

Sterling College Self-Sufficiency Portfolio
Compiled and composed by the Sterling College Self-Sufficiency Task Force¹
June 19, 2020

General Introduction

In response to COVID 19, Sterling College mobilized a number of context-specific task forces to assess a way forward for the college amid the public health and economic crises that will likely continue in the wake of the pandemic. This task force was assembled specifically to inventory the college's existing land-based resources as leverage points for increasing both institutional and community self-sufficiency and resilience. Such a task included establishing specific goals for increasing community food and energy security and identifying those existing assets and initiatives already underway, as well as possibilities for the intensification and expansion of those efforts necessary to achieve these goals. This process necessarily demanded a further enumeration of resource needs to meet these expanded goals. Each of these points of analysis was placed within a four-part framework that sought to situate our effort within the mission of Sterling College and the Wendell Berry Farming Program. The four nodes² are:

1. Institutional-Level Self Sufficiency
2. Community Function
3. Curricular Intersection
4. Work Program Integration

In the course of our weekly meetings, we identified additional “resource clusters,” defined as areas of asset concentration and the resources necessary to increase the efficacy of self sufficiency efforts within each node. These resource clusters³ are:

1. Farm & Agroforestry Resources
2. Forest & Energy Resources
3. Work Program as a Labor Resource

The structure of this portfolio report is built around these nesting frameworks, with sub-reports from each resource cluster further clarifying assets and needs. The report is

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² For an outline of the assets within each of these nodes, see Appendix A.

³ For a table of resource needs within each cluster, see Appendix B and Appendix C.

further sub-divided between the Vermont and Kentucky campuses⁴, as each has a very different set of assets and/or is in a different phase of developing those assets.

Vermont Resource Cluster Reports

Farm and Agroforestry Resources

Self Sufficiency

On Sterling College Farm & Forest lands, we have been steadily working toward increasing campus food production and self sufficiency capacity (in Craftsbury) over the last several years. On the college farm more specifically, we have done so systematically, through several trial phases, several of which we are implementing this year, partly in response to COVID 19, and partly as an accident of timing. During this period of growth, several initiatives have increased overall production on the farm, including improved cold storage at the gardens, diversification of plantings and perennial crop propagation, and a burgeoning CSA and food hub.

In fall 2019, we were awarded a Work College Consortium (WCC) grant to purchase a commercial scale grain mill that will increase our ability to process farm-grown flour and cornmeal, which we are growing out at scale this year (Red Fife, a heritage red spring wheat, and Calais Flint corn, a heritage, indigenous corn). We are also actively increasing alternative protein production, focusing specifically on growing more beans (all of them locally adapted heritage varieties). We are continuing to experiment with supplemental legumes and pulses (i.e., soybeans, trialed here over the last two years, cowpeas, and fava/broad beans) as well as alternative grains, including amaranth, quinoa, African pearl millet, and upland rice. We are also actively increasing our focus on heritage livestock, focusing especially on heritage poultry (layers and broilers), sheep, and pigs. All of this experimentation is geared toward increasing on-campus food production capacity while serving a simultaneous agrobiodiversity conservation function, and supporting community wide food security and farm business viability in our area. The combination of improved production and processing capacity at the farm, along with broadened community involvement with and support of the farm, and contribution to a vibrant local farm economy, all add resilience to our on-campus food system.

⁴ See Appendix C for WBFP-specific resource needs

Curricular Integration

Perennial crop production and agroforestry projects have also increased in recent years in direct association with curricular development. These include forest-based mushroom production systems, and substantial plantings of fruit and nut trees in existing garden and pasture lands. In the fall of 2019, we enjoyed our first-ever harvest of hazelnuts from six year old plantings installed by students in courses and through the work program. This kind of curricular integration will be even more pressing in the move toward more on-campus food production. For example, classes such as the recently revived Permaculture course can use the campus land base as a palette for student designed projects that can result in a transition toward a “food not lawns” model of perennial food production. Other courses can similarly integrate student learning objectives with increasing food production capacity.

Community Function

In direct response to COVID 19, we have also actively sought to leverage the farm as a community resource in the 2020 growing season. Without an operating kitchen, we have increased our CSA subscriptions substantially, offering vegetable, meat, and egg shares. We have initiated a newly integrated food hub project to supplement our CSA, providing outlets for local start up producers who may be facing financial insecurity, while increasing food security options for local residents. We have been awarded an emergency WCC grant this season to support this effort. Through application to the USDA, we are now an approved and authorized EBT/SNAP vendor, creating greater access to local community members in need. We hope this latter effort will be further supplemented through becoming a participating site in NOFA VT's 3squaresVT, Farm Stand Match Program, which provides participants up to 50% discounts at participating farm stands. In these efforts, we are actively creating a more equitable and resilient food system in our community (see Figure 1, below).

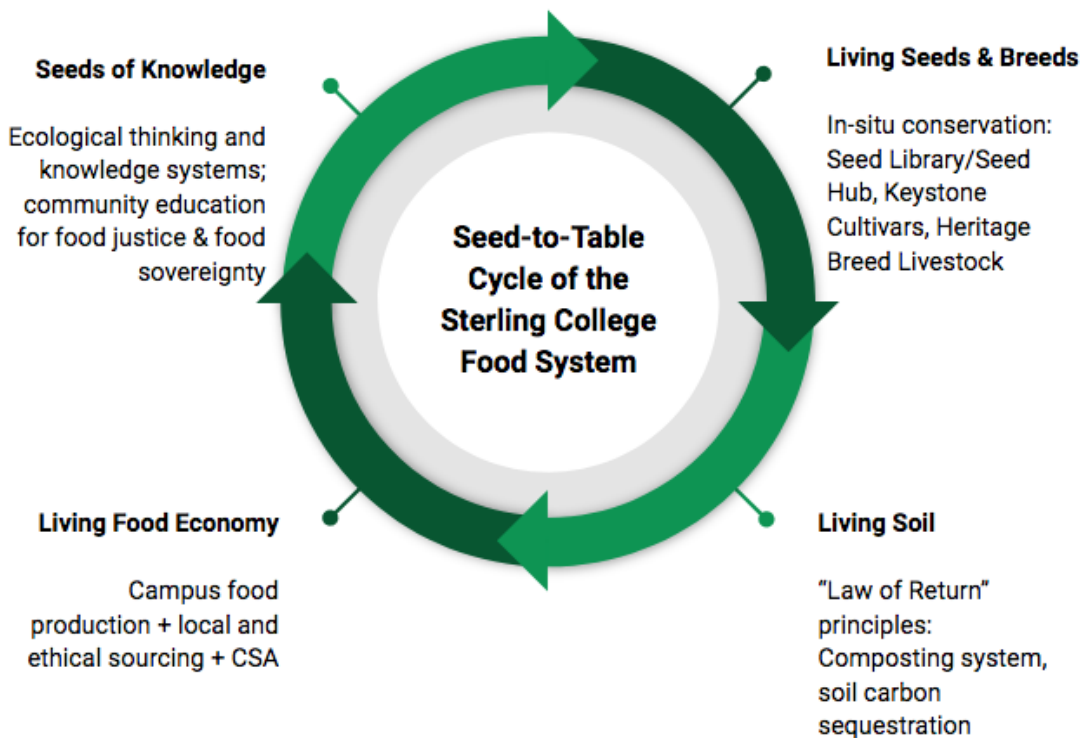


Figure 1. Sterling College Seed to Table Cycle

In addition to this season's efforts, the newly established Black River Seed Library (established winter 2019/2020) can also serve as a critical resource for establishing and perpetuating local seed sovereignty. We have consciously sought to populate the library with seed grown at Sterling and/or by other seed savers in local/regional networks in order to maximize a supply of resilient, locally adapted seed. With this year's growing season, which includes several seed crop projects, supplemented by community donations, it is our hope that the seed library will be up to full functional capacity this coming fall/winter. It is our contention that we cannot have local food sovereignty without local seed sovereignty.

Finally, The Sterling College Farm site can provide space for community garden plots for residents, commuters, faculty, staff, and other landless neighbors. We do so in the spirit of the historic Victory Gardens movement, as has been articulated and mobilized nationally via the work of the Cooperative Gardens Commission and other groups. Such a scenario at Sterling would make plots available by request and/or on the basis of need, with plot-holders consulting with RFC faculty and staff about plans, needs, and equipment use requests for preparing and maintaining plots.

Forest and Energy Resources

Self Sufficiency

Sterling College has been active in managing its land since 1976, with our current land base in Craftsbury being stable since 1989. The Grassroots Program and first AA degree focused on “Rural Resource Management”. So this current initiative is not a new endeavor, but a refinement to match today’s challenges. Actions are directed at meeting our campus needs with fewer outside inputs, reducing waste, and engaging students with direct application of concepts and techniques learned in their classes. Some actions will see immediate results this Fall, while others will pay off over a longer time scale.

Winter heating is a big deal in Vermont. Reducing outside imports like heating oil and propane, or even purchased lumber, helps to improve the Earth’s carbon balance while also improving the College’s cash flow. Using some of our own resources helps students see the necessary ecological connections between resource extraction and human needs and wants. However, to get to that point significant investment of labor and capital is needed. Some steps are simple and some are more complex.

Example 1 - Utilize the high value resources we have such as logs that can be used whole for construction timbers, or sawn for boards. Simple steps like scheduling truck use, hiring a portable sawmill, as well as buying a couple new choker chains and a skidding cone will quickly allow lower cost construction of pasture animal shelters and other similar structures by student work crews.

Example 2 - Improving thermal insulation and air sealing in campus buildings will bring long term and continuous reductions in fuel use and heating costs. A well insulated building also creates a more comfortable living environment and resilience in the face of occasional loss of electricity. Getting the buildings super-insulated is important before trying to heat a leaky building with wood because a negative carbon balance, lower air pollution, and careful land stewardship are the goals.

Community Function

When seeking to harvest larger sawlogs, top and branches can make good firewood without the need for cutting additional trees. While leaving rough woody debris in the forest during and after harvesting is ecologically important, some of the harvest can be

planned to be directed to firewood for heating. Currently, the Sugar House has the only wood heating on campus.

Example 3 - In the short term, getting the wood on the landings to people who can use it for firewood is a community good. In the longer term, utilizing wood for heat in some Sterling buildings could reduce fossil fuel import, and connect students to the land we all depend on.

Possibilities could be needy community members, or using firewood to reimburse employees for small expenses instead of cash.

Curricular Connections

Using logs from the forest for small rough construction projects (Example 1) will hopefully be carried out by the combination of the Draft Animal, and Forestry Techniques classes this Fall. Those classes are in different Pods this Fall, but students both in class time and with associated work crews will work toward the objective. The Forestry Techniques pod is building a plan to have the all students in the pod participate in a work crew that cuts and moves firewood to needed locations, builds simple structures using harvested logs as a main structural material, and maintains campus trails and bridges. Six to eight hours per week of supervised work time is anticipated for students (up to 12) in this pod.

Spring semester 2021 will hopefully allow the start of training a student crew in building renovation for thermal efficiency in coordination with the Renewable Energy Analysis and Design class. This would allow a start on Example 2. All the campus buildings are brought up to high standards, then a well trained crew could eventually help local homeowners with energy efficiency improvements.

Work Program as a Labor Resource

Self-Sufficiency

The work program allows students to offset some of the costs of their education while performing meaningful work for the college. By efficiently allocating work to students, we can decrease the cost of a Sterling education and give students a sense of satisfaction in their work. The efficient allocation of this work requires a careful prioritization of labor needs across campus. The farm, forest, and kitchen serve as work sites where the essential work of supporting the College occurs. The Associate Dean of Work-Learning

will develop a fair and transparent methodology for allocating labor across the Vermont and Craftsbury campuses in the 2020-2021 Academic Year.

Community Function

The work program provides a source of labor that can be directed toward serving the greater Sterling community. Seven percent of all student work is required to be directed toward community service. There are ample opportunities for students to work toward organizing efforts to increase food sovereignty within the community, as well as producing and processing food that can directly address food security of individual community members. The production of fiber and forest products also provide opportunities for giving back to the community.

Curricular Intersection

The work program is integral to the academic experience of Sterling residential students. The pod structure adopted in the 2020-2021 Academic Year allows for novel opportunities for linking credit-bearing instruction to meaningful work. A main focus of the work program in a non-pod environment is to allow students to progress in skills and leadership through their work program jobs. This progression should still be encouraged in the pod structure, and will be facilitated by the diversity of pods catering to students at different points in their Sterling education.

Wendell Berry Farming Program, Kentucky

Overview: Self-Sufficiency, Curriculum Integration, and Community Function

The COVID-19 pandemic punctuates the urgent need to teach farming that is ecologically sound, locally adapted, economically viable, and rooted in community. Likewise, the economic fallout of this public health crisis underscores the need for dependable sources of healthy food distributed through reliable, parity-driven markets as well as through cooperative networks. Now, as ever, we need agricultural education that promotes frugality, ecology, diversity, self-sufficiency, and inclusive communities.

A self-sufficient Wendell Berry Farming Program will be interdependent with its Henry County neighbors. Sterling College students and faculty will continue to teach and learn alongside area farming families, particularly those in The Berry Center's Our Home Place Meat (OHPM) program. With resources, the WBFP can also provide a measure of farm and forest provisions to students, employees, and our local community.

To do so, in the coming year we will establish initial management systems at the Brown Farm and begin livestock production and forestry work. Coming onto a farm that has been well managed by the same family for nearly sixty years is a substantial leg up. Understanding the ground beneath our feet and taking stock of the existing infrastructure is a job of work, as is adapting those assets to meet our production goals using mixed power systems.

Our goal is to develop educational livestock and forestry enterprises that benefit students, OHPM farmers, and the broader community by employing cost effective, ecologically based land use and livestock production techniques. Our vision is unique in agricultural education: to interweave a hands-on, liberal arts, farming curriculum with a diversified mid-scale farm and forest. The WBFP's sustainable agriculture curriculum is focused on the survival of small and mid-size farms through profitability within ecological bounds. Thus, the farm is the curriculum, including its full-scope of operations, accounting, and cultures.

Our educational working farm will model how to afford to farm well, from frugality to mixed power systems and informed engagement with multiple markets. The current agricultural marketplace has two primary points of entry: small and entrepreneurial or big and industrial. Neither of these alone provides reliable, modest, parity-based incomes. There is virtually nothing in between, which is why The Berry Center's Our Home Place Meat (OHPM) program and its burgeoning cooperative production,

processing, and marketing work are so important. As the WBFP helps develop OHPM, it helps establish a viable market and model for graduates and community alike for long-term, interdependent sufficiency.

Kentucky Resource Cluster Reports

Farm

Self-Sufficiency: Farm Assets

The WBFP will lease from The Berry Center its 200-acre ridge farm located at 8462 Maddox Ridge Road, Turners Station KY, about 3 miles west of Port Royal, in Henry County. Dalton and Ann Brown owned, farmed, and lived on this land from 1964 to 2019. The farm has a history of careful use. Its hillsides have been kept in a perennial grass cover, making it a good livestock farm. About 100 acres of the farm are in hay, 50 acres in pasture, and 50 acres in forest. The farm once had a 20,000-pound tobacco base, annually producing about 5 acres of tobacco. Its highest stocking rate was 30 cow/calf pairs, but the hay has since been cut on shares. Most recently, Mr. Brown ran 17 cows and a bull on the land. Three barns, various outbuildings, and fences are all in usable condition, though some repairs and renovations are necessary.

The land is ideally suited for grass farming and a diversity of livestock: beef cattle, sheep, draft animals, and pasture poultry, a combination that provides the most potential for farm income. The farm has 50 acres of woodland that would benefit from a “worst-first” management plan that would provide lumber, a small annual income to the farm, provide a classroom to students, and improve the health of the woods at the same time. The use of draft animals would provide a low-cost source of power and require a community of teamsters that could be provided by students as they become able.

The farm will also serve as a research and community education demonstration farm for The Berry Center’s Our Home Place Meat program. OHPM focuses on good pasture management through ruminant and small livestock production as well as on the development of viable, cooperative, alternative markets. WBFP students learn about and participate in this program through the curriculum, Work Program, and on-farm research.

Together, the farm will embody the components of good land stewardship that remain in agricultural communities like Henry County, and we intend to learn from and strengthen those practices. Using our grass, livestock, and forests like three legs of a stool, we will

form a model that is biologically based, economically viable, and able to make a long-term difference for community interdependence.

In the first year, we are moving onto the farm in the ways any farmer does—taking small steps, building capacity, and using what is ready at hand. First, we have a liberal arts, hands-on curriculum that integrates the farm and its community into coursework. Second, we have a Work Program and students eager to learn by working. Third, we have draft animals (mules, oxen) with whom we can work the forest. Fourth, we have access to the equipment used by the Brown family to operate the farm. Fifth, we have guidance from colleagues at Sterling College, The Berry Center, and the broader neighborhood.

Self-Sufficiency: Livestock & Pasture Plans

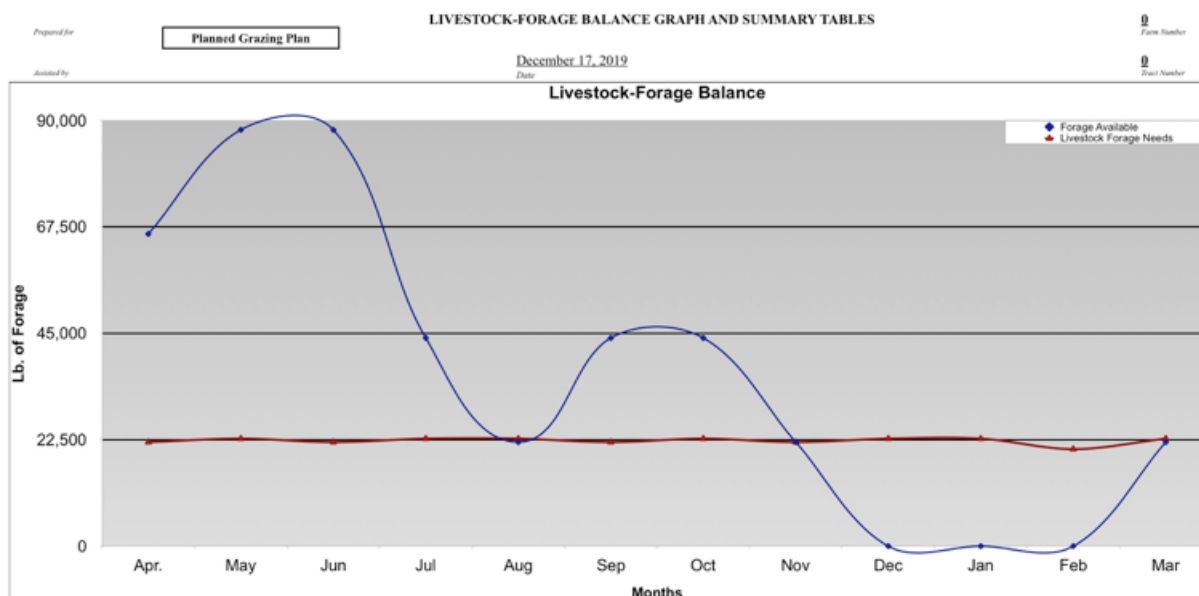
With the necessary resources, we will create grass-based beef cattle genetics that fit Our Home Place Meat standards and benefit farmers of Henry County and the surrounding region. We will begin with a base herd of locally-adapted Red Angus cattle, breeding them to Tarentaise bulls to maximize the heterosis of F₁ hybrid cattle. Dalton Brown estimates that the farm can carry 50-head of beef cattle. With proper forage management this number can be increased significantly. In addition to providing locally-adapted, grass-based genetics, a portion of the beef cattle will be available to offset costs and meet student, faculty, staff, and community needs.

Sheep and goat numbers in Kentucky increased following the “Tobacco Buyout” then declined as markets remained stable. The purported reason for the decline is the high maintenance of poorly adapted breeds resulting in high incidence of foot rot and intestinal parasites. This later condition is likely to worsen as parasites are showing resistance to commonly used anthelmintics. Our program seeks to breed locally-adapted hair sheep demonstrating resistance to both foot-rot and intestinal parasites. By overcoming these obstacles we hope to provide animals to OHPM farmers that are synergistic with beef cattle in providing more marketable products per acre, while diversifying farm income. In addition, our goal is to educate students on the science/art of using small ruminants in targeted-grazing to manage vegetation without expensive chemical/mechanical methods that often damage essential ecosystem properties.

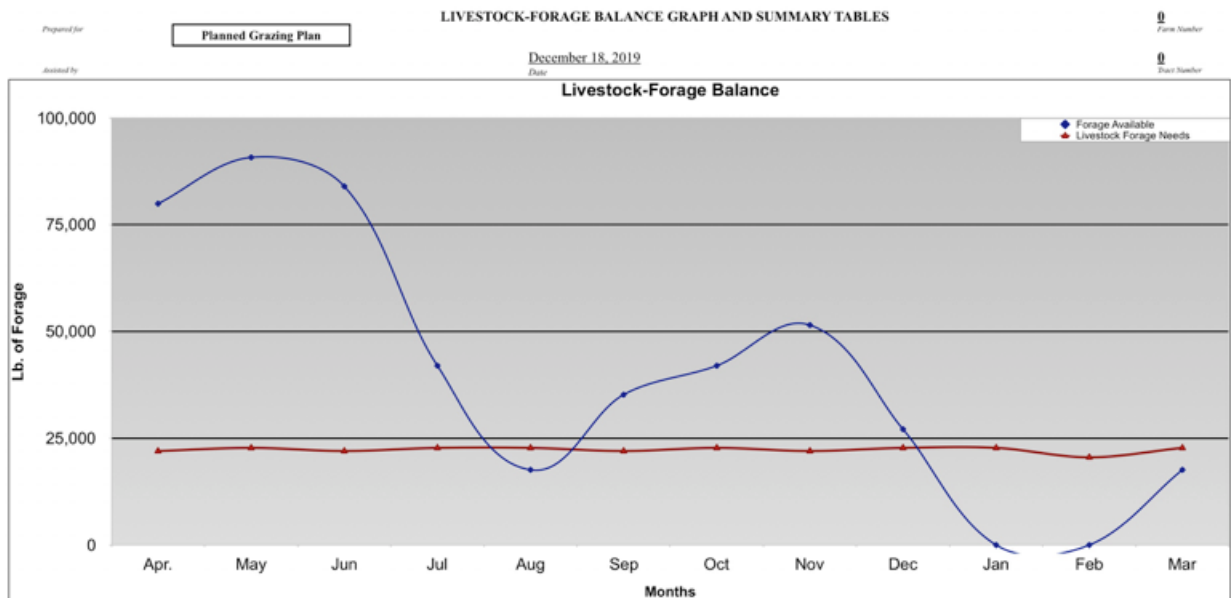
Of the 200 acre Brown Farm, approximately 2/3 is in pasture and 1/3 in woodlands. We anticipate that sheep and cattle will graze 110 acres of pastureland and farm ground. Our goal is for a 300-day grazing season (60-day winter feeding period).

Table 1. Allocation of Acreage on the Brown Farm		
Primary vegetation	Acres	Acres
Woodland		70
Pasture		130
Draft Animals	20	
Managed Grazing	90	
Farm Ground	20	
Total	130	200

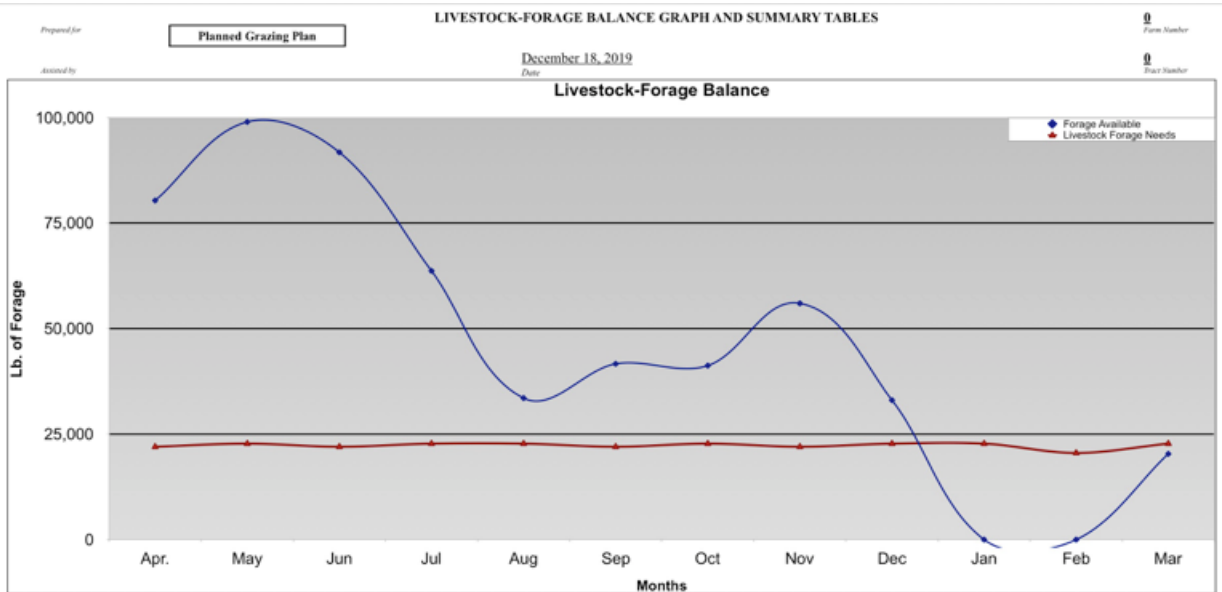
Currently, 100% of the pastureland is in Kentucky 31 tall fescue with varying amounts of legumes. Assuming 20 cow-calf pairs and 40 ewes, we are able to provide sufficient forage with about 120-day feeding period during the winter (see the following graph).



Stockpiling 1/5 of the tall fescue reduces winter feeding to 90-days.



To address the summer forage deficit, we take another 1/5 of the available pasture and plant warm season forage sorghums followed by winter cover crops. This reduces the winter feeding period to 60(70)-days, and eliminates mid-summer forage deficiencies.



Most of the above improvements can be attained within the first 1- to 2-years. Additional partitioning of the remaining pastures to improve plant health by controlling grazing will improve overall forage production and animal gains. We also can replace toxic

Kentucky 31 tall fescue with alfalfa- orchard grass to improve animal gains (meat production/acre). The result is improved grazing efficiency and greater forage yields. We now have a cushion in case of drought or other conditions that may negatively impact forage conditions. We also can increase livestock numbers by retaining stockers and/or developing bred heifers for sale.

Curricular Intersection: Livestock & Pasture

In the coming year, students and faculty will undertake these goals through Work Program (especially infrastructure development and livestock care) and through coursework, primarily Whole Farm Planning, Small Business Management, SPM I, Introduction to Crop Production, and DAPS III. In the coming years, Pasture Systems Management, Holistic Livestock Husbandry and Grazing, Whole Farm Thinking, DAPS I and II, Agroecology, and Landscape, Food, and Culture will engage this work, as well. We will also identify and pursue opportunities for Vermont-based faculty and student involvement in workshops, guest lectures, and community education events.

Community Function: Livestock & Pasture

By conducting trials of locally adapted genetic breeding and pasture management, the WBFP will undertake experiments that are necessary but difficult for farmers to take on. As well, by providing the community with a Red Angus-Tarentaise cross, the WBFP minimizes direct economic competition with local and regional farmers, both in genetics and meat markets. In consultation with The Berry Center's OHPM and other agricultural organizations (e.g., Black Soil), students and faculty will offer community field days that demonstrate our visions, procedures, and lessons learned.

The Brown Farm site will provide community garden plots for residents, commuters, faculty, and staff. With capacity for orchestration of resources and health safety, we may phase in opportunities for neighbors to access garden plots. All applicants will consult with WBFP faculty and staff to develop proposals, including plans, needs, and equipment use requests for preparing and maintaining plots.

Forestry, Agroforestry, and Draft Energy Sources

Self-Sufficiency

The first phase of developing a 30-year forestry and agroforestry plan at the Brown Farm is to systematically survey the farm's wooded land and watershed to determine

what is present, possible, and right to do while developing a 30-year agroforestry and “worst first” management and marketing plan. We will utilize draft teams consisting of a combination of animals leased from the Thomas family as well as a mule owned by the College.

We will also initiate our first agroforestry installation through a partnership with the Kentucky Chapter of the American Chestnut Foundation (ACF). In consultation with ACF scientists, the WBFP will work to restore the American Chestnut to Kentucky. This collaboration is designed to bring students and the community together to learn of this tree’s rich history, its ecology, and the science needed to restore this tree’s socio-ecological prominence. The WBFP project will establish the beginnings of an orchard of pure American Chestnut trees. WBFP faculty submitted a \$3000 grant to the Work Colleges Consortium to fund this project.

In Summer 2021, we will initiate the second phase of forestry: data management and development of a forest management plan for the wooded land on the Brown Farm. We will scout and identify appropriate sites for additional agroforestry installations, such as reforestation, riparian buffer improvement, erosion management in high traffic zones, windbreaks, nursery installation, orchard site(s), wildlife habitat improvement, and forest farming projects.

In phase three, from Fall 2021 through Summer 2022, we will ramp up our forestry work by developing step-wise implementation prescriptions for forest management and begin work. The initial project will focus on a logs-to-lumber approach to convert raw material into usable farm resources. In the summer, we will continue work on initial phases of woodlot management, build out the forest management plan in five year increments, establish monitoring sites throughout the stand(s), and develop a schedule for continual survey and data acquisition. A new or used band or circular sawmill would make this work possible.

In phase four, from Fall 2022 through Spring 2023, we will schedule our first harvest using draft power and based on farm needs and market analysis. We will prepare soil for additional agroforestry installations, and we will establish monitoring parameters for pre-cut/post-cut surveys focusing on best management practices and presence/absence/potential establishment of invasive species. This work will require a young, big pair of draft horses.

In phase five, from Fall 2023 through Spring 2024, we will continue “first harvest” work, and we will prepare for and implement additional agroforestry installations.

Curricular Intersections

From Summer 2020 through Spring 2021, the forest and watershed assessment work will be informed by Work Program positions and by coursework: Senior Year Research Projects (SYRP), academic study (courses in Watershed Ecosystems Analysis; Soils, Plants, and Microbes; Restoration Forestry; Watershed Systems, Crop Production Systems, and Foundation of Ecology), and general cruising by various and knowledgeable support people. In later phases, Homecoming, Whole Farm Thinking, and Agroforestry will also incorporate this site's forestry projects.

In the American Chestnut project, multiple courses will intersect with this project. Since our students work and study as a cohort and course management is shared across all three faculty members, embedding topics associated with this project are multi-faceted. Topics in plant physiology/pathology, disease vectors, soil management systems, ecological thinking/planning, cultural significance, human connections, and other topics will use the project as fodder for curriculum design. Students in forestry, ecology, and crop science courses will use this opportunity to develop an understanding of plant physiology and disease, orchard husbandry, and forest ecology to nurture trees planted in 2021 and 2022 on the Brown Farm. All crews of the Work Program will be involved with project preparation and maintenance.

Community Functions

We are laying the groundwork for a multi-faceted educational forest that will serve Sterling and the neighborly community. We will host field days and workshops in which community members can learn about strategies for diversifying farm income while improving riparian zones, forest health, and forest product security. In the long view, we will be exploring the prospects for developing a regional forest economy and providing the testing ground for possibilities.

Work Program as a Labor Resource

Self-Sufficiency

The farm, forest, and The Berry Center serve as work sites where the essential work of supporting the College occurs. The Kentucky-based Work Program coordinator collaborates with faculty, staff, and The Berry Center staff to determine work positions and collaborates with the Vermont-based Associate Dean of Work-Learning for record keeping and assessment.

Community Function

Because the Brown Farm and Forest site has been envisioned as an instructional site both for Sterling and its Kentucky community, work conducted in the farm and forest ultimately serve its neighbors. Health safety permitting, students and faculty will continue to work and consult with area farmers on all manner of farm operations and planning activities. Direct service to The Berry Center through Work Program not only bolsters the organization's efforts but also integrates students into the life of the community so that they see the real stakes of their work.

Curricular Intersection

Work Program expands the educational opportunities beyond credit hours of a class. Because all students in the cohort enroll in the same courses, this model especially lends itself to using Work Program to enhance materials covered in class.

Conclusion: Toward a Food & Energy Secure Future

Sterling Farm/RFC, Craftsbury, VT

Amid the unfolding of our current global public health crisis, the COVID 19 pandemic has exposed fractures and fissures in the industrial food system and conventional food supply chains. However, it has also presented opportunities for the assertion of the relevance and resilience of local food systems. Around the country CSA subscriptions have increased as much as 50%. Small scale poultry producers are thriving even as the industrial poultry complex falters as spikes in COVID 19 cases among packing house workers endangers a system that relies on both cheap inputs and cheap labor to deliver cheap meat. Small seeds companies are witnessing record sales as first time and returning gardeners seek to build household and community food security amid this time of uncertainty.

Sterling College's Farm staff has responded in kind to these cues. Early in mobilizations responding to the COVID 19 context, Sterling became a signatory in the bi-national (U.S./Canadian) effort now known as the Cooperative Gardens Commission. Sterling's goals in the present moment mirror those of the CGC, who define their efforts as "working . . . to increase community food production, facilitate resource-sharing, help first-time gardeners succeed, build more resilient communities, and support existing food sovereignty projects and networks."

Our farm has a long history of serving as a critical source for institutional food security. By our last assessment as participants in the Real Food Challenge, the Sterling College Farm produces around 30% of all the food we consume. Through several concerted efforts described in this report and listed in Appendix A, we are striving to increase this percentage while also transitioning some of our systems to embody the values of “non-violent” and “biodiverse” food, farming, and forestry paradigms. Guided by these principals, in 3-5 years we would like to increase our overall food production capacity to around 50%, while also expanding community-oriented functions. In 5-10 years, we would like to see increases beyond 50%. Similarly, we hope to increase our energy independence and efficiency. These goals cannot be achieved, however, if we are not appropriately resourced. As it currently stands, we are functioning near our maximum production capacity. To make these goals realizable, we need investments in both capital and human resources that increase our capacity and efficiency. This will include a redesign of the work program that will not only provide needed additional resources but also a more fulfilling student experience that is more closely linked to the curriculum, emphasizes skills building and better aligns with student career aspirations. If adequately resourced, we are confident that the Sterling College land base can serve as both an institutional and community hub for increased local food security and sovereignty. It is the hope of this task force that the current report will serve as a baseline for these efforts.

Wendell Berry Farming Program, New Castle, KY

We envision a day when the Brown Farm site serves as an agrarian education center nestled into a mid-scale, mixed power, demonstration and training farm and forest. Novice and seasoned farmers as well as a slate of agrarians, matriculated and otherwise, will learn with and from the place through the Wendell Berry Farming Program.

Our efforts during the first five-year phase will center on establishing and teaching foundational livestock and forest management systems. Likewise, we will establish and teach start-up operation and infrastructure economics as well as short- and long-term planning. Starting at a sixty percent stocking capacity, we will build herds to full stocking rates that will provide viable, if modest, returns on investments. At the same time, we will increase stocking capacity and yields through improved pasture management. We will determine the viability of sheep production and marketing with OHPM, and we will also be poised to diversify farm income through grass fed stockers and other enterprises, such as pastured poultry.

All the while, we will provide space for Sterling and the neighboring community to self-provision vegetable, medicinal, and/or fruit stocks with an eye toward expanding the scope of community garden operations and benevolent contributions based on local needs.

During this time, we will continue discerning answers to pressing concerns: How can we make the most of integrating a liberal arts curriculum with a working, mid-scale farm in a rural community? How can we close entwined ecological and economic loops on the farm? What roles can we play in helping farmers afford to farm well? What parts can we play in invigorating a local forest economy? What educational approaches resonate with and meet the needs of students and neighbors? How can our collaborations with OHPM and The Berry Center root the WBFP solidly in the community, and how can our obligations to and affections for one another serve this place? How can we cultivate a culture that supports agriculture that is inclusive, equitable, parity-based, resilient, and grounded in ecology? How can we be good neighbors? How can our curriculum and Work Program be expanded and further integrated to better enable us to answer these important questions?

In “People, Land, and Community,” Wendell Berry writes:

For good farming to last, it must occur in a good farming community—that is, a neighborhood of people who know each other, who understand their mutual dependences, and who place a proper value on good farming. In its cultural aspect, the community is an order of memories preserved consciously in instructions, songs, and stories, and both consciously and unconsciously in ways. A healthy culture holds preserving knowledge in place for a long time. (76)

The prospect of learning to answer these questions and be a part of a good farming community is invigorating. Creating an educational nexus drawing others into this good work is essential.

Appendix A

Overview of Assets, Initiatives, & Possibilities

1. Self Sufficiency: Increasing Production Capacity for Institutional Food & Energy Sovereignty
 - a. Existing production capacity (Craftsbury): 30-35% (based on 2017 assessment). Reduced by recent transitions, but will increase above previous rate in coming years, through the following:
 - i. Continued Diversified Vegetable Production
 1. Improve efficiency of tillage, cultivation, and handling (field equipment, washing, transportation, and storage)
 2. Add marketing improvements
 - ii. Circular Grain Economy
 1. WCC Grant--Meadows Mill
 2. Heritage wheat & corn this year
 3. Add to CSA/Food hub options
 4. Develop products using our own grains
 5. Continuing Trials: Amaranth, Quinoa, Pearl Millet
 - iii. Alternative Proteins
 1. Increase in legume production
 2. Heritage dry beans this year
 3. Continuing Trials: soybeans, cowpeas, fava beans
 - iv. Meat & Egg Production
 1. Meats
 - a. Away from industrial breeds and toward heritage breeds - research on sheep breeds and cattle breeds
 - b. Increased on-site processing of meats (poultry)
 - c. Diversification of food offerings (ie: balance of types of meat, reduced reliance on beef & chicken).
 - d. Improve processing capacity for on-farm poultry processing
 - e. Bulk grain capacity to decrease grain cost, increase choices of grain (non GMO or organic possibilities) for chickens and pigs
 2. Eggs - Chicken & Ducks
 - a. Substantial increase in egg production through infrastructural improvements via Farm to Fork donor gift funds

- v. Perennial Fruit and Nut Production and mushroom
 - 1. Apples, pears, berries
 - a. Create a highbush blueberry planting with enough berries to save and store. Location in Pine pasture has been strongly considered. This would be a large project.
 - 2. 1st Hazelnut harvest this year
 - 3. Long-term investment
 - 4. Now able to produce significant amt of mushrooms for campus use and CSA
 - 5. Could improve ability to produce mushroom spawn & nursery stock.
- vi. Energy
 - 1. Draft Animal Program
 - a. \$5000 earmarked for draft program investment--field equipment, see above; Mowing capacity; basic flat bed wagon.
 - b. Training tools-round pen, training aids/training course to improve animal handling interactions making them more efficient when working
 - 2. Decrease reliance on outside feed sources for livestock
 - 3. Electricity use is relatively low in most dorms, but high in Dunbar/Kane, over 200 kwh per day.
 - a. Conservation
 - b. Making more of our own electricity? Sterling generates about $\frac{3}{4}$ of its yearly electricity on a net-metered basis
 - 4. Transportation -
 - a. Hybrid Wellness car + 3 gas vans + gas truck + tractor + Draft animals
 - 5. AO -Heating annual energy is currently about 33,000 gallons of oil. Plus some propane
 - a. Before burning lots of wood, we need to better insulate and air seal our buildings.
 - b. One of the first steps should be heat recovery ventilation units. With COVID-19 more ventilation of indoor space is essential. HRV's warm incoming air with the outgoing air.
 - c. Dunbar would be the first choice to insulate because it

is the highest user with the worst insulation.

- d. Some waste heat from the kitchen and server room could be tapped into better in Winter.
- e. Improvements in ability to start early seeds (incubation chamber) could save garden fuel use.

vii. Forest

- 1. Lumber - Choosing some of the best logs for building materials is feasible, including hiring in a portable sawmill when needed to make lumber.
 - a. Fence posts, sawlogs, round logs for rough construction.
- 2. Firewood -
 - a. Not much way to use this on campus right now. Sugarhouse is the main user.
 - b. Capacity for moving the logs and wood to the landing is limited.
 - c. Cutting wood for sale with paid student labor, is a money loser. But selling some leftover wood is better than letting it rot.
 - d. Some firewood could be used to “pay” employees who want or need it.
- 3. Mushroom production
- 4. Silvopasture - 20 ft outside fence Edge browse with nut and fruits integrated
- 5.

viii. Kitchen

- 1. Better utilize harvest - preservation (issues: need more labor).
- 2. Re-assess food values & purchasing choices, can we produce some of the items we purchase outside of our local range? (Grains, nuts, jams, boulder food, etc.)

2. Community Function: Increasing Access for Community Food Security

- a. CSA
 - i. 2020 Increase in subscriptions
 - ii. CSA add-ons (VAPG products from kitchen, local products - kimchi, bread)
- b. Food Hub
 - i. Food Hub WCC Service Grant, approved
 - ii. Food in Your Local Community Grant application (VAAFMM), in progress
- c. EBT/SNAP
 - i. Application in review by USDA
- d. 3SquaresVT Farmstand Match
 - i. Enabled by EBT status
- e. Coronavirus Seed Hub
 - i. Cooperative Gardens Commission project
 - ii. Partnering with St. J Schools; identified through NEK Collaborative
 - iii. Continuing role for Sterling Seed Library
- f. Community garden spaces?
 - i. Hosting a cooperative commons project
- g. Community kitchen?
 - i. Expand on current model of community use of kitchen
- h. Farm Office/FoodHub/CSA pickup location? - possibility of more centralized accessible space for multi-use (Common House? or Old Post Office space)

3. Curricular Intersection

- a. All of the above . . .
- b. AO - for internal community function - if we can meet more student needs on-campus, hopefully they will do less travelling off campus.
 - i. Shopping, music shows, recreation, athletics, etc.
- c. Permaculture Course
 - i. Permaculture design plans for all campus buildings and grounds
 - ii. "Food not lawns" perennial production
 - iii. This group could develop a map of priority sites (Charlotte's suggestion)
- d. IFP
- e. Community Food Action

- f. Landscape Food and Culture
 - g. Forestry Techniques
 - h. Draft Classes
4. Work Program Integration
- a. "Resource driven work program"
 - b. Students will be in Pods of 8-16
 - i. Each pod will be its own work crew
 - ii. Pods can't work directly with other pods
 - iii. Different pods may be able to work in the same area on different days
 - c. Total number of students on-campus is uncertain
 - i. Needs should be prioritized so pods can be assigned to most critical jobs first
 - ii. There may drastic swings in campus enrollment throughout the semester due to uncertain number of non-residential programs
 - d. Work Program Rules
 - i. Need to provide 80 hours of work or at least 5 hours of work per week
 - ii. All residential students must participate, 50% of all enrolled students must participate
 - iii. 7% of all work must be community service oriented

What do we need to move forward:

Build in an emotional charge to our proposition: address the emotional toll of Covid on our community, engaging in dialogue with staff and faculty, to create productive dialogue with our students - how to be a model of resilience not just from an operational system, but from a socially dynamic frame.

WBFP: Overview of Assets, Initiatives, & Possibilities

1. Self Sufficiency: Increasing Production Capacity for Institutional Food & Energy Sovereignty

FARM

1. Purchase 20 bred cows (optimal)
2. Purchase 40 ewes and a ram (optimal)
3. Heifers with optimal genetics for OHPM
4. Feasibility research into sheep genetics and markets for OHPM
5. Pasture improvements
6. Infrastructure improvements (fences, outbuildings, water sources, internal traffic flow, et al.)
7. Meat for students, beef & lamb (amount, cost, etc. TBD)
8. Community garden space available by proposal for students, faculty, and staff; evaluation of feasibility for offering garden plots to neighbors
9. Mixed power systems: combustion equipment assessment, training, and plans for optimal integration with draft power

FOREST / AGROFORESTRY / DRAFT POWER

1. Chestnut project
2. Forest inventory
3. Agroforestry site determinations
4. Draft power: lease Thomas family's animals (2 oxen, 2 mules, 1 horse) combined with 1 mule owned by College.
 - a. By Fall 2022, purchase young, big draft horse pair

2. Community Function: Increasing Access for Community Food Security

1. OHPM research: genetics, forages, hay
2. Field days (possible expansion into SNAF short courses)
3. Community Garden

3. Curricular Intersection

1. 2020-2021
 - a. Whole Farm Planning
 - b. Small Business Management
 - c. Restorative Forestry
 - d. Soil, Plants, and Microbes I
 - e. Watershed Ecosystems Analysis
 - f. DAPS III

- g. SYRP I and II
- 2. 2021-2022 and beyond
 - a. Whole Farm Thinking
 - b. Pasture Systems Management
 - c. Holistic Livestock Husbandry and Grazing
 - d. DAPS I & II
 - e. Agroforestry
 - f. US Farm and Food Policy
 - g. Homecoming
 - h. Literature of the Rural Experience
- 3. Cross-campus collaborations
 - a. workshops, guest lectures, and community education events.
 - b. Continue to identify coursework that can be delivered via distance learning modalities across campuses (e.g., Rick Thomas teaching “Horse Care” and “History of the Horse” and Dr. Ed Fredrickson teaching “Introduction to Foraging Ecology”)
- 4. Work Program Integration
 - 1. Livestock management and infrastructure work by residents and commuters
 - 2. Positions at The Berry Center in OHPM, Archive, and Advancement
 - a. as deemed necessary and safe.
 - b. TBC should agree to responsibility contract

Appendix B

Resource Needs

1. Work Program as a Labor Resource

- Estimate and prioritize labor needs to realize goals
- Identify if work program labor is sufficient or appropriate
- Identify if additional staff are necessary
- Analyze return on investment in terms of revenue and learning outcomes

2. Forest Energy: AO

Need	Initial Cost estimate	Savings ?
Install wood burning heater in the best insulated building. Maybe an outdoor boiler hooked to Merlin/Mager or Library heating system? Or the pellet system John Feinberg planned	\$5000	Less oil
Build woodshed nearby- To hold 3-4 cords for when students are on-campus to feed the boiler	\$1000	
Allow use of school pick-up truck for moving wood	\$10	
Keep cutting wood for Sugar House.	\$100	
Figure out if any buildings could be heated with cord wood in a wood stove (Logging Shop?)		Less propane

3. Other Forest resources AO

Need	Initial Cost estimate	Savings ?
Move already sawn lumber to a covered location from "landing"	Labor + truck	Buying less lumber

Budget for hiring a portable sawmill to saw lumber in Fall	\$400	Buying less lumber
Keep improving draft animal skidding capabilities. - Choker chains - Skidding cone	\$60 \$150	
Peel bark off logs we want to use for construction poles	labor	Buying less lumber

4. Building Infrastructure - Reduce heat loss.

- 1) Add insulation and air seal existing buildings
 - a) Dunbar uses the most heating oil - almost 5,000 gallons/year
 - i) Replace door on the side wall by coffee/tea area.
 - b) Use student labor in conjunction with maintenance staff and or professional contractors. (Best if crew is linked to a class that complements learning like Renewable Energy Analysis and Design)
 - c) Bring walls up to R-40+, Ceiling R-60+,
 - d) Some doors and windows need improvement too.
 - e) Floor insulation R5 to R10
 - f) Find the opportunities while other renovations are happening (Simpson) or furnaces being replaced (Rural Arts building)
- 2) Replace any electric resistance heating with air source heat pumps (South House?)
- 3) Install Heat recovery ventilation in all buildings.
- 4) Expand solar hot water heating to Madison

New Logging Shop Construction Ideas:

- Tied into a series of Summer classes - maybe professional studies?
 - Design, siting, and permits (1-2 weeks) - Spring semester
 - Excavation and Foundations - forms for poured concrete, and porch posts (1-2 weeks)
 - Masonry and chimney building (1-2 weeks)
 - Framing and roofing (2-4 weeks)
 - Solar electric installation (1 week)
 - Composting toilet design and construction (1 week)
 - Thermal insulation and windows installation (1-2 weeks)
 - Interior finish work (2-4 weeks)

-Use student crews to construct other infrastructure needs where rough construction is acceptable. AO

Structure Need	Timing	Initial cost	Location
Canoe Shed	Fall 2020 Block 1		
Animal Pasture Shelter			
Trail Bridge	Fall 2020 Block 2		
Smoking shelter			
Woodshed	2021		
Re-roofing Logging Shop	ASAP		
Bike Sheds			

Transportation:

Need	Timing	Initial Cost	Savings
New Van for Instruction Get one with lowest operating cost (best mileage)	This August	\$40,000 new	Lower operating cost. Less fuel used.
Smaller vehicle for small class or teams. Could the Wellness Car be used?	anytime		Less fuel used
Electrical vehicle and charging station lets us use a resource we create on campus	2021	vehicle= Station =\$1300	
Better ride sharing coordination. Both for students and employees. On-line maybe?		A little effort	Less fuel use, less parking
Build covered bike sheds to encourage bike use on campus, and to and from campus	anytime	\$1000 per shed	Less car use

5) Farm Infrastructure:

	Item	#	Details	Total	Source
WASH HOUSE EQUIP					
*	3 bay stainless steel sink	1		\$500.00	
*	Washable wall coverings	4	120"x48"x1/16" @ \$35.77 ea.	\$143.08	https://www.farmtek.com/farm/supplies/prod1:ft_building_materials-ft_polymax_sheets:pg106835.html
*	Barrel washer (stainless steel)	1	46" wide x 51" deep x 73" tall, SS	\$4,495.00	http://vegetablebarrelwasher.com/
	CSA pick up containers	100		\$1,000.00	
			TOTAL:	\$6,138.08	
			PRIORITY ITEMS TOTAL:	\$5,133.08	
HOOPHOUSE					
	Rimol Nor'easter	1	32' x 84'	\$15,000	https://www.rimolgreenhouses.com/greenhouse-series/high-tunnel
	(Could be NRCS funded)				
UPDATED GARDEN TOOLS					
*			34" Flail Mower (Brush hog)	\$1,150.00	http://www.newhavenpower.com/BCS_INDEX.html
			Rotary Plow	\$1,350.00	http://www.newhavenpower.com/BCS_Rotary_Plow.html
*	4-Row Pinpoint Seeder			\$249.00	http://www.johnnyseeds.com/tools-supplies/seeder/four-row-pinpoint-seeder-9285.html?cgid=seeders#start=1
*	Tractor Brush hog			\$2000	
	Tine weeder			\$1500-3000	https://www.tilmor.com/en-us/products/222/einboc-k-aerostar-tine-weeder

	Groffdale transport discs			\$1500-2400	https://ackermansequipment.com/product/groffdale-transport-discs/
	Homesteader implements			\$2500	Or similar. Plow, potato hiller, potato plow, cultivator.
	Flatbed trailer			\$2000	
POULTRY PROCESSING ROOM EQUIP					
	Grain bin	1		\$2500	
	Scalder	1	Optional	\$1,305.00	http://www.cornerstone-farm.com/equipment/poultryman-manual-scalder/
*	Plucker--Turkey	1	Would allow us to process turkey's as well.	\$2,850.00	
*	Kill cone--turkey	2	Would allow us to process turkeys.	\$103.00	
	Transport Crates	5		\$260.00	
	Transport Tubs, w/ lids	12	Carry 8 dressed birds each	\$250.00	http://www.uline.com/Product/ProductDetailRootItem?modelnumber=S-14363
*	Doors	1	Screening	\$100.00	http://www.amazon.com/New-York-Wire-FCS-9739-M-Screening/dp/B00NAFF8IQ/ref=sr_1_5?ie=UTF8&qid=1457715734&sr=8-5&keywords=fiberglass+screen+wire
	Kill zone curtains	2	Curtain dividers	\$600.00	
*	Thermometers	2		\$50.00	
*	Handwashing sink	1	w/ plumbing	\$50.00	
*	Chilling system	1	Chest freezer plus external thermostat	\$350.00	http://www.sears.com/kenmore-7.0-cu-ft-chest-freezer-white/p-04612702000P?prdNo=4&blockNo=4&blockType=G4
*	Evisceration tables	2	Stainless steel, with lip and drain	\$1,000.00	
	Knives	8		\$100.00	
	Cutting boards	6		\$105.00	http://www.webstaurantstore.com/18-x-24-x-1-2-red-cutting-board/20318245RD.html

	Waste water tank & trailer	1	Transport pink water for spreading on pastures.	\$500.00	
*	Scale	1	Legal for scale.	\$200.00	http://www.scalesgalore.com/easyweigh_ck_p_rice_computing_scale.htm
*	Hoses, nozzles, plumbing			\$100.00	
*	Wall coverings	12	Washble wall covering	\$350.00	https://www.farmtek.com/farm/supplies/prod1;ft_building_materials-ft_polymax_sheets;pg106835.html
	Fans	2		\$50	

6) Additional Staffing Needs

General Farm Staff - Hourly - 1 Staff to work on Garden and Livestock as a full time staff. This person would help with projects when student labor is not able, chores coordination, breaks, weekends, and assist with work program task management. This would allow for increasing production goals.

TOTAL budgeted hours: 40 hours per week

Kitchen - Labor needs: 2 staff members on at all meals:

- Opening - Breakfast & Lunch shift (2 people):
 - First in: 5:30am-1:30pm (8 hours)
 - Second: 6:30am-2:30pm (8 Hours)
- Closing - Dinner Shift (2 people)
 - First in: 10:30am-6:30pm (8 hours)
 - Closer: 12:00pm-7:00pm (7 hours)
- Weekend (2 people)
 - First shift Sat & Sun: 7:00am-2:00pm (7 hours)
 - Second Shift Sat & Sun: 12:00pm-7:00pm (7 hours)

TOTAL budgeted hours: 183 hours per week

Our current staff capacity is 5 staff members at 32 hours a week which comes out to 160 hours a week. With thought given to sustainability, efficiency, and quality production - and if it's economically possible - I'd like to advocate hiring one more person on a part-time basis for 25-30 hours a week. This will also make it possible for staff members to take time off, as right now it's virtually impossible, and often a huge burden on the team when someone needs to take a day (or more). In the past, we've leaned heavily on student work to mitigate these scenarios - but with student work in the kitchen being limited in this time, I'd rather not lean on that option.

Appendix C

WBFP Resource Needs:

<https://drive.google.com/file/d/1dph-IBW-ZFXXXZhmb4J-KNadCaj4REsS/view?usp=sharing>

Livestock, Pasture, and Mixed Power Systems		
ITEM	COST	Per Animal
20 bred Heifers	\$40,000.00	2,000
1 Bull	\$3,000.00	
40 Ewes	\$8,800.00	220
1 Ram	\$500.00	500
Guard Animals	\$700.00	700
Bedding	\$624.00	624
Feed (Sheep)	\$4,800.00	\$122
Feed (cattle)	\$3,500.00	175
<i>Cattle Supplies</i>		
Beef cattle AI/Synchronization/Semen	\$1,080.00	54
Additional supplies TBD		
<i>Sheep Supplies</i>		
Weaver® Poly Rope Sheep and Goat Halter - Green/Blue/Purple	36.75	
Optimiser™ Injector/Drencher Optimizer	43.95	
Weaver® Nylon Ewe Marking Harness	98.60	
Medium Sheep Marking Crayon - Red	16.60	
Medium Sheep Marking Crayon - Blue	16.60	
Medium Sheep Marking Crayon - Green	16.60	
Allflex® Global Medium Double Female Numbered Tags (with Studs) - Yellow, Numbers 1-25	31.75	
Allflex® Global Medium Double Female Numbered Tags (with Studs) - Yellow, Numbers 26-50	31.75	
Allflex® Total Tagger™+ Applicator	51.50	
E-Z™ Nurse Milk Specialty Bottle with Nipple	34.50	
Luer Lock Syringes, Needle, Box of 100, 6 ml with 20 g 1" needle	16.95	
Luer Lock 12 mL syringes, 18 ga x 1" needle (Box of 100)	18.50	

All-Weather Paintstik® Livestock Marking Crayons, 12 assorted colors	12.49	
Shoulder-Length O.B. Gloves, box of 100	22.38	
Nitrile Disposable Gloves, box of 100 - Small	8.99	
Nitrile Disposable Gloves, box 100 - Medium	17.98	
Nitrile Disposable Gloves, box 100 - Large	17.98	
Nitrile Disposable Gloves, box 100 - X-Large	8.99	
Cydectin® Oral Sheep Drench, 1L	69.97	
SHARPVET Feeding Syringes	9.99	
Foot Rot Shears	32.97	
Grain & Feed Scoops	17.98	
Vet Thermometer with Clip & Cord	3.49	
2-Second Thermometer	16.95	
Oster® Turbo A5® Two-Speed Clippers	121.75	
Professional Sprayer, 32 oz	9.98	
Mobile Tool Box With Wheels	75.99	
31 Gallon Galvanized Steel Utility/Trash Can	39.98	
8' Starter Combination Feeder w/Galvanized Pan	685.00	
10 Gallon Galvanized Steel Utility/Trash Can	19.99	
<i>Infrastructure</i>		
Exterior Fencing	TBD	
Woven Wire Fencing	TBD	
Polywire	TBD	
Handling Equipment (breeding box)	TBD	
Mechanical Shop Renovation (white shed)	TBD	
Front Barn Renovation (for livestock handling, lambing)	TBD	
High Traffic Area Design Work (curtail muddy conditions)	TBD	
<i>Sheep Fencing</i>		
3' Ground Rod T-Handle	15.49	
Warning Signs	15.96	
Fence Volt/Current Meter	103.99	
Fence Jumper Leads	19.98	
Geared wheel	80.99	
Heavy Duty Pigtail 42"	203.97	
Turbo Wire 2,624', 3/32"	145.99	
Gallagher Smart Fence 2	213.99	

Gallagher B100 Fence Charger with solar option	289.00	
12V 105Ah Deep Cycle Marine Battery	215.88	
<i>Tools</i>		
Forgecraft USA 6 Tines Forged Pitch Fork with Long Fiberglass Handle	183.40	
Cequent Products Cequent Laitner Company 1434AJ 24 in. Assembled Stiff Bristle Push Broom With 60 in. H	37.39	
Precision 250 ft. Hose Reel Cart	82.59	
Craftsman Brass Twist Nozzle	9.99	
Dorcy Industrial Rechargeable Xenon Lantern	23.62	
<i>Community Garden</i>		
Small Tools	2,500.00	
Walk-behind tractor maintenance & fuel (annual)	TBD	
Amendments / Soil Preparation	TBD	
Fencing	TBD	
<i>Mixed Power Systems</i>		
Tractor Training: safety & maintenance	TBD	
Tractor & Equipment General Maintenance (annual, fluids, etc.)	TBD	
<i>Draft Animal Haying (in combination with combustion tractor equipment)</i>		
I and J ground drive riding sickle bar mower with 7' cutter bar	\$6600.00 for mower, \$1750.00 for 7' cutter bar = \$8350.00	
Ground drive forecart with 12V 4-way hydraulic lift	\$3,550.00	
Tedder	\$1,800.00	
Power rake	\$1800-3500.00	
<i>Pasture Management & Improvement</i>		
alfalfa & orchard grass	TBD	
native grasses	TBD	
cover cropping	TBD	

Forestry, Agroforestry, & Draft Power			
ITEM	COST	TIMELINE	PHASE
General Survey Equipment	\$400	Summer / Fall 2020	1
<i>CHESTNUT PROJECT (grant submitted to Work Colleges Consortium)</i>			
Soil Amendments	\$75	Fall 2020 / Spring 2021	1
Irrigation	\$250	Fall 2020 / Spring 2021	1
Tree Guards	\$270	Fall 2020 / Spring 2021	1
Deer Fencing	\$2,330	Fall 2020 / Spring 2021	1
Community Engagement	\$75	Fall 2020 / Spring 2021	1
General Survey Equipment	\$200	Summer 2021	2
Rootstock / Trees / Nursery Supplies	\$1,000	Summer 2021	2
Circular Sawmill, new or used	8,000-22,000	Fall 2021	3
Sawmill Maintenance Budget	\$500	Fall 2021 +	3
Sawmill Accessories Sharpener, Edger, Etc.		Fall 2021	3
Pair of Draft Horses, young and big to carry the forestry program forward for 10 years	\$8,000	Fall 2022	4
Harness Upgrades		Fall 2022	4
Logging Tools, miscellaneous	\$1,200	Fall 2022	4
Sawmill Use / Maintenance	\$500	Summer 2023	4
Grafting Supplies / Mushroom Spawn	\$400	Fall 2023	5