2015

GVSU Sustainable Agriculture Project Handbook

Youssef Darwich
Grand Valley State University

Dana Eardley
Grand Valley State University

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Authors: Youssef Darwich & Dana Eardley

Advisors: Yumiko Jakobcic & Sarah King

Spring 2015

The GVSU Sustainable Agriculture Project was started by a group of Grand Valley students in 2008, and is a project of the Brooks College of Interdisciplinary Studies. The original farm site is on Luce Street on the Allendale campus.

The purposes of the project include:

1. SEEDING SUSTAINABLE FOOD PRACTICES

   We foster sustainable farming practices to promote ecological and food literacy. The farm strives to implement intensive agricultural practices that are ecologically durable, socially responsible, and economically viable. We promote social and food justice, while exploring various means of sustainable food production.

2. CULTIVATING LEADERSHIP AND LEARNING

   We value student leadership with the continued mentoring and support of faculty and the farm manager. We foster student leadership through the Farm Club, volunteerism, internships, and student-led research. The farm is a student-led space.

   We value sustainable food system education that is rigorous and experiential. The project provides support to courses across the university. We encourage research projects that are student-initiated and/or interdisciplinary. We wish to foster collaboration and experimentation within all teaching and learning in the project.

3. NURTURING PLACE

   We value land and its ecological integrity. Place-based learning is at the heart of our work. The project sites provide places where the practical, political, ecological, and symbolic challenges of such work can be negotiated and explored.

4. GROWING COMMUNITY

   The project is rooted in community. We seek to grow relationships by providing a space for dialogue across disciplinary boundaries, the negotiation of interdisciplinary practices, and the contestation of ideas.

The purpose of this document is to provide an overview of the history and organizational structure of the Sustainable Agriculture Project. We hope to document and share useful techniques and insights gained from past experiences of the SAP community. Finally, we hope to capture the current vision and share potential ideas for future growth. This handbook is an iterative document that needs updating and refining as time goes on.

Contents

History

In 2008 the Sustainable Agriculture Project began as student run community gardens. The creation of the SAP was rooted in a vision for a campus garden on campus and was carried out by a group of six students who became invested in the idea through a philosophy practicum course with Professor Kelly Parker. During this course, the students (Danielle Ostafinski, Sarah Chartier, Alica Crawford, & Michael Bonarek) were responsible for initiating the idea, coordinating the people, creating the plan, recruiting engagement, building relationships, and managing the garden. Their proposal was well received and facilities graciously granted them the initial plot of land. The work that these student completed in a semester set the stage for creating what the SAP has become today.

The Community Garden in 2010. Courtesy Levi Gardner

Farm Club Breaks Ground. Pictured: Levi Gardner, Amy Page, Kendall Gilbert, and Josh Lycka. Courtesy Lanthorn

The Initial Vision:

> "By providing students, faculty, staff and the Allendale community with a space to gather we hope to promote experiential learning through the growing of food, build relationships within the community and host various educational events and activities. In the future the garden will provide an avenue for individuals, groups and organizations to work together to foster a greater engagement with sustainability and environmental stewardship, as well as contributing to an overall sense of community on campus."

Organizational Structure

The SAP engages a broad community. Here is a list of the key stakeholders who are currently involved:

- Advisory Board
  - The Advisory Board is comprised of a diverse group of faculty, staff, and students that seek to promote educational opportunities at the SAP. This committee is responsible for making general programmatic decisions, creating policy, and creating and identifying synergies between programs, activities, and users. The Advisory Board additionally seeks to facilitate communication and collaboration between stakeholder groups.

- Facilities Planning and Services
  - Facilities have been instrumental in the development of the SAP from the start when they initially allotted an acre of land to the production of diversified vegetables for the SAP. Furthermore, facilities assists with maintenance of the site and they are in charge of approving any permanent changes to the land.

- Faculty
  - The SAP serves as a living laboratory and outdoor classroom for the University. Professors bring their students to the SAP for class visits and/or to work on projects that further explore concepts that are being taught in the classroom.

- Farm Club
  - Farm Club members are charged with connecting the SAP to the larger community to spread awareness of the project and other food system issues. They have the ability to do so by working with Student Senate to secure funding for events, workshops, and special projects. This group provides the SAP with passion, varied skill sets, and creative ideas.

- Farm Manager
    - The Farm Manager additionally plays an active role in educating and mentoring on the best practices of sustainable agriculture. The Farm Manager is tasked with providing operational advice, creating crop plans, scheduling interns, and overseeing daily operations. Further, the Farm Manager is tasked with implementing the policies and decisions made by the SAP advisory board to ensure the site is supportive for programming and activities.

- Interns
    - Interns are responsible for maintaining the fields, keeping production records, managing produce orders, and communicating between the Farm Club and the farm manager. Interns are also charged with providing leadership for Farm Club members to help them carry out special projects and learning opportunities.

- Office of Sustainability Practices (OSP)
    - The OSP provides administrative support through various channels including budgeting, employment, communication, and logistics. OSP also helps with the marketing and advertising of SAP related programing.

- Volunteers
    - Volunteers play a critical role to the success of the SAP. Volunteers enable the SAP to thrive by providing the labor necessary to manage the farm. In return, volunteers can fulfill service hour requirements, learn about sustainable agriculture, and have fun getting their hands dirty.

- Wesley Fellowship
    - The Wesley Fellowship provides a supportive presence for the student leaders of the SAP. The Wesley House provides a physical structure for students to gather, cook, receive mail, and even reside, thus providing a home for the project.

It is important to note that is not an inclusive list and the SAP is a highly collaborative space where new people and ideas are always welcome.

Funding

The SAP has received monetary support from a number of entities within the University. The largest contributor has been the Sustainable Reinvestment Fund, which provided most of the funding to install our two hoop houses. Additionally, Farm Club members have received funding from Student Senate for events and materials. Various academic departments, colleges and individuals have also provided monetary support. Finally, the SAP generates funds through the sale of produce (See Marketing).

Production

Principles

The principles of our growing practices are best summarized by three words: Ecological, educational, and economical.

The ecological focus refers to supporting the diverse web of organisms that comprise our farm ecosystem. By focusing on biologically intensive growing methods we build soil fertility and optimize crop production.

Education is a primary goal at the Farm. We aim to provide a space that is easily accessible and document our production so we can improve our production methods over time. By experimenting with a variety of production methods we hope to learn and share the best practices for our climate and soil type.

Levi Gardner teaching a group of Farm Club students

Ultimately, economic profitability is what keeps a farm sustainable. We are continually exploring outlets for our produce (see Marketing) and improving our production systems. We hope to explore the profitability of a variety of sustainable growing methods to benefit the larger community.

Practices

There are many books on practices and techniques used by successful growers that are far beyond the scope of this handbook. Because many of these techniques have aggregated over the years, many listed below do not have a single direct source. However, the majority of our production systems have been modeled after the MSU Student organic farm, Elliot Coleman, John Jeavons, and Jean Martin-Fortier. We encourage people to improve the cropping systems at the SAP by exploring different techniques through visiting other farms and exploring additional resources. A list of useful books, online resources, and local farms is located in the appendix.

Scheduling and Planning

Effective planning and scheduling is critical to ensure the most efficient use of resources. The majority of planning should take place in the winter off season when there is time to reflect, analyze trends, refine production and set goals for the upcoming season. Effective planning can minimize unused space and allow for 2 to 5 crops to be produced in a single bed per year.

Bed Preparation

Preparing beds for planting is one of the most labor intensive processes involved in vegetable production. There are many different tools used in the process, the most relevant to our situation are discussed below.

Rototilling

The most common implement to prepare soil in a small farm setting in a roto tiller. Rototillers disturb the surface layer of the soil, killing weeds and providing a clean bed for planting or seeding. They are operated by a single person who walks through behind the machine as it move through the bed. We have not found rototillers to be extremely useful at the SAP for two reasons. First, the spaces are tight in the hoophouse and most bed preparation can easily be done with hand tools. Second, the rototiller we have on site is not powerful enough to penetrate the clay hardpan in the field. Nevertheless, a rototiller may be appropriate in applications where the soil is not severely compacted or when plastic mulch is applied over the bed.

Tractor Cultivation

A more powerful method of cultivation is used with the assistance of a tractor. While the SAP does not currently own a tractor, we have routinely rented them at the beginning and end of the growing season. Tractors allow for large areas of land to be prepared in a time efficient manner. However, due to the physical conditions of our soil, special consideration must be given to the soil moisture. If the soil is too wet, tractors will leave deep tire ruts and further compact the soil.

While tractors and rototillers are very useful to bring to soil into an initial, workable state, they should be avoided where possible because they destroy the soil structure in the long term and lead to the formation of a hardpan (which already exists due to historic tillage).

Stirrup hoes have a thin, hollow head with a blade that cuts through weeds just below the surface of the soil. These are great to use in the hoop houses, walkways, and other areas requiring little soil disturbance to create a clean seed bed. Further, stirrup hoes, along with collinear hoes, can be used to weed between crops within beds. However, they are not efficient to use over large area.

Stirrup hoe weeding between rows. Courtesy Youssef Darwich

Wheeled stirrup hoe between beds. Courtesy Youssef Darwich

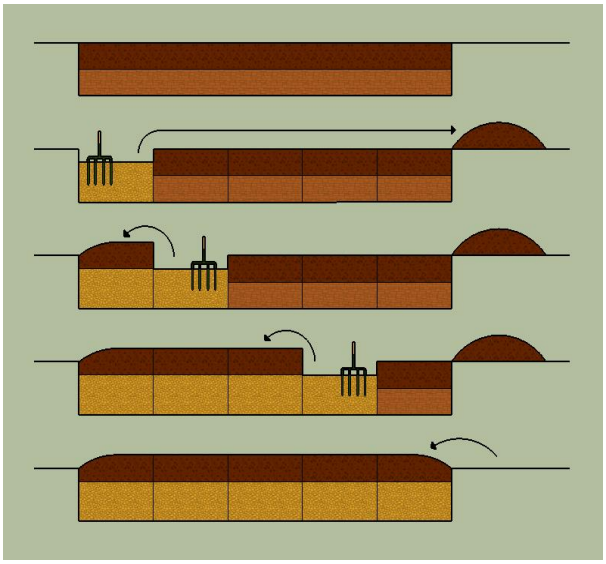
Wheeled hoes are a great advancement over hand-held hoes. Using the two handles, the operator pushes the hoe through the soil. Several attachments can be added to the base structure, however a stirrup blade is most commonly utilized, performing a similar function as the hand held hoe with more force and less effort. Wheeled hoes are great for maintaining walkways or even preparing entire beds without bringing new weed seeds up from the seed bank. The stirrup style attachment is not practical to weed within beds, however new attachments can be purchased to allow for weeding within rows.

Due to the severely compacted soil of the site, it is often necessary to aerate the subsoil. The two main methods are using a broad fork and double digging.

Broad forks are wide with several tines that penetrate the soil when the operate steps on the bar. Once inserted, the operator pulls back and the tines create macro pores within the soil, which allow us to aerate the soil without turning it. The purspose is to create loose, fertile soil, while encourages the crop roots to spread downward rather than sideways (Fortier). However, the soil on site is so severely compacted that broad forks often cannot penetrate deep enough the break up the hardpan.

Kali Smolen using a broadfork. Courtesy Youssef Darwich

Double digging can be used to de-compact deep into the subsoil. First, a small section of the bed is removed of topsoil, which is placed into a wheelbarrow, exposing the hardpan. Digging forks are then used to create pore space. Top soil from the adjacent section is placed over top of the recently aerated section, and the exposed subsoil is also aerated. This process repeated down the bed. At the end, the initial topsoil in the wheelbarrow is placed on the last section and the bed is complete. While double digging is extremely effective at creating a fertile bed, it is extremely labor intensive and should only be used when establishing permanent beds.



Double digging diagram. Created by Youssef Darwich

Permanent raised beds, especially in our heavy clay soil, are the optimal way of building and maintaining soil structure. Raised beds allow for better drainage, reduced compaction, faster warming, and ultimately higher yields. The raised beds are especially important in the early spring when the soil is often saturated, which negatively affects plant growth by prohibiting air from getting to the roots.

Mounding the beds increases the distance from the water table (gives more room for roots to respire), as well as increasing surface area and creating easier harvesting conditions. To mound beds, we dig soil out of the walkways and pile it onto the beds. We can use the channels between the mounded beds to harvest and distribute it evenly throughout the field.

Mounded beds in the production field after a light rain. Courtesy Youssef Darwich

Cover Crops preform several soil building functions and are generally used as part of the crop rotation. Their leaves gather carbon via photosynthesis and add the organic matter into the soil. Their roots burrow deep into the soil, creating habitat for organisms and pulling nutrients from the subsoil to the surface. Their shade prevents weeds from germinating and their coverage helps prevent soil erosion.

Rye cover crops in the hoophouse. Courtesy Youssef Darwich

Mulching

In general mulching helps retain moisture and suppress weeds. The two main types of mulch used are plastic and organic.

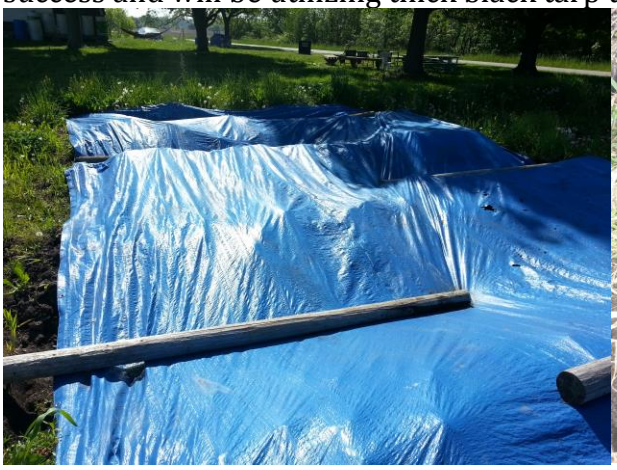
Plastic mulch – almost eliminates the need for weeding, however it is time consuming to install and remove. Regardless, the time saving in weeding often justifies the energy expenditure. The greatest return is from crops that have long times to maturity such as tomatoes and squash.

Levi Gardner and Dana Eardley planting into plastic mulch

Straw mulch on vegetable bed. Courtesy Youssef Darwich

Organic mulch – helps to suppress, but not eliminate, weeds. Also encourages a healthy biological community by covering the soil with organic matter. However, it is important to ensure any organic mulch is free of weed seeds.

Tarping can be used as a method to prepare the bed for planting without turning the soil. Covering the soil with a UV treated tarp creates warm, moist conditions where weed seeds readily germinate but die in the absence of light. The result removes weeds from the seed bank and provides a clean bed to plant into. We have used blue tarps with moderate success and will be utilizing thick black tarp to minimize penetrating light.



Tarp covering beds in field. Courtesy Youssef Darwich

Worms under covered soil. Courtesy Youssef Darwich

Planting

Once the bed is prepared, there are two ways to plant the crop of choice: direct seeding and transplanting. Deciding which method to use is a function based on crop type, bed condition, and labor availability.

Transplanting – By starting seeds in the green house, we can more easily control temperature and moisture for maximum germination success. Seeding in the greenhouse also allows us to start earlier in the season. Larger plants, such as tomatoes, may need to be potted up into bigger containers as they mature. Once plants have established themselves they are transplanted into the hoophouse or the field.

Spring seedlings in the greenhouse. Courtesy Youssef Darwich

Seed starting calendar. Courtesy Levi Gardner.

Crop	Number of weeks to start seeds before setting-out date	When To start inside			Setting-out date	
		From	To	Safe time to set out plants (relative to frost-free date)	From	To
Basil	6	7-Apr		1 week after	19-May	
Beets*	4 to 6	17-Mar	31-Mar	2 weeks before	28-Apr	
Broccoli	4 to 6	17-Mar	31-Mar	2 weeks before	28-Apr	
Cabbage	4 to 6	3-Mar	14-Apr	4 weeks before	14-Apr	12-May
Cauliflower	4 to 6	17-Mar	14-Apr	2 weeks before	28-Apr	12-May
Celery & celeriac	10 to 12	25-Feb	10-Mar	1 week after	19-May	
Collards	4 to 6	3-Mar	17-Mar	4 weeks before	14-Apr	
Corn salad/mache	4 to 6	18-Feb	24-Mar	3 to 6 weeks before	31-Mar	21-Apr
Corn*	2 to 4	14-Apr	12-May	0 to 2 weeks after	12-May	26-May
Cucumber	3 to 4	21-Apr	5-May	1 to 2 weeks after	19-May	26-May
Eggplant	8 to 10	17-Mar	7-Apr	2 to 3 weeks after	26-May	2-Jun
Kale	4 to 6	3-Mar	17-Mar	4 weeks before	14-Apr	
Kohlrabi*	4 to 6	3-Mar	17-Mar	4 weeks before	14-Apr	
Leeks	8 to 10	18-Feb	3-Mar	2 weeks before	28-Apr	
Lettuce	4 to 5	10-Mar	24-Mar	3 to 4 weeks before	14-Apr	21-Apr
Melons	3 to 4	28-Apr	5-May	2 weeks after	26-May	
Mustard*	4 to 6	3-Mar	17-Mar	4 weeks before	14-Apr	
Okra*	4 to 6	14-Apr	12-May	2 to 4 weeks after	26-May	9-Jun
Onions	8 to 10	4-Feb	18-Feb	4 weeks before	14-Apr	
Parsley	9 to 10	11-Feb	25-Feb	2 to 3 weeks before	21-Apr	28-Apr
Peas*	3 to 4	18-Feb	10-Mar	6 to 8 weeks before	17-Mar	31-Mar
Peppers	6 to 8	31-Mar		2 weeks after	26-May	
Pumpkins	3 to 4	28-Apr	5-May	2 weeks after	26-May	
Spinach	4 to 6	18-Feb	24-Mar	3 to 6 weeks before	31-Mar	21-Apr
Squash	3 to 4	28-Apr	5-May	2 weeks after	26-May	
Swiss chard	4 to 6	17-Mar	31-Mar	2 weeks before	28-Apr	
Tomatoes	6 to 8	24-Mar	14-Apr	1 to 2 weeks after	19-May	26-May
Watermelon	3 to 4	28-Apr	5-May	2 weeks after	26-May	

* Usually direct-sown, but may be started indoors

Direct seeding – the simplest way to plant crops is to put the seeds directly into the ground. The three main approaches used at the sap are hand seeding, earthway seeder and the precision seeder.

Hand seeding – simplest and easiest to ensure seeds are placed properly in the bed. Seeds are dropped into a hand dug furrow and buried. While this is the simplest and easiest method to ensure seeds are placed properly in the bed, it is by far the most time consuming.

Earthway seeder – a large seeding device for seeds are placed into a hopper and planted into a furrow as the wheels spin. This is best suited for large seeds, such as peas or beans, and does not work great for small seeds such as lettuce or carrots, although several sized plates are available.

Earthway seeder. Courtesy Youssef Darwich

Pinpoint seeder. Courtesy Youssef Darwich

Pinpoint seeder – a smaller seeder pulled along the bed, dropping up to 4 rows of seeds into the bed. Works great for dense crops with small seeds, such as lettuce and carrots. However, furrows tend to clog with soil if the bed is even slightly moist.

Irrigation

The main purpose of irrigation is to ensure optimal germination rates for direct-seeded crops and to provide sufficient moisture in the ground for transplanted seedlings (Fortier). Irrigation also serves to ensure maximal production by providing a continuous supply of water for crops. The 3 main types of irrigation used at the SAP are sprinklers, overhead, and drip irrigation.

Sprinklers are advantageous because they require little labor to cover a large area of crops. However, due to evaporation and wind, sprinklers are not the most water efficient nor do they provide consistent coverage. Sprinklers are best suited for relatively large sections of beds.

Overhead irrigation applies water directly to a bed via a wand. This type of irrigation is the best method for irrigating direct seeded crops and small seedlings because it is possible to ensure uniform coverage of the seedbed, which is critical for young plants without robust root systems. However, overhead irrigation by hand is time consuming and should be avoided once plants have become established.

Dana Eardley waters a newly seeded bed. Courtesy Lanthorn

Drip irrigation is the preferred method of irrigation for mature plants and those planted in plastic mulch or in the hoophouse. Drip irrigation relies on “tape” or plastic tubes to slowly release water onto the soil.

A main “header” is connected to the hydrant, which is a large tube running perpendicular to the beds and 2 drip irrigation lines extend from the header into each bed. These drip lines have tiny holes which release water directly to the soil surface.

However, drip irrigation can be inconvenient in the field because the lines often get tangled when they are moved for bed prep or weeding. We are beginning to transition away from drip irrigation lines in the field because the complex lines and the consistently high moisture content of our soil.

Companion and Succession Planting

Utilizing ecological principles, such as succession and companion planting, is large component of our production. For management at a market garden level, planting complexity needs to be balanced with ease of harvest, weeding tools and background knowledge of incoming volunteers. Planting succession, especially with aid of hoop houses, makes it possible to yield multiple crops from the same bed in a season.

Combining permaculture principles with an understanding of the growth, harvest, and death patterns of a particular crop enables one to maximize time of production and minimize duration where soil is left bare.

Here are some of the companion plantings we use in our production beds:

Spinach to tomatoes: spinach thrives in cold temperature but "bolts" or begins to go to seed once temperatures reach a certain point. In our hoop house we had spinach, planted in September, thriving at the beginning of April – the same time tomatoes are ready to go in the ground. Instead of ripping out all of the spinach, we simply ripped out the middle row in each bed and planted tomato seedlings in between.

Tomatoes planted into spinach. Courtesy Youssef Darwich

Once the spinach began to bolt we removed about 95% of the plants, only leaving spinach with desirable traits to save seed from. In hindsight we would make this selection as soon as the plants begin to bolt, as we learned large spinach plants will compete with tomato seedlings for nutrients.

Pepper and garlic: Garlic is a crop that overwinters and can be harvested at any point of its growth cycle. We harvested the interior of the bed while the garlic was young, planting peppers in the harvested area. Because these crops have different growth forms, there is minimal competition for light or soil resources, and the garlic releases odors deterring pests.

Peppers and garlic interplanting. Courtesy Youssef Darwich

Zucchini and cosmos interplanting. Courtesy Youssef Darwich

Zucchini and cosmos: This combination has proved to be a success. Anyone who has ever harvested zucchini knows how sharp the leaves can be. The cosmos have soft, feathery leaves, which makes reaching in to harvest the zukes a more pleasant experience. Further, the cosmos bring aesthetic beauty to the garden, fill space between zucchini, support pollinators, and provide cut flowers to bring to market

Basil and eggplant: These two appear to have positive effects on one another. The basil doesn't out compete the eggplant for soil resources or light; the eggplant provides light shade for the basil, which slows the basil from going to seed.

Eggplant and basil interplanting. Courtesy Youssef Darwich

Kale and onion interplanting. Courtesy Youssef Darwich

Kale and onion: These two crops work well together. Similar to garlic, onions also excrete odors into the environment which deter pests. However, to get a healthy onion crop, harvest the kale heavily to ensure enough light reaches the onions.

Season Extension

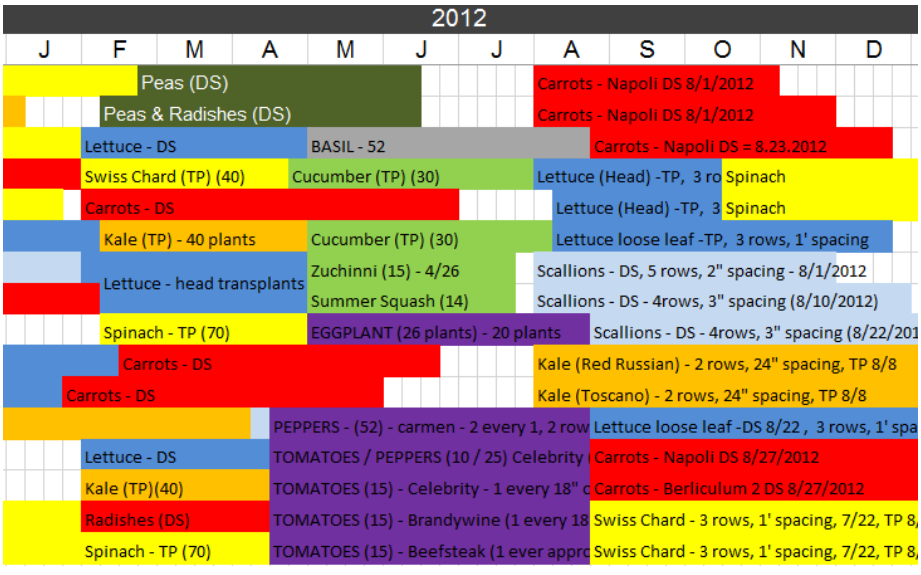
The greenhouse serves as a plant nursery in the spring while hoophouses are used for season extension. Crops such as spinach, kale, and carrots can be overwintered in the hoophouses, which extend the growing season. These crops do not grow quickly in the winter, however the hoophouses provide enough protection to serve as a "living refrigerator".

Winter 2013 at the SAP. Courtesy Youssef Darwich

In the summer, the hoophouses are suited to grow heat loving crops such as tomatoes, cucumbers and peppers (Fortier). Crops such as lettuce and spinach "bolt" in warm temperatures and are better suited in the cooler spring and fall.

Layouts

Effective planning of bed layouts is critical to maximize production while reducing pest pressure. Microsoft excel is a great tool to use in the planning process. Below is a snapshot of the spreadsheets maintained by former manager, Levi Gardner



2012 Hoophouse Layout. Credit Levi Gardner

Volunteers

Volunteer coordination is among the most challenging, and rewarding, parts of working at the SAP. Groups of volunteers are one of the greatest assets to the success of the SAP, however they do present unique challenges. Friday open volunteer hours are often sporadic in the number of people participating. It is important to have lists of simple activities and avoid leaving inexperienced volunteers doing tasks that have not been very clearly explained and supervised by experienced members at the start. Assuming volunteers know what is obvious to more experienced members of the SAP crew is a critical mistake. Doing so may result in crops being weeded or lost.

Further, volunteers are often seasonal, with large numbers in the spring and fall but few in the summer months when the most help is needed. With that in mind it is important to plan big projects when volunteers are plentiful. Volunteer hours are wonderful in the diversity of people who attend and the relationships that form by working together.

Tree planting in Fall 2014. Courtesy Cullin Flynn

We attempt to recruit new volunteers by hosting workshops, providing a space for classroom service hours and attending campus events such as student life night.

Continued, committed volunteers often lead to internships. We try to ensure volunteers have a rich rewarding experience by providing meaningful activities for each individual. Continued, committed volunteers who demonstrate leadership often lead to internships.

Tree planting Fall 2013. Pictured Kali Smolen, Dana Eardley, Casey Davenport, Dillon Lee, Burritt Watrous, Allison McDowll, Erin Shelly, Youssef Darwich, Matt Dejonge, & Jordan Hart. Courtesy Levi Gardner

Food Safety

At the SAP we are committed to adhering by the measures established by the Michigan Safe Food Risk Assessment. From 2012-2014, we researched several different safety certifications in order to determine what codes best fit our operation. In 2014, we gained certification through the MSRA that has since enabled us to sell to campus dining and see to it that our customers are getting the highest quality produce possible. The health and safety of our customers is a top priority and we take this commitment very seriously.

For detailed account of the details and processes please refer to the Food Safety Manual on the SAP website. gvsu.edu/sustainableagproject

Food Safety Basics

Pre-harvest

- Only trained individuals can participate in the harvesting process
- Wash hands before handling produce or equipment
- Sterilize equipment before and after use

Harvest

- Utilize proper tools and containers
- Do not eat while harvesting

Postharvest

- Store produce properly in regard to appropriate temperature and containers
- Wash produce with sanitizing solution
- Wash equipment
- Log harvest

Youssef Darwich washing beets. Courtesy Lanthorn

Dana Eardley harvesting lettuce. Courtesy Youssef Darwich

Marketing and Distribution

CSA

Our community supported agriculture (CSA) program allows customers to pay a lump sum at the beginning of the season in exchange for a weekly share of vegetables. In turn, the CSA gives us a stable source of revenue and allows our members to share in the abundance of the harvest throughout the season. After experimenting with different lengths for CSA sessions, in 2015 we have arrived at breaking our CSA into three ten-week sessions.

Youssef Darwich and Dana Eardley at the farmers market.

Farmer's Market

Our participation in the Grand Valley Farmers Market allows us to sell directly to our customers, sell any crops that we have ready, and gives us a bigger presence on campus. The Farmers Market gives us the opportunity to meet customers, tell our story, and get feedback from our community. The primary downside to this distribution avenue is the inconsistency of foot traffic.

Campus Dining

Selling to campus dining provides a way for us to engage students in the dialogue on where their food comes from, moves us towards closing the gap between producers and consumers, and provides an effectively limitless market. The primary difficulty with distribution through campus dining is the fact that campus dining is not active in the summer.

Youssef Darwich hands produce to chef Rick Roberts. Courtesy GV Magazine

Work-shares

In 2015 we are experimenting with workshops. By having students participate in work shares (exchanging labor for a share of produce) provides an opportunity for structured involvement for students. This provides the SAP with more consistent volunteer labor and gives students the opportunity to become closer to their food source while engaging with sustainable agriculture.

Other

We continuously explore other avenues for distributing produce, including donating excess to the GVSU food pantry and posting surplus product on the GVSU Barterboard.

Education

The SAP functions as an outdoor collaborative learning environment where disciplines and perspectives converge. This space is unique in that it provides a physical place for students and professors to observe and act upon concepts previously discussed in the classroom. The SAP has the potential to fulfill diverse needs for a variety of classes through hands on learning, collaborative projects, and systems thinking. Various disciplines can approach the SAP with their own unique perspectives, problems, and skill sets. The space and its many facets serves as a reliable source of volunteer hours for students from any class that incorporates service learning into its curriculum.

Class involvement with the SAP can take many forms. Examples of courses that have been involved in the SAP:

Food for Thought – Professors Sarah King, Amy McFarland, & Kirsten Bartels

- This course is an honors sequence that looks at food issues from an interdisciplinary lens, examining food and its impact on our bodies, our wallets and our planet. This class explores the cultural, scientific, and economic 'evolution' of our food systems and investigates the causes and consequences of producing food for the modern world.
    - At the SAP this course has engaged in varied projects including canning workshops, cooking demonstrations, tree plantings, and the development of a composting system. This course requires additional volunteer hours at the SAP where students participate in common growing activities. These hours are instrumental in giving students a genuine farming experience.

Sustainable Agriculture Practicum – Professors Levi Gardner & McFarland

- This course teaches students about agricultural systems while exposing them to applied research at the sustainable agriculture project site. Here students investigate models of sustainable food systems that link production to economics, consumption, and nutrition.
    - This course is based on taking concepts that students explore in their readings into practice. In the past, the majority of in class time has been spent at the SAP. Some of the activities that students engage in vary from sowing seeds to double digging, and from to building planter boxes to creating sanitation stations.

Global Agricultural Sustainability – Professor Sheila Blackman & Jodee Hunt

- This course explores the biological and environmental principles at the foundation of agricultural sustainability; looking at how various traditional and modern agricultural practices follow those principles and how social, cultural, and economic factors ultimately control agricultural practices.
    - This course visits the SAP at the beginning of each semester to learn about sustainable agriculture techniques and tour the site. In class, they have created projects relating to improvements that could be made to the SAP.

This course additionally requires each student to complete volunteer hours in the field.

- In the summer of 2015, a section of the course will establish experimental plots at the SAP. Students will be given the opportunity to compare different tillage techniques using a variety of tools and methods. The students will then research how various tillage techniques affect crop production.

Diversity is at the heart of collaboration. From marketing to nutrition, from engineering to ecology, virtually every discipline has role to fill in achieving the SAP's mission. The SAP provides a place for quantitative research, experiential learning, and individualized experimentation.

Vision

In hopes of creating a space for the broader community to engage with the SAP, we created an annual Harvest Party. This annual event allows us to reach a broader community, strengthen existing relationships, and share in the abundance of the growing season. This past year, we spent a large portion of the Harvest Party working through a visioning process. During this process we determined and documented what our collective goals, objectives, and dreams are for the SAP. Below we have included the insights and outcomes from the event as compiled by Professor Sarah King.

Over 90 people attended the 2014 SAP Harvest Party. After supper, 45 of us gathered to discuss our goals for the SAP and our vision for its future.

Harvest Party Fall 2014. Courtesy David Schofield

We began by reflecting on the values which had emerged from our survey of the SAP community:

Experiential and Interdisciplinary Learning • Sustainable Food Production and Environmental Stewardship • Ecological and Food Literacy, Social and Food Justice • Community Building and Community Engagement • Student Leadership • Student-Initiated and Interdisciplinary Research

Our discussion largely affirmed these values. We found that our energy focused around four key areas:

Seeding Sustainable Food Practices

"I became a better person when I understood the effort that it takes to produce a plate of food."

The SAP is all about food, after all. It is a place where students can learn about growing, preparing and eating healthy food. It can be a "nest of change" for the broader student community – a place that cultivates relationships and skills that support healthy foodways and sustainable food systems.

Promote Food Morality • Interdisciplinary Projects • Cultivate solidarity
Raise awareness • Food Distribution • Durable economic models

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Growing Community

"As it expands, one of the goals is to maintain the experience. People volunteer and have dinner together. We want to keep that as we grow."

Community is what the SAP does best – we need to find a way to grow while still maintaining a strong community. We also want to get better at reaching out to the larger GVSU community. Perhaps we could start by feeding them.

Community is Fundamental • Student/Community Outreach
Maintaining a close-knit community while we grow •Intangibles

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Cultivating Leadership for Learning

"This place saved my education, it turned it around."
"The experience of working here at the SAP makes you a better student"

We need to continue to foster the existing successful leadership of students at the SAP, while providing more mentoring and support from faculty and from the farm manager. This would allow us to develop more programs, support more volunteers, and do more teaching (e.g. during volunteer hours) while maintaining our focus on student leadership.

Many people supported developing a new diversified model of student leadership, one that divides the responsibilities and creates opportunities for more students. For example, we could have students developing expertise and leading various areas: compost, beekeeping, irrigation, nursery, weeding, trees, social networking, think tank, administrative relationships.

Diversified Leadership • Improved Faculty-Intern Communications •Encourage roles, avenues of specialization
As student leaders, make it our mission to bring people out and provide opportunities for engagement •
Mentoring

Building Place and Space

"This place is a sanctuary."

People had many ideas about how to improve the infrastructure so that the SAP is more able to realize its goals. The two most commonly mentioned suggestions were:

- Getting more land under cultivation (so that we can accommodate more classes and more volunteers).
- Creating more places to discuss and learn together while at the SAP – more benches? an outdoor classroom space? an indoor classroom space? (so that there are more options for creative teaching and learning).

Increase infrastructure for purposes that fit the values, such as:
commercial kitchen, wash/pack, classrooms, student housing, interdisciplinary research

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A portion of the Harvest Party included a large map of the GVSU property around the farm site. People were encouraged to draw on the map, make notes, and dream of how the land could optimize its potential.

As product of this dialogue, in addition to many other conversations, research, and site analysis, the following conceptual design was created for the land around the farm site.

The design attempts to provide a framework for the future development of the 100 acres of GVSU land by focusing on restoring the natural features of the land. Further, the design seeks to optimize the long term educational and economic potential of the site, while meeting the goals of the GVSU community.

A video with more description of this project can be found at vimeo.com/115021876

Growing Grand GVSU Restoration Plan: Conceptual Design. Created by Yousef Darwich

Acknowledgements

We would like to sincerely thank the many people who have contributed to the SAP, including:

Levi Gardner, Dave Feenstra, Sarah King, Yumiko Jakobcic, SAP Advisory Board, Office of Sustainability Practices, Campus Dining, Student Senate, Brooks College of Interdisciplinary Studies, Facilities Planning, Professors, Community Garden Founders, SAP Interns, CSA Members, Volunteers and hundreds of other members of the GVSU Community

The SAP would not be where it is today without the help of many hearts and hands.

Appendix

Books

The New Organic Grower. Eliot Coleman

The Market Gardener. Jean Martin-Fortier

How to Grow More Vegetables. John Jeavons

Gia's Garden. Toby Hemmingway

Crop Planning for Organic Vegetable Growers. Frederic Theriault

Fields of Learning: The Student Farm Movement in North America. Laura Sayre & Sean Clark.

Holistic Management Handbook. Jody Butterfield, Sam Bingham, & Allan Savory.

The Organic Farmer's Business Handbook: A Complete Guide to Managing Finances, Crops, and Staff--and Making a Profit. Richard Wiswall.

Farms

8th day farm	www.eighthdayfarm.com/
Cold Stream Farm	www.coldstreamfarm.net/
Grandpa's Orchard	www.grandpasorchard.com/
Green City Acres	www.greencityacres.com/
Green Wagon Farm	www.greenwagonfarm.com/
Groundswell Farm	www.groundswellfarm.org/

Hope Farms	www.bethany.org/grandrapids/hope-farms
Lubbers Farm	www.lubbersfarm.com/
MSU Organic Farm	www.msuorganicfarm.com/

Other Resources

ATTRA	attra.ncat.org/organic.html
Debryun's seeds	www.debruynseed.com/
Hudsonville growers co-op	www.fcelevator.com/
Old Farmer's Almanac	www.almanac.com/
Permaculture Voices Podcast	www.permaculturevoices.com
The Ruminant Podcast	www.theruminant.ca