches that empower farmers, sustain genetic diversity, and drive innovation in organic agriculture. Future efforts will focus on expanding these collaborations and refining selection strategies to address emerging challenges and opportunities in sustainable tomato production.

2. Participatory breeding starting with independent plant breeders

Growers, including farmers and gardeners, are an important part of the network to ensure their evolving needs and applicable knowledge are incorporated into varieties. The continuous feedback of consumers, such as chefs and the public, ensures that new varieties have a viable market upon release. Developing a network of seed breeders, seed companies, growers, and consumers leads to long term benefits. With these objectives and stakeholders in mind, the goals of the project were to build a collaborative network in the Midwest, to release a website that integrated the results of both university research stations and participant farms, and to release novel, flavorful varieties with priority traits.

Two plant breeders, Erica Kempter of Nature and Nurture Seeds (Dexter, Michigan) and Keith Mueller of KC Tomato (Kansas City, Missouri) have established independent tomato breeding

programs. Erica's initial breeding objective for this project was an open-pollinated red saladette tomato, comparable to the hybrid variety "Juliet", but with superior flavor. This variety was intended for direct sale through her small-scale seed company. Keith's focus for this project was on breeding yellow- and orange-fleshed tomatoes with high carotenoids, with the goal of producing great tasting fruit featuring high acidity and sweetness. As a small-scale breeder, Keith's objective was to further develop lines for adoption by seed companies.

2.1. Methods

Both Erica and Keith made initial crosses and conducted selection in the F₂ generation of their populations. These populations were registered with the Open Source Seed Initiative (OSSI) and distributed under the OSSI pledge. In the spring of 2021, Erica and Keith provided F₃ seed to the Seed to Kitchen Collaborative at UW-Madison. At university research stations, these lines were scored on traits such as disease resistance, productivity, appearance and marketability, and sensory attributes, including taste preference. Concurrently, the lines were sent out to trial participants across the Midwest to evaluate the same traits. This process was facilitated by SeedLinked, an online platform which enables trial managers to coordinate trials and engage participants, including plant breeders. Through SeedLinked, participants can record data, compare results with others in real time, and communicate via a social media-like feed, fostering collaboration between the trial manager and participants as well as among participants.

After each season, growers returned seed from their most preferred varieties. This seed, along with on-station selections, had a winter greenhouse season to advance the generation and screen for disease. The following year, grower selections were sent back to them, along with a randomized subset of selections from the independent breeder, university researchers and other grower participants. Selections were made jointly with the project team, including Erica and Keith, to ensure alignment with project goals and evolving market demands.

Each year, there were several tasting events hosted at university research stations, participant trials, and restaurants. Depending on the audience, the taste tests included objective questions, hedonic questions, or a combination of both. Commonly assessed attributes included appearance, sweetness, acidity, intensity, umami, and overall preference. After a tasting event, quantitative data was collected on °Brix and titratable acidity, as citric acid.

2.2. Results

From Erica's lines, there emerged five distinct phenotypes: orange, red, and striped saladette fruit types, and pink and red round types. We are currently producing seed of the top selections which are now stable lines. In January 2025, Erica released "Jada", a saladette type with pink flesh and golden stripes through Nature and Nurture Seeds. From Keith's lines, we have stable and highly rated yellow/orange bi-color lines of cocktail size, with the goal of connecting to organic seed companies to up-scale seed production. Finished lines are also pledged to OSSI.

SeedLinked has evolved to be a community hub of over 11,000 global growers and has incorporated a seed marketplace. Over the four years of the project, the Seed to Kitchen Collaborative conducted twelve trials featuring Erica and Keith's lines with nearly 300 participants. The platform generates immediate live results from growers' data which has significantly reduced the turnaround time for distributing trial outcomes. This is a substantial

improvement over the previous method where participants used paper datasheets, necessitating manual data entry and analysis by researchers.

Additionally, other accomplishments from the project include the “Climatic Considerations and Risks for Seed Production in the Midwest” report which was spearheaded by the Organic Seed Alliance (Organic Seed Alliance, 2024). eOrganic, an online resource for agricultural growers, produced many materials during the project including articles, webinars, and tutorial videos (<https://eorganic.info/node/34505>).

As well as successes, the project faced several challenges. The grant was issued in January 2020, shortly before the onset of the COVID-19 pandemic in March 2020, which resulted in the temporary closure of some institutions and the transition of others to remote operations. The inability to collaborate in person and insufficient virtual meeting technology at the beginning of the grant led to a slow start. COVID-related labor shortages further complicated the project, resulting in challenges of maintaining plants and managing harvests effectively for researchers, independent breeders, and growers alike.

Together, the University of Wisconsin-Madison, Nature and Nurture Seeds, KC Tomato, SeedLinked, the Organic Seed Alliance, and eOrganic, formed the Midwest Collaborative Plant Breeding Network. This region-specific network established connections that will persist beyond the end of the project and fostered relationships among other individuals, such as growers, chefs, and consumers.

Conclusion

These projects provided insight into the opportunities and challenges associated with participatory plant breeding. The projects helped identify and release diverse tomato varieties that excel in organic farming systems and meet market demands, especially flavor. The collaborative efforts between organizations across the Midwest created a network of growers, researchers, independent breeders, seed companies, and consumers that generated high-quality data and will foster ongoing collaboration. The project also highlighted the importance of balancing diverse stakeholder priorities. Aligning growers’ preferences with breeders’ objectives allowed efficiency while addressing market-driven goals. Overall, this initiative provided a sustainable model for participatory plant breeding and developed varieties that have potential for future advancement.

References

- Carvallo Lopez, A., Nix, M., Hickey, T., & Dawson, J. C. (2024). Improved Tomato Breeding Lines Adapted to Organic Farming Systems Have Enhanced Flavor, Yield, and Disease Resistance. *HortScience*, 59(9), 1299-1307.
- Hoagland, L., Navazio, J., Zystro, J., Kaplan, I., Gomez, J., Gibson, K. (2015). Key Traits and Promising Germplasm for an Organic Participatory Tomato Breeding Program in the U.S. Midwest. *HORTSCIENCE* 50(9):1301–1308.
- Organic Seed Alliance. (2024, August 30). *Climatic considerations and risks for seed production in the Midwest*. https://seedalliance.org/publications/midwest_climatic_considerations/

Listening Session: Seed Grower Education

Speakers: Lauren Buffaloe-Muscatine, University of California, Davis / Napa County Seed Library; Chris Keeve, University of Kentucky / Ujamaa Cooperative Farming Alliance / Utopian Seed Project; Amirah Mitchell, Sistah Seeds, Ira Wallace Seed School

Facilitator: Chris Smith, Heirloom Collard Project

Organizers from the Ira Wallace Seed School will share their approach to designing accessible seed production education for Black, Indigenous, People of Color (BIPOC) growers. Drawing on feedback from their inaugural cohort, they will present lessons learned and invite attendees to share their own experiences, challenges, and successes in learning seed production. This session fosters discussion on how to make seed education more equitable and inclusive for diverse communities.

Local Seeds for Local Food: Strengthening Regional Seed Systems for Sustainable Communities

Speakers: Julia Dakin, Going to Seed; Melissa DeSa, Working Food; Jim Embry, Sustainable Communities Network/Cumberland Seed Commons/Atrus Ballew Farm/Slow Food USA; Nancy Kost, The Buffalo Seed Company; Anna Mieritz, Going to Seed;

Facilitator: Edward Johnson, Oregon Tilth

Jim Embry

Our family came to Virginia in an enslaved condition largely out of Nigeria around 1780 or so and were later forced to move across the Appalachian Mountains into Kentucky, where we've been since 1800. I live in this rural Black agrarian community that's been here for over 200 years. My ancestors brought a deep reverence for the land. They danced and prayed for food, celebrated harvests, and honored the cycles of the moon and earth. Seed saving wasn't separate from other tasks like quilt-making or barn-raising. Food, seeds, and rituals were inseparable.

Our connection to seeds goes back billions of years—back to the formation of the earth. I like to think of seeds cosmologically. We're stardust, condensed into human form, and seeds are a physical representation of that. This perspective informs how I approach farming, food, and life.

Resilience is about survival—not just as individuals, but as a species. Communities must adapt to overlapping crises, like climate change and pandemics. We need smaller-scale, bio-regionally focused communities where people produce food locally and share resources. Everyone should be growing something.

I see myself as a pollinator. On our farm, we've created pollinator habitats with native plants, but I also pollinate ideas. My vision is grounded in an earth-centric and woman-centric foundation. Indigenous knowledge is crucial here. For example, in Turtle Island, people call corn, beans, and squash the “three

sisters,” emphasizing their familial connection. We need to build on these traditions while addressing systemic issues like corporate seed monopolies. The agribusinesses have 25-year plans to dominate global agriculture. We need a 25-year vision for our seed movement. Universities educate future leaders in every field—agriculture, government, business. If we can influence their priorities, we can drive systemic change.

Nancy Kost

I’m from Bolivia. I didn’t realize we were poor until I read reports in grad school stating Bolivians lived on less than \$1 a day. Growing up, we had the freshest food and a connection to seed saving. In my community, planting was a shared process. For example, with potatoes, we’d save the seeds, plant in September, harvest around March or June, and process them during the cold months to make *chuño*—dehydrated potatoes that stored well. We had diverse varieties, and everything felt connected. I loved it.

When the price of quinoa shot up, people planted every bit of available land. It created conflict. Community lands were overused, families fought over plots, and soil was overtilled. Hybrid quinoa, synthetic fertilizers, and mechanized farming were introduced, and traditional methods like resting the soil for years were abandoned. By 2011, people had stopped planting quinoa for themselves and switched to buying pasta and rice instead.

Realizing how consolidated the seed industry was becoming, I started saving seeds around 2010. We searched the USDA seedbank for crops from climates similar to ours, and trialed about 550 varieties of crops. In 2018, we launched the Buffalo Seed Company, selling exclusively seed produced in Kansas and Missouri. Through workshops like “Seed Saving: Enhancing Diversity and Resiliency,” I teach the importance of saving seeds to build resilience and adapt to climate change. Everyone’s preferences and growing conditions are unique, so I advocate for saving seeds that reflect those needs.

Julia Dakin

I grew up in a house where everything was always about to fall apart, and I was really worried about the world’s food supply. I saw how dependent agriculture is on fossil fuels, how wasteful it is, and how many people would be in danger if the price of gas went up. From a young age I was drawn to working with soil, plants, and animals. For years, I focused on soil health, as one does in regenerative agriculture. A series of events led me to question almost everything I had learned in agriculture, and the book *Landrace Gardening* opened my eyes to what I had been missing: genetics and the long relationship with the crops we grow. My western agriculture mindset had me trying to control field conditions so my crops would thrive, but now I saw that inviting genetic diversity and allowing crops to adapt was the path to resilience.

Locally, I am part of *Nourishing Seeds*. We grow and share seeds adapted to our cool summer coastal California climate, host community seed saving parties, and distribute and collect seeds from the community. It’s a testing ground for my work with Going to Seed, and I’m learning how to support other seed libraries in increasing locally grown seeds.

I’ve also worked with Indigenous Women-led non-profit Xa Kako Dile:, growing native food crops and practicing traditional ecological knowledge. This year I’m collaborating with Women With Bows,

growing produce locally for instant meals for tribally distributed commodity boxes, replacing ultra-processed food products.

Melissa DeSa

My interest in agriculture comes from my work for many years as a wildlife ecologist that merged when a friend got me involved in our local Slow Food chapter. The connections between the natural world and our agricultural food systems became apparent to me as I learned more about farming practices, food and the ways it impacts our natural communities. Slow Food was great, but we felt limited as part of such a large national organization. So, we branched off to focus locally, forming Working Food in 2012. We organized farm tours, hosted workshops, and even started a small flower farm. A student who was working on a seed library project helped me realize just how few seeds came from local sources. That sparked a deeper interest in seeds, and eventually, seed saving became a central part of our nonprofit's work. I come to the seed growing world with an ecological lens, curious about all the interactions in a plant's life from seed to seed in our unique and challenging climate. As an artist, these are often the delights that find their way into my work.

Working Food has three main programs: youth education, seed collective, and commercial kitchen program. We grow and save seeds on-site, teach growers seed-saving techniques (from kinder-gardeners to commercial farmers!), distribute those seeds back into the community, and sell our locally adapted varieties online that helps support our work. Farmers can be hesitant to try new things. They have to grow what their customers want and prioritize consistency, which makes them lean toward larger seed companies and familiar varieties. To address this, we do the experimentation – trialing new crops, adapting them to our place through seasons of local selection, show that they can succeed here, host taste tests, and invite farmers to see the results.

I'd love to see our seed program grow into a true grower collective, with more people actively growing and experimenting with seeds, and every farmer saving seeds as part of their routine farm planning. On a broader level, I'd like to connect our kitchen program more closely with farmers—helping them value-add their products and fostering stronger ties between local food businesses and local farmers.

Nonbinary Botany: In Practice

Speakers: Rue Genger, University of Wisconsin-Madison; K Greene, Hudson Valley Seed Co / HV Farm Hub; Chris Keeve, University of Kentucky / Ujamaa Cooperative Farming Alliance / Utopian Seed Project

Facilitator: Molly Travis, Organic Seed Alliance

Nonbinary botany is an emerging que(e)ry that invites people to question and reimagine the binary constructs imposed on botanical sciences, making space for more inclusive and expansive relationships with plants. The colonial and heteronormative language and practice of mainstream horti/culture and agri/culture has an outsized, and largely unquestioned, influence on how plants are studied and grown, in particular how breeding and seed work interacts with the full life cycles of plants. This limits the scope and accessibility of the knowledge base and genetics that

reverberate through seed companies, farms and gardens, universities, popular media, and markets. Panelists will introduce six years of nonbinary botany exploration and share examples of a nonbinary approach to plant and seed work. This session will include a Q&A and facilitated hands-on nonbinary botany design process using the collective skills, knowledge, and experiences of the group to dream into what real-life nonbinary botany plant space.

Nourishing Seed Ancestors, Seed Workers, and Social Justice Movements

Speakers: Leeza Chen, Utopian Seed Project; Nate Kleinman, Experimental Farm Network; Amirah Mitchell, Sistah Seeds, Ira Wallace Seed School; Owen Taylor, Truelove Seeds

Facilitator: Chris Keeve, University of Kentucky / Ujamaa Cooperative Farming Alliance

This roundtable continues ongoing discussions about the ethics of seed work and the importance of nourishing community-centered social justice through seeds. It will feature a diverse set of perspectives from across the small-scale seed world, including growers and organizers from Truelove Seeds, Experimental Farm Network, Ujamaa Cooperative Farming Alliance, Utopian Seed Project, and the Appalachian Seed Growers Collective. Through a frank and open conversation with the broader seed community, we encourage each other to cultivate our own seed politics in community with other practitioners. Session leaders aspire to hold space for the possibilities of seed work beyond Eurocentric worldviews, embracing community-led racial and economic justice. The discussion will include ethical questions of growing and selling cultural seeds, diasporic and transnational solidarities, environmental justice and regional adaptation, descriptions and naming, germplasm, worker compensation, sustainability practices, and space-making for ancestral seed stories. All seed folks are invited, including non-farmers, to think critically about the relations we all have with seed, and to ask ourselves: what does “ethical seed farming” mean to me?

Open-Source Seeds Worldwide – Breeding, Growing, Selling, and Spreading

Speakers: Almendra Cremaschi, Bioleft, University of San Martin; Carol Deppe, Open Source Seed Initiative; Andrew Still, Adaptive Seeds; Daniel Wanjama, Seed Savers Network Kenya

Facilitator: Cathleen McCluskey, Organic Seed Alliance

Bioleft: Commons-Based Participatory Breeding for more just and sustainable seed systems

Almendra Cremaschi (presenting author); Patrick van Zwanenberg; Julián Asinsten; María Laura Bravo; Gustavo Schrauf.

Abstract:

The global seed system, characterized by market consolidation, technological advancements, and stringent intellectual property regimes, poses significant challenges to agricultural biodiversity, farmer autonomy, and the sustainability of food systems. In this context, Bioleft offers a transformative alternative through its Commons-Based Participatory Breeding (CBPB) model. This approach integrates open-source principles with participatory plant breeding (PPB) to create a protected commons for genetic resources, ensuring equitable access while fostering decentralized, farmer-led innovation.

By involving farmers, researchers, and other stakeholders as co-innovators, Bioleft's CBPB model addresses practical challenges such as breeding seeds for organic and agroecological conditions while promoting the values of sharing, solidarity, and collective action. Through initiatives like maize and tomato breeding programs, Bioleft demonstrates the effectiveness of combining farmer knowledge with scientific expertise to develop seed varieties that are resilient, nutritionally enriched, and tailored to diverse agroecological systems.

This paper highlights Bioleft's successes and challenges, including its innovative use of digital platforms to scale collaboration, and the financial and institutional barriers it must navigate. Ultimately, Bioleft exemplifies the potential of CBPB to reshape seed systems and agricultural innovation by prioritizing equity, sustainability, and inclusivity. Supporting such initiatives is critical for building resilient food systems that benefit farmers, biodiversity, and the environment.

Introduction: The Global Seed System's Challenges and Bioleft's Vision

Over the past four decades, the global seed system has undergone profound transformations driven by technological advancements, market consolidation, and the commodification of genetic resources. The advent of plant genetic engineering and increasingly stringent intellectual property rights over seeds has shifted research and development in crop varieties from public sector-led initiatives to dominance by a few multinational corporations. This consolidation has severe implications for agricultural biodiversity, farmer autonomy, and the sustainability of food systems. It restricts access to seeds and germplasm essential for further breeding and adaptation, while also reducing the diversity of crop varieties available to farmers (ETC Group, 2022; Howard, 2015; Kloppenburg, 2005).

Small-scale and organic farmers are particularly disadvantaged by this system. The global seed market prioritizes varieties designed for industrial, high-input agricultural systems, leaving little room for seeds adapted to low-input or organic practices. Farmers outside these systems often depend on informal seed networks, which can be inconsistent in quality, or must purchase costly proprietary seeds ill-suited to their needs. In Argentina, these global trends are compounded by the country's reliance on industrial agriculture, which has marginalized organic farmers, reduced biodiversity, and exacerbated socio-economic inequality (Brieva et al., 2008; Marin et al., 2023).

This paper explores Bioleft, an initiative addressing these challenges through a Commons-Based Participatory Breeding approach (CBPB) that combines open-source principles with participatory plant breeding (PPB). By integrating PPB with open-source seed licenses, CBPB ensures genetic resources remain accessible, fostering a "protected commons" that emphasizes collaboration, equity, and sustainability in agricultural innovation (Cremaschi & van Zwanenberg, 2020).

This paper begins by examining the rationale for Bioleft's open-source approach as a response to these systemic inequities. Subsequently, the paper delves into the practical implementation of Bioleft's breeding programs, detailing both its successes and limitations. The analysis reflects on the broader implications of Bioleft's CBPB approach, exploring how its model contributes to seed justice, sustainability, and the democratization of agricultural innovation.

The Origins of Bioleft: Forging Open-Source Seeds

Bioleft was created in the late 2010s as part of an international research-action project funded by Future Earth, which sought to co-produce social innovations for sustainability by working closely with stakeholders outside the academic research community. The initiative began with a small, interdisciplinary team based at the Centro de Investigaciones para la Transformación in Buenos Aires (Marin et al., 2021; van Zwanenberg et al., 2018).

Bioleft began developing open-source licenses for the transfer and sale of novel plant varieties. The central idea was to ensure that germplasm remained freely available for adaptation and improvement, while incorporating a copy-left framework to guarantee that derived materials would also be shared under the same terms (Cremaschi & van Zwanenberg, 2020).

One significant challenge arose early on: while many public sector breeders supported the idea of open-source licensing, their institutions' technology transfer offices often prioritized exclusive licensing agreements with commercial seed firms to secure royalties. Such royalties are critical for financing public breeding programs, which operate under very constrained budgets. To address this, Bioleft designed a flexible material transfer agreement (MTA) that allowed breeders to retain some control over commercialization. Regardless, any further transfers or derivatives of the seed material would have to be shared under the same open-source license (*Bioleft – Semillas Abiertas*, n.d.).

This compromise sought to bridge the gap between open-source ideals and the practical constraints faced by public breeders and small seed firms. It aimed to make the model attractive to public sector institutions and smaller seed companies that, while requiring royalties, were otherwise supportive of breeders' freedom to operate and farmers' rights to save and replant seeds. Bioleft's goal was to build a broad coalition of seed system actors who rejected the patenting of germplasm and contributed to a growing pool of unpatentable genetic resources.

Another major challenge was the logistical complexity of implementing open-source licenses for seeds, as these licenses are not automatically applied upon transfer or sale. Unlike copyright, seed transfers require a contract that explicitly accompanies each transfer of seed material. To streamline this process, Bioleft developed a web-based platform to record and manage seed transfers (<https://plataforma.bioleft.org/catalogo>).

Commons-Based Participatory Breeding: A Path to Inclusive Innovation

In its effort to democratize seed systems, Bioleft recognized that creating a protected commons for seeds was necessary but insufficient to address the needs of organic and agroecological farmers, who faced a significant lack of seeds adapted to their production conditions and to avoid replicating the systemic injustices of mainstream seed systems. Complementing open source with

PPB emerged as a powerful approach to this aim, allowing farmers to act as innovators contributing to decentralized, collaborative networks of seed breeding (Cremaschi et al., 2020).

This was the origin of our Commons-Based Participatory Breeding approach. Bioleft's CBPB model draws inspiration from the open-source software movement, which demonstrated the transformative potential of collective innovation (Kloppenburger, 2005; Benkler, 2006). By involving farmers, researchers, and other stakeholders in the breeding process, Bioleft redefines agricultural innovation as a participatory endeavor, challenging proprietary ownership models and empowering those directly engaged with farming systems (Ceccarelli et al., 2009).

During the development of a digital platform to register seed transfers and open-source contracts, Bioleft realized the platform could also facilitate collaborative breeding. By enabling farmers to share data on seed performance across diverse environments, Bioleft created an infrastructure for distributed field trials on a scale unachievable by public sector breeders alone. This collaborative approach combines farmers' practical knowledge of agroecological contexts with scientific expertise, ensuring seeds are tailored to challenges like pest pressures, climate variability, and low-input farming needs, enriching both process and outcomes.

CBPB in Bioleft: The Experience of Maize

The maize breeding initiative is a clear example of Bioleft's CBPB approach. Conventional hybrid maize seeds, designed for high-input systems, often fail to meet the needs of organic farming. To tackle this gap, Bioleft collaborated with organic farmers, public sector breeders, and extension workers to develop open-pollinated varieties tailored to low-input systems. This effort created a hub of decentralized experimentation, where farmers and public R&D institutions tested genetic materials, shared seeds, and exchanged performance data.

A key success of this initiative was its focus on nutritional quality and practical performance traits. Many tested varieties exhibited higher protein content compared to commercial hybrids, increasing their nutritional value. Farmers also observed that their livestock preferred these OPVs to commercial hybrids, reinforcing the value of farmer-led selection in meeting real-world needs. Traits such as plant health, pest resistance, and robust kernel size were prioritized through on-farm trials. This process led to the creation of "Original," a 100% GMO-free maize variety bred specifically for organic systems. Developed by a participating farmer, "Original" is now in the process of registration, enabling its release under an open-source license (Cresta et al., 2021).

Bioleft played a crucial role in structuring and supporting collaboration. Regularly organized meetings with farmer-breeders, researchers, and other stakeholders provided platforms for collective decision-making. These interactions ensured that breeding priorities aligned with ecological and economic needs. Bioleft also prioritized documentation and dissemination through videos and farmer-led conference briefs. By strengthening connections with regulatory institutions, Bioleft facilitated smoother registration processes and broader adoption of open-source varieties. This initiative demonstrates Bioleft's ability to bridge gaps between farmers, researchers, and policymakers, fostering trust and empowering agricultural communities through shared knowledge and collaborative innovation.

CBPB in Bioleft: The Experience of Tomato

Bioleft's second line of work focuses on tomato breeding in collaboration with researchers from the School of Agriculture of the University of Buenos Aires. These researchers recovered 160 heirloom tomato varieties from seed banks, once widely grown in Argentina during the early 20th century but later lost from mainstream cultivation. To revive these varieties, the group started a participatory breeding project with urban growers and agroecological producers.

This participatory process focused mainly on the evaluation of three accessions that were multiplied by the Ministry of Agrarian Development of the province of Buenos Aires-Argentina. Each grower received three tomato accessions to cultivate and evaluate under diverse, real-world conditions. To support this, Bioleft co-designed observation protocols with farmers, detailing traits to monitor and methods for collecting data at key stages of crop development. Farmers' observations on traits such as pest resistance, flavor, and productivity provided invaluable feedback to guide the breeding process. At the end of each growing season, the team conducted public tasting sessions to identify the preferences of consumers.

Bioleft's digital platform facilitated transparent data sharing among participants, creating a collaborative network that combined farmer knowledge with scientific expertise. The participatory approach has yielded three new tomato varieties adapted to agroecological systems. These varieties offer enhanced pest resistance and improved flavor, supporting sustainable production and strengthening small-scale farmers' economic resilience by meeting market demands.

Navigating Challenges and Unlocking Opportunities in CBPB

The success of Bioleft's CBPB approach stems from its structural, cultural, and methodological innovations. A key structural advantage is the involvement of breeders from universities and public R&D institutions, who operate with a degree of flexibility not often found in other contexts. This autonomy allows researchers to collaborate freely with grassroots initiatives like Bioleft, bridging the gap between scientific research and practical agricultural innovation.

Culturally, Bioleft thrives on the remarkable dedication of its network participants, even in the face of limited financial resources. This commitment is deeply tied to the CBPB model. Open-source licensing ensures that genetic resources remain within a protected commons, accessible for continuous improvement and adaptation. Simultaneously, PPB involves farmers not just as end-users but as co-innovators, fostering a sense of shared ownership and purpose. This dual framework reinforces solidarity and motivates participants to invest their time and expertise, despite resource constraints.

The CBPB approach further distinguishes Bioleft from traditional PPB programs. Open-source licenses legally secure the commons, ensuring that both seeds and knowledge are perpetually accessible. This legal innovation aligns seamlessly with PPB, creating a collaborative ecosystem where contributions are valued and shared. Farmers and breeders alike benefit from a system that respects their autonomy while fostering collective progress, breaking away from the proprietary models dominating conventional seed systems.

Nevertheless, Bioleft faces significant challenges. One major hurdle is securing sustainable financial resources. Unlike traditional seed programs, Bioleft depends on grants and short-term

project funding. This dependency limits its ability to plan long-term and scale its initiatives. Institutional resistance further complicates Bioleft's efforts. Many public and private organizations remain entrenched in intellectual property regimes, prioritizing exclusive rights and royalties. Even public sector breeders, while supportive of CBPB principles, often work under policies that conflict with open-source approaches. Moreover, regulatory frameworks for seed registration create bureaucratic hurdles, particularly for small-scale farmers and independent breeders, limiting their inclusion in Bioleft's network.

Despite these challenges, Bioleft offers transformative opportunities. By fostering inclusivity through participatory breeding, it develops seed varieties that enhance biodiversity, resilience, and local adaptability. Its digital platform scales decentralized collaboration, enabling distributed field trials across regions and expanding its impact. Importantly, Bioleft's CBPB model provides a foundation for policy advocacy, showcasing how the integration of open-source principles and participatory methods can lead to more equitable, sustainable, and just agricultural innovation. In doing so, Bioleft sets a compelling example of how CBPB can reshape seed systems and agricultural practices globally.

Final words

The systemic inequities inherent in the global seed system, driven by intellectual property regimes and the priorities of industrial agriculture, marginalize organic and agroecological systems, restricting access to vital resources and eroding biocultural diversity. Bioleft's Commons-Based Participatory Breeding model provides a transformative alternative by integrating open-source principles with PPB. This innovative approach ensures that genetic resources remain accessible within a protected commons and reimagines agricultural innovation as a collaborative, decentralized, and equitable process.

The synergy between open-source licensing and PPB is central to the CBPB model. Open-source principles establish a robust legal framework that reinforces transparency, equity, and accessibility, ensuring the perpetual availability of shared resources. However, licensing alone cannot resolve the systemic challenges of seed development. PPB complements open-source principles by actively involving farmers, breeders, and other stakeholders in multi-stakeholder networks. These networks co-create seeds tailored to specific contexts, addressing both the practical need for local adaptation and the symbolic values of sharing and collective action.

In CBPB, farmers and breeders are positioned as co-innovators rather than end-users, fostering a sense of ownership, trust, and community. This collaborative dynamic reshapes the seed system into a more inclusive and resilient framework that values localized knowledge and fosters collective progress. The process enriches both the seeds developed and the relationships within the network, creating a transformative alternative to proprietary and exclusionary seed systems.

While Bioleft has demonstrated the transformative potential of CBPB, challenges remain. Financial sustainability is a critical issue. Innovative funding mechanisms, such as co-financing by cooperatives, producer groups, and public institutions, could align financial support with the collective ethos of CBPB.

Bioleft's model also underscores the importance of policy advocacy. Its success demonstrates that agricultural innovation can prioritize biodiversity, farmer autonomy, and equity while

delivering practical, scalable solutions. The digital platform developed by Bioleft exemplifies how decentralized collaboration can expand the reach and impact of participatory breeding, enabling a level of innovation unachievable by public institutions or private corporations alone.

In conclusion, Bioleft's integration of open-source principles with participatory breeding represents a bold and transformative vision for the future of seed systems. Supporting and scaling initiatives like Bioleft is not merely an opportunity but an urgent necessity to build food systems that work for farmers, biodiversity, and the planet. The CBPB approach offers a pathway to agricultural innovation that is as inclusive and collaborative as it is sustainable and just.

References

Benkler, Y. (2006). *The wealth of networks: How social production transforms markets and freedom*. New Haven (CT) and London: Yale University Press.

Bioleft – Semillas abiertas. (n.d.). Retrieved 13 January 2025, from <https://www.bioleft.org/es/>

Brieva, S., Ceverio, R., & Iriarte, L. (2008). *Trayectoria de las relaciones socio – técnicas de los derechos de propiedad intelectual en la agricultura argentina: Los derechos de obtención de semillas (DOV) en trigo y soja desde principios de los años '70 a la actualidad*.

Ceccarelli, S., Guimarães, E. P., & Weltzien, E. (2009). *Plant breeding and farmer participation*.

Cremašchi, A. (2024). *Transiciones a la sustentabilidad en el sistema de semillas de Argentina* [Doctoral Thesis]. Universidad Nacional de La Plata.

Cremašchi, A., & van Zwanenberg, P. (2020). Bioleft: Open-source seeds for low-input farming systems. *Journal of Fair Trade*, 2(1). <https://doi.org/10.13169/jfairtrade.2.1.0039>

Cremašchi, A., van Zwanenberg, P., Marin, A., Basch, M., & Lowenstein, V. (2020). Bioleft: Beyond open source seeds. *XRDS: Crossroads, The ACM Magazine for Students*, 26(4), 20–23. <https://doi.org/10.1145/3398404>

Cresta, E., dos Santos, M. P., Cremašchi, A., Bravo, M. L., & Musacchio, E. (2021). Evaluación participativa de maíz no transgénico: Desafíos y oportunidades. *LIBRO DE RESÚMENES*. 2° Congreso Argentino de Agroecología, Chaco – Región NEA, Argentina.

Etc, G. (2022). *Food barons 2022*. Etc Group. https://www.etcgroup.org/files/files/food-barons-2022-full_sectors-final_16_sept.pdf

Howard. (2015). *Intellectual Property and Consolidation in the Seed Industry*. <https://doi.org/10.2135/cropsci2014.09.0669>

Kloppenborg, J. R. (2005). *First the Seed: The Political Economy of Plant Biotechnology*. Univ of Wisconsin Press.

Marin, A., Stubrin, L., & Van Zwanenberg, P. (2023). Technological lock-in in action: Appraisal and policy commitment in Argentina's seed sector. *Research Policy*, 52(2), 104678. <https://doi.org/10.1016/j.respol.2022.104678>

Marin, A., Van Zwanenberg, P., & Cremaschi, A. (2021). Bioleft: A collaborative, open-source seed breeding initiative for sustainable agriculture. In *Transformative Pathways to Sustainability*. Routledge.

van Zwanenberg, P., Cremaschi, A., Obaya, M., Marin, A., & Lowenstein, V. (2018). Seeking unconventional alliances and bridging innovations in spaces for transformative change: The seed sector and agricultural sustainability in Argentina. *Ecology and Society*, 23(3), art11. <https://doi.org/10.5751/ES-10033-230311>

Breeding Plants for Super-Vigor, Organic Adaptation, Resilience to Wild Weather and Climate Change, and Human Survival for the Next Ten Thousand Years

Carol Deppe, Open Source Seed Initiative

Introduction

I started breeding plants in the 1980s. By the 1990s more and more seed companies were replacing open pollinated varieties with hybrids and varieties with patents or other IP (intellectual property) restrictions on them. When even the university plant breeders started putting IP on their varieties I could understand it. But I thought that for humanity to survive the next ten thousand years we need the opposite of the sort of seed system that was evolving.

In 1553 a mega-volcanic eruption caused trees worldwide to stop growing for three years or more. Dendrochronologists tell us the trees suffered freeze damage right through the summers. Human populations collapsed. Letters from people in China said the summer sun shone for only four hours a day and was red and gave no heat. The Little Ice Age in Europe started in 1315, lasted most of the rest of the millennium, and caused a population loss of half to two thirds. Geologists say the maritime Northwest gets an average of two or three Richter-9 mega-earthquakes per thousand years and we are about due. After each natural disaster the failure of agriculture leads to starvation-associated epidemics and wars that cause far more death and destruction than the initial disasters.

I can't do anything to stop volcanic eruptions or earthquakes. But if I can help build a nation and world of farmers and gardeners who are maximally resilient and independent, and a seed system that is likewise, humanity can rapidly rebound from disasters and avoid the starvation-associated disease epidemics and wars that would otherwise follow. To survive the next ten thousand years, we need farmers and gardeners who are not dependent on imported seed from faraway places. We need a highly dispersed seed sector with many seed companies serving local markets. We need more farms like the organic farms of today. We need open-pollinated seed varieties with no IP restrictions that farmers and gardeners have full rights to, which they can save and sell seed of, and with which they can do further breeding. We need resilient organically adapted varieties designed to enhance farmer and general human resilience, independence, and survival instead of destroying it. Plant breeders breed their values right into their varieties. I decided that in the USA we needed a whole army of plant breeders operating largely outside the worlds of universities

and multinational seed companies and motivated by largely different goals and values. So, I decided to write books about plant breeding for gardeners and farmers. (Deppe 2000, 2010, 2015, 2021.) With my help and that of many others, we now have the good beginnings of such an army of independent plant breeders in the USA. But we had no home, no organization to tell the world about us and help us introduce, sell, and promote our varieties.

At the Department of Community and Environmental Sociology at University of Wisconsin-Madison, Jack Kloppenburg had devoted his career to studying and documenting the changes in the seed system in the USA and to tracking the loss of farmers' rights to seeds. This work culminated in his book *First the Seed* (Kloppenburg 2004). He then got tired of simply documenting the loss of seed sovereignty and decided to do something about it. In 2012 he joined with University of Wisconsin plant breeder Irwin Goldman and a number of other academics, farmers, independent plant breeders, and seed rights activists to create the Open Source Seed Initiative (OSSI). I read *First the Seed* in 2015, promptly OSSI-Pledged all my varieties, and joined the OSSI board of directors. My role as a teacher and mentor to independent plant breeders meant I was able to bring many of them and their seed companies into OSSI. Today, a decade later, OSSI has about 50 OSSI-associated plant breeders, more than 600 OSSI-Pledged varieties, and about 70 OSSI Partner Seed Companies selling those varieties. More than 95% of the OSSI-Pledged varieties were bred by independent plant breeders. Nearly all were bred on organically managed land. For information on OSSI and OSSI-Pledged varieties see osseeds.org.

My presentation illustrates how to breed the plants that we need through the stories of the breeding of three super-resilient, widely adapted varieties now being sold by seed companies, and how I bred, OSSI-Pledged, and introduced them. In this paper and in my general organic gardening books (Deppe 2010 and 2015) I explain plant breeding using simple guidelines, some used by all plant breeders, and others that I have developed in my personal approach to breeding. For a more genetics-based approach see Deppe 2000. To find where to buy seeds of my or any OSSI varieties look them up on the searchable Seed page on the OSSI website, which contains photos, descriptions, and direct links to all the OSSI Seed Company Partners selling each variety.

Breeding 'Fast Lady Northern Southern Pea' (Southern pea; cowpea; *Vigna unguiculata*)

Sometimes breeding a new variety is easy. Cowpeas are not normally grown in maritime Oregon. They need more summer heat than we usually have. And they don't like our cold nights that extend right through the summers. Most Oregonians don't even eat cowpeas. But I spent my high school years in Georgia, and there I learned to love cowpeas. I started with a trial of about a dozen varieties, focusing on all the earliest varieties I could find. I just wanted to identify a variety that would produce here in Oregon and would dry its seed before the rainy season starts in fall. A few days before the first heavy rain of winter was due, I went out and evaluated the varieties. All but one variety were nowhere near done ripening their seeds. One variety, 'Lady

Pea,' had ripe seeds but the plants and seeds were still completely green, except for one plant. That single plant had completely dried down, including its seeds! It was a good two weeks earlier and a little more determinate than the rest. My first rule of plant breeding is: **Notice Things**. My second rule of plant breeding is: **Be wildly optimistic and suspiciously cynical simultaneously**. Maybe this plant would not only let me grow cowpeas in Oregon. Maybe it would retain its hot climate adaptation and be cold-weather tolerant and cold night tolerant too. Maybe it would be the earliest cowpea in the country. Maybe it would have the widest regional adaptation. On the other hand, maybe the early plant was early because it was diseased and simply died early. I opened a few pods. The seeds were healthy looking and looked just like the seeds I had planted. And the yield appeared to be comparable to that of the other plants.

Initially I just grew out and increased the seeds from that single, early plant without practicing any selection. Selection involves discarding plants and genes. When you have just a few seeds, you could be discarding the only copy you have of a great gene that happens to be in a not-so-great plant. Therefore, it's best to keep the seeds of all the plants (and genes) until you have more seed. **It is almost never optimal to start selecting in the first generation after finding an interesting individual plant or after doing a cross**. For the first three years, I practiced only one plant breeding technique. **I always do my seed increases and selections under the same conditions that I will use with the projected finished variety**. I grow all my corn, beans, and squash by direct seeding on organically managed land that has modest levels of fertility. I direct seed them because **transplanting tends to select for roots that aren't optimal for direct seeding and vice versa**.

After the third year I began selecting. The plants were already quite uniform except for a degree of

bushiness and maturity. I saved seed for replanting from the earliest half the plants, but only those that had average or above average yield. **I prefer to practice gentle selection on whole populations of plants rather than saving seed from just the supposedly best one or few**. That way I develop varieties that are less inbred and more vigorous than most varieties. Another of my plant breeding (and seed production) rules: **For the next year's planting I save seed only from plants that are average or above average in yield**. This practice selects directly for yield. I think it also gives strong selection against diseased plants and for general and specific disease resistances, even if the disease is invisible.

Since cowpeas are often called 'Southern Peas,' I named my new variety 'Fast Lady Northern Southern Pea'. Like its 'Lady Pea' parent, it has small white seeds with a very thin delicate skin, fine texture, and mild, slightly sweetish flavor as a dry bean. 'Fast Lady' can also be used green shelled, of course. I like the dry seeds for use as a noodle substitute and often put spaghetti sauce on top. It's nice having a cowpea, which can be cooked well without first soaking overnight, in my culinary repertoire. I also like it in my field. Cowpeas are more drought resistant than

common beans and many other crops. I can plant them in rows at the edges of the irrigation pattern on corn or squash or common bean plantings where there isn't enough water for the main crop. Cowpeas, like peas, soybeans, and fava beans, have their own species of nitrogen fixing bacteria that are much better nitrogen fixers than those of the common bean. Further, like peas, soybeans, and favas, cowpeas can be used as green manure crops.

I breed varieties for my region. They don't need to be widely adapted. I discover the range of adaptation when I send the new variety to seed companies for trial. Small regional seed companies can do well selling locally adapted varieties that best use unique aspects of our climate. Widely adapted varieties provide better resilience to wild weather and climate change. 'Fast Lady' proved to be both cold weather and warm weather adapted. As far as I know it is the earliest cowpea grown in the USA. It's now grown and sold by seed companies in New York and Canada as well as the southern USA and Oregon and California. There is a charity that has distributed thousands of packets of 'Fast Lady' as a survival crop to farmers in the Appalachian Mountains. In the mountains of the Southeastern USA, you may need an early variety with both heat and cold adaptation.

Breeding 'Cascade Ruby-Gold Flint' Corn

One of my rules for plant breeding is to have multiple motivations for any project I undertake, some grand, others modest or personal. I decided I wanted to breed the ultimate survival crop, the variety that, if you could have just one variety of one crop to grow when the next disaster happens, this would be the crop and the variety. That is, I wanted my new variety to help save humanity. But I also have celiac disease. I wanted a staple based on traditional delicious Native American corn varieties, not wheat or the animal feed by-product that gets sold as corn meal in grocery stores these days. I also just wanted to play with corn. The ears are beautiful. I wanted a variety that would make great whole grain polenta and johnny cakes as well as cornbread. After trialing many different varieties, I chose 'Abenaki', an 8-row New England flint corn with solid-colored ears in red or yellow. It had relatively large 8-row ears with huge seeds, and the flavor of the cornbread it makes is great. It's so different from the flavor of commercial corn you would not think it was corn from its unique flavor. 'Abenaki' is very early. **Earliness is a valuable feature in a crop you want to survive wild weather and climate change.** If you plant early and get a late frost, there is time to replant. You can also plant it after the first planting of something else fails. **In addition, you can usually get adequate isolation for pure seed just by planting an early variety early.** The commercial and most other varieties are too late to contaminate it. **Big seeds are faster and more vigorously germinating.** Watch your germination tests and see. And big seeds have more stored food in case the weather is overcast for days, and the only light has been truncated by clouds. **I select big seeded potential parents in breeding projects where possible. When I harvest ears of corn, or I open seed squash, I discard those with smaller seed.**

Unfortunately, I couldn't grow Abenaki very well. It had poor husk coverage that allowed birds to rip into and eat the developing kernels in the milk stage. Then aphids would infest the opened ear and cover the rest of the kernels with aphid poo and goo. **When you like some features of a variety, but it lacks some characteristic you need, do a cross to a variety that has the missing characteristic.** I also didn't like the fact that the yellow ears in Abenaki were pale and unattractive, which was associated with the flinty endosperm being pale yellow. As the other parent I chose Byron flint, another early 8-row New England flint that had pencil cobs and smaller kernels, but the interior color of the flinty layer was a deeper richer orange and husk coverage was excellent. I crossed the two varieties. I just planted them in alternating rows, then detasseled one variety in one block and the other in the second block. I made some crosses with each as the maternal parent. There was no telling which would be best. I wanted to retain as much genetic heterogeneity as possible in my new variety. **Genetic heterogeneity tends to promote vigor, especially in naturally outbreeding crops, and most especially in corn.** I don't select for uniformity in characteristics that don't matter. I would have to if I intended to apply for IP on my variety—but I don't approve of IP, of course. The requirement for uniformity, necessary for genetic identity for IP purposes, limits the use of genetic heterogeneity to create super-vigorous varieties. OSSI-Pledging doesn't require uniformity.

I grew the corn crosses out for about three or four generations allowing the genes of the two varieties to mix thoroughly before doing any selection. Then I began selecting gently for better husk coverage, nice gold or orange ears in the non-red ears, big ears, and big seed, and against poor husk coverage, pale yellow ears, pencil cob, and small seed. **You can select for many things at once if your selection is gentle and you have enough ears.** Recipes for 'Cascade Ruby-Gold' (corn-only cornbread, polenta) may be found in Deppe (2010). You can't use commercial corn recipes. 'Cascade Ruby-Gold Flint' Corn has bigger ears than 'Abenaki', huge seeds, good husk coverage, and 8 -12 row ears in the colors red, orange, maple-gold, or deep yellow. It's exactly what I wanted. The flavor of the cornbread or polenta is spectacular. Note: Don't select for pure red in 'Cascade Ruby-Gold'. Purity for the gene associated with the red skin color leads to smaller plants, much smaller ears, and poor yield.

Breeding 'Goldini Zucchini II summer and drying squash' (Cucurbita pepo)

The Goldini project started when I learned that the main squash staple for the Hidatsa Indians of Minnesota was dried slices of squash picked at the summer squash stage. I spent a lot of time trying out the drying of different squash varieties. Most, when dried, were tasteless. However, I found that summer squash carrying the precocious orange gene had a great flavor, raw, cooked, or dried. Could I breed a summer squash that tasted great, could also be dried for making soups and stews in winter, and might possibly be the fastest growing squash on the planet? The answer was 'YES!' This work and how to dry the squash is described in detail in Deppe 2010.

A method for developing very fast-growing squash or other big-seeded plants is the point I'll make today. It involves understanding that the germinating seedlings are growing largely on the action of the machinery of the mother plant rather than the virtues of the seedling's own capacities. I figured this out by observing that chlorophyll-less mutants segregating in crosses grow as well as their green siblings up until they are about three inches high. Then they stop dead. However, most people thin them then or earlier. If we instead thin later with wider spaced plants, we can get very powerful selection for fast germination and early growth. And it turns out that fast early growth is just fast growth. And that when plants grow fast enough, they can outgrow many diseases and other problems.

Introducing and Selling the Varieties Under the Open Source Seed Initiative Pledge through OSSI Seed Company Partners

I OSSI-Pledge all my varieties. That is, I fill out a form establishing that I bred the variety, and that I will honor the Open Source Seed Initiative Pledge with respect to the variety. The Pledge reads:

You have the freedom to use these OSSI-Pledged seeds in any way you choose. In return, you pledge not to restrict others' use of these seeds or their derivatives by patents or other means, and to include this Pledge with any transfer of these seeds or their derivatives.

I grow organic seeds on contract for retail seed companies. When I have bred a new variety, I ask various seed companies I work with, all OSSI Partner Seed Companies, if they would like to trial the variety. If they say yes, I ask for email confirmation that they understand that the seed of the unreleased OSSI-Pledged variety I am sending them is for trial only, not for seed increase or further breeding. In the 'About' tab on the OSSI website there is a section of FAQs that covers MTAs and other contracts that breeders, seed growers, and seed companies can use with each other. The basic concept is they can make any arrangements or contracts they want as long as no restrictions pass on to third parties. That is, the retail seed customer, the gardener or farmer who buys the seed, must get it with no restrictions whatsoever except those in the OSSI Pledge itself. A year or two later I usually have one or more seed companies who want the variety. I grow the seed and send it to the seed companies, who then add the variety to their catalogs.

Voluntary Royalties for OSSI-Pledged Varieties

More than a decade ago, Fedco Seeds, now an OSSI Partner Seed Company, began offering “voluntary royalties” of 10% to independent breeders of public domain or OSSI-Pledged open-pollinated IP-free varieties to support independent breeders in their breeding work. These voluntary royalties only apply if Fedco produces the seed themselves instead of buying it from the breeder. When breeders produce and sell seed of their own varieties, they usually charge a bit more to cover their breeding work. About ten OSSI Partner Seed Companies have followed suit, with the bigger companies usually paying 10%, and the smaller ones 5%. Now we can create an

income stream from our OSSI-Pledged varieties without being contract seed growers or starting a seed company.

Spreading Open Source Seeds Right Now

Let's spread some open source seeds right now! I've brought with me two packets of OSSI-Pledged seeds, one of 'Cascade Ruby-Gold Flint' Corn, one of 'Goldini Zucchini II Summer/Drying Squash' for each person in the audience who agrees to respect the accompanying Pledge. In honor of this occasion and the participation of speakers from OSSI's two sister open source seed organizations Bioleft, Argentina and Seed Savers Network Kenya, the OSSI Pledge accompanying these seeds is presented in English, Spanish, and Swahili. Enjoy.

References

- Deppe, C. (2000). *Breed Your Own Vegetable Varieties: The Gardener's and Farmer's Guide to Plant Breeding and Seed Saving* 2nd ed. Chelsea Green Publishing Co.
- Deppe, C. (2010). *The Resilient Gardener: Food Production and Self-Reliance in Uncertain Times* (Including the Five Crops You Need to Survive and Thrive—Potatoes, Corn, Beans, Squash, and Eggs). Chelsea Green Publishing Co.
- Deppe, C. (2015). *The Tao of Vegetable Gardening: Cultivating Tomatoes, Greens, Peas, Beans, Squash, Joy, and Serenity*. Chelsea Green Publishing Co.
- Deppe, C. (2021). "Freelance Plant Breeding," Chapter 5, pp 113-186 in *Plant Breeding Reviews* Vol. 44, Irwin Goldman, ed. John Wiley and Sons, Inc.
- Kloppenburg, J. R. (2004). *First the Seed: The Political Economy of Plant Biotechnology, 1492-2000* 2nd ed. University of Wisconsin Press.

Organic and Seeds in the Farm Bill: How Does the Farm Bill Relate to the Needs for Organic Seed Growers

Speakers: Steve Etko, National Organic Coalition; Kelli Case, Indigenous Food and Agriculture Initiative; Brise Tencer, Organic Farming Research Foundation
Facilitator: Cathleen McCluskey, Organic Seed Alliance

This session will focus on the federal Farm Bill, and why the legislation matters to organic seed growers. The panel will talk about "marker bills" and how they relate to the Farm Bill process, using Senator Tammy Baldwin's Seeds and Breeds for the Future Act as an example of a marker bill endorsed by many organizational members of the Seeds and Breeds Coalition. There will also be discussion of how priorities of the Native Farm Bill Coalition were incorporated into the

bill, and led to their endorsement of the bill. The panelists will explain the status of the Farm Bill and will compare how the 2024 House and Senate versions of the bill address organic and seed issues. While Farm Bills are usually passed every five years, the process leading up to the final passage of often takes several years. As soon as a Farm Bill is enacted, the process of USDA implementation of the legislation starts. As such, Farm Bill advocacy is perpetual. The panel will discuss this on-the-ground reality and how it relates to the work of the advocacy community. The session will include a discussion how seed growers can engage in the Farm Bill advocacy process and a Q&A.

Participatory Plant Breeding: Insights and Experiences from the Organic Farmer Perspective

Speakers: Pryor Garnett, Garnetts Red Prairie Farm; Beth Hoinacki, Goodfoot Farm; Brise Tencer, Organic Farming Research Foundation

Facilitator: Michael Lordon, Organic Seed Alliance

Participatory plant breeding, where farmers and breeders collaborate to develop the best crop varieties, is thriving in the northwest. Programs focused on organic vegetables, small grains and other specialty crops are well-established and successfully working toward crop improvement, but what is it like to be a farmer who works within a participatory program? This panel features organic farmers, including Beth Hoinacki of Goodfoot Farm and Pryor Garnett of Garnetts Red Prairie Farm, collaborating with breeders on participatory plant breeding projects. They will share their experiences, challenges, and benefits of working with researchers to improve crop varieties. Attendees will gain insights into how collaborative breeding impacts on-farm productivity and supports organic seed systems. This session is geared towards farmers, organic seed industry professionals, researchers, and undergraduate and graduate students.

Predictive Yields for Small-Scale Staple Crop Production Using Common Homestead Equipment and Minimal Inputs

Speakers: Eleanor & Scott Hucker, Great Lakes Staple Seeds

Facilitator: Alexis Yamashita, University of Vermont

This session, led by heirloom seed growers Eleanor and Scott Hucker of Great Lakes Staple Seeds, will provide insights into their SARE-funded research project “Predictive yields for small-scale staple crop production in North Central States using common homestead equipment and minimal inputs”. Topics include predictive yields and small scale crop production of barley, buckwheat, corn, millet, oats, potatoes, rye, sorghum (milo), soybeans, sunflower, triticale, wheat, amaranth, and beans.

Seed Academy: Small Bioregional Seed Company Roundtable

Speakers: Brian Campbell, Uprising Seeds; Sarah Kleeger, Adaptive Seeds; Frank Morton, Wild Garden Seed; Andrew Still, Adaptive Seeds; Don Tipping, Siskiyou Seeds

Facilitator: Jared Zystro, Organic Seed Alliance

Since 2013, the Seed Academy has supported the growth of bioregional seed stewards and companies. This lively session will feature stories from participants leading grassroots initiatives in seed stewardship. Learn how the vanguard of those with their fingers upon the pulse of seed are advancing local food systems and fostering resilient communities.

Seed Cosmology of Indigenous and African Women and Our Vision of Being Good Ancestors

Speakers: Jennifer Bailey, Systems Transformation Partnership; Jim Embry, Sustainable Communities Network/Cumberland Seed Commons/Atrus Ballew Farm/Slow Food USA

Facilitator: Laurajeau Lewis, Organic Seed Alliance

"We do not own the seeds, we borrow them from our Children" -Mohawk Proverb

*"What if we called the Big Bang the Big Seeding when stardust became seeds for the Universe"
-Jim Embry*

"Seeds are not just seeds, they're like ancestors. They have a history. Seeds have stories."-Winona LaDuke

"The rapid loss of the world's biological diversity is increasingly recognized as one of the most pressing issues of our time sitting alongside and interlinked with climate change. This crisis needs addressing." -Dan Saladino

Regenerating the world's biodiversity and fostering higher levels of diversity in our food system is essential for security and resilience – and ultimately for our survival.

Cosmic Seeding

What if we called the Big Bang the BIG SEEDING when stardust became seeds for the Universe? We would then regard Stardust flowing out as cosmic sparkles of seeds germinating all over...all around and through and beyond the Universe. Some of those cosmic seeds then congealed in the form of our Terra Madre....our Mother Earth. Then our Mother...our Sky Woman... seeded all her children.

Land, water, and sky all connect as one space, and the stories of ancestral figures and the creation of features on the land, in the water, and in the sky are all connected.

And now we, humans, who are still maturing into wise beings...homo sapiens....are bundles of Stardust congealed in human form and also serve as vessels of seeds.

Earth Seeding

We recognize that when we touch, plant, save, honor seeds, we are touching stories, energy, spirit that goes back 200 million years to the rise of flowering trees and plants that produce seeds. As hu-womans arose 2-3 millions years ago, these seeded plants were there to nourish and sustain us in-right relationship. Then 12,000 thousand years ago, women as the sacred vessels of germinated seeds learned from these plant mammas and began a deep-time and sacred relationship with seeds. Like seed capsules of many various forms, women also carry the seeds of future generations with their wombs much like Earth carries all of her children within her womb.

Our Great Work

In this 21st Century we find ourselves with a need for a paradigm shift, a Great Work, a Great Turning towards an Earth-centric human presence guided by individual and collective mental and spiritual transformation.

We are the seeds of our ancestors' dreams.

We are inspired by seeds to germinate ideas and practices that help us become good ancestors. We believe that *a new world is possible... on a quiet morning we can hear her breathing!*

How to Become a Good Ancestor

In honor of the grand lineage of Seed keepers who have faithfully passed down seeds for our nourishment, we make a restored commitment to care for these precious seeds for those yet to come. We become good ancestors by honoring relational foodways that restore seed security, seed sovereignty and honor the pathway of seed rematriation.

Seed Commons, Cosmos

In the age of the increasing industrialization of our food and the erosion of biodiversity within cultural contexts, the global seed keeper network asks the questions that assist communities of diverse cultures and backgrounds. Can we envision a Seed Commons, and coordinate collaborative efforts to care for and protect our seeds that is in right-relationship to a diverse understanding of cultural values and cosmology?

This link describes our concept paper which provides the rationale for Seed Commons:
<https://www.cumberlandseedcommons.org/wp-content/uploads/2024/02/SEED->

[COMMONS-Conceptual-Framework.pdf](#)

How can we use the process of reclaiming our traditional seeds and food as a powerful means of cultural restoration? Integral in this seed movement are the cultural memories and stories, and how we regain a sense of who we are as a culture through our foods and seeds.

With seeds at the center of our work, we are helping nurture the global seed movement which is fundamental to working towards a just and sustainable future. Our work is to support the development of Seed Commons around the USA-Turtle Island and to connect with seed communities around the world. We see the Seed Commons as a community of kindred spirits grounded in their bioregion with sacred regard for the watershed, soil, flora, fauna, and seeds!

Our Seed Commons Guiding Principles:

Biodiversity

We support and celebrate seed diversity. Seed diversity is the biological foundation of agriculture and agricultural crops have to evolve if we want them to survive. Because agricultural crops are domesticated their evolution is in our hands.

Education

We are committed to offering access to seed education which is fundamental to the seed movement, essential to the health and preservation of cultural identity, and is a key element in climate change preparedness.

Seed justice

We believe all people should have fair and equitable access to local seeds, healthy food, financial support and knowledge to grow food and save seeds. Seeds are gifts from nature, caretaken with great attention by the ancestors for thousands of years and should not be owned or patented, but freely planted and shared as a community resource. We support the work around seed rematriation as an important pathway to seed justice.

Honoring seed stories

We honor the origins and stories of seeds and believe they need to be preserved. Stories have spirit, language, history, and lessons; they heal us and teach us how to care for seeds, one another, and the natural world. We are committed to safeguarding, caring for and preserving seed heritage and cultural knowledge.

Land acknowledgment

We acknowledge that the history of North America was based upon stolen land from Indigenous peoples and stolen labor from African peoples to do agriculture. This foundational contradiction has not been fully resolved and still presents the need to address this injustice.

We celebrate the culture of Indigenous peoples who were stewards of land and seeds long before European settlement. We recognize the Africans and other non-native communities for their contributions to our relational food and agriculture ways.

We honor the Indigenous women who spent generations adapting and developing crops through sacred regard and relationship with seeds.

We honor the African women who were forced from their homelands in Africa but carried various seeds hidden in their braided hair across the Atlantic to new homes. We honor women as the Sky Women of seeds...the midwives of seeds.

“We do not own the seeds; we borrow them from our Children.” –Mohawk Proverb

Indigenous women

We recognize that 12,000 years ago, Native American women were the first agriculturists on

Turtle Island, a highly influential role within largely matrilineal kinship communities. They learned from these plant mammas in relationships with seeds and their own life-force giving body temples of the Divine Feminine.

We lift up the herstory of Indigenous women who were entrusted across generations to tend the soil, plant, harvest, cook and store food, and experiment, adapt, and save seeds—in turn staying in connection with human and other-than-human ancestors. It was women who learned the ways of companion planting and that certain crops like squash, corn and beans best grew together. Proclaiming familial kinship, corn, beans and squash are known as Three sisters! Native American women, through their sacred regard and relationship with seeds, are responsible for the development and improvement of many of the foods we enjoy today.

African women

We honor the African women who were forced from their homelands in Africa, but carried various seeds hidden in their braided hair across the Atlantic to new homes. We know from history that rice farmers in West Africa, particularly women rice farmers, had been perfecting the practice for generations before.

Seeds are living beings that form the foundation of agriculture. Knowing where seeds come from and how they are grown is the root of seed literacy. We make a commitment to care for these precious seeds and for those yet to come—those on their way.

The Twi word from the Akan Tribe of Ghana, “Sankofa”, literally means it is never too late to go back and fetch what has been lost. In many ways we have lost or forgotten our path, our relationship with the environment, and our ancient wisdom. We must find ways to protect, love, and root ourselves in our innate wisdom and understand our connection to Earth as a system—including the rocks, the water, the air, the minerals, the animals. We must be educated and lift our voices to inform others of these teachings; ensuring that they are embedded at the highest levels of our organizations, promote the sharing of knowledge, stories of seeds and to be about the business of a paradigm shift ...knowing where we have come from and to know where we are going in the future.

So, with this workshop, we affirm our need to ground our seed work in the Indigenous [cosmology of seeds](#) and the African women’s ethos of seed relationship, protection and holding for future generations. It is up to us to deepen our own consciousness of history and seek out this wisdom of women to revitalize ourselves and discover new ways to be in right-relationship with the land, our natural environment and our fellow humanity.

May the Force of Seeds be with us!

<https://www.cumberlandseedcommons.org/wp-content/uploads/2024/02/SEED-COMMONS-Conceptual-Framework.pdf>

[Cultivating the Cumberland Seed Commons Article](#)—Ag Mag Spring 2024 p. 10-13

[Ultimate List of Black and Brown Owned Seed and Garden Shops](#)

[Cherokee Nation – Global Seed Vault Deposit](#)

[From Civil Rights to Food Justice – Jim Embry Reflects on a Life of Creative Resistance](#)

[Protecting Our Living Relatives: Environmental Reproductive Justice and Seed Rematriation](#)
(Elizabeth Hoover)

[Seed Policy Platform](#)

[Southern Exposure Seed Exchange Growing Guides](#)

MEDIA

[Seed Mother – Coming Home](#)

ORGANIZATIONS

[Organic Seed Alliance](#)

[Ujamaa Seeds](#)

PAST EVENTS

[Cumberland Seed Commons Track – TN Local Food Summit 2024](#)

[Ujamaa Farms Spring Convening 2023](#)

[Al Gore Greeting to Ujamaa Spring Convening 2023](#)

[Feather Smith – Keynote Speaker – TN Local Food Summit 2023 \(Feather Smith\)](#)

Seed Liberation: Reflections on Seeds in Diaspora, Rematriation, and Reciprocity

Speakers: Nate Kleinman, Experimental Farm Network; Amirah Mitchell, Sistah Seeds, Ira Wallace Seed School; Vivien Sansour, Palestine Heirloom Seed Library; Chris Smith, Heirloom Collard Project

Facilitator: Bonnetta Adeeb, Steam Onward Inc/Ujamaa Cooperative Farming Alliance

A Personal Reflection on “Seed Liberation”

Nate Kleinman, Co-Director, Experimental Farm Network; Founding Member, Ujamaa Cooperative Farming Alliance

Like most Americans, I was born a colonizer. It took me a long time to realize that truth, and I’m still grappling with its implications. It doesn’t matter that none of my own ancestors even arrived in the United States until the 20th century. Nor that during the darkest days of American genocide — displacement and destruction of Indigenous peoples, enslavement and oppression of millions of Africans and their descendants, imperialist war against the Philippines — my own ancestors, nearly all Jews, were being persecuted in Eastern Europe. It’s likewise immaterial that

if my ancestors hadn't left when they did, they would likely have perished in the Nazi Holocaust, as some of their siblings did. But the fact remains: I was born and raised on someone else's land, in a country built by the stolen labor of enslaved people, and I have benefited throughout my life from those structural circumstances. Maybe you have to.

As an adolescent, I had only the vaguest understanding of the fact that I lived my life amid the ruins of an ancient society. Born in Philadelphia and raised in nearby Jenkintown, I was aware that the frequently-used geographical names of places I visited all the time — Wissahickon, Pennypack, Manayunk — were Lenape words, but these, along with a few historical plaques and the occasional statue, were the only reminders of the people who had stewarded the land of the Delaware Valley since time immemorial. The Lenape, to the extent they were discussed at all in my youth, were always discussed in the past tense. I wasn't even aware that Lenape reservations still existed (in Oklahoma, Kansas, Wisconsin, and Ontario), let alone that there are still vibrant Lenape communities living on their ancestral lands in multiple places just a short drive from my home. So when I first sought out Lenape seeds in my early 20s, I thought I was looking for seeds from an extinct people.

I can't remember if I first learned that Lenape seeds were still in circulation from a news article about Dr. William Woys Weaver and his Roughwood Seed Collection or a Seed Savers Exchange yearbook, but I know it was through Seed Savers that I made my first attempt to bring Lenape seeds back to their place of origin — which at the time seemed to me to be a worthwhile goal in itself. A Seed Savers member in Ohio had listed “Oklahoma Delaware Blue (Sehsapsing)” corn, so I mailed off my three dollars and began awaiting my seeds. A few months later, I received an envelope with the same three dollars, seeds for a different blue corn, and an apology from the sender. He'd run out of the Lenape corn (“Delaware” and “Lenape” are synonymous here), so he suggested that I reach out to the USDA's National Plant Germplasm System (NPGS) for seeds. He included a link to the Agricultural Research Service's Germplasm Resources Information Network (www.ARS-GRIN.gov), commonly referred to as GRIN, which is the government's online database from which anyone can request free seed samples, as long as they include a compelling explanation describing the “legitimate research, breeding, or educational purpose” for which the seeds were requested.

The Seed Savers Yearbook had been eye-opening enough for me, with its thousands of heirloom varieties available from members around the country, but searching through GRIN was downright mind-blowing. With well over half a million “accessions” from around the world, including heirlooms, landraces, crop wild relatives, breeding populations, and even perennial plants distributed clonally (as bulbs, cuttings, tissue-cultured in vitro plantlets, etc.), the NPGS is the largest collection of publicly-held crop biodiversity in the world, rivaled only by the national seed banks of China, Russia, and Germany, and the Svalbard Global Seed Vault in Norway. The first time I put in a request for seeds, I asked for 37 accessions — seeds, scionwood, and one unrooted live mint cutting — and all of them arrived within a couple months, mailed from different USDA research stations around the country.

In looking through my records while writing this essay, I found an email I sent to my parents back in 2011 (still in my twenties, but barely), just after putting in that first request. My mom was in treatment at the time for what turned out to be a terminal cancer, so I sent her the GRIN entry of each of my requests as “some interesting reading material for you if you're bored.” After detailing some of the crops I was most excited about (like the ‘Tyson’ pear, a variety of European pear that actually originated in little ol’ Jenkintown!), I wrote this: “The two Mazatec corns gave me a good idea. Both were originally taken from Oaxaca in 1970, so there's a strong likelihood that these varieties are no longer grown, due to the various pressures on corn farmers there (namely Monsanto & NAFTA). So I was thinking how cool it would be to bring samples to the folks whose ancestors developed them. It could be the start of a huge project: how many indigenous people have no idea that their long-lost plants are being preserved in a USDA seed bank? I'm not saying there would be any kind of legal obligation to return them (though some might make that argument), but certainly it would be the moral thing to do.”

I had forgotten that returning seeds to their people was my instinct from the jump. That was two years before Dusty Hinz and I started Experimental Farm Network (EFN) — with the main mission being facilitating collaboration on plant breeding projects, especially aimed at developing perennial staple crops. It was five years before I heard Rowen White talk about “rematriation” at my first Organic Seed Growers Conference in 2016. I didn’t have any sort of intellectual framework for seed rematriation, let alone best practices, but a few key points were obvious to me: that the economic system exported around the world by my country was deeply unjust, that it resulted in many people losing their ancestral seeds, and that having this knowledge along with the proven ability to access the US government’s seed hoard obligated me — morally, if not legally — to give seeds back. Ultimately, neither of those Mazatec corns did well enough in Pennsylvania for me to send anything back to Oaxaca, but that kernel of an idea took root, and as the years progressed more and more of my work with seeds has revolved around rematriation and conservation of seeds with a long-term intention of rematriation.

That initial GRIN request had also included two Lenape corns, *Sehsapsing* and *Puhwem*, both of which thrived in Pennsylvania and southern New Jersey (where Dusty and I began farming in 2014). We also grew other regional Indigenous heirlooms, most accessed through Seed Savers or Roughwood, including the Lenape heirloom beans ‘Black Shackamaxon’ and ‘Hannah Freeman’, a *Nicotiana rustica* tobacco known as ‘Delaware Indian Sacred Tobacco’, and the first local heirloom I ever grew, a winter squash (*Cucurbita maxima*) accessed via the Seed Savers “vault” under the name ‘Nanticoke Indian.’

From the first time I grew that squash, I knew it was special. I only grew one plant — my whole backyard measured just 8 feet by 20 feet — but it produced a few gorgeous softball-sized fruits that were pale pink on their sun-exposed side and pale blue on their dark side. They were delicious, but I decided to leave one on my kitchen counter just to see how long it would keep — and it was 18 months before I noticed the first small soft spot. I had never seen a squash keep for so long. So I started spreading the seeds around. My friend Connie grew a bit in her garden, and

the two fruits she returned to me looked nothing like what I had grown: one was almost brown and the other was green. I planted some in a community garden at a food pantry in Keansburg, New Jersey, where I was doing Hurricane Sandy recovery work. Keansburg was far from where I lived, so I only visited every few weeks, and toward the end of the season I saw a discarded ‘Nanticoke’ squash in the garden’s compost heap, looking exactly like one I had watched develop for the past couple months. It had pale grey skin covered with corky warts. Clearly, someone had assumed these warts meant it was no good, but I’d been told they signify a particularly sweet fruit (Germans call them “sugar warts”), so I salvaged it and added it back to my population of stock seeds.

When Dusty and I landed in South Jersey in 2014, we planted the rest of the original ‘Nanticoke’ seeds from Seed Savers, plus a few from each of the fruits I or my friends had grown, and we soon watched them take over a large chunk of the field. As summer wore on, we realized that each plant made unique-looking fruit, and by the end of the season we were shocked at the diversity on display. Some were blue and pink, like my first ones, but they grew much larger in Jersey’s fertile sandy loam. Some were brown or green, like Connie’s. Others were red, grey, tan, peach, or salmon-colored. Some were bicolor or multi-colored. And a handful had sugar warts. By this point I was worried someone might have made a mistake along the way in stewarding it. Maybe it had gotten all crossed up. But when we took a sampling of fruits to Dr. Weaver — we had gotten to know him after answering a call for volunteers from Owen Taylor, then Roughwood’s garden manager — he told us it was not unusual for Indigenous varieties to be quite heterogenous, because Indigenous people selected for resilience, not uniformity. What’s more, he was thrilled to see at least one form — a grey-skinned type similar to the Keansburg warty fruit — which resembled an heirloom squash Dr. Weaver had grown before called ‘Appoquinimink’, originating in the northern part of the Nanticoke’s Delaware homeland.

Starting that first fall in Jersey, I made my first clumsy attempts to repatriate the Nanticoke squash. I first tried to bring squash to the tribal headquarters in Bridgeton, NJ, but it seemed to always be closed. I tried calling and emailing, but heard nothing back. Then one day I was invited to an event where then-Chief Mark Quiet Hawk Gould would be speaking. After the program, squash in hand, I found Chief Gould and introduced him to his people’s squash. He seemed intrigued, if a bit skeptical, but told me that Nanticoke farmers weren’t farmers anymore, so he wasn’t interested in seeds. Deflated but undeterred, I tried a few more times to see if I could find any Nanticoke people still interested in growing their squash. I attended local powwows and other community events, always with at least one squash in hand, but no one I met was very interested. I began to think Chief Gould was right. After all, no one knew the community better than he did, having been a major force behind the tribe’s coming out of hiding and beginning to hold public powwows for the first time in the 1970s (he was also instrumental to their incorporation as a legal entity in 1978, and their securing official recognition from the state of New Jersey in 1982). So at some point I basically stopped trying, and with some ambivalence we began selling ‘Nanticoke’ seeds when EFN launched our first catalog in 2018. We included this

note: “25% of the proceeds of these seeds will be donated to the Nanticoke Lenni Lenape Nation based in Bridgeton, NJ. Any Nanticoke or Lenape people interested in growing these seeds should contact us to receive a packet at no cost or to have it refunded from your order.”

Finally, late one night in April 2020, I received an email from one Cory Ridgeway. She explained that she is a member of the Nanticoke tribe of Delaware, and her husband Urie is a member of the Nanticoke Lenni Lenape tribe of NJ. She said she was doing some research and came across “a squash named after our people,” and saw on our website that we would be willing to donate seeds to tribal members. So the next day, I found myself sitting around a fire in Cory and Urie’s backyard swapping seeds and stories. After growing their squash for a decade, and six years of failed attempts, the process of rematriation had finally begun. On my short drive home — they live about half an hour south of me — I breathed a huge sigh of relief.

In the five years since that day, it’s been fortunate to get to know many more Nanticoke and Lenape people, both in New Jersey, Pennsylvania, New York, and Delaware, as well as in their far-flung diaspora. I’ve helped many of them access the heirlooms mentioned here so far, plus ‘Munsee Wampum’ beans, ‘Lenape Blue Pulling Corn’ sweetcorn, and the Nanticoke summer squash landrace known as ‘Maycock’ (an anglicization of the Nanticoke word for squash, ‘macac’). One of my most fruitful collaborations lately has been with Native Roots Farm Foundation (NRFF), a non-profit dedicated to preserving Nanticoke agricultural lands and cultural heritage. Founded by Courtney Streett, a Nanticoke woman from Delaware, not only is NRFF growing Nanticoke and Lenape heirlooms to save the seeds, they’re growing enough to actually share these traditional foods with their people. Courtney got a handful of Lenape blue corn seeds from me a few years ago and has since transformed them into one pound bags of freely distributed cornmeal (not to mention delicious bread, cookies, etc.). It’s been impressive to watch and very gratifying. It also might never have come to pass if we hadn’t decided to sell the seeds in the first place.

Over the years, EFN has worked on rematriation of crops from South Sudan, Syria, Puerto Rico, Mexico, Malta, Korea, Japan, Iran, and Palestine, among other places. Sometimes we already had connections with people from those places when we requested their seeds through GRIN, and sometimes we didn’t. We’ve often requested seeds from communities under threat from war, sea-level rise, desertification, poverty, globalization, etc., because we know those seeds are far less likely to be preserved *in situ* than seeds from more stable places, and we don’t trust the USDA collection to always exist (or to continue being accessible to the public). I fully recognize that the US government’s collection of seeds around the world, without any sort of just compensation and for over two centuries, has marched hand in hand with American imperialism, colonialism, and exploitation. But it’s not reason enough for throwing out the baby with the bathwater. On the contrary, it makes it all the more important for today’s generation of seed people to do better than our forebears. Should we just ignore the collection, consigning it to the exploitation of giant agribusinesses and other profiteers? Or should we work, one seed at a time, to get them back to the people with whom they belong? Of course I believe the latter, even if the

work is slow, messy, and at times uncomfortable or controversial. How the seeds came into the collection does nothing to diminish their potential importance.

Even in situations where EFN has no personal connection to a seed's community of origin, I believe it's rarely inappropriate for us to grow or even sell said seed — though there are certainly exceptions — because the potential good of being about to help a stranger re-establish a relationship with an ancestral seed far outweighs the feelings of ethical discomfort we may stir by selling it. I'm sure some people strongly disagree with me on this, but I've received far too much encouragement from friends and strangers alike to stop. I would probably feel differently if we were getting rich selling seeds, and it's not as if I'm trying to lock-in a role for myself as gate-keeper to other people's seeds. Quite the contrary, I teach anyone who'll listen about how to access seeds from the USDA system and other seed banks, and give lectures and workshops on seed-saving, agrobiodiversity, and plant-breeding as often as I can. I also helped found Ujamaa Cooperative Farming Alliance (UCFA) — a BIPOC-led collective working to diversify the US seed industry, increase availability of culturally meaningful seeds, and grow more BIPOC growers — and for much of the year I spend more time on UCFA work than EFN. I'll be happy to slow down when loads more people are doing similar work, especially bringing seeds back to their own communities, and I'm working all the time toward that goal. It also bears mentioning here that I've requested and grown seeds from places where my ancestors lived too, like Romania, Belarus, and Ukraine, so I'm not only utilizing the government system to gain access to other peoples' seeds.

It was actually UCFA's co-founder Bonnetta Adeeb who helped me most to feel confident in the righteousness of liberating seeds from “seed jail”, as she calls it, or even actively collecting seeds from other parts of the world (so long as its done in the least extractive ways possible, with respect and reciprocity). Bonnetta was raised in California, her family refugees from white supremacist terror in the South. I wouldn't blame her if she rejected my assistance with her great wor, but she's welcomed me with open arms — really, we're family at this point. Being an elder, born around the same time as my own parents, and coming to agriculture late in life, Bonnetta approaches seed work with a palpable urgency. She sees it as her mission to grow more seed growers from historically oppressed and marginalized communities, and to increase access to culturally-important seeds, not only here but around the world — and especially in Africa and African diaspora communities. Bonnetta appreciates that I grow Togolese basil and Chadian sorghum gleaned from GRIN, even though I don't know any people from Togo or Chad, because she knows that by offering them in our catalogs, people from those places will be able to find them — just as Cory found her people's squash. Of course there are lines that shouldn't be crossed — both Bonnetta and I have been entrusted with the stewardship of seeds we would never sell, for a variety of reasons — but every seed is worthy of thoughtful consideration.

As a Jew, my work with Vivien Sansour and the Palestine Heirloom Seed Library has felt the most important and timely as of late — for I can't help but see the strong parallels between the displacement and oppression of Palestinian people by Israel (even before the war on Gaza) and

the displacement and oppression of Indigenous peoples by the United States. Two long-running genocides waged through persistent dehumanization and official marginalization, punctuated far too often with brutal violence. As devastation rained down on Gaza in late 2023, at a time when I was increasingly involved with Nanticoke and Lenape farm projects, my understanding of the reality of American settler-colonialism became so much more vivid and visceral. I could no longer move through my world without seeing it as a giant crime scene. In that context, liberating seeds from “seed jail” suddenly felt all the more necessary.

Vivien first came into my life in 2018, after I contacted her out of the blue to offer the Seed Library some seeds of a durum wheat from Gaza. Collected in 1947 by a Latvian immigrant to Minnesota, it had been held since then in Maryland and later Idaho by the USDA. As with Bonnetta, I wouldn't have blamed Vivien if she refused my help or my friendship because I'm a Jew. Or if she refused the seeds. But she chose otherwise.

More than anyone else in my life, Vivien has helped to liberate my mind. Her seed work — scouring Palestine for seeds while Palestine itself hangs on a precipice — is legend, but what's behind it is even more impressive. Vivien approaches seed work with an almost religious fervor, firm in her belief that every seed is a living being worthy of our respect and love. It's hard to argue with her.

Being her friend has helped dissolve away some the most pernicious dogmas drilled into my brain over a lifetime, including Zionism, nationalism, patriarchy, and white supremacy, even as they experience a resurgence in popularity. Her reverence for the natural world, and especially her native Palestine, qualifies her as the exact opposite of all those deadly forces poisoning our planet and abusing its inhabitants.

While some seeds do come with real baggage, born of our profoundly imperfect world, all seeds themselves are quite perfect. And each and every seed — like each and every person — deserves the chance to live up to its potential. So when my life's path and a seed's intersect, the best I can do is try to do right by that seed and its people. And I'm grateful to all the people and all the seeds who got me to this point.

Reflections on Seed Liberation

Bonneta Adeb, Steam Onward Inc / Ujamaa Cooperative Farming Alliance

My thoughts travel to many places and times. Here are some of them.

SPIRIT: Beyond the present state lies another manifestation. Another reality. This plane allows one to soar above all earthly things. Within each seed lies this sphere.

MIND: “Free your mind and ..” Thoughts are things Nature has secured her reality and imagination within the core. With these tools we can construct the world we chose to live in. My friend Dr Ruha Benjamin from Princeton calls it ”World Building”

BODY: My desire to fully manifest the essence within seeds requires physical action on my part. As a senior, I see planting and growing as an act of liberation against my personal limitations.

TRUTH: My liberation lies in great part within history. And acknowledgement of the wisdom of ancestors who were seeds keeper, agrarians and responsible for bringing us the nourishment and joy of foodways today. When I feel weak or unable, the words of our elders ring loudly in my ears. “Of course you can do it, after all your ancestors built the pyramids.”

MEDICINE: Much healing lies with the somewhat lost knowledge of living in harmony with the natural world. Recipes for treatment of many everyday illnesses are locked inside those seeds. Recovering that knowledge will lead to greater self reliance. Rediscovery of those lost arts of roots and herbs will free us further and inspire treatments for the future.

CONNECTIONS: My connection to the ancestral strength will be furthered by acknowledgement of their technologies, and wisdom. Like the great redwood trees we are all dependent upon each other but the ties have sometimes been lost. We will do this work in simple ways by talking about seeds, seed stories and the seed keepers who stewarded them.

LAND: Touching the soil and the act of planting allows the secret wealth of the soil to penetrate and strengthen me. Reuniting people to the land is essential to building a healthier relationship to the planet.

ACTION: Liberation is an action in response to oppression, colonization, imperialization. It is a response to fear and self-loathing and thoughts of limitation. It sets in motion the universe that is working for our good. Seed liberation is food security and leads toward actions of land security.

AUTONOMY: I always explain my need to sometimes rename seeds (such as saying “African Peas” for *Vigna unguiculata* which are most commonly called “cowpeas”) as a response to the “death by a thousand cuts” inflicted upon my people since they arrived on these shores. The need of enslavers to degenerate the agricultural achievements by people of African descent in this country has to be fought by healing the wounds one cut at a time. And yes, this particular example is a semantic battle, but it all counts in my mind.

FEELING: Self-determination follows actions and delivers the strength to move even more deliberately toward liberty. Success in growing is the reward that gives us the strength to dream bigger and accomplish more.

LAND OF ORIGIN: Looking back to our ancestral homeland is a step in building the courage to achieve what we must to survive and thrive as a human race. We work to help people regain the knowledge of their past but to rematriate seeds back to communities that have been robbed of their seeds and the knowledge to steward them.

WARFARE: I feel that seeds are the most powerful tool I have found toward liberation of my people. More powerful than the gun, easier to conceal or carry. Small and real like when people talk about “real estate” we all get it.

The Colonizers, the Saviors, and the Liberators

Chris Smith, Utopian Seed Project / Heirloom Collard Project

When I was a kid there was this mean thing we did. If someone (usually smaller than you) was looking over a railing or leaning out a window or something, you would push them and then grab them in the same motion while yelling, “Tell your mom I saved your life!” At least back then, we were honest enough to acknowledge the hypocrisy.

In 2023 I received a Champion of Conservation award from Garden & Gun magazine for my work with seeds in the Southeast. It was an honor to receive the award and I deeply appreciate the work of Garden & Gun in the realm of conservation, but the article they published about my work was titled, Chris Smith: Seed Savior. I had multiple friends reach out and ask if it was a typo. ‘Surely they meant seed saver,’ they asked. That designation, seed savior, made me want to burn the magazine and crawl under a rock. It’s interesting to reflect on why, especially in the context of liberation. I’m all about liberation, in a similar way that I’m all about seed saving. But I’m pretty skeptical about the liberator and the savior.

So much of the work around seed saving, and seed preservation, is fueled by a narrative of loss. These narratives of loss create the moral obligation to rescue. Dr. Helen Curry chronicles this beautifully in her book, *Endangered Maize*. Primarily white seed saviors recognized declining biodiversity in corn populations, and sought to save it. Across the Americas plant collecting trips collected, chronicled and preserved corn diversity. In tandem step, the same coloniser governments pursued aggressive policies of Indigenous displacement and erasure. The very communities who were creators and stewards of the corn diversity they sought to save.

The seed saviors, coupled with violent colonialism, created the conditions that necessitated liberation. And this, primarily white, saviour complex is ongoing and real, and still often fueled by good intent. Recently, I spoke with a seed saver who recognized that some Oaxacan varieties were threatened. The primary thought was to get the seeds and grow them in Western North Carolina, to save them, and then send them back. The primary thought was not, how do we support the existing systems of Peasant and Indigenous agriculture in Oaxaca? Or what local work is already happening that we can uplift or support? Or, more critically, how the United States' own neoliberal agro empire policies have created the conditions to gut traditional Mexican agriculture in the first place. Tell your mom, I saved your life.

Collard Complexities

As early as 1992, Dr. Mark Farnham, a USDA research geneticist specializing in Brassica, the genus of cruciferous vegetables that includes collards, noticed a severe lack of genetic diversity

in collards (*Brassica oleracea* subsp. *viridis*), and began collecting samples. In the early 2000s, he connected with cultural geographers Ed Davis and John Morgan, who were researching what made the South unique and had arrived at collards as a lens through which to answer the question. Farnham, Davis, and Morgan received USDA funding to travel across the Southeast in search of collard diversity (2003-2006). They collected 78 samples from backyard seed-savers, traveling over 12,000 miles across 12 states. None of these collards were in seed catalogs or had documented histories. Furthermore, many of the seed-keepers were elderly and reported that they had no one to pass the seeds to when they died, indicating that the varieties would likely die with them. The researchers reported that only one seed-keeper declined to share seeds, and most of the seeds were offered with great thanks. The collected varieties were added to the National Plant Germplasm System, through which they are publicly available for research and education work through GRIN.

We can easily imagine a scenario that had these collards not been collected and stored by the USDA, they would no longer exist. Because these varieties lacked documented histories, we would not even know that they had ever existed. Thus we should give great thanks to the efforts of Davis, Morgan, and Farnham, and acknowledge that many varieties—collards and otherwise—are surely already lost. This is the narrative of loss, and it's real. Sadly, access to the germplasm resource collections is often restricted to academic and corporate plant breeders for creating improved varieties, which are often released as proprietary hybrids or patented genetics, further consolidating the seeds within the power of corporations and institutions. In a positive feedback loop, the work of preservation leads to the consolidation of seed genetics through the introduction of "improved cultivars," which further undermines in situ maintenance and availability of agrobiodiversity and therefore fuels the urgent (and morally justified) call for greater preservation efforts. In addition, it is the seeds, or genetic strains, that are often "saved," but the people and communities who have stewarded them are forgotten, ignored and/or alienated.

While it is undoubtedly true that we are in real danger of losing many seed varieties, the work of preserving biodiversity is complicated. Institutional seed preservation separates seeds from the communities that steward them, placing a high value on the genetics of seeds without considering the importance to both the people and the seeds of in situ preservation efforts. As the collards example shows, ex situ work is arguably urgent. However, while the seeds are technically saved, when the community seed-keepers die the seeds will still be lost to the communities. The separation of seeds from people and land is a core problem.

Seeds sitting in a seed bank and not freely exchanged and grown within a community will not be able to live and adapt to the needs of the community and a changing environment. While the collard collection trip demonstrates how institutional seed preservation can play an important role in agrobiodiversity conservation, especially in times of socio-political unrest, there needs to be much greater effort to support community seed-keeping if seeds (and therefore food) are to

remain in relation with people. Accepting that a whole bunch of seed savoring has already happened, we need to examine what ethical liberation and stewardship looks like.

The Heirloom Collard Project could be thought of as a seed liberation project. Called the “Godmother of Southern Seeds” by The New York Times, Ira Wallace is a seed-keeper and educator who lives at Acorn Community, an egalitarian intentional community in central Virginia that manages the heirloom-focused seed company, Southern Exposure Seed Exchange. In 2015, Wallace chanced upon a collard variety trial that Mark Farnham was running in Charleston, South Carolina. The trial included around 60 of the varieties collected by Davis and Morgan. Wallace was astounded by the diversity on display and made a vow to get these varieties back to people who cared about collards. This was the beginning of an idea that developed into the Heirloom Collard Project. Through a diverse network of community-based seed stewards, HCP is working to regenerate and reintroduce collard diversity back into the food system. The aim is to develop relationships—including traditions of growing, cooking, and eating them—with these varieties beyond the standard seed catalog transaction so that they can return to communities without the threat of extinction.¹

1 This work and the work of The HCP have been widely reported, for example, in the book *Collards, A Southern Tradition from Seed to Table* (Davis & Morgan, 2015) and the National Public Radio story, “A community of seed savers has a recipe to revive rare varieties of collard greens” (Wood, 2022). Information about The HCP is available at <https://www.heirloomcollards.org>. I would also like to note that both Dr. Ed Davis and Dr. Mark Farnham have been highly supportive of this work.

The Heirloom Collard Project is organized by a broad collaboration of people deeply connected to collards and community. There are many similar efforts underway to rematriate culturally important seeds back to their communities. Dr. Mehmet Oztan and Dr. Florentina Rodriguez have co-created a Culturally-Informed Community Seed Pledge. The pledge states, ““I respect the natural rights of seeds and their people by producing CICS-Pledged seeds under the pledge’s culturally-informed practices and code of ethics. I am including this pledge with any transfer of seeds or their derivatives to ask others to continue following these guidelines.” It’s an attempt to create a framework of seed practice that respects the seed’s people and place.

The Heirloom Trap

If our aim is to have robust, decentralized and dynamic seed keeping communities, then there is another layer of liberation that is important when we talk about saving seeds. Humans have been saving seeds since the dawn of agriculture. For the most part, people and seeds have long been in a dialogue of ever-changing genetics, environmental conditions, cuisines, cultures and curiosity. Seeds have changed us, and we have changed them. People are plant breeders, it’s innate.

But this is not how we talk about heirlooms, loosely defined as open-pollinated varieties that will reliably breed “true to type” – that is, producing plants identical to their parents – and predate the

second world war. When most people talk about heirlooms, often with glassy-eyed nostalgia, the stories are almost always historical. When seed catalogs arrive in the fall and winter, we flick through the glossy pages of varieties, reading their biographies. Heirloom descriptions generally read like this: this variety can be traced back to sometime in the 1800s or early 1900s to some dude or his wife who “discovered” or bred or selected it, and it’s been passed down the generations and looks like this.

It is almost always a story of heirloom by immaculate conception. The question “What was that seed before this somewhat arbitrary point in time?” goes largely unasked, feeding the erasure of Indigenous, enslaved and Peasant contributions to agrobiodiversity. And this “beginning” becomes the last page of the seed’s story, which is repeated as well-meaning seed savers strive to preserve the seed so it grows like it’s almost always been grown. Heirloom seeds get frozen in narrative time.

The naming and describing of an heirloom variety reinforces the notion that the seed is a static thing. Seed stories are almost always histories. Strict adherence to varietal purity stifles another query: “What could this seed be in the future?” or perhaps, “Who are you, and who do you want to be?” The naming and describing of an heirloom variety reinforces the notion that the seed is a thing, and capitalism thrives on thingification. The appearance of named varieties (and therefore most heirlooms) coincided with the formation of the American Seed Trade Association (ASTA) in 1883, which established business alliances with the seed industry (which was previously government-sponsored (which had its own imperial complications)). By 1924, the ASTA had persuaded the federal government to stop its free seed distribution program. This commodification and privatization of the seed industry has cemented expectations of varietal uniformity. Most people don’t question why they want all of their favorite tomatoes to look exactly like their 100-year-old ancestor. In this light, the seed’s story is a cage. And the seed saver becomes the jailor. Therefore discussions of seed liberation need to include a critique on the assumption of Distinct, Uniform, and Stable as (often legally enforced) best practice. And if seeds are seen not just as a captive of colonialism, but also capitalism, then liberation must also mean decommodification.

The Plant Breeding Fallacy

Core Premise of Plant Breeding: Plant breeding requires access to a genetically diverse pool of germplasm for crop improvement i.e. developing elite lines.

1. Genetic erosion occurs (historic and ongoing) because of wide-scale adoption of a limited number of elite breeding lines.
2. Peasant, Indigenous, and rural communities steward high levels of seed diversity.
3. The narrative of loss triggers a moral obligation to conserve this diversity because it is ‘essential’ for breeding efforts i.e. the creation of elite lines.
4. Seeds are ‘preserved’, become genetic resources, and are used to create elite lines.

5. These elite lines are often proprietary (patents or hybrids) and are generally released with large marketing budgets from a consolidated seed industry.
6. See #1 and repeat.

Here's the fallacy in academic form (excerpt from Neglected landraces of collard from the Carolinas (USA)):

“Genetic erosion of this collard germplasm pool has been severe in recent decades as commercial hybrids have been adopted by both large-scale producers and home gardeners (1). Although a significant number of collard landraces are being perpetuated to this day (2), existing diversity among landraces still grown in the region is now in the hands of an aging population of seed savers who maintain germplasm through on-farm preservation (3). From 2003 to 2006, we explored the coastal plain region of North and South Carolina in search of collard gardens containing traditional landraces. Exploration trips were conducted mid-winter to early spring. About 90 samples of collard were obtained from seed savers during the course of this exploration. Observations of morphological differences of these landraces indicate that significant diversity exists in this group. Obtained landraces are being deposited into the U.S. plant introduction collection and will be available for future use (4). This preserved collection could prove to be an important new source of genes for *B. oleracea* improvement. (5)” If the fallacy is that developing elite lines is a cause and a cure—a positive feedback loop of declining biodiversity—then we can liberate ourselves from the fallacy by removing those elements (which happen to be both colonial and capitalist in nature). When the elite lines are removed, we are left with the statement: Peasant and Indigenous communities steward high levels of seed diversity. It is rarely acknowledged that these communities aren't just passive stewards or recipients of some fortuitous heritage, but rather active intellectual agrarians. They are carrying on the 10,000+ year legacy of community plant breeding. The path to liberation is redirecting all the resources currently spent on developing elite lines into supporting, empowering, resourcing, celebrating Peasant, Indigenous, and rural community plant breeding initiatives.

Seed Production Contract Guidelines Presentation and Community Discussion

Speakers: Katie Hastings, Gaia Foundation's Seed Sovereignty Programme (UK); Helena Gonzales, Native Seeds/SEARCH; Joel Johnson, Native Seeds/SEARCH

Facilitator: Heron Breen, Seed Worker Organizing

At the 2025 Organic Seed Growers Conference session “Seed Production Contract Guidelines Presentation and Community Discussion”, the audience will hear from three presenters with intersecting perspectives of seed contracts, shared agreements, trust, transparency, and mutual benefit. The presenters hope to spark questions, sharing and conversation with and between those in attendance. We thank you for bringing your experiences with the past and current structures of seed work, and also your passion and imagination for what can evolve ahead.

Heron Breen has spent twenty-six years working within the retail seed trade. For twenty of those years, Heron has operated a research, seed production and plant breeding business named ‘Fruits of Our Labors’ (FOOL). Heron will play dual roles as session facilitator as well as presenting on behalf of the Seed Production Contract Working Group, a self-organized group of volunteer seed growers who are part of Seed Worker Organizing.

Katie Hastings is the Wales Coordinator for the Gaia Foundation's Seed Sovereignty Programme. In this role, she works alongside growers and farmers to build a resilient and diverse seed system. Katie facilitates a network of farmers - Llafur Ni (Our Cereals) - to revive traditional and rare Welsh oats. She has facilitated the formation of the Wales Seed Hub - a seed selling cooperative in which agroecological growers work together to sell their seeds. She works to deliver trainings and movement building events across Wales.

Joel Johnson serves as the Farm Manager at Native Seeds/SEARCH—a nonprofit seedbank based in Tucson, AZ that grows, preserves, and distributes over 1,000 varieties of arid-adapted crop seeds and wild crop relatives. Joel was born and raised in Tucson and studied Sustainable Agriculture at Messiah College. He has led Native Seeds/SEARCH's in-house seed production and farm expansion since 2020. Joel is honored to learn from and work with these seeds and land under the direction of such a caring community of Indigenous seed keepers, staff members, volunteers, and supporters.

The Seed Production Contract Guidelines iterative document, developed by the SWO Seed Production Contract Working Group
Heron Breen, Seed Worker Organizing

Started just after the 2022 Organic Seed Growers Conference, Seed Worker Organizing (SWO, <https://seedworkers.org/>) is a self-organizing group of seed growers investing in mutual aid, knowledge sharing, advocacy for fair seed prices and contracts, better seed ethics practices, and agrobiodiversity conservation.

In 2022, an evolving and volunteer working group within SWO began to look deeply into the seed contracts commonly used between small scale seed growers and seed companies. The working group recognized that the keys to good seed contracts include fair and timely compensation, and terms in which risk and responsibility are equally shared between both parties to the contract.

Multiple drafts of a document called Seed Production Contract Guidelines were shared with seed growers within SWO for feedback. The document was then shared with the broader seed grower community for further input. In Winter & Spring of 2024, the draft document was also made available to many seed companies for their input. Please explore the most recent version of the Seed Production Contract Guidelines at <https://seedworkers.org/>

As a presenter, I will be highlighting the key focal points of the Seed Production Contract Guidelines document. My Seed Production Contract Working Group colleague Edmund Frost will be speaking in the Exploring the Potential of Seed Source Transparency and Attribution session, addressing additional core elements of the Seed Production Contract Guidelines.

First, the Seed Production Contract Guidelines document frames shared seed contract language and concepts that seed growers and seed companies can use together. Whether in seed contract negotiations, or solving a contract problem that may arise, or seeking advice from a seed community peer, there are innumerable situations where a common language around seed work can reduce stress, create quicker resolutions and evolve our collective thinking. Naming and describing some of the most common types of seed contract payment models is an example of where language has helped seed growers see the business and economics of seed work more clearly. Beginner seed growers especially benefit from learning shared language and concepts, as there is no formal orientation or education when entering this field.

Second, the Seed Production Contract Guidelines document proposes that every contract should be mutually developed, and that both parties should feel ownership of the end agreement. Thus, the terms therein should reflect the responsibility, accountability and authority of each party. At the end of the day, it is the responsibility of the seed grower to advocate for the terms and prices that frame their sustainable livelihood.

Third, the Seed Production Contract Guidelines document describes concepts for determining fair terms and price such as Adjusted Plant Populations, Pilot Productions, the purchase of seed production overage, and existence or lack thereof of relevant seed production data that supports a successful seed production. The document also addresses the “when” of seed contract payment timelines, and the financial risk and capital outlay/carrying cost upon the seed grower.

Fourth, the Seed Production Contract Guidelines document presents recommendations for areas where problems arise in seed production contracts. Diseased, or poor germinating, or not-true-to-type stock seed, as well as poor or non-existent communication are sadly not uncommon in seed contract relationships. Challenging outcomes can be vehicles for mutual understanding and the evolution of better policies/practices for all. But, when negative situations are left unaddressed or repeatedly addressed in a one-sided manner, communal trust between seed growers and seed companies can be damaged.

Fifth, the Seed Production Contract Guidelines document reminds us that all engaged in seed work have an opportunity and a choice to actively pursue good seed quality as an individual and communal goal. If our seed community has shared understandings around good seed quality, we can work together to further scale-appropriate research and best practices. Customer experiences, expectations and perceptions of seed quality can and will impact our shared marketplace.

The Gaia Foundation’s Seed Sovereignty Programme Seed Contract Toolkit
Katie Hastings, Gaia Foundation’s Seed Sovereignty Programme (UK)

The Gaia Foundation's Seed Sovereignty Programme (www.seedsovereignty.info) began work on building a more resilient agroecological seed system in the UK in 2017. Our programme was designed as an intervention for a vegetable seed system which felt like it was built on shaky ground.

At our inception, three small scale seed companies were supplying agroecologically grown open pollinated seeds in the UK, with another three small companies supplying Ireland. Despite a lack of concrete facts around volumes of seed being imported into the UK, a generally agreed estimate was that 80% of organic seed was being imported from outside of our islands. On top of this, we were facing widespread loss of seed production skills on farms, with the majority of small-scale farmers in the UK and Ireland buying seeds rather than adapting seeds to their land.

Having already worked across the world to stand alongside seed sovereignty activists, the Gaia Foundation turned their attention to their home ground, realizing that our food system in the UK and Ireland really was built on the sand. Inspired by the Bauta Family Seed Initiative in Canada, we began work to build a more diverse, flourishing and resilient seed system here in the British Isles.

For the last eight years, the Seed Sovereignty Programme has been working from the grassroots up, to support a seed sovereignty movement which is growing faster than we anticipated. Our first intervention was to set up training events to reskill our farmers, market gardeners and community growers in the craft of seed production. In the eight years the Seed Sovereignty Programme has been running, we have trained over 1,700 growers in seed production, resulting in over hundreds of new seed varieties being grown across the UK and Ireland.

Building on the very practical intervention of upskilling our farmers to take on the revival of the seed system, we have been consciously working to build a seed sovereignty movement. A combination of peer-to-peer learning, relationship building and celebration events have strengthened farmer to farmer connections, which as we all know, results in exponentially more seed sovereignty cascading from these relationships. We put a strong emphasis on regional work, placing regional coordinators in the five different areas of the British Isles, allowing us to respond to the differences of these bioregions and cultures.

Having established a foundation of training and movement building, we have turned our attention to building a commercial seed system with sustainability and fairness as its heart. We have instigated the formation of a seed selling cooperative – the Wales Seed Hub – to allow growers to produce seeds on their own farms, while working together to market and sell these seeds. We have facilitated the Small Packet Independent Seed Sellers (SPISS) forum, allowing small to medium sized seed companies in the UK to work together around the challenges that leaving the EU brought.

Advancing on our aim to build a fair seed system, we created a seed contract toolkit. Developed with lawyer Gesina Dybdahl-Ovesen and David Price, who has a background in contract

management, growing and marketing seed, the toolkit gives a template contract between a seed grower and seed company. The template allows users to edit sections to suit their needs, while giving a framework for transparently agreeing on responsibilities and risks up front.

Connecting with the Seed Workers Organizing Group in the USA, we were inspired by the work already done to establish seed contract guidelines. Seeing no cause to reinvent the wheel, we used these guidelines as our springboard. Utilizing the expertise of our seed lawyer, these guidelines were translated into a legally robust contract, usable by anyone who wants to download it.

Quality has been key to the development of our contract template. The template suggests agreements around population sizes, isolation distances, excluding pesticide use, pest control, storage, labelling and germination testing. Through the process of identifying terms and specifications within the template, we are seeking to embed quality at the heart of expanding production.

Offering different payment options – including a balloon payment on delivery of the crop and a segmented payment in which growers are paid a portion of the cost at the staggered points of cultivation, harvest and delivery – we are offering the option to spread financial risk more fairly between grower and seed company.

As with all contracts, our template is intended to be a guideline for progressing a professional relationship. The basis of every healthy relationship is clear, open communication. Relationships between seed growers and companies will flourish if they can develop a foundation of trust and transparency. It is our hope that our contract toolkit will ease relationship building, rather than confine it to the pages of a legal document.

Our aim is to support both growers and seed companies working to produce open pollinated, agroecologically grown seed in the UK and Ireland. It is clear that both are needed to build a robust seed system in the British Isles, and establishing a foundation of equity of risks and rewards will ensure this seed system has longevity.

At the same time as looking to build a flourishing seed economy, we feel a deep resonance with the fact that seeds cannot be reduced to a product. Seeds carry stories, histories of stewardship and powerful possibilities. We are inspired by the work of organizations such as Native Seed Search, who are working to create seed systems which go beyond a ‘seed for money’ transaction, recognizing farmers skills, time, equipment and intentions in the seed growing process.

At the Seed Sovereignty Programme, we work to honor seed stories, support seed stewards, stand alongside community growers and emphasize the power of seeds for our collective good. It is our belief that this work can sit in balance with our work to build a robust seed economy, and that both roads lead to a flourishing seed landscape.

Native Seeds/SEARCH Seed Production Contract Renovations

Joel Johnson, Native Seeds/SEARCH

Native Seeds/SEARCH (NS/S) is a non-profit that has worked to conserve and promote the food and farming traditions of the Desert Southwest since 1983. NS/S works with over 1,800 accessions of arid-adapted, open-pollinated seeds that have cultural roots in over 50 Indigenous and other communities throughout Mexico, the Southwestern United States, and the Sonoran Desert region. These seeds are the product of generations of farmers, most of them Indigenous, selecting, nurturing, and sharing seeds to best suit the land and people of their communities. Native Seeds/SEARCH and these seeds would not exist without the Indigenous communities who shared and saved these seeds and continue to farm these crops. We are keenly focused on providing priority and greater seed access to communities that are culturally and historically connected to the seeds in our collection so that those seeds can continue to exist and thrive in their communities of origin.

Every year, we grow out a portion of our seeds for regeneration of our seedbank and for distribution. In order to regenerate seeds for the seed bank and make seed available through our free seed donation programs such as Native American Seed Share, Community Seed Grants, and to make available a rotating offering of seed packets for public distribution, NS/S grows the majority of distributed seed in-house on the organization's Conservation Center Farm in Tucson, AZ. These internal grow-outs are supplemented by a variety of volunteer, hobby, and in some cases, professional seed growers in different locations within the region who are passionate about contributing to the conservation and sharing of these seeds.

Historically, Partner Farmers, external seed growers partnering with NS/S to regenerate and increase the seeds, have participated in two ways:

1. Bulk Seed Exchange Program - The Bulk Seed Exchange program allows a grower to access seeds within the seed bank (with some guidance and limitations) at no cost, provided they return 25-50% of a successful harvest to regenerate the seed bank and make seed available for distribution through the various NS/S programs. Bulk Seed Exchange growers may be professional farmers, individuals growing in their backyard, or other non-profit gardens and programs. The growers are not charged for the seed they access, but neither are they compensated beyond reimbursement of shipping costs. This program represents the significant majority of external seed growers working with Native Seeds/SEARCH.
2. Contract Growing - A small number of growers partner with NS/S as contract growers, completing a formal agreement and receiving a per-pound payment upon successful seed return. While all of these growers have greatly contributed to the work and mission of NS/S, for a number of years there has been a clear need to work with more seed growers in the context of a formal contract in order to provide equitable compensation for the work of seed stewardship, to

ensure a high-level of quality and quantity of the seed is returned, and to keep pace with the regeneration needs of the large seed bank collection.

Virtually participating in the last OSA conference allowed several NS/S staff members to connect with the Seed Worker Organizing (SWO) group that emerged from that gathering, and follow along with their work over the last several years. For the last year in particular, a team of NS/S staff members has regularly met to work on renovating the NS/S Partner Farmer contract process to incorporate best practice recommendations from the SWO Contract Guidelines. In 2025, NS/S will be exploring testing out a new contract system with a small number of contract growers designed to better address the following issues, many of which are detailed in the SWO guidelines:

- Regularly checking that payment amounts for varieties correspond to documented yield data from in-house grow-outs to ensure growers are receiving fair and adequate compensation for the expected harvest
- Providing some form of up-front payment at the beginning of the season so growers don't have to wait until the end of the season for the first compensation
- Using stipends and equipment grants to meet grower's needs and provide adequate and culturally appropriate compensation for grower's time and skills while also recognizing that the seeds themselves are not a product or commodity that can be reduced to a simple monetary exchange
- Providing extra compensation for growers working with older, weaker seed lines, and for the extra work involved in significant rogue-ing and crop data collection
- Cultivating long-term relationships with growers so they can provide feedback about what is and is not working, improving the process for current and future seed growers
- Hosting training and professional development opportunities so growers can share their knowledge with each other and contribute to improved health of community and regional seed and food systems

Changes to the program are very much a work in progress, but we are excited about the direction the program is moving and eager to receive more feedback from seed growers so we can best support the seeds and the individuals who grow and care for them.

Seed Starting 101

Speaker: Laura Collins, Gaia Herbs

Facilitator: Susana Cabrera-Mariz, Organic Seed Alliance

This session, led by experienced organic grower Laura Collins (Gaia Herbs), will provide insights into starting seeds for a market farm. Topics include timing, methods for direct and greenhouse sowing, and seedling care. Collins will also share experiences using various direct-seeding tools and techniques to optimize success in organic farming systems.

Seed to Seed in the Desert Southwest: Native Seeds/SEARCH and Indigenous-Based Circular Community Food Systems

Speakers: Helena Gonzales, Native Seeds/SEARCH; Joel Johnson, Native Seeds/SEARCH; Veronica Limeberry, Native Seeds/SEARCH, Northern Arizona University

Facilitator: Susana Cabrera-Mariz, Organic Seed Alliance

Food begins with seed, and as such, community-based circular food systems (C-B CFS) must start at the seed. Many Indigenous cosmovisions support a circular vision of life, emphasizing that all threads are intimately connected, whereas if one thread is touched, all others ripple; in this way, seed as the central thread of all food systems shapes the entire web of relations around it. The U.S. southwest-based organization Native Seeds/SEARCH (NS/S) has long recognized the centrality of seed for community and food systems. NS/S embodies an Indigenous-based, holistic vision of seed-to-seed models for regional food sovereignty. As climate change, economic crises, border politics, and rapid land-use change disrupt both foodways and communities in the desert southwest, the sacred knowledge and seeds of Indigenous peoples across the region steward possibilities for transformative, sustainable change. Panelists will discuss how a healthy food system must be embedded in a healthy, regional seed system that incorporates the practices and realities of Indigenous keepers of these seeds and foods. This session explores NS/S's 40-year history, from creating a community seed bank to fostering Indigenous-led seed-to-food systems to building and supporting circular (but not enclosed) seedways that bridge food and cultural sovereignties. Attendees will learn how these initiatives address climate challenges while honoring the region's cultural and biological diversity.

Starting a Small-Scale Seed Business: Formation, Sustainable Growth, Systems and Infrastructure

Speakers: Katie Jagger and Samuel Scheidt, Saltwater Seeds

Facilitator: Kiki Elfendahl, Organic Seed Alliance

Katie Jagger and Sam Scheidt of Saltwater Seeds will share their experiences forming and growing a small scale seed business in the Maritime Northwest. Their talk will cover forming a multi-owner seed business, their systems for crop management and seed processing, and securing grant funding. They will share crop successes and failures, management of diverse farm sites, and the learning curve involved in managing the evolving needs of their operation. They will present their findings of incorporating a new energy efficient seed drying/ cleaning barn into

their systems which was funded through the WSDA Infrastructure Grant. Participants will be encouraged to share their own experiences, ask questions, and explore solutions to common challenges.

Strategies for Economic Sustainability in the Retail Seed Industry

Speakers: Reiley Carney, Snake River Seed Cooperative; Gina Covina, Open Circle Seed; Mike Levine, Nature and Nurture Seeds; Chris Thoreau, BC Eco Seed Co-op

Facilitator: Dan Brisebois, Tourne-Sol Co-operative Farm

How Can Small Seed Companies Compete for Economic Success While Living in the Shadow of "Big Seed"

Mike Levine, Nature & Nurture Seeds

Summary

Small and independent seed companies face increasing challenges in competing with larger players in the seed industry, referred to here as "Big Seed." These larger entities often dominate marketing, production, and distribution channels, creating significant obstacles for smaller players. This panel discussion explores practical solutions for small seed companies to achieve profitability and sustainability, focusing on collaboration, niche opportunities, and strategies for navigating power dynamics in the industry. Attendees will gain insights from former and current employees of larger seed companies, smaller successful seed companies, and struggling smaller seed companies.

Introduction

Small and independent seed companies face increasing challenges in competing with larger players in the seed industry, referred to here as "Big Seed." This term encompasses multinational corporations, medium to large domestic organic seed companies, and even successful niche players. This session is designed to explore strategies for achieving profitability and sustainability in the shadow of these larger entities. The panel will feature insights from former and current employees of larger seed companies, smaller successful seed companies, and struggling smaller seed companies.

The discussion will focus on identifying practical solutions for small seed companies, from marketing and production strategies to collaboration and advocacy, as well as examining whether smaller-scale operations can thrive or if consolidation is an inevitable reality of the industry.

Challenges Faced by Small Seed Companies

- 1) **Marketing Competition:** Larger companies dominate digital advertising, bidding up the cost of clicks and conversions during peak months. Smaller companies struggle to achieve a sustainable return on investment (ROI) during these periods.
- 2) **Industry Consolidation:** Market consolidation leaves fewer opportunities for small

companies to scale profitably. Medium-sized organic seed companies can also exert significant pressure on smaller players.

- 3) **Power Dynamics:** Larger companies sometimes abuse their market power, such as demanding credit for public-domain varieties or leveraging contractual relationships unfairly.
- 4) **Financial Viability:** Rising inflation, labor costs, and deferred maintenance strain profitability. Many small companies face uncertainty about how long they can remain in business without significant growth.

Panel Discussion Topics

- 1) **Identifying Challenges:** Panelists will briefly share the most pressing challenges they've faced in the industry, providing context for deeper discussions.
- 2) **Strategies for Success:** Seed racks, while a tempting way to increase market visibility, often present significant risks for small companies. High upfront costs for manufacturing, stocking, and distributing racks can strain financial resources. Additionally, managing relationships with retail outlets and dealing with unsold inventory can further erode profitability. Panelists will discuss whether seed racks can be a viable strategy and how to minimize their risks, or if alternative approaches are more sustainable.
- 3) **Marketing Tips and Strategies:** How to compete with Big Seed's marketing budgets. Identifying shoulder season opportunities where ROI is better for small companies. Alternative marketing channels (e.g., community networks, partnerships with like-minded organizations).
- 4) **Collaborative Opportunities:** Mentorship programs to match smaller companies with more experienced peers. Seed co-ops for shared marketing, production, and distribution. Leveraging programs like TOPP (Transition to Organic Partnership Program) to foster cooperation. Seed company networks to share resources and avoid duplication of effort.
- 5) **Cooperatives and Shared Models:** Forming seed co-ops to pool resources for production, marketing, and distribution. Creating collaborative platforms to collectively negotiate costs for advertising, shipping, and supplies. Partnering with regional seed companies to focus on local markets and shared infrastructure.
- 6) **Diversification and Niche Markets:** Identifying opportunities in neglected areas that Big Seed is not addressing, providing room for smaller companies to make a profit. Risks of overexposing niche opportunities and saturating the market.
- 7) **Sustainability Metrics** What does a sustainable seed company look like? Key metrics include: Gross revenue and profitability thresholds; optimal size in terms of employees, land, and production; balancing economic sustainability with ecological and community goals.
- 8) **Learning from Big Seed:** Insights from former employees of larger seed companies, tips for streamlining operations and increasing efficiency, navigating supply chains and production contracts. Insights from struggling smaller seed companies to highlight pitfalls and lessons

learned.

- 9) Audience Engagement and Problem-Solving: Open the floor for audience questions and discussions about their own challenges. Facilitate brainstorming sessions to explore solutions, with panelists offering feedback and insights.
- 10) When to Pivot or Exit: Establishing benchmarks for success and failure, knowing when to "throw in the towel" and transition to other opportunities, planning for retirement and financial stability while managing the business.

Key Questions for the Panel

- Is it feasible for a small seed company to scale profitably in today's market?
- What are the best models for small seed companies: staying small or aiming for growth?
- How can larger seed companies be encouraged to treat smaller companies fairly?
- Are there untapped opportunities or niche markets that small companies should explore?
- What is the role of collaboration, mentorship, and co-ops in supporting small seed companies?
- How can co-ops and shared networks help small companies increase their market share?
- Can antitrust laws be leveraged to create a more level playing field in the seed industry?
- What areas is Big Seed neglecting that smaller companies could focus on to create profitable niches?
- What lessons can be learned from struggling smaller seed companies to avoid common pitfalls?

Conclusion

This panel will serve as a critical opportunity for small seed companies to learn from experts, share experiences, and identify actionable strategies for competing with Big Seed. By fostering collaboration, exploring niche opportunities, and advocating for fairness within the industry, small seed companies can find ways to thrive despite the challenges they face. Attendees will leave with a better understanding of the dynamics of the seed industry and practical steps they can take to ensure economic sustainability and long-term success.

Call to Action

We encourage attendees to:

- Join or support collaborative initiatives like seed co-ops and mentorship programs.
- Advocate for fair treatment and transparency within the seed industry.
- Share their own experiences and insights to strengthen the small seed company community.

Together, we can build a more equitable, diverse, and resilient seed industry.

The Canadian Organic Vegetable Improvement Project (CANOVI): The Power of Collaborative Networks in Organic Vegetable Variety Development

Speakers: Craig Boychuk, No Coast Seeds; Michelle Dang, The Bauta Initiative on Canadian Seed Security, a program of SeedChange; Weijia Wang, University of British Columbia

Facilitator: Susana Cabrera-Mariz, Organic Seed Alliance

The Canadian Organic Vegetable Improvement (CANOVI) project is a collaborative network of farmers and researchers working to strengthen Canada's organic vegetable sector by developing open-pollinated (OP) vegetable varieties suited to regional agro-ecological farming systems. Collaboratively run by the Bauta Family Initiative on Canadian Seed Security (a program of SeedChange) and the Centre for Sustainable Food Systems at the University of British Columbia (CSFS), CANOVI bridges lab and field practices to support on-farm variety trialling, breeding, and seed production.

CANOVI collaborates with farmers to increase awareness of regional OP vegetable varieties, generate agronomic data on vegetable varieties trialled under organic conditions, share germplasm, and provide training, education, and resources on organic vegetable development. Since 2018, over 100 farmers have conducted trials on more than 50 vegetable varieties to assess their performance in regional, organic growing systems and their potential for seed production. In the past, the program has focused their attention on rutabaga, radicchio, and sweet peppers, with their focus more recently being on lettuce, carrots, and bok choy. Past work has focused on rutabaga, radicchio, and sweet peppers, with more recent work focusing on lettuce, carrots, and bok choy. The program has also hosted field days, variety tastings, participatory selection events, and seed production workshops across the country.

This panel brings together three CANOVI participants who engage with the program in distinct ways:

- Weijia Wang, a postdoctoral researcher, sharing her experience as an academic researcher and breeder;
- Craig Boychuk, a seed farmer, sharing insights as a seed grower, farmer-breeder, and CANOVI trial participant; and
- Michelle Dang, a nonprofit research coordinator, sharing perspectives as the project manager

Together, they discuss how they all got involved with CANOVI, how participation has shaped their work, and what they have all learned from engaging in a diverse network. They speak to the benefits of getting involved, at any experience level, and the various levels of participation to suit your commitment level. The panel also explores current practices when running a decentralized program like CANOVI, as well as areas for improvement to enhance efficiency, accessibility, and collaboration.

Panelists also discuss the broader agricultural landscape in which CANOVI operates. In the absence of strong public agricultural extension services and vegetable breeding programs in Canada, CANOVI has helped address this gap by supporting on-farm and participatory breeding. Although CANOVI is partially funded by Agriculture and Agri-food Canada's Organic Science Cluster partnership, it is not a substitute for government-run plant breeding programs essential to farmers and seed growers. CANOVI has benefited from international partnerships, such as collaborations with the Organic Seed Alliance and the Carrot Improvement for Organic Agriculture (CIOA) project, which have provided invaluable expertise and germplasm.

Expanding networking opportunities with experienced plant breeders for troubleshooting and mentorship—particularly for farmer-identified priority crops—would further strengthen the program.

CANOVI will be starting a new year of programming this upcoming spring (2025), and welcome new participants and collaborators! If you want to learn more or get involved, please visit seedsecurity.ca/canovi.

This research is part of Organic Science Cluster 4, co-managed by the Organic Federation of Canada and the Organic Agriculture Centre of Canada at Dalhousie University, and supported by the AgriScience Program under Agriculture and Agri-Food Canada's Sustainable Canadian Agricultural Partnership.

The Heirloom Collards Project

Speakers: Chris Smith, Heirloom Collard Project; Eva Steinberg, Heirloom Collard Project; Ira Wallace, Southern Exposure Seed Exchange

Facilitator: Edward Johnson, Oregon Tilth

The Heirloom Collard Project is a grassroots collaborative initiative to keep seeds and collards in the hands of communities who will grow, save, and celebrate them. The HCP stewards over 100 collard varieties throughout its partner organizations. Representatives from the core HCP team will present the ever adapting and evolving organizational model of the HCP, which is decentralized and fluid, and aims to support and inspire authentic collard connections. The HCP spans youth education, community plant breeding, variety preservation, culinary exploration, cultural traditions, art and poetry, farm and gardening, and so much more. We'll share a number of collard-focused projects, which have grown out of the HCP, and invite you to develop your own collard initiative.

The Origins of The Heirloom Collard Project

Ira Wallace, Southern Exposure Seed Exchange

The project began with the seed of many landrace collard varieties that John Morgan and Edward Davis collected and described in their book *Collards: A Southern Tradition from Seed to Table*. One thing that Davis and Morgan noticed is that these stewards were all old, some really old and many did not have a family member to carry on the seed saving tradition. Mark Farnham at the Charleston, SC USDA Agricultural Experiment Station grew-out many of the varieties and took beautiful pictures as testimony to the uniqueness and variety of this collection.

Southern Exposure Seed Exchange and Seed Savers Exchange began working together to learn more of the story of the seeds that had been donated to the USDA seed bank. To get the project going Seed Savers Exchange requested seed samples of the Davis/Morgan Accessions from the

USDA. In 2016, as a training run for new stewards, we set up an initial grow out of some varieties. In 2017 the number and size of collard grow outs for the project increased. That September, the Heirloom Collard Project had its first large meeting, with training for collard seed saving and oral history gathering, at the Heritage Harvest Festival at Monticello.

We already had the seed samples from the USDA of 60 heirloom landrace collards planted for evaluation at the Seed Saver's Exchange Heritage Farm and Acorn Community Farm. Some varieties were distributed for seed increases with both experienced and new seed savers.

Since then many groups and publications like the Heirloom Gardener and Mother Earth News are sharing the story of these varieties with readers. Chefs we talked to at the Southern Foodways Alliance, including Michael Twitty, were eager to try these varieties. In 2020, we had more opportunities to collaborate with chefs, farmers, and gardeners when Lane Selman of the Culinary Breeding Network added Collard Week to their Winter Vegetable Sagra series. Our goal is to build a strong community of "self-sustaining" heirloom seed stewards. Seed Savers Exchange, Southern Exposure Seed Exchange, Working Food, the Utopian Seed Project, Ujamaa Cooperative Farming Alliance, and a growing list of individuals are committed to the project. As we increase the quantities of seeds, we need more gardeners and farmers who want to steward these varieties.

A Collaborative Framework

Chris Smith, Heirloom Collard Project

The Heirloom Collard Project is an expansive network of collard loving folks who are working to grow, eat, save and share collards. The project team includes seed savers, farmers, chefs, artists, and gardeners, and self-describe as, "A crock pot of sorts, where the ingredients are each respected, but the true magic is in the pot likker."

It is important to recognize that the HCP only exists because of the people who will it to exist. The HCP is not incorporated, it does not have an EIN number, non-profit status, or by-laws. It does not have a chairperson or a secretary or a treasurer. Instead, it is an idea held between organizations and people who hold the core belief that collards are special and should have the opportunity to thrive in the hands of the people and communities who appreciate them. A core leadership team meets monthly to check-in, discuss collard-related opportunities, and generally keep the ball rolling. HCP has a Slack account, where planning questions and conversations can happen. There are no restrictions on who can attend these meetings or join Slack.

The core group is clear that they are not the owners of the seeds or even the project itself. Imagining themselves to be more of a container that holds space for exciting collard-related things to happen. The vision is a decentralized and energized collard landscape of seed growing and sharing, collard cooking and creativity, and all sorts of art, science, and research related to collards. In this way, the collaborative nature of HCP is very pure - anyone can bring anything to the table. However, this creates its own barriers because the only projects that gain momentum

require someone with resources to step up and make them happen (this is often time, but also money). It means the energy of the project can ebb and flow.

We've experienced this twice when key members of Seed Savers Exchange have left suddenly and are no longer active in the HCP. There was a leadership void. We have since tried to mitigate this by further decentralizing our efforts, but it continues to be a balance of efficiency (strong leadership but concentrated power) and stagnation (no leadership but decentralized power).

An observation: When there is a specific, tangible goal (i.e. a collard tasting at an event, or a variety trial) then the group becomes focused and motivated, meetings are dynamic and engaging. Collard things happen! But without a tangible goal, conversations meander, and meeting energy can feel low.

Project Partner Examples

Collardz 4 Kidz - Discovering Biodiversity Through Seed Saving

Through the COLLARDZ 4 KIDZ project youth learn the basics of seed breeding by starting with the nutrient dense green vegetable crop known as collard greens. Considered by many to be a culturally meaningful vegetable, collards are often served at holiday meals during the fall and winter months.

The Collards 4 Kidz project starts at the beginning of the school year with the planting of the collard seeds. In May or June the youth will harvest and save seed from the collards of their choice. To demonstrate the amazing biodiversity that exists in this amazing crop, each class gets a packet of six varieties of heirloom collards.

Collard Week Collab with Culinary Breeding Network

This was the first-ever Collard Week and it was part of a series of events, the 2020-21 Variety Showcase + Winter Vegetable Sagra. Speakers included Michael Twitty, author of *The Cooking Gene*, Ira Wallace, of Southern Exposure Seed Exchange, Jon Jackson, the founder of Comfort Farms, Amirah Mitchell, of Truelove Seeds, and Ashleigh Shanti, a chef in Asheville, NC. Each day of the event explored the significance and deliciousness of collards.

Collards are a highly nutritious leafy green vegetable that have a significant role in African American history. Chris Smith, Co-Organizer of Collard Week and Executive Director of Utopian Seed Project, told Food Tank, "Enslaved people of West Africa readily adopted collards in place of the dark leafy greens they knew from their homeland, and in that way became a food of the African diaspora."

Michael Twitty shared that collards originated in Eurasia, and were brought to Africa by Portuguese settlers. The first Africans brought to Virginia through the slave trade were heavily influenced by the Portuguese and brought seeds, including collard seeds, with them. Enslaved

Africans in the U.S. cultivated collards, which, Twitty says, were “superfood powerhouses” that filled nutritional gaps in their diets.

Antonio’s Root Work

In 2020 The Heirloom Collard Project characterized the above-ground growth habits of 18 landrace collard varieties across 250 organic gardens. Antonio Brazelton PhD student studies root systems of collards. Little work has been published to investigate collard root system architecture, which influences both quality traits and ecosystem services that contribute to sustainable crop production. Antonio analyzed the root systems of 18 collard landrace varieties to evaluate spatial and temporal features of this population that can be best adapted for low-input and climate resilient agricultural systems. He hypothesizes that there is a range of root phenotypic diversity that exists within these varieties that can be exploited for improving drought tolerance in urban soils.

Collard Ultracross

In 2020, as a collaborator on the Heirloom Collard Project, we trialed 21 varieties to explore some of the diversity in the collection (Read the full story of collard diversity here: From Heirloom to Ultracross). We loved seeing all the phenotypes, and we worked with chefs to taste many tender and beautiful collards. One important observation is that these ‘heirloom’ varieties displayed high levels of intra-varietal diversity. The assumption we made was that the community seed keepers who had stewarded these seeds didn’t place a huge amount of value on hyper uniformity.

The plan never included seed saving because collards are obligate outcrossing and we had no way to isolate each variety. However, the part of the field the collards were occupying was not immediately needed, so we allowed the collards to continue growing after the trial data had been collected. The collards were unprotected and more or less ignored. That winter we experienced a sudden drop in temperature - a severe temperature swing from the high 70s down to a low around 8F. I expected to have lost all of the collards (8F uncovered is tough for collards at the best of times, let alone with the rapid swing). What we experienced in the field was about 40% plant loss, but at the same time, many of the survivors looked quite undeterred. An interesting observation was that the surviving plants were spread out across the 21 varieties. Looking at a healthy plant and a mushy plant next to each other made it extremely clear that some plants had a genetic advantage for surviving cold weather.

We decided that a super tough, yet deliciously tender, and beautifully diverse collard mix sounded like a worthwhile project. Our simple strategy was to allow any winter survivors to flower and set seed. The obligate outcrossing nature of collards (highly promiscuous) ensured that everything would be completely shaken up. As we started sharing online about our highly diverse collection of collard seeds, two close Heirloom Collard Project collaborators (Mel Edwards and Mel Desa) created the term ultracross. First as a description i.e. that’s an ultra cross.

Second as a catchy hashtag. And from that point forward we have described this diverse mix as an ultracross.

The Ultracross Collards have been well received and are now distributed by multiple seed companies, and grown across the United States of America. Along the way we have maintained a highly diverse population of environmentally selected collards in Western NC. They shift and change with the seasons and are regularly praised for their field hardiness and kitchen tenderness. We have also heard a lot of enthusiasm about purple phenotypes and have begun the work of selecting a Purple Ultracross Collard population. Each year we cull the non-purple plants and allow the most purple to go to seed. This is an ongoing and exciting selection process!

Collard Atlas

Collard Atlas is a collaboration between the Utopian Seed Project and researcher Chris Kieve that is deepening the work of The Heirloom Collard Project through grounded community connections and regional seed work. Collard Atlas started by identifying 15 heirloom varieties that were originally stewarded in North Carolina. During the 2024/25 Utopian Seed Project grew these varieties, and Chris K also grew them all in partnership with Tierra Nigra near Durham, North Carolina. In addition Black farmers across the state were also recruited to grow these varieties, share observations and reflections, and reintegrate these collards into NC communities.

Through growing these heirlooms, the aim is to reconnect communities with their seeds and traditions by documenting and mapping their histories, stories, and movement throughout NC. It is an attempt to connect their potential futures with deep stories of their pasts. Collard Atlas has also become an interactive session, where participants are invited to think about their own stories and geographies.

Collard StoryCorps

Collard StoryCorps is a newer project that has grown out of the Heirloom Garden Oral History Project (HGOHP). The HGOHP is led by Ujamaa Cooperative Farming Alliance and partners with Princeton and Spellman to document BIPOC oral histories in Appalachia and the Southeast. Ujamaa is also part of the HCP core team and so there has been a natural tendency for some of the oral history interviews to lean heavily towards collards. The Utopian Seed Project also has a program called, Crop Stories, which takes crop-specific deep dives through art and storytelling. Finally, Chris Kieve, as part of the work with Collard Atlas, is committed to doing follow up recorded interviews with participants.

All these things came together in 2024 when we launched the Collard StoryCorps, which is an open invitation for folks to share a short collard-related story, memory, or experience. We are recording these at events and working on a digital version. The StoryCorps will be hosted on the Heirloom Collard Project website.

CFSA Tastings

As a part of HCP’s goal to engage the broader community, we have hosted several collard tastings at Carolina Farm Stewardship Association’s (CFSA) annual Sustainable Agriculture Conference. In 2024 we collected 16 varieties of collards from local farmers, many of which were a part of the Collard Atlas Project. Participants were invited to sample each of these varieties, then write their flavor notes and mark their favorite and least favorite of the collards. Many were amazed to see how many types of collards were out there, and how different they look and taste.

Similarly, at CFSA in 2022, we invited chef Adrian Lipscombe and fermenter Meg Chamberlain to create dishes featuring creative uses of collard greens, and, alongside the community collard leaf tastings, served four dishes: collard kimchi, collard “dust” (flour made from dehydrated and ground collard leaves) crackers, bread and butter collard stem pickles, and, our favorite, collard mustard (which will be showcased at the 2025 Organic Seed Alliance Organic Seed Growers Symposium mini Variety Showcase)

Collard Art with Oak Springs Foundation

Oak Springs Garden Foundation is a foundation that hosts residencies for artists and people who study plants from a variety of disciplines. Their Virginia estate includes a farm, formal gardens, and extensive botanical book and art collections. Their farm includes a seed collection that focuses on local varieties, and artists in residence design seed packets for the foundation.

A few years ago, Ira and some others from Southern Exposure Seed Exchange met with Christine, the farm manager, who was very excited about our work at HCP. Since that meeting, they have grown eight or nine different collard varieties and held outreach programs to encourage local students to engage with the collards—including collard-related art projects (Melissa DeSa’s collard life cycle art and leaf prints, for example) and incorporating collards into their kitchens.

Year of the Collard

Eva Steinberg, Heirloom Collard Project

Because 2025 is the ten year anniversary of the Heirloom Collard Project, we decided to turn the entire year into a celebration of all things collard through several aspects:

- 1) Recipes: We kicked off the year with a guide to New Year Collards, based on information gathered at several events in the fall to showcase the different ways that people make collards for the new year, whether with more traditional ingredients or with their own regional spin. Throughout the year, we are planning to highlight new recipes and creative ways to cook with collards, culminating in a collard cook book at the end of the year. We will be hosting virtual cook-alongs.

- 2) Collard of the Week: Every few weeks, we will be showcasing one of the collards in our collection, sharing some of its history and talking to farmers who are currently stewarding these varieties.
- 3) Collard growers guide: We are in the process of compiling a list of farmers growing collards around the country, including which varieties they are growing and where you can buy them. We are hoping to map this information so that folks can easily find farmers and collards near them! We are also working on collating information about growing collards in different USDA growing zones, such as seeding time, harvesting time, and guides to saving collard seed.
- 4) Ultracross “quilt”: In addition to being the 10th anniversary of HCP, 2025 is the 5th anniversary of the original Ultracross population! We are reaching out to folks who have grown and saved seeds of the Ultracross to send us some of their seed, with the hope to grow the Ultracross offspring next to each other to see which directions people have taken their collard populations.

The Heirloom Gardens Oral History Project

Speakers: Bonnetta Adeeb, Steam Onward Inc/Ujamaa Cooperative Farming Alliance; Chris Keeve, University of Kentucky / Ujamaa Cooperative Farming Alliance / Utopian Seed Project; Justice Madden, Ujamaa Cooperative Farming Alliance; LuAnna Nesbitt, Utopian Seed Project, Princeton University; Ira Wallace, Southern Exposure Seed Exchange;
Facilitator: Tessa Lowinske Desmond, Princeton University

The Heirloom Gardens Oral History Project and/or Reflections on Tending a Story Garden

Correspondence: heirloomgardensproject@gmail.com

The Heirloom Gardens Oral History Project (HGP) was established in September 2022 to conduct interviews documenting the stories of people working to preserve Black and Indigenous seed and foodways. The first phase of the project ran from September 2022 to September 2024. During that time, a group of collaborators from Ujamaa Cooperative Farming Alliance (UFCA), Princeton University, and Spelman College worked together to conceive of, define, develop the oral history project and to conduct a pilot and two seasons of interviews during the summers of 2023 and 2024. To date, HGP has conducted 140 interviews across locations in the Southeast United States and Appalachia including Alabama, Georgia, Kentucky, Maryland, Mississippi, North Carolina, Virginia, and Washington D.C.

The archive of interviews in the HGP collection are housed at Spelman College and made publicly available by the Atlanta University Center’s Woodruff Library. Approximately fifty interviews are currently available to the public. The remaining interviews in the collection are being processed and should be available by the end of 2025.

While the initial phase of HGP was developed and conducted in a community-university collaboration, the goal for the future of HGP is that UFCA would provide future oversight and

administration of the project. The HGP team is currently developing a full suite of training materials and an equipment lending library that will assist UFCA in creating a story corp among their membership to continue the work of HGP in other geographic locations.

In this paper, we discuss the process and methods that HGP has employed in developing our collaboration, the project's infrastructure, and the lessons that we've learned so far. To learn more about HGP, you can visit our project website. To listen to the stories in our archive, you can visit the audio booth exhibit available at the OSA conference or the Woodruff Library's archive website listed below.

Project website: <https://heirloomgardens.princeton.edu/>

Archive: <https://radar.auctr.edu/islandora/object/sc.heirloom:9999>

History

HGP grows out of the work of the Ujamaa Cooperative Farming Alliance (UFCA). UFCA is a BIPOC-led seed cooperative with a mission to “grow BIPOC growers” by training BIPOC farmers to include seed production on their farms. In UFCA's early days, the founders were especially concerned with identifying which culturally meaningful plant varieties were most in need of stewarding. A key question was: How can we figure out what counts as ‘culturally meaningful’? UFCA hosted focus groups of grandmothers to discuss what they remember about their grandmothers' gardens. What makes a seed culturally meaningful? Who decides? How long does cultural meaning hold? What seeds are worth saving? Growing out of these initial conversations, UFCA was officially established in 2020 during the COVID-19 Pandemic. Since its founding, hundreds of people have become involved in UFCA by attending convenings and trainings, joining working groups, and signing up for membership.

From the grandmothers' grandmothers' story circles, UFCA compiled a list of plants and developed a general sense of their vision for what they wanted to find, grow, and maintain as an organization. However, in those conversations, disagreements also came up regarding the stories themselves. Some of the participants began asking questions about what responsibilities UFCA might have to steward the stories along with the seeds. The stories felt vital and urgent to some. Some of the participants wanted to find ways to broadcast the information that was shared. To others, the stories felt sacred and private. Amidst this growing cleavage, the story circles dissolved. But it was clear to UFCA founders that the organization would need to return to the stories and develop a plan for how to offer an opportunity for sharing while also ensuring that the stories were thoughtfully archived and shared.

The Heirloom Gardens Project (HGP) was conceived as a way for UFCA and the broader public to document and access the stories of people who have been working to preserve Black and Indigenous seed and foodways. Several of the scholars involved in HGP are also active in UFCA's activities. Over time, we have had many conversations about how to move forward with an oral history project. HGP combines the methods expertise of university colleagues with the agricultural expertise and community networks of UFCA. There are many obstacles to deeply collaborative and equitable university-community partnerships. In this paper, our goal is to share the process of developing this community-engaged oral history project. After outlining how we

came together and our early design process, we detail some of the problems we encountered and solutions we devised in order to launch this free, open-access digital archive.

Building Consensus and Collaborative Relationships

The first phase of HGP's work was funded by Princeton's Alliance for Collaborative Research and Innovation (PACRI) and involved faculty from Princeton University, Spelman College and leaders from UFCA. In early 2022, Princeton University announced a grant opportunity for Princeton faculty to propose partnership projects with faculty from a select number of HBCUs. Knowing that UFCA was looking to document seed stories among Black and Indigenous gardeners and farmers, Dr. Tessa Desmond and Dr. Hanna Garth, who co-lead the Princeton Food Project and are both founding members of UFCA, brought together members from UFCA and the Food Studies Program at Spelman College to discuss applying for the funding to collaborate. At Spelman we partnered with Dr. Kimberly Jackson, Director of Food Studies at Spelman, Chair of Chemistry and Biochemistry, Spelman College Archivist, Holly Smith, and Spelman College Oral Historian, Dr. Gloria Wade Gayles. Two of UFCA's co-founders who also participated in the story circles joined the team as co-investigators, Bonnetta Adeb and Fatimah Hasan.

Drawing from UFCA's networks and folks we understood as key stakeholders we tried to create a group of core members of the BIPOC growing community in the Southeast and Appalachia who were interested in participating and having us collect oral histories within their networks. Once we had established a group of folks interested in this work from UFCA and other partner organizations we started to engage folks over zoom to understand their vision for the oral history project and how it could serve their organization's needs. These teams also began to develop contact lists of well-known seed savers and growers in the region or who had already expressed interest in sharing their stories. As much as possible we wanted to enact the vision of Black and Indigenous elder growers in creating this oral history project. Although there were some competing desires, we tried to compromise within the constraints of our time and budget. We held a series of zoom meetings and one on one conversations with our stakeholders to determine several dimensions of the project including where to house the archive, what topics and themes to address in the interviews, a collectively sourced list of key contacts for interviews, and any relevant information for the consenting documents we would create. We shared, discussed, and ultimately followed the guidelines and ethics outlined by the Oral History Association. We agreed to invite narrators to tell their stories knowing that our intention was to build a free, open access archive where those stories could be used by current and future generations. We agreed that we wanted narrators to share stories of their own accord and not feel pressured to do so. We wanted to train young people to conduct the interviews as oral historians. We expected our interviewers to build relationships with the narrators, and, when possible, spend time volunteering in their gardens or on their farms before sitting down for a recorded interview.

Oral History Ethics and Diverse Visions Across Collaborators

At the outset only a few members of the team had formal training in oral history collection. To prepare ourselves for this work, we turned to the Oral History Association to understand the ethics and best practices of oral history. Unlike ethnographic research, oral history is not considered to be human subjects research and so does not fall under the purview of institutional review boards. Instead, oral history falls under "The Final Rule" which states that

“scholarly and journalistic activities (e.g., oral history, journalism, biography, literary criticism, legal research, and historical scholarship), including the collection and use of information, that focus directly on the specific individuals about whom the information is collected” (not generalizing to other individuals). Our team agreed that the goal of our work was to document individual stories as such and not to make generalizations about the people or stories that we were documenting. Additionally, the project was being developed within a university context but it was not intended to continue to depend on universities (and, thus, internal review boards). The goal for the project was that UFCA would become the primary stewards of the work and archive after the infrastructure was in place and the pilot was complete. Therefore, the leadership team has taken care to maintain focus on individual stories to ensure that the project adheres to The Final Rule.

Although we aimed to center the narrators and their stories, due to our constraints we felt the need to develop an interview guide to help keep the stories focused on themes related to growing, seed saving, and cooking with culturally meaningful crops. We held meetings, had one-on-one conversations, and solicited feedback using Google Forms to gain input from as many stakeholders as possible regarding the kinds of questions the project should ask. In our interview guide we needed to create flexibility that allowed the interviewers to have access to a wide range of possible questions but also gave them the freedom to tailor the interview to the expertise and experience of the narrator. The guide, therefore, includes a section of introductory questions that allow narrators to warm up as well as several different possible sets of follow up questions that are focused on specific technical or cultural elements related to types of seeds, farming techniques, and food preparation practices. There are additional sections that interviewers can draw from when asking questions about migration, access to land, and family history.

Before the interview ever begins, interviewers call narrators on the phone to discuss what they can expect during the interview. Interviewers schedule a time and place for the interview and then, if the location is at the place where the narrator farms, gardens, or cooks, the interviewer arrives early and offers to assist with the work of farming, gardening or cooking. After time spent building connection, the interviewer and narrator select a location to conduct the interview. This is done with careful attention to the audioscape of the location. The interviews begin with a question about memory, such as “Close your eyes and try to remember a kitchen from your life, maybe your grandmother’s, what were the smells and tastes you remember? What was growing in the garden, coming into the home to make some of those delicious dishes?” From there, the interviewer moves through the interview guide or pursues additional lines of inquiring within the scope of the project.

Identifying an Archive and Piloting the Interview Process

The Oral History Association’s best practices include identifying a repository or archive to house the oral histories before they are collected. OHA states that “oral historians should take care to select a repository that aligns with the project’s goals, has the capacity to preserve the oral histories, can enforce any signed agreements, and will make them accessible to the public.” The stakeholders for the project wanted the archive to be housed at an institution with national recognition and a documented history of supporting the lives and traditions of BIPOC people. With Spelman College as one of the partners on the project, it was agreed that The Spelman College Archives would serve as the primary repository and the Atlanta University Center’s

Woodruff Library would host the interviews for public access. In line with OHA standards, we created our own consenting documents and a demographic information sheet based on what our partners wanted to know and included the typical metadata that would be included in an archive of this nature.

In April 2023, a subset of our team travelled with members of UFCA to Kentucky to pilot our methods at a convening of elder Black farmers and growers. The convening was part of 2023 James Beard Award winner Jim Embry's annual birthday celebration and planting day at his family farm. This coincided with the UFCA Spring convening at Berea College. During the visit, we collected 4 pilot interviews with local farmers, familiarized ourselves with the recording equipment, worked out issues with the interview guide, and adjusted our plans for our summer oral history student internship.

Throughout the spring term we cultivated relationships with partner organizations and collectives of BIPOC growers throughout the region. Members of our team attended the meeting of the Federation of Southern Cooperatives, the Black Urban Growers meeting, Carolina Farm Stewardship Association meeting, the Heirloom Variety Showcase, and UFCA convenings.

Training Oral Historians

Undergraduate students worked as oral history interns each summer. Spelman students were selected through their already existing food scholars' program. In late spring, Princeton student interns were selected through partnerships with two internal organizations: the Program for Community Engaged Scholarship and the Recognizing Inequities and Standing for Equality fellowship hosted by the Pace Center for Civic Engagement.

Working closely with our team at Spelman, we designed an oral history training to prepare our team for the collection of oral histories over the summer. During a two-day boot camp held at Spelman College, students learned to build trust with narrators, establish connections, and lead narrators to sites of memory that are sometimes blocked or hidden. Students also learned how to use the recording equipment and about the process of preparing interviews for the archive, metadata collection, and had opportunities to practice interviewing one another as well as an elder from UFCA during the workshop.

After the boot camp training, students moved to their fieldsites where they lived for eight weeks and worked 30-35 hours per week. Each fieldsite location had strong UFCA leadership and community networks. The students were mentored and supported by a multi-layered team that consisted of a graduate project manager who supported students across all of the fieldsites, a fieldsite mentor (from UFCA) who helped students meet narrators and understand important pieces of historical and cultural significance in their particular site, and a fieldsite coordinator who helped students to arrange logistics and who supported on-ground problem-solving as needed. During the summer of 2023, HGP had teams in the greater Atlanta area, Washington, D.C., and Kentucky. During the summer of 2024, HGP had team based in Asheville, North Carolina, the Greater Atlanta Area, and southern Alabama and Georgia.

While the students lived in their fieldsites, the graduate project manager hosted regular meetings that were structured by a syllabus with readings and discussion topics relevant to particular stages of their work in the field. These included topical weeks such as the early

session on “Showing Up: Outreach, Protocols, and Conduct” and a later session on “Homegrown Stories: Connecting Land, Spirit, and Community.” Assigned readings ranged from first-person narratives to theoretical articles and reflections.

Interviews are recorded and stored, along with consent forms, in restricted access shared drives on the Google Cloud and on an external hard drive until they are fully processed and posted in the online archive. During the academic year, the interviews are processed by a team of archivists from the institutional partners including UFCA members as well as faculty and students from Princeton, Spelman, and the Atlanta University Center.

Reflections

The overlapping involvement of people from university communities and UFCA has enabled our team to engage in many conversations about the strengths, stakes, and pitfalls of university-community collaboration. We took more than a year to develop materials and methods that thoughtfully weave together strengths that each of us brings including rich discussions of ethics, history, what constitutes research, past harms that need to be attended to, and how benefits from oral history projects can be conferred, attributed, and shared. In our work thus far, we have learned several important lessons. (1) Many organizations also want to collect oral histories but lose precious time and resources creating their own tools and processes of collection, (2) BIPOC narrators’ stories of growing and cooking are rooted in larger histories that range from nostalgic to traumatic; interviewers need to be trained and prepared to deal with this range of responses, (3) Ethics and follow-through are especially important when collecting interviews in BIPOC communities that have suffered from unethical and extractive research projects in the past. Many oral history projects are recorded but never processed through to a final archive, which has created suspicion about the practice within the communities in which we work.

Beyond the process of archiving oral histories, the story collection work happening through HGP is reparative, and a way to honor elders and those who have been pivotal in keeping seed and foodways alive in BIPOC communities. HGP wants to draw attention to the work of people who may otherwise go unacknowledged. HGP and UFCA seek to build relationships with the narrators and to draw them into a larger movement of people who are working to center BIPOC contributions to food and farming and bring more justice to issues like labor exploitation, biopiracy, and land loss among BIPOC communities.

The Northeast Seed Network Taking Root: Ecotypes, Ecoregions, and Ecological Restoration

Speakers: Dina Brewster, Northeast Seed Collective; Sefra Alexandra, The Seed Huntress;
Facilitator: Samantha Hilborne-Naluai, Rodale Institute

The Northeast Seed Network tackles the critical shortage of native seeds for restoring degraded ecosystems. The demand for ecotypic — source-identified, genetically appropriate native plant materials of known provenance — consistently outstrips the available supply. The Ecotype Project trains a new growing cohort of small-scale organic farmers in the specialty crop of

restoration seed throughout the Northeast. This has germinated the farmer-led Northeast Seed Collective, which includes the Eco59 and Eco84 brands to reference EPA Ecoregion Level III seed provenance. This model of increasing seed literacy by engaging botanists, small-scale farmers, and end-users to make ecotypic seed commercially available is intended to be used as a replicable template for seed networks in North America and around the world. Participants will learn about the Northeast Seed Network Map, a tool enhancing collaboration among diverse stakeholders, and discuss how this replicable model can support ecoregional restoration efforts globally.

Towards a Perennial Paradigm in Agriculture

Speaker: Chris Homanics, Head, Hands, Heart Nursery; Nate Kleinman, Experimental Farm Network;

Facilitator: Nate Kleinman, Experimental Farm Network

Perennial crops offer numerous benefits, from soil conservation to carbon sequestration, yet annuals dominate modern agriculture. This panel will discuss the importance of shifting the prevailing paradigm in agriculture from annual- based cropping systems to more resilient systems that incorporate perennial crops. This panel will explore advances in breeding and utilizing perennial crops, including vegetables, grains, and fruit trees. Attendees will learn practical strategies for breeding, harvesting and processing, and marketing perennial seeds.

Traditional Seed Preservation Methods as Alternatives to Chemical Seed Dressing

Speakers: Mercy Ambani, Seed Savers Network; Raoudath A. O. Bouraima, Les Jardins de L'espoir; Daniel Wanjama, Seed Savers Network Kenya

Facilitator: John Kariuki Mwangi, Slow Food Kenya

The Seed Savers Network (SSN) will present organic alternatives to chemical seed treatments, featuring traditional methods such as wood ash, neem leaves, and soot. This session will explore the results of SSN's extensive research and fieldwork in collaboration with the National Gene Bank of Kenya and local farming communities across Kenya, highlighting the efficacy and benefits of organic seed preservation techniques. Extensively researched in collaboration with Kenyan farming communities, these traditional techniques offer sustainable solutions for maintaining seed viability and promoting soil health. Participants will learn practical applications and gain insights into advocating for organic seed preservation at policy levels.

A Participatory Organization to Create Both New Buckwheat Populations and Affordable Dehulling Equipment in France

Veronique Chable, INRAE UMR BAGAP, Rennes, France
Kevin Morel, INRAE UMR BAGAP, Rennes, France
Thomas Néau, INRAE UMR BAGAP, Rennes, France
Benoit Robert, INRAE UMR BAGAP, Rennes, France
Clara Gueguen, FRAB, Rennes, France
Emma Flipon, D'une Graine aux autres, Rennes, France
Estelle Serpolay, D'une Graine aux autres, Rennes, France
Guillaume Delaunay, L'Atelier paysan, Saint Nolff, France
Pierre Guéret, L'Atelier paysan, Saint Nolff, France
Pascal Faes, Triptolème, Questembert, France
Morvan Le Coz, Triptolème, Questembert, France
Anne Guérin, Ideographe, Redon, France

Summary

Modern seeds, like agricultural machinery, have supported the intensification of agriculture. For 25 years in Brittany, few pioneers initiated a participatory research with the French National Institute for Agriculture, Food, and Environment (INRAE) to respond to their specific needs and to the regulatory injunctions of producing organic with organic seeds. After more than 20 years of participatory plant breeding projects, including European projects since 2007 such as Liveseeding, we have demonstrated the interest of crop diversity, including forgotten or neglected species, to increase resilience of food systems. The bottlenecks are becoming the know-how and availability of specific machinery to support diversification from field to plate. Buckwheat, a well-known crop for the traditional Breton pancakes, is currently being explored for other uses such as dehulled seeds to answer to the recent request of a more vegetarian and diversified food. However, very few varieties exist in the field and on the market in France. This situation encouraged farmers to initiate buckwheat breeding for new populations with new objectives for a wider range of products (Liveseeding EU project). But the tools necessary for processing these are not on the market or at costs incompatible with short circuits, such as buckwheat dehulling tools. An enlarged participatory research has emerged with farmers, represented by FRAB (an organic trade union), Triptolème (a farmer seed association), a new entrepreneurial activity to support on-farm diversity development (D'une graine aux autres-DUGA), an association for peasant machinery (l'Atelier paysan-AP). OutilSem project, supported also by Brittany region, is organizing the processes for the co-creation of the dehulling equipment and the buckwheat population.

Introduction

The first European wide organic regulation was introduced in 1991. In Europe, when the EU Regulation 1452/2003 requiring the use of organic seed for planting went into force in 2004,

organic seed professionals were not ready to fulfil the demand. Thus, organic farmers and their organizations started to meet with researchers and to build participatory plant breeding (PPB) projects on several species (Chable, 2014). Several European Union (EU) projects have been running since 2007 to reorganise the seed system in Europe to consider on-farm plant breeding besides professional seed companies, and to adapt seed regulations. The Liveseeding¹ project brings together more than 37 European partners. The main objective of Liveseeding is to promote growth of organic seed and plant breeding for more sustainable local food systems.

In Brittany, in the western part of France, since early 2000, some farmers organized themselves to fulfill the needs for organic varieties and seeds (Chable et al., 2008). In 2006, the seed association Triptolème was created. Buckwheat was a good candidate for participatory research because it has lots of agronomical interests and has a huge traditional value in emblematic Breton recipes. However, few varieties are available on the market for buckwheat cultivation in Brittany. Moreover, citizens' wishes for a more vegetarian diet are increasing in Europe, mainly within the organic world. Producers request a broader panel of products from buckwheat, for instance, with dehulled seeds. Breton landraces and the current variety (La Harpe) cannot be dehulled easily. Regional funds support participatory research in Brittany and provide means through calls for proposal (Research and society²) that aim at putting science at the service of the territory. These kind of initiatives have been existing for 15 years in Brittany. Several projects have been successively implemented since 2010 to support seed networks, organic farmers and researchers involved in the renewal of cultivated diversity, including different forms of product qualities for several crops. Currently, the challenge of a project called OUTILSEM is to integrate the participatory research processes of varietal innovation and those of farm equipment innovation for buckwheat. OUTILSEM partnership is meeting an extensive experience in both subjects: FRAB (an organic trade union), Triptolème (a farmer seed association), a new entrepreneurial activity to support on-farm diversity development (D'une graine aux autres-DUGA), an association for peasant machinery (l'Atelier paysan-AP) and INRAE-BAGAP (Serpelay et al., 2018).

Objectives

The challenge of the project is to work on two dimensions, at the same time: (1) the on-farm plant breeding activities and (2) the adaptation of farm equipment with the farmers. For buckwheat, the main selection objective is to pilot the population evolution toward a better dehulling rate. In parallel, the Atelier paysan (AP) will work with the farmers on the achievement of a first prototype of a small-scale and low-cost dehulling equipment. Meanwhile, the group has wished to launch a global reflection about the appropriate equipment to support on-farm seed breeding and multiplication.

Methods

1) Plant breeding strategy

¹ <https://liveseeding.eu/> Transforming organic seed systems

²

<https://www.bretagne.bzh/actualites/recherche-et-societe-un-appel-a-projet-pour-accompagner-les-transitions-de-notre-monde/>

Buckwheat on farm selection began 10 years ago with the study of breeding strategies for diversity in organic conditions. Two methods of selection based on the same five initial varieties have been compared during a previous EU project (DIVERSIFOOD): (1) mixtures provided by spontaneous crossings within a “dynamic population” and (2) Cross Composite Populations (CCP), created by hand crossing the 5 different populations (Chable, 2018; Meyruey, 2014). A genetic study after 5 years has shown the same level of diversity in both populations (Villard, 2020) and farmers cannot see any difference in their fields, so they mixed them. Then, the experimental population was named “5 pop”. The experimentation is now running to increase the dehulling ability. The strategy is to sow dehulled seeds, during two successive generations, to test if it increases the rate of seeds that have acquired the traits to be dehulled easily.

2) Testing the dehulling equipment built by AP

A prototype of a buckwheat dehulling equipment has been created with the aim of making on-farm processing accessible, during a previous project supported by Fondation de France, (a philanthropy network in France³), with the same partners. From a prototype, AP used to organize specific trainings during which farmers are building their own machine.

Coupled with the selection of the buckwheat “5 pop”, the OUTILSEM project aims to continually improve the buckwheat dehulling machine by testing batches of harvested buckwheat each year until a high dehulling rate is achieved.

3) Exploring appropriate equipment to develop on farm plant breeding

During the first half of 2024, semi-structured interviews were carried out with 30 actors (farmers, researchers, agricultural advisers) involved in on-farm seed breeding and multiplication in France to investigate their bottlenecks, needs and priorities related to available and appropriate machinery and equipment. This study aimed to provide a global overview of farmers' needs at all stages of farm operations (from sowing to post-harvest management). The question of technical feasibility to develop each equipment will be addressed in a second phase, in another funded project.

Results

1) About plant breeding activities for buckwheat

The protocol that has been experimented to improve dehulling ability of the “5 pop” buckwheat has been planned for 2 years. We have no results about its efficiency because only one year has been achieved. Nevertheless, it was a challenge to implement it on farm because of the non-adapted sowing machine, available on farm, for dehulled seeds which are more fragile (60% germination rate compared to normal seeds, whereas the germination rate for dehulled buckwheat when hand-sown is usually much better).

During the first-year steering committees, the farmers have shared their concern about another important trait: the earliness. Indeed, a new issue is emerging (Loiseau, 2023; York, 2021): the need to avoid contamination with prosulfocarb (an herbicide broadly used by conventional farmers on cereals in early autumn), organic farmers are forced to harvest earlier and therefore

³ <https://www.fondationdefrance.org/en/who-we-are>

adapt their seeds. Moreover, it was observed in the context of the previous project (Néau, 2023), a gain in lateness of the “5 pop” buckwheat population: full bloom had been observed at 573 degree-days Celsius in 2020 and 752 degree-days Celsius in 2022. The phenomena can be explained by one of the 5 components (Billy) that has been known for their late production but also for its good dehulling ability. Farmers who aimed to harvest the largest quantity of seeds tried to wait as long as possible for harvesting since buckwheat is characterized by indeterminate flowering and blooms throughout the growing season.

For the next season of OUTILSEM, two strategies that will be tested: (1) select within the “5 pop” population the earliest grains to regain precocity and (2) add a sixth component, a very early cultivar from Finland.

2) About dehulling equipment

The first prototyping equipment has resulted in a machine that dehulls buckwheat by abrasion of the grain between two disks of different materials. It has been first improved according to various parameters: abrasive disk materials, disk inclination, disk spacing and speed. With the cv Spacinska, one of the five components chosen for its good dehulling ability, the rate of dehulled seeds can reach 70% at the first pass, and only 50% for the “5 pop”. Then, several modifications have been made to the huller in 2024 to improve its efficiency and its affordability: fixing the tool speed at 700 rpm, variator removed, tilting the huller (fewer blocked seeds), securing the grids, replacing the pipes with transparent pipes.

The follow-up steps will be: changing the discs material to be easily replaceable according to the type of seeds, grids for sorting hulled/unhulled seeds. The machine can process 20 kg of buckwheat per hour, which corresponds to the needs of small farms. The next improvements will be based on growers' needs, with the possibility of adding a sorting module upstream and downstream of the machine. A survey sent to farmers will ensure that a seed sorting module is appropriate before improvements are made.

3) About appropriate equipment

Through the interviews, we identified a wide range of needs to support on-farm seed breeding and multiplication at many steps of farm operations. Beyond the post-harvest management of small quantities of seeds (e.g. mini field thresher, dehulling equipment, modular refrigerated spaces on farm to store seeds), the two major challenges related to field crops were the sowing and the harvest. Seed breeding involves efficiently sowing and harvesting different seed batches on a high number of small plots, from a few m² to thousands of m², without mixing seeds between plots. Experimental planters and harvesters are designed to fulfil these functions and can be easily emptied or cleaned between each batch. However, these machines are very expensive and not accessible to farmers. There is therefore a huge need to design low-tech equivalent of experimental seeders and harvesters.

Discussion

When we started the project, we did not imagine all the climatic and economic difficulties that actors would have to face since 2023. The year 2024 was very rainy (after a very dry season in 2023), so that sowing and harvesting was very difficult to manage. Moreover, the agricultural sector is going through a profound crisis rooted in structural problems of income and

recognition. The organic sector has not escaped the crisis. Having grown steadily since 2010, from 2021 onwards it has been experiencing a gradual decline in France in terms of both value and volume (loss of confidence, rising prices, insufficient supply) (Brocard and Saujot, 2024). Farmers were not currently very available to participate in research and have prioritized their farm management and activities. Atelier Paysan (AP) was also very impacted by the situation since the farmers have no more availability to come and be trained by the organization. By the way, the AP Breton site will probably not continue its activities at the end of 2025. Nevertheless, the initiative to create a group of reflection and prioritization for the creation of new equipment is going on, with the name of “Parlement des technologies paysannes”.

Despite the situation, the group is maintaining all the project activities (Figure 1), trying to adapt them to the context in a very good spirit within the group. INRAE, DUGA and FRAB teams have helped the farmers as much as possible, and have interacted individually with them because, for several of them, it was very difficult to come to meetings.

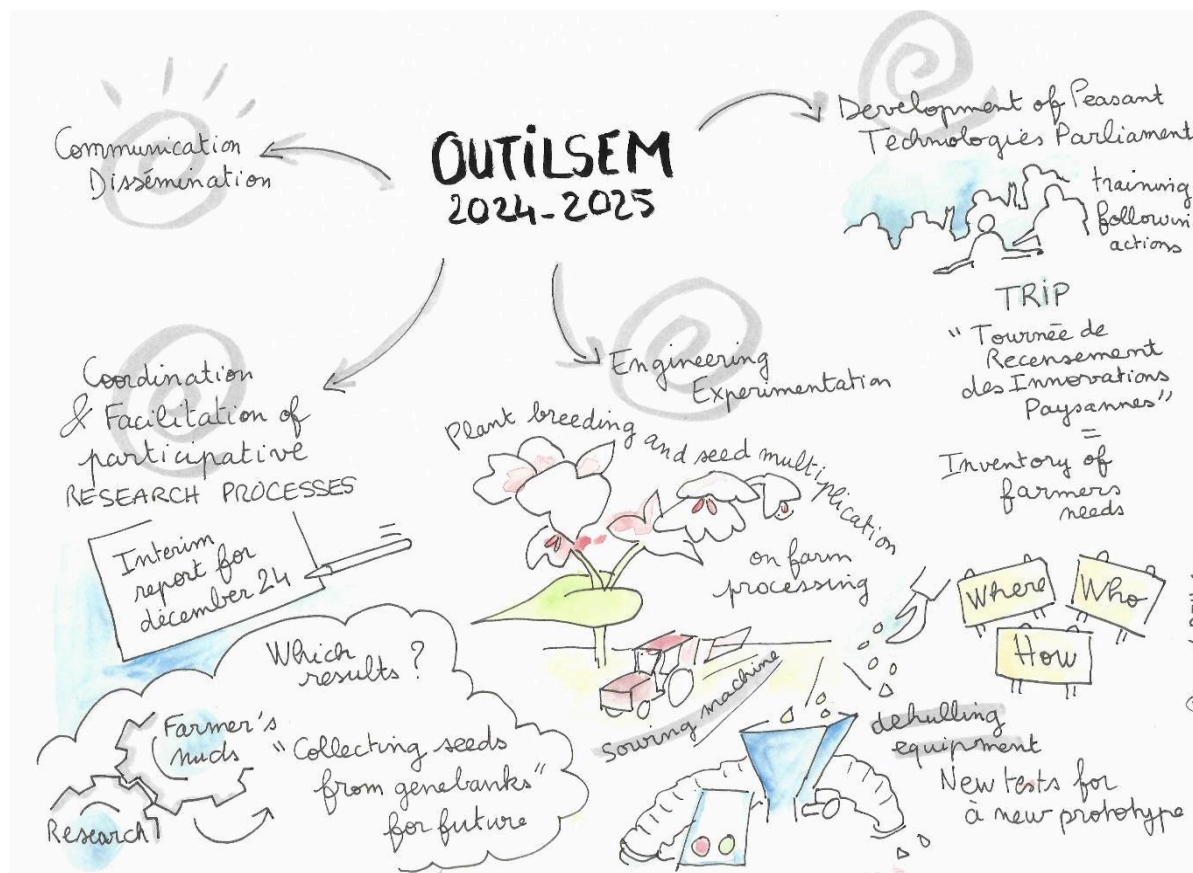


Figure 1: scheme describing the actions and relationships between actors during OUTILSEM project. It was drawn by Anne Guérin, an “ideographe”. She was given the role of “tiers-veilleur”⁴, a third party who is in charge to observe and to accompany participatory research in the project consortium. Her means are provided by Breton region, the project funder.

⁴ <https://sciencescitoyennes.org/wp-content/uploads/2019/04/AccompagnementRechercheParticipative-va.pdf>

Conclusion

The Breton buckwheat breeding initiative is managed within two projects: EU Liveseeding and Breton OUTILSEM. The European context has brought the global organic seed reflection (breeding strategies and regulation evolutions) and the participatory action-research tools such as Living labs concept (FRAB and Triptolème actors belong to the West organic LL of the project). OUTILSEM has anchored the initiative in the territory involving complementary actors (DUGA and AP) whose actions are indispensable to the progress in the real socio-economic context. Our action-research aims to remain very close to the farmers' needs and constraints, knowing that the socio/economic/political constraints⁵ are preventing farmers in the commitment for on-farm research.

References

Brocard, C., Saujot, M. (2024) How to relaunch the organic sector: we first need to reboot the system, IDDRI February 1st 2024.

<https://www.iddri.org/en/publications-and-events/billet-de-blog/how-relaunch-organic-sector-we-first-need-reboot-system>

Chable, V. (2018) Buckwheat, DIVERSIFOOD INNOVATION FACTSHEET #6, June 2018, https://orgprints.org/id/eprint/38324/1/Diversifood_innovation_factsheet6-Buckwheat.pdf

Chable, V., Conseil, M., Serpolay, E., Le Lagadec, F. (2008) Organic varieties for cauliflowers and cabbages in Brittany: from genetic resources to participatory plant breeding. *Euphytica* 164:521-529 <http://dx.doi.org/10.1007/s10681-008-9749-7>

Loiseau, F. (2023) Sarrasin bio, quinoa, pommes... Un herbicide méconnu s'infiltré partout, Reporterre 21 septembre 2023

<https://reporterre.net/Sarrasin-bio-quinoa-pommes-Un-herbicide-meconnu-s-infiltre-partout;>

Loiseau, F. (2025) Le Sénat et le gouvernement veulent supprimer l'Agence bio, <https://reporterre.net/Le-Senat-et-le-gouvernement-veulent-supprimer-l-Agence-bio>

Meyruey, S. (2014) Analyse de la diversité génétique du sarrasin pour l'élaboration d'une stratégie de sélection paysanne.

https://infodoc.agroparistech.fr/index.php?lvl=notice_display&id=171106

Néau, T. (2023) Evaluation de l'adaptation d'une population de sarrasin, Mission recherche et innovation-Rapport de l'Ecole supérieure des agricultures, (ESA Angers, France)

Serpolay, E.; Nuijten, E.; Rossi, A.; Chable, V. (2018) Toolkit to foster multi-actor research on agrobiodiversity. Diversifood Project,

https://diversifood.eu/wp-content/uploads/2017/09/toolkit_multi_actor_research_BAT_web2.pdf

Villard, A.L. (2020) Evaluation de la diversité de populations de sarrasin commun (*Fagopyrum esculentum*). Mémoire fin d'étude ESA Angers.

⁵ <https://reporterre.net/Le-Senat-et-le-gouvernement-veulent-supprimer-l-Agence-bio>

York, J. (2021) Organic crops in France found to contain herbicide carried in wind, <https://www.connexionfrance.com/news/organic-crops-in-france-found-to-contain-herbicide-carried-in-wind/412265>

Carrot Improvement for Organic Agriculture: Leveraging On-farm and Below Ground Networks

Micaela Colley, Washington State University

Organic growers need vegetable varieties that are adapted to organic growing conditions and have market qualities demanded by organic consumers. In carrots, weed competition, nutrient acquisition, nematodes, and disease pressure are particularly crucial challenges to both fresh market carrots and carrot seed production, while flavor, appearance, and nutrition are key market qualities. This project will deliver improved carrot varieties for organic producers and consumers; improved understanding of cultivar performance in organic systems; improved understanding of how carrot genotypes interact with the root microbiome to access key nutrients and induce disease resistance; and a breeding model that may be adapted to other crops for organic cultivar development. Organic farmers, students, and industry stakeholders will participate in the breeding, variety trials, and planning aspects of the project. The project will train graduate and undergraduate students in plant breeding, soil microbial ecology, and vegetable trial development for organic systems. New varieties adapted to organic conditions will enhance organic vegetable production and organic farmers' economic returns, thus facilitating expansion of organic agriculture in the USA. Publicly available breeding lines, including germ plasm with nematode resistance will support organic seed industry development of additional new varieties. The development of improved carrot varieties with greater tolerance to biotic and abiotic stress will bring broad environmental benefits by reducing the need for off-farm inputs. Organic seed companies, producers, and consumers will benefit from access to new varieties.

Comparison of Fiber Content of Experimental Fiber Flax Varieties from the Fibrevolution Breeding Program Using Two Screening Methods

Jennifer Kling, Zoë Griffith, Shannon Welsh, and Angela Wartes-Kahl; Fibrevolution

The North American Linen Association (NALA) was established in 2023 to promote the production and processing of fiber flax and to establish a flax to linen industry in North America. We have been breeding fiber flax varieties in Oregon since 2016, but have been constrained by the lack of rapid and inexpensive screening methods for fiber content. In 2023 we conducted preliminary studies to identify potential methods that have acceptable levels of precision. In the fall of 2023 we planted a replicated trial to evaluate 37 experimental varieties and four commercial varieties for agronomic traits, winter survival, and fiber content. A subset of the most promising varieties were planted in the spring at a second location. We will use traditional

fiber processing methods to evaluate total and long fiber content for 31 experimental varieties and checks at the fall testing location. For this analysis we collected 50-stem samples from two to four field replicates prior to seed maturity to obtain fiber samples of good quality. At both sites we will use a modified Fried test to extract fiber from 10-cm stem sections from 20 plants in each plot to evaluate total fiber content. With this method, retted stems are placed in centrifuge tubes with boiling water and shaken vigorously with a vortex shaker to separate the fiber from the stems. Results from this study will permit us to identify the most promising experimental varieties and to compare them to commercial standards. We will also determine how consistent the measurements and ranks of varieties are across two very different production environments.

*not sure if it is Fried or Freid

Comparison of Standard and Proposed Accelerated Methods of Selection in Potato Breeding

Guillaume Ravel, Sherbrooke University

We present a modified potato breeding program aimed at addressing issues faced by small scale organic producers in Quebec, with a focus on resistance to *Phytophthora infestans* (late blight). Marker assisted selection and the discovery of new molecular markers for various disease resistance genes allow for efficient screening of large numbers of seedlings at the early stage in breeding for resistant varieties. However, current large scale breeding methods lack precision in the early stage of a program in identifying desirable agronomic and consumer traits in the early stages of a breeding program. This latter issue is problematic for smaller breeding programs geared towards organic agriculture, where one cannot afford to discard potential cultivars due to constraints on resources. The presentation will focus on these issues and present the result, an alternative method to standard plant breeding that is adapted to small scale breeding programs.

Dry Farming Tomatoes Variety Trial

Anca Barcu, University of California Davis Department of Plant Sciences

During the summer of 2023 I conducted two greenhouse experiments where I compared 30 tomato varieties in terms of yield. My focus in organic dry farming so after the conclusion of the experiments I compared certain functional traits and both gross and marketable yield for the 30 varieties. Seven varieties performed better than the rest under drought conditions and were sent to a farmer in Oregon and to UC Santa Cruz to be planted along with UC Davis SCOPE varieties to assess performance in the field and compare to greenhouse results. Data analysis is still underway.

IFOAM Seeds Platform

David Gould, IFOAM Organics International

The IFOAM Seeds Platform is a global network of individuals and organizations advancing seed and plant breeding for organic systems. We need greater diversity and larger supply of high-quality, regionally adapted planting materials for organic producers all over the globe. Building these genetic resources and ensuring their survival is an existential imperative. It will take all of us to be successful, the whole organic value chain and food system working together. The Seeds Platform is evolving and inclusive. We blend experience and wisdom with new ideas. We encourage young leaders to step forward!

Our Seed, Our Heritage

Sam Nderitu, Grow Biointensive Agriculture Center of Kenya

Seed sovereignty, food justice, and food sovereignty are essential pillars in ensuring sustainable and equitable food systems. This poster highlights the interconnectedness of these concepts and their role in preserving biodiversity, strengthening local food systems, and empowering communities. The foundation of life lies in the diversity of seeds, which form the basis of resilient agricultural practices and food security.

Seed banking emerges as a crucial strategy in conserving traditional and indigenous seed varieties, which are increasingly threatened by industrial agriculture and corporate control. By prioritizing seed diversity, farmers can enhance their resilience against climate change, pests, and diseases while maintaining culturally significant and nutritionally rich crops.

Food justice is achieved when communities have access to healthy, culturally appropriate food produced through ecologically sound methods. This aligns with the broader goal of food sovereignty, where communities regain control over their food production and distribution systems. Ensuring seed sovereignty allows smallholder farmers and marginalized communities to reclaim their rights to save, exchange, and plant diverse seeds without restrictions.

The poster underscores the urgent need for policies and initiatives that support seed saving, agroecological farming, and the establishment of seed banks. Protecting biodiversity and fostering a decentralized, farmer-led seed system are critical steps toward a just and resilient food future.

Student Collaborative Organic Plant Breeding Education

12th Organic Seed Grower's Conference

Emily Chung and Atlas Mumfrey, University of California Davis

The Student Collaborative Organic Plant Breeding Education (SCOPE) project is a student-led collaborative of student plant breeders, guided by faculty and staff, working with local organic growers on improving crop varieties for organic farming systems in California. The organic plant breeding project was developed in 2015 in direct response to California's organic growers, who have reported a scarcity of seeds for cultivars that meet the needs of organic farming. Using traditional, field-based plant breeding methods, new varieties of tomatoes, wheat, spinach, celtuce, and zinnias are being developed on certified organic land at the Student Farm at UC Davis. Additional trials are held at Cal Poly Pomona and UC Santa Cruz to breed for the hotter, drier conditions of Southern California and the cooler, wetter conditions of the coast. The breeding objectives of these projects were based on input from local organic farmers and the Organic Seed Alliance, as well as the diversity of their cropping systems and growing seasons. In addition to managing the breeding projects, SCOPE students participate in seminars focused on organic farming methods, plant breeding, and project management. They also host events such as field days and taste tests to showcase their work to a broader audience.

The Genetic Improvement of Zinnias for Organic Growers

William Hazzard

Zinnias for cut flowers have emerged as an important crop for California organic growers due to their low margins, localized production and ecosystem services. However, many of the current available varieties lack the ornamental and agronomic qualities that growers and consumers desire. The Student Collaborative Organic Plant Breeding and Education Project at the University of California, Davis have spent the last five years developing new, modern varieties, to fit these market niches. These varieties are exceptional due to their unique colors and shades, petal shape, as well as their performance in the field, with longer stems and improved petal size. These successes have been achieved through phenotypic selection and the development of breeding techniques for outcrossing, seed propagated crops. This presentation will show off advanced breeding varieties, participatory plant breeding practices, and their performance relative to currently available varieties.

Global Seed Stories from Slow Food's Terra Madre and the Ark of Taste

Jim Embry and Jennifer Bailey

We will be attending Terra Madre September 26-30 in Torino Italy as Slow Food USA community delegates along with other delegates from 170 other countries that are part of the global Slow Food network. We will interview 40-50 seed farmers about their work with seeds...saving, breeding, adaptation, research, education and policy...with the purpose of

12th Organic Seed Grower's Conference

sharing these stories during this session. Terra Madre is the flagship festival of the Slow Food grassroots organization, which aims to support food producers who protect the environment and communities. Terra Madre, which translates to "mother earth" in Italian, is a network of food communities and a large conference held every two years that is a gathering of small-scale food producers, farmers, seed keepers, cheesemakers, meat producers, cooks, academics, students, educators, activists, chefs and indigenous peoples from around the world to discuss issues, learn from each other, and collaborate. The event also includes a food marketplace, workshops, networking, and music. The Slow Food Ark of Taste initiative began in 1996 with a vision to preserve the vast biodiversity of foods that were at risk of extinction. Just like the biblical figure Noah built an ark and boarded animals two by two to save them from being eliminated by a widespread flood, Slow Food began to “board” seeds and animals, traditional recipes, and unique processes to the Ark of Taste to safeguard them. Today, more than 150 countries have boarded nearly 6,000 items to the Ark of Taste, including more than 300 in the United States through Slow Food USA.

Observations from a Citizen Grow Out Participant

Vivian Neal

In 2023 and 2024, I participated in community seed growouts as a volunteer seed grower with Seeds of Diversity, a Canadian organization “dedicated to preserve, perpetuate, study and encourage the preservation of heirloom and endangered food crop varieties”. The 2023 grow out, Beans for Canadian Climates, aimed to increase the number of endangered beans of 14 varieties; I grew one variety, the Spanish Pinta. For the beans, I was lucky to have access to a space on my friend’s farm where I sometimes volunteered. In 2024, I am participating in the Collaborative Breeding of an Upright Ground Cherry, the goal of which is to create more upright plants with sweeter tasting fruit. For the ground cherries, my community garden neighbour offered me the use of a 2m by 3m area of his plot because he is away for much of this summer. In this lightning talk, I’ll share some of the successes and challenges of a gardener trying to increase the resilience of our food systems.

Organic Seeds: Sahaja Seeds - A Business Model from India

Ravi Kumar Magal, G.Krishna Prasad, Syed Jamal, Keshavmurthy

An overview of a Farmer producer company operating in certified organic seeds to enhance the quality of life of Farmers and to supply healthy products to the people. Very different from a Corporate entity.

Potato breeding for organic agriculture with living labs in Slovenia

Marion Champailler

In Slovenia, the Plant Reproduction Material (PRM) market has expanded in recent years. Despite this, access to PRM for organic farming is a challenge for farmers. The offer is more or less adapted to needs in terms of varieties, adaptation to territories and cultivation techniques, the quantities are limited and finally the visibility of the offer is restricted. At the same time, European regulations are changing, and derogations for non-organic and untreated PRM is scheduled for 2036. As part of the ECOBREED project, the Slovenian Institute of Agronomy worked with farmers to carry out potato variety trials on their organic farms and to initiate a potato selection process in order to offer a range of products adapted to environmental and climatic conditions, local practices and challenges. The LIVESEEDING project will enable this research to continue. The aims are to facilitate the emergence of lines that meet needs of local organic production thanks to partnership trials with organic farmers as living labs, to share knowledge about variety selection and to facilitate the adoption/distribution of new selected varieties. For this 3rd year of selection, a panel of 21 crosses and 4 registered varieties are being grown on 3 farms and on the institute's site. Growing and harvesting are managed by the farmers. Physiological and organoleptic data are studied by researchers and farmers. The results of the trials will be disseminated and discussed with partners in preparation for the following season.

Seed exchanges and swaps as a tool for community and biodiversity regeneration

Andrea Toro Ortuño

Through an experiential workshop, the intention of this session is to share our experience and learnings on how community seed swaps and seed exchanges build resilient and regenerative communities. How these practices not only support food sovereignty but also build resilient communities. This workshop is practical and interactive and it is intended to share practice tips on how to start seed swaps and also generate reflection on the importance of this practice in the agro-ecological movement.