



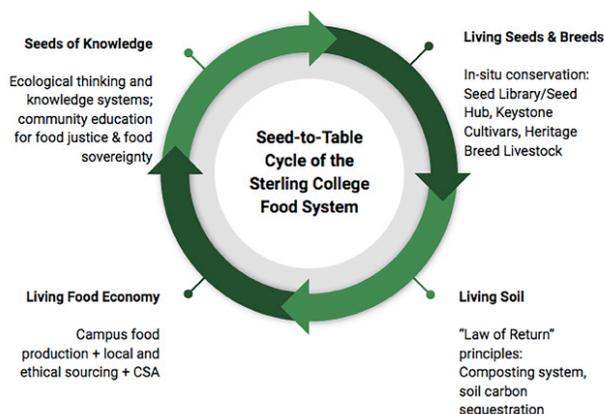
The Seed-to-Table Cycle at Sterling

Dr. Tony VanWinkle, Director of the Rian Fried Center and Faculty in Sustainable Food Systems

Weekly discussions for the Fall 2019 semester's Foundations in Sustainable Agriculture and Food Systems class were organized around Vandana Shiva's book, *Who Really Feeds the World?*. The concluding chapter discusses the food and farming model employed at Navdanya, the farm and community seed bank project founded by Shiva in 1987 to practice and promote "non-violent, biodiverse, organic farming and fair trade" in northern India. Central to that mission is the implementation of a seed-to-table cycle incorporating four major links: Living Seeds, Living Soils, Living Food Economies and Seeds of Knowledge. In reflecting on the considerable achievements of the Fall 2019 season and semester, several of which are highlighted in this newsletter, it felt fitting to transfer Navdanya's seed-to-table formulation to Sterling's own food system in order to map out recent and future directions for our farm, forest and kitchen triad.

Guided by the diagram below with some modification, the Sterling College food system embodies the four links described above. The Living Seeds & Breeds link has reached a new level of realization this fall with several major contributions from Rian Fried Center (RFC) faculty, staff and students. These include graduating senior

Maia Usher-Rasmussen's senior year research project in reciprocal seed systems, related expansion in the conservation of heritage crops and processing capabilities, as well as the acquisition of heritage breed livestock and draft animals. Deepening this link, in the near future we plan to implement the Keystone Cultivar project in Dunbar Dining Hall, a project that will bring attention and awareness to rare and endangered food crops and culinary knowledge. Link two, Living Soil, has been well underway at Sterling for decades, and we continue to refine and adapt our systems to meet the challenges of the present moment, including the increasing demand for carbon sequestration functions on farm and forest lands. Much of this work has been made possible by many donors, including the Kenneth Goldman Donor Fund.



A Living Food Economy is also well established at Sterling, with our farm continuing to produce nearly a third of the food we eat together as a community. For those items we can't grow ourselves, we are committed to sourcing from our neighbors whenever possible, and ethically for items produced afar (including fair trade and eco-friendly certified products whenever possible). In doing so, we hope to contribute to an equation wherein local here

+ local there = decentralized, trans-local networks of sustainable producers everywhere. We are also increasing our contributions to our immediate community beyond campus as we grow our Community Supported Agriculture program.

Finally, the fourth link, Seeds of Knowledge, is Sterling's *raison d'être*. As an institution of higher learning whose educational mission and vision is grounded in ecological thinking, experiential learning and community action, the RFC serves as a resource hub for the theory and practice of "non-violent" and "biodiverse" food, farming and forestry paradigms that challenge monocultural farming systems and "monocultures the mind" alike. This newsletter features some of the projects and perspectives through which we continue to build our own seed-to-table cycle.

Heritage Grain Trial Results

Dr. Tony VanWinkle,
Director of the RFC & Faculty in Sustainable Agriculture

The 2019 growing season was the second year of our ongoing trials of heritage small grains (wheat, barley, emmer and einkorn). From the varieties trialed in 2018 in partnership with the Rocky Mountain Seed Alliance, we selected 13 varieties that performed exceptionally well for a second season of trials to determine which of these are best suited to our region and our farm. In addition to selection for regional adaptation, another intended outcome is the adoption of two or three key varieties of wheat and barley for incorporation into the Sterling farm and food system. Of those original 13 varieties, three varieties of wheat and three varieties of barley outperformed others on the basis of several criteria, including lodging tendency, productivity and ease of harvest and processing. The two ancestral wheat cultivars, emmer and einkorn, also performed well, though their adoption will be largely for conservation purposes for the time being. The best performing wheat and barley varieties were:

- "Red Fife" wheat (Canadian landrace, developed in the 19th century)
- "Globe" wheat (ancient Indian landrace, a variety of Indian dwarf wheat)
- "Baart Early" wheat (South African landrace, introduced to the U.S. in the early 20th century)
- "Jet" barley (Ethiopian landrace)
- "Sheba" barley (Ethiopian landrace)
- "Tibetan Purple" barley (Tibetan/Central Asian landrace)

Many of these varieties are rare and unavailable in quantities sufficient to plant at scale. The one exception is Red Fife, a variety experiencing a regional resurgence for its exceptional milling and baking qualities. Our 2020 farm plan will include a one-quarter acre rotation of Red Fife grown from purchased seed. All other varieties will be grown for seed only, until we build quantities necessary for production. In future seasons, we hope to be able to produce sufficient quantities to both save



Jet Barley, grown in the Sterling gardens.

our own seed and to mill for use in our kitchen and dining hall. Our capacity for the latter increased this season as well, with the acquisition of a commercial scale grain mill made possible by a grant from the Work Colleges Consortium. Thus, in addition to immeasurable educational value, goals enabled by projects like the grain trial include an overall increase in internal food production levels, an aspiration that will be achieved in part through the development of our own seed-to-table grain economy.

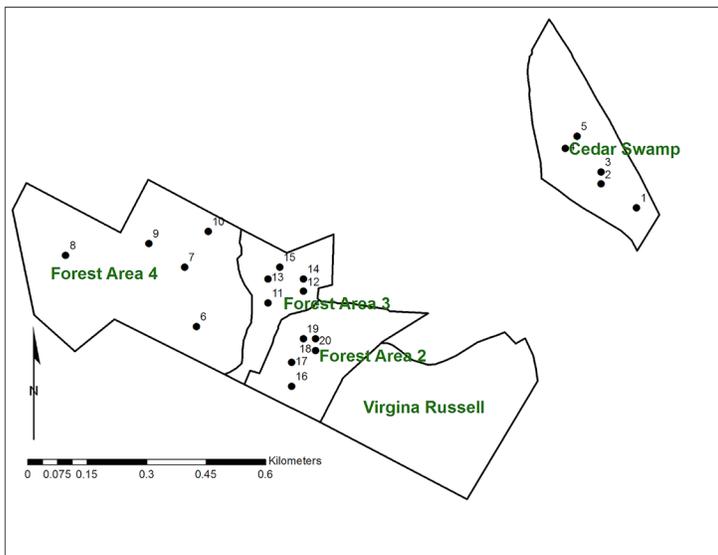


Sheba Barley, grown in the Sterling gardens.

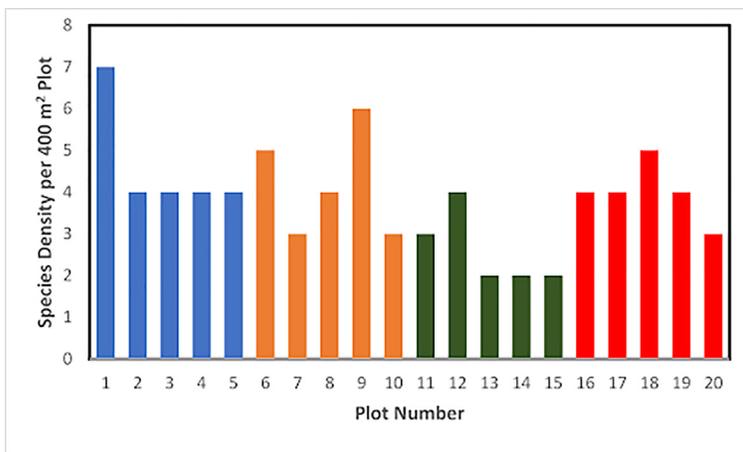
Long-Term Monitoring in Sterling's Forest

Dr. Jeff Richardson,
Faculty in Sustainable Agriculture

Fall 2019 saw the implementation of a new course, *Forest Ecology and Management*, co-taught by Jeff Richardson and Farley Brown. This upper-level course combined ecological concepts, field data collection and analysis and the creation of five forest management plans for landowners in the Northeast Kingdom. Students in the class worked in pairs to collect ecological data on 20 different 400 m² circular plots stratified across Sterling's forest. Each year, students will collect additional data from these plots with the goal of building up a long-term dataset devoted to monitoring changes in the forest. This is especially important with the imminent arrival of the Emerald Ash Borer. In the first year, students collected data that helped to show which areas of Sterling's forest had the highest species diversity.



A map of the forested areas of Sterling.



Graph displaying Species Density per 400 m² Plot / Plot Number.

Celebrating Sterling's First Hazelnut Harvest

Dr. Charlotte Rosendahl,
Faculty in Sustainable Agriculture

Six years ago Sterling's first agroforestry planting was established as part of the first Restoration Agriculture class taught at Sterling College. At the top of the Pine Pasture, a polyculture of hazelnuts, chestnuts, apples and chokecherries was planted. The American Hazel (*Corylus americana*) is native to Vermont, but has a smaller nut than the European Hazel (*Corylus avellana*). The hazels planted at Sterling are a hybrid of the two kinds and the nuts are a medium size. This year was a bumper crop for nuts in general and both wildlife and humans benefited from the harvest. We left plenty for the animals to harvest through the winter and the rest of the nuts were dried, husked and stored in the fridge to be used to germinate for more hazel bushes at Sterling. Our long-term plan with the hazels is to grow enough that we can produce seeds and seedlings to offer to Sterling alumni and harvest enough nuts to produce oils and nuts for the kitchen as an alternative source of proteins and fats. When the oils are pressed out, the flour that remains is nearly pure protein. Our hope is to use the valued shells for biochar and the wood for basket weaving. The hazel likes it here in the Northeast Kingdom (NEK) and Sterling is dedicated to growing several different varieties to show how this "alternative" crop might actually become mainstream on a NEK farm. We look forward to seeing our chestnuts in Pine Pasture produce their first crop—maybe next year!



A hazelnut harvested from the Restoration Agriculture plots planted in 2014.

News from the Alford Draft Animal Barn

Dr. Elsa Acerbo, Faculty in Sustainable Agriculture

As my first semester at Sterling College as the Draft Animal Educator drew to a close, the winter break allowed for some quiet time with the animals and reflection about the fall semester. With 10 students successfully completing a new course named *Legs, Hooves and Claws: Practical Foot and Leg Care on the Farm*, and another 12 getting their feet wet in *Draft Animal Power Systems I: Driving Principles*, Sterling's draft animals were busy this fall doing what they do best—teaching, challenging and educating our students. As the facilitator of these courses, I consider our draft animals my partners in student education.

What is most memorable to me about this past semester was not only the transfer of specific skills in students enrolled in both of these courses, but perhaps more importantly, the growth in mindfulness, confidence, teamwork and empathy that I saw in each student.

In the classroom, the students in *Draft I* were exposed to the history of human-animal partnerships, draft animals in myth and legend, questions surrounding domestication, draft animals in use today both in the U.S. and abroad and how their use in the future may help maintain a sustainable food system worldwide in the face of climate change. In the lab, students learned to harness, drive and skid logs from the woods to support a concurrent fall building class.

In *Legs, Hooves and Claws*, the classroom was a place for functional anatomy, physiology and student-led discussions of common veterinary problems, diagnostics and treatments, as well as larger discussions about how domestication, breeding,

husbandry and our modern food system play a role in creating and perpetuating these common farm animal ailments. In the lab, students learned to handle, diagnose issues with and trim the feet of horses, oxen and chickens.

On the farm this season, the horses helped to weed or “cultivate” the potatoes, and to finally dig them up with the potato plow in an incredibly satisfying afternoon as we unearthed our beautiful fall harvest.

Sterling's working animals have an incredible impact on all those who see, interact with and work one-on-one with them. Sterling students utilize these opportunities to grow and learn both inside the classroom and out, and conversely, the love, dedication and hard work I saw them put into this semester will pay dividends in their academic pursuits, our school's vibrant community and beyond into their personal and professional lives.



Elsa unearthed a perfectly heart-shaped potato!



Using the potato plow to unearth the potatoes, the first step in harvesting.



Pushing boundaries in an outdoor hoof trimming lab.



Working together to clean Belle's hooves.



Students work as a team in the gardens.



Students training the new calves.



Students training the new calves in the snowy sugar woods.

Winter on the Farm

Gwyneth Harris, Garden Manager & Azsa Greiner, Livestock Manager

As the seasons change, the Sterling Farm shifts gears. The slight frenzy of late-season harvest fades into the more deliberate tasks of putting gardens to bed and wrapping up the grazing season. Even so, it's not uncommon in our Northeast climate for people to ask, "So, what do you do in the winter?"

While the Garden Sleeps

Winter provides us with a few quiet moments to think through what went well in the season, and what could go better next time. It's when we create the crop and rotation plans for all the production areas, including seeding dates and estimated harvests. It also is a time for managers and students alike to do a little of our own dreaming and to decide on projects for the spring season.

The past season was a successful one for our Community Supported Agriculture (CSA) program, and we almost doubled our number of members. This season we will be integrating student Lara Weise in the creation of a separate Crop Plan, and we will also employ a student across the summer months to manage CSA production and share distribution.

Summer 2019 also saw us adding fiber production in the form of flax, as well as a Dye Garden, growing indigo, madder, weld, woad, calendula, amaranth and other plants for the Environmental Humanities program. Adjunct instructor Prin Van Gulden '07 uses these plants, along with the wool sheared from our 20 ewes, in her fiber arts classes. This year, her students also crafted a beautiful rug for 2019 commencement speaker Vandana Shiva, showcasing naturally-dyed fibers and the range of colored fibers produced by our flock. In the coming season, we will expand the types and volume of dyes produced.

2020 will be the third year of our heritage grain trials, and we are excited to move from the tiny 4' x 20' plots to a scale that will provide us with enough grain to run through our new grain mill for human consumption, but almost more importantly, a foray into field-scale grain production, using tractor and horse-powered cultivation techniques. Most of our crops fall into the category of market gardening. Field crop production opens students up to a whole new range of skills, from blind cultivation to mycotoxin testing.

Winter is a time to get our proverbial ducks—or in this case, onions—in a row, but it is not all paperwork and daydreaming. The farm's 30' x 84' hoop house is planted with early spring greens and a batch of overwintering onions. Onions are not the most exciting of crops, perhaps, but they are a crop that takes a long season to grow, and our community eats around 100lbs of onions every week. A storage onion grown from seed in the

Northeast goes into the soil as early as late February and is not harvested until August or even later in the fall. During the seedling stage, the 5-7,000 plants that we grow each year take up roughly 70% of our high-value growing area in the heated glasshouse. Overwintered onions allow us to provide onions earlier in the summer. New this year, we plan to purchase most of our onion plants later in the season from a distributor, rather than growing our own. That way we can start more of the summer crops that are here so briefly, like juicy tomatoes, sweet and spicy peppers and a whole rainbow of different cut flowers.

Livestock in Winter

When most people think of lambs, they think of spring. But with Vermont's long winters, our lambing season feels a lot like winter! This year it will run from late February to the middle of April, and produce somewhere around 30 lambs. Last season's lambing resulted in enough animals to begin the process of selection for those traits best suited to our climatic and biotic conditions. Those goals include providing quality fiber to be used in our fiber arts program and lambs growing large enough to profitably produce meat for our kitchen in a single grazing season. In practice, this means animals that do well on pasture with limited supplementation, require minimal medical intervention for pregnancy, birthing and growth, including natural resistance to gastrointestinal nematodes—globally, one of the most critical issues in sheep production as these parasites increasingly develop resistance to chemical dewormers. On the ground, this includes using rotational grazing as a natural means of controlling parasite loads, maximizing flock vigor to improve immunity and culling animals that show ongoing susceptibility to parasitism.

Here at Sterling, our sheep are sheared twice annually; once right before lambing, and again in late summer. In our long-wooled breeds, this not only gives students double the opportunities to experience shearing and skirting our fleeces, but also maximizes production, and keeps the wool as clean as possible. Indeed, this past fall we had enough white fiber to have a batch of our own yarn processed. Looking ahead, we hope to offer skeins of yarn from Sterling sheep, dyed with plant dyes grown and processed on campus.

Using our own fiber, dyed with our own dye plants, is one of many ways we establish and maintain holistic, closed-loop systems that link the production, processing and consumption stages of food and fiber systems. While our sheep support a distinct "seed-to-sweater" cycle, they also contribute to our "seed-to-table" food system. This year, 800lbs of lamb, much of it processed into breakfast sausage, found its way into the dining hall.

The sheep on the Sterling Farm, along with our growing layer flock of heritage chickens, continue to be Certified Animal Welfare Approved (AWA), a voluntary certification that expresses our commitment to the humane and ethical treatment of farm animals throughout their life cycle. We look forward to adding pigs to our certification over the coming year.

Seeds & Students: Maia Usher-Rasmussen '20 and the Sterling Seed System

Dr. Tony VanWinkle,
Director of the RFC & Faculty in Sustainable Agriculture

Over the Fall 2019 semester, several major milestones contributed to the continued growth and maturity of Sterling's interrelated seed system projects. Many of these were the results of graduating senior Maia Usher-Rasmussen's Senior Year Research Project (SYRP) and an independent study in grant writing. Two successful grant applications authored by Maia helped to build critical infrastructure for our seed systems work, including several equipment acquisitions that have made possible the launch of the Black River Seed Library and the Dawnland Seed Hub. Integrated into Maia's SYRP on Reciprocal Seed Systems, these two major outcomes are the culmination of two years of previous work increasing Sterling's seed conservation capacity. The Black River Seed Library is a free community seed library open to any member of the larger community. As a lending library, participants "check out" seeds, grow them out at home and promise to save some seed to contribute back to the library for others to grow out. Participants may donate seeds of their own for sharing through the library as well. As "open source" networks, seed libraries can serve as critical nodes in the realization of local food sovereignty efforts, which begins with seed sovereignty.



Maia Usher-Rasmussen '20, holds up a traditional Abenaki variety of corn.

In contrast, the Dawnland Seed Hub is a restricted repository for the conservation and rematriation of Abenaki heritage seeds. As described by Mohawk seed saver and advocate Rowan White, "In the seed movement, we have begun to use the word 'rematriation' as it relates to bringing these seeds home again. In many communities . . . the responsibility of caring for the seeds over the generations is ultimately within the women's realm. Both men and women farm and plant seeds, but their care and stewardship are part of the women's bundle of responsibility. So the word 'rematriation' reflects the restoration of the feminine seeds back into the communities of origin. The Indigenous concept of 'rematriation' refers to reclaiming of ancestral remains, spirituality, culture, knowledge and resources, instead of the more patriarchally-associated 'repatriation'."

Furthermore, as White adds, "There is powerful healing work of reconciliation when we work cross-culturally to bring these seeds home to their communities of origin." Indeed, this is the primary goal and intention of the Dawnland Seed Hub and the Abenaki-Dawnland Heritage Garden. As an example of a collaborative conservation initiative, the heritage garden and seed hub ask us to "imagine how the idea of seeds as living entities embedded in the communities that care for them could shift dominant thought, changing our food system and agro-ecosystem (Hill 2017)."

Through the Work Program and in her role as a teaching assistant for the *Landscape, Food and Culture* class, Maia also led seed harvesting and processing efforts throughout the fall semester. One major challenge encountered through this work was our lack of appropriate drying facilities and equipment. In a great example of systems thinking and action, Maia addressed this problem through designing and building a seed drying rack for her final project in the Fall semester's *Introduction to Woodworking* class. Maia's dedication and hard work will be deeply missed, but she leaves a lasting legacy that will continue to serve community members and our Abenaki partners for years to come.

Note: Not long after completing all requirements for graduation in December, Maia was offered a job at Seed Savers Exchange in Decorah, Iowa, one of the oldest heritage seed companies in the United States. Congratulations, Maia!

For readers interested in donating seed, or for further information on these projects, please contact Tony VanWinkle at tvanwinkle@sterlingcollege.edu.

Sources:

Hill, Christina Gish. (2017). Seeds as Ancestors, Seeds as Archives: Seed Sovereignty and the Politics of Repatriation to Native Peoples. *American Indian Culture and Research Journal* 41(3):93-112.

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