

# Four-Season Student Farming

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How do you tell the story? How much from the head and how much from the heart? Is it a narrative grounded in the academic literature, or is it rather a story about place, people, process and transformational change? The history of the Michigan State University Student Organic Farm (MSU-SOF) can be told in many ways. The account offered here is from the perspective of a tenured faculty member and professor who partnered with students, staff and other colleagues to cultivate what has developed into a thriving student organic farm at a land grant university. The intent is to paint an instructive picture for those seeking to start similar farms at other schools, as well as for those walking the path of personal growth in a "learning-farm" culture.

The MSU-Student Organic Farm started as a location for organic high tunnel research and quickly expanded to a 48-week community supported agriculture (CSA) program to research and demonstrate year-round vegetable production and to provide students with organic farming experience. From the beginning, the goal of the MSU Student Organic Farm has been to incorporate student requests for practical organic farming opportunities with the additional need for research, outreach and service to the campus and local communities. Creating an integrated program has been a key objective, as well as a budgetary reality, for the SOF from the start. A research project established the site and funded the first two high tunnels, providing a foundation for later expansion. Undergraduate employees of the research program later became undergraduate farm crew employees of the SOF. The connection to a research project and to specific teaching programs (the Horticulture Department and the Residential Initiative for Study of the Environment specialization, or RISE) provided additional funding and a clear direction for development while enabling students to take an active and defining role.

Michigan State University's tag line is, "Advancing knowledge. Transforming lives." The story of the MSU-SOF also includes the theme of transformational change. Our experience has shown that the most important aspect of the MSU-SOF is not necessarily the horticulture or the farming; it is the opportunity for transformation that students experience daily. Finding the words to describe this transformation is more challenging than bringing people to the farm to see it. But it is a story that needs to be told.

Another theme that will emerge in the story that follows is the importance of four-season farming for local food. For the educational farm, four-season farming allows for expanded learning within an already condensed academic experience. There are more opportunities to practice and more opportunities to consider the principles of balance and discipline. Summer on the farm does not have to be all work and no fun if production and sales are extended across the year.

The first 15 years of the MSU-SOF have seen continuous growth that I like to characterize with a horticultural metaphor of five phases: 1) preparing the soil; 2) sowing the seeds; 3) developing roots and a healthy plant; 4) flowering; and finally 5) fruiting and dispersing seeds. In the first part of this essay I will trace this developmental process of growth; then, I will describe the MSU-SOF's current configuration in more detail.

## **Preparing the soil: 1994-1999**

The MSU-SOF grew out of the fertile ground prepared by the Michigan Sustainable Agriculture Network (MSAN), a cross-disciplinary, joint graduate and undergraduate student organization started in 1994. Graduate assistantship funding for a coordinator position for MSAN was provided by Richard Harwood in his role as C.S. Mott Endowed Chair for Sustainable Agriculture. Extension Specialist Susan Smalley worked with the coordinator and other students to invite outside speakers, establish a for-credit seminar class, and stimulate learning with an emphasis on participatory processes. A

motivated core group of students representing multiple departments used a steering team structure with a rotating meeting facilitator and note-taker to foster shared responsibility and leadership.

Two other student programs that would later impact the SOF also emerged at this time. One was the Residential Initiative for Study of the Environment (RISE), an undergraduate specialization with students from seven colleges coming together as a cohort. A second was the Bailey Scholars Program, a specialization in "connected learning" that emphasizes personal identification of learning goals, course conveners in place of instructors, and a strong focus on dialogue and listening.<sup>1</sup> The two programs provided opportunities for students, staff and faculty to work together with an emphasis on participatory education and a common theme of food.

I was doing my own soil building during this time following my first sabbatical, moving to a new home with land to plow, and becoming a full professor after my first ten years of teaching and research in production and fertility management for greenhouse ornamentals. MSU funding for a minority graduate student assistantship combined with funding from the Organic Farming Research Foundation (OFRF) for a project on organic production of edible flowers started my shift from flowers to food and from non-organic to organic production systems.

Another essential step in preparing the ground for me was meeting Laura DeLind, a colleague at MSU, and learning about community-supported agriculture. With more than a decade of experience as an early CSA pioneer, Laura convinced me that horticulture was only part of what was necessary to make the farm a success. People and community skills were equally important. Two books she recommended, Brian Donahue's *Reclaiming the Commons*, and Trauger Groh and Steven McFadden's *Farms of Tomorrow Revisited*, had a major impact on my understanding of what the MSU-SOF could achieve and how to make that happen. The authors provide essential explanations of how agriculture and farming depend on access to land and engaging people.

Two other books from the early 1990's need to be offered for your consideration. When you have the awareness to know that something seems wrong with the current story, the next step is to find a new story that makes more sense. *Ishmael* (also *My Ishmael*) by Daniel Quinn challenges us to question which story we are enacting, what premise shaped the story of modern agriculture, and whether "the world belongs to man" or "man belongs to the world". *The New Organic Grower* by Eliot Coleman is often cited as source of inspiration for aspiring new farmers. It is not a step by step cookbook, but an outline of essential components of the successful farm and a story supporting the premise that "man belongs to the world".

### **Sowing the seeds: 1999-2002**

With the ground prepared, the seeds of the MSU-SOF were sown in a variety of ways. The first MSAN meeting to discuss a student farm was held in April 1999. Over the next two years, a dedicated group of 10 to 20 students worked as the Student Organic Farm Initiative (SOFI) to collect information from outside and inside the university, to build a vision and to seek funding for a farm. We continued the MSAN tradition of offering a selected topics class with a focus on learning about and understanding organic farming. The students also spent time contacting and visiting existing student farm projects around the country. Valuable information was obtained from programs at Iowa State University, Colorado State University, Middlebury College, Warren Wilson College and others. An independent study course the following semester provided the focus to move the idea forward.

I too was studying and traveling during this time. Attending the Upper Midwest Organic Farming Conference for the first time in 1999 opened my eyes to the dynamic, innovative, welcoming community of organic and sustainable producers across the Midwest. Participating in a season extension and cold storage workshop in Albany, New York, where I met legendary high-tunnel

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<sup>1</sup> For more information on the Bailey Scholars Program, see <http://www.bsp.msu.edu/>.

producer Steve Moore and made a trip to Eliot Coleman's Four Season Farm in Maine got me thinking about the possibilities of a year-round CSA. Gradually, my edible flower research grew into organic transplant research, which grew into high tunnel and compost research. A USDA Sustainable Agriculture research grant at MSU funded construction of high tunnels and organic winter salad greens research at the Horticulture Teaching and Research Center (HTRC) in early 2001.

Up until the point of starting the research program at the HTRC in 2001, we were all looking for a place for the student farm that would be close to campus and more visible to the public. But once we built the first research high tunnels at the HTRC, we realized the site had many advantages as a place for the SOF. An orchard of forty year-old fruit trees was being removed and a 10-acre area was becoming available. The organic high tunnel research was placed on the west side of the HTRC to avoid spray contamination. While we started with one acre, once the site was selected for the SOF, the area gradually increased to three, then five and finally ten acres.

The W.K. Kellogg Foundation inaugural Food and Society Conference in 2001 was important for the students because several from the SOFI attended and spoke directly with Kellogg program directors about funding. The students worked with Laurie Thorp, another MSU colleague, to prepare and submit a concept letter to start a student farm. I submitted a separate research proposal for high tunnels for year-round local food. Thanks to creative thinking we were asked to combine the proposals and the idea of creating three, 16-week CSA sessions to align with the two academic year semesters and one summer session was born. The funding was approved for the summer of 2002 and provided for the first graduate student farm manager, some basic equipment and three high tunnels. The required plan for sustainability of the project was provided by growing the CSA and farm income over time.

Because MSU is a land grant university, a key measure of program success is the ability to extend new knowledge to off-campus audiences. In 2001 I submitted a proposal to the North-Central Sustainable Agriculture Research and Education (NC-SARE) program that would form the foundation for future outreach efforts. We received funding to build one high tunnel at a local farm and a second at a local school. After a year of experience, the "farmer" at each location helped present a one- or two-day workshop for other farmers. After a year of experience, the "farmer" at each location helped present a one- or two-day workshop for other farmers. The educational materials developed for these workshops provided the foundation for later outreach efforts, and many workshop participants now have high tunnels of their own.

So, by early 2002, we had people, a site, a program and funding. With these essential features in place, it was time to get growing.

### **Developing roots and a healthy plant: 2002-2005**

The fall of 2002 was an exciting time, with the construction of three high tunnels by students providing a sense of success after several years of preparation. Every Saturday and several evenings for a 10-week stretch, as many as twenty students worked on building the structures and forming the planting beds. More than half of the students had little or no prior experience with tools. I look back on this as one of the most rewarding times in my academic career. I usually have the image of the students standing in front of the newly completed high tunnel in my mind. The dedication of the students was obvious. I remember asking some of the students why they came every Saturday and the answer was a clear and obvious, "We had to!" They had to because of their own enthusiasm for and commitment to what they were building.

In parallel and just prior to the Kellogg Foundation Proposal submission in 2002, a USDA Higher Education Challenge Grant was submitted based on the proposal that students could learn about organic farming during the academic year by growing in high tunnels. The proposal was funded on a second try in 2003 and the \$100,000 over two years funded an undergraduate student farm crew as well as an additional graduate assistantship for an assistant farm manager who focused on

working with class instructors to bring their students to the SOF. Students learned about organic farming, season extension, CSA and local food.

The 48-week MSU-SOF-CSA was launched in May of 2003 with 25 memberships. As part of another for-credit selected topics class, graduate and undergraduate students worked together from January through April to formulate a planting and distribution plan and to recruit the first CSA members. They gathered information from a variety of sources including Laura DeLind and another local farmer, Susan Houghton. Starting in January 2003, the day-to-day farm management was directed by graduate assistant Michele Ferrerese. She had previous CSA and farming experience and, equally important, a passionate commitment to experiential learning and group dynamics. Michele's combination of plant and people skills was essential to both the short- and long-term success of the farm. She worked with the students to establish a culture of cooperation and respect for the place, the process and the people. The first year she was assisted by five paid students who had interned on small-scale organic vegetable farms the summer before.

While we can honor Michele's success, we also learned that managing a year-round farm while completing courses and writing an extensive report is not conducive to personal health and sanity for a graduate student. It was done because that is how the funding was available and perhaps because we didn't know any better. In retrospect the process was not consistent with the principles we wanted to promote at the SOF. The next farm manager position was developed as a full-time, technical staff position and provided a more reasonable set of expectations.

The dynamics of the MSU student groups and what they were learning—MSAN (sustainable agriculture), RISE (environmental awareness) and Bailey Scholars (self-directed learning)—had a significant influence on the students that shaped the early years of the SOF. A few students were involved in all three programs. It was also important because the programs had directors or coordinators (as opposed to faculty) who were able to focus on student learning and cultivating student activities, as well as funding to support those activities.

Looking back, the use of one-credit selected topics courses to move the discussion of the initiation of the farm from the evening, registered student organization meetings (MSAN and SOFI) to the daytime classroom sessions was important and likely essential. The consistent meeting time and student participation, the focus, and the efforts of students to complete graded activities that advanced the group consensus all contributed to the realization of the goal. The third one-credit course became the first SOF practicum class in the fall of 2005, which provided the initial experience of how to blend classroom self-directed learning and working at the SOF for credit and not a paycheck. Going forward, we would learn that having students paying to work next to students working for pay would require a new process.

### **Flowering: 2005-2008**

As the farm, the CSA and organic production grew, we kept looking for the opportunity to provide undergraduates with organic farming courses. We also found that there was plenty of demand for providing farmer workshops about season extension and organic farming. The original plan was to focus more on classes first and then outreach, but the outreach opportunities grew so quickly that the two happened in parallel.

The discussion of how to start classes began in the fall of 2005 and early 2006. A proposal was developed within the MSU system and funds were requested to focus on developing classes rather than continuing to increase the size of the CSA. Simultaneously, a team of MSU faculty submitted a multidisciplinary proposal to the organic research and outreach program that included a request for funding to start courses using a modular approach that could be used both for students and farmers. A new academic specialist was hired (Corie Pierce) to help develop and coordinate the program. Over a year was spent developing the courses and going through the necessary MSU approval process. A year-long, 40-credit organic farming certificate program was approved in mid 2006 and the first cohort of certificate students arrived in 2007. To help teach the courses, the SOF

farm manager (Jeremy Moghtader) was reappointed as an academic specialist and additional farm income from a summer-only CSA and an on-campus farm stand was used to employ a new assistant production manager (Tomm Becker).

For outreach presentations, the main topic was season extension using high tunnels. The soil and crop management methods presented just happened to be organic because it made sense. The method of leading with season extension and providing information about organic farming as a method that makes sense has been a successful outreach strategy that we continue to use today. The foundation of our work is built on the four common recommendations to:

- Build soil organic matter for long term fertility and water conservation;
- Increase crop or product diversity to minimize risk;
- Develop diverse markets that maximize return to the farm;
- Use season extension techniques to spread work and income.

Additional workshops were developed on Organic Transplant Production, Compost Production and Use, Managing Soil Organic Matter and Health, and Basics of Vegetable Selection, Scheduling and Production. The information originally developed for workshops later became the curriculum for the organic farming courses on campus. Organizing workshops takes time and funding. The Michigan Food and Farming Systems (MIFFS) project (a Kellogg Foundation-funded non-profit located at MSU) was willing and able to organize and fund season-extension, high tunnel and soil-building workshops. Their funding from the USDA Risk Management Agency (RMA) Community Partnership Program provided a focus on reaching underserved audiences. After several years of presenting workshops with MIFFS, in 2006 additional support from RMA funded a half-time outreach academic specialist position (Adam Montri) for high tunnel education within the domain of the MSU-SOF. The other half of the position was funded by a research grant to study the economics of high tunnel production and to assist farmers with construction and crop production. The now full-time outreach position is supported by the RMA Community Partnership Program, with additional support for urban agriculture education in Flint and Detroit. In addition to regular high tunnel workshops at the SOF and for regional groups working on new farmer development, the high tunnel outreach specialist is working with farmers in Flint and Detroit.

The impact has been extended by partnering with at least eight other outreach organizations or conferences addressing farmer or new farmer education. This visibility provided an important opportunity for recruiting students for the on-campus teaching program. Another part of the story is developing outreach programs that will eventually be self-supporting through program fees. The current effort focused on underserved audiences does not provide that opportunity or focus yet, but the value we are creating in our programs will keep that door open.

### **Fruiting and dispersing seeds: 2008-2010**

The basic model for research at the SOF is to provide opportunities for small- to medium-sized undergraduate and graduate student projects (not large replicated trials) and the testing of ideas identified in faculty research. Here is an example of what can happen. Students doing an independent study about the campus food system determined that MSU was purchasing 20 tons of lettuce per year. Further calculations estimated that 100, 30' x 96' high tunnels would be needed to produce that amount of lettuce. Dr. Mike Hamm, the current C.S. Mott Chair for Sustainable Food Systems, sponsored a high tunnel project at the SOF to begin growing lettuce for the campus with a goal of eventually having 20 to 25 local farms with four or five high tunnels each producing lettuce for MSU and other institutions. In the winter of 2008-09, the SOF produced 35 pounds of salad greens a week for the University. Students assessed the perceptions of other students about local and organic salad greens. This project has grown into a key partnership with the Division of Residential and Hospitality Services, which organized a fund-raising event for the SOF in the fall of 2009 that brought in over \$16,000 for a student scholarship endowment. The local and organic dinner was held under a tent at

the SOF and featured five courses prepared by five MSU chefs; it is now envisioned as an annual event.

Initially there was no fee for use of the land, equipment and cooler at the HTRC. As funds became available, the SOF has made an annual payment of \$2,000, increasing over time to \$5,000, to the HTRC. The energy and maintenance costs of the coolers and cold storage are significant and must be budgeted. A class project during the fall of 2008 completed a carbon footprint analysis of the SOF and identified refrigeration as at least 90% of the farm's energy use. Protected classroom, work and tool storage areas were initially (2003) provided with a high tunnel/greenhouse structure. A much-needed washing and packing structure and shaded work/teaching area were provided in 2007 with funding from the MSU Mott Group Chair.

The SOF farming activities that support the base income have continued to expand and diversify. From the original CSA of 25 memberships in year 1 and 50 memberships in year 2, the program now includes 60 year-round shares (at roughly \$480 for 16 weeks or \$30 a week), 40 summer-only shares, an on-campus farm stand open from April to October and the sale of produce for student dining programs. Each program grew gradually, with students and farm staff developing ideas for how to expand programs in a way that funded the necessary farm activities. The budget in Table 1 provides an overview of current income and expenses.

A common question is, "how many people are at the farm each day?" The number continues to grow. In addition to staff, there are normally three student employees working 40 hours per week during the summer; during the academic year this shifts to 8 to 12 students working 8 to 16 hours per week. In addition, 12 to 15 certificate-program students have been at the farm part-time for the last three years. The number of volunteers at the farm also continues to grow. The current process for selecting paid undergraduate farm crew employees favors students who have volunteered at the SOF and already learned basic planting, cultivation and harvesting methods.

The Organic Farming Certificate Program (OFCP) completed the third cycle in 2009. Techniques for integrating farm production and student learning have been developed, practiced and refined.<sup>2</sup> A key was continuing to develop methods where students paying to "learn/work" shared the farm with students working for pay. The system developed with three people (Jeremy, Corie and Tomm) who worked together well and were dedicated to figuring out how to make it work. When Corie took the opportunity to go back home to family in Vermont in 2009, and Tomm to get married and start his own farm, Jeremy became the farm and training program coordinator and Dan Fillius the new production manager, responsible for hiring students and managing the planting and harvesting. So we now have two people to do what was covered by three while the system was being developed. The training program coordinator is primarily responsible for the CSA and farm stand. Students learn to take responsibility for key tasks—from field or high tunnel management to CSA and farm stand harvest and distribution—and an emphasis is placed on helping them "think like a farmer." In addition to the course work and on-farm experience, the development of personal learning plans has evolved as a successful teaching tool. Program coordinators meet with students one-on-one on a regular basis to identify personal learning goals and to assess progress.

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<sup>2</sup> For more details see John Biernbaum, Laurie Thorp and Matthieu Ngouajio, "Development of a Year-Round Student Organic Farm and Organic Farming Curriculum at Michigan State University," *HortTechnology* 16, 3 (July-Sept 2006): 432-36.

<sup>iii</sup> For additional details about the start up of the MSU-SOF see Michelle Ferrarese's thesis and other publications at [www.msuorganicfarm.org](http://www.msuorganicfarm.org) .

## **Farm management details**

The current setup of the MSU-SOF includes three 20' x 96' high tunnels, two 30' x 96' high tunnels and one 30' x 144' high tunnel with a mobile 30' x 96' high tunnel to be built in 2010. The spaces between the high tunnels are used for intensive seasonal salad crop production. Two heated 20' x 96' greenhouses are used for transplant and vegetable production. We have ten acres for field production, with approximately five of those acres in production each year. Initial soil fertility was primarily from animal manure compost produced on campus; current fertility is a combination of compost, cover crops and green manures integrated into the crop rotation. Seven, 0.5 acre fields are used for the rotation. One 0.6-acre plot is used for research and demonstration of temperate-climate edible forest gardening based on permaculture principles.

Over 50 vegetable and herb crops are produced together with at least 20 cut flower crops. In addition, small quantities of berries and tree fruit are produced as part of the edible forest garden planting. The farm has also maintained a flock of laying hens in a mobile coop, four hives for honey production and practiced small-scale shitake mushroom and maple syrup production. The 11,500 sq ft (roughly 6% of total space) of high tunnel area yielded 10,500 lbs of produce (approximately 25% of total yield) compared to 28,000 lbs of produce from approximately 175,000 sq ft of field production. One of the unique aspects of the MSU-SOF is the year-round farming process. Through a combination of high tunnels for season extension of summer fruit crops and winter harvesting of salad, leafy greens and root crops, and refrigeration for longer term storage of potatoes, squash, onions, cabbage, carrots, beets and garlic, local produce is provide year-round. The details are in the scheduling of crop production and the management of the high tunnels and cold storage. The high tunnels are passive solar greenhouses (not heated), a steel frame covered with one or two layers of polyethylene film, that protect crops from wind, rain and snow and trap the heat of the soil just as clouds keep the earth warmer than a clear sky.

After a three-year transition, the farm was certified organic in 2004 by the Organic Growers of Michigan and has been certified since by Ohio Ecological Food and Farming Association. Tractors are used for primary and secondary cultivation in the fields and for application of compost. Transplants are grown in a heated greenhouse on site using a compost-based potting medium in plastic cell trays (50 or 128 cells). Drip irrigation is used in all fields and some high tunnels with primarily hose and breaker watering in the high tunnels. High tunnel production is maintained by adding a five-gallon bucket of high quality compost to each 20 sq ft of bed space at each planting (2 or 3 times per year). The compost is made from hay, decomposed vegetable residues, straw, wood shavings, sphagnum peat and soil. Additional minerals are added based on annual soil tests and may include gypsum for calcium, sulfur to lower pH, and potassium sulfate.

We start with the premise that there is no one right way to farm. Farming is about choices: what to grow, how much to grow, when to plant, how to keep crops healthy. Each decision requires more knowledge. Is the process a battle with the elements or an orchestration of blending components in a dynamic environment? Is it about working with nature or against nature? The answer is simple for us. Organic farming is not going backwards and is not simply farming without pesticides and chemicals. Organic farming is ecological farming based on managing the farm as a complex living organism starting with the soil. Slowly soluble mined minerals and certain non-synthetic pest management materials are allowed. However, compost, green manures and cover crops provide the bulk of the fertility. Pest management strategies include crop rotations, diverse plantings, exclusion with crop covers, physical removal by hand or vacuum, and occasionally targeted pesticide sprays with biological or short-lived materials.

## **Challenges and achievements**

After fifteen years of planning, analysis, growth, and experimentation; of building infrastructure and soil fertility, relationships and alliances, the MSU-SOF has much to be proud of. We are still learning and adjusting; still juggling multiple, mostly complementary objectives; and still seeking long-

term financial stability and institutional permanence. Providing students with opportunities to learn and grow is the heart of what we do and is more important than our food production. We know that what we are doing is working. We see the SOF recruiting students to MSU and positively impacting the retention of students at MSU. We see what participants at the SOF are doing when they move to other communities and the growing influence of MSU-SOF alumni and their activities as teachers and agents of change.

Future projects under discussion for the MSU-SOF include increased incorporation of livestock into our production systems; the development of an adjacent woodlot for woodland herb wild crafting and mushroom production; and construction of a pond for aquaculture. The potential value of animals at the SOF was first demonstrated when a graduate student brought sheep from the Animal Science Sheep Farm to graze down cover crops in 2003. Over the years, Laurie Thorp and the RISE program have brought chickens, bees and pigs to the SOF. There is a spot suitable for a pond and/or for animal housing and pastures. Aquaculture is also possible in the high tunnels or greenhouses, and donors have expressed interest in supporting such projects. The limitation lies in finding faculty or staff to provide the expertise and leadership for enthusiastic students.

As indicated above, after three years of offering the Organic Farming Certificate Program, staffing transitions and the funding realities of the University prompted a reformulation of teaching strategies. While 15 students in a 40-credit program at approximately \$300 per credit generates \$180,000, there is no way for tuition dollars to come directly back to the certificate program. It did not appear that recurring funding would be provided for a teaching position. For the 2010 season, I will continue to teach on-campus organic farming classes for degree students, but the on-farm training portion will shift from a for-credit to a non-credit on farm experience, similar to the longstanding six-month farm apprenticeship program at the University of California–Santa Cruz. Rather than two days on campus and two days at the SOF each week, students will be full time at the SOF, independent of the academic schedule. The newly renamed Organic Farming Training Program (OFTP) will be reduced from 11 to 9 months (March through November) which will still provide experience with four-season farming while giving the program coordinator and lead instructor down time for annual program revisions. The other benefit is that for the non-credit program the cost is the same for in-state and out-of-state students (out-of-state tuition doubled the original certificate program cost). With a program cost of \$7,400 (for 2010) per participant and 15 participants, the program will become a nearly self-supporting outreach program when combined with the nearly self-supporting farm operations.

Most of the classroom courses will continue for undergraduate students as long as enrollment can be maintained. A Sustainable and Organic concentration in the Horticulture major has been developed in response to the growing student interest. Some of the workers and volunteers at the SOF have changed majors to horticulture.

A strategic planning process begun in the fall of 2007 sought to identify options for recurring funding and to take the SOF to a broader platform in the University. Ten other student farms were contacted in an effort to identify practices at other farms or a model familiar to MSU administrators. One recurring question that emerged during the strategic planning process was whether a name change might facilitate the SOF's transition from a project to a program. Many possible names were considered, most including the word "center". The name "Student Organic Farm" may not adequately represent the full range of current activities, but it is a reminder of the project's origins as a student-driven initiative. There may be an institute or center in the future of the Student Organic Farm, but there is a clear consensus that the physical place of the program's activities will always be the SOF.

In June 2008, twenty-five SOF students and alumni were surveyed regarding transformative learning outcomes, as distinct from farm skill competencies. The results showed that students placed a high value on the learning community they found at the SOF. This community was often described as empowering students to effect change on a larger scale. The SOF was described as a safe place where students were able to test ideas, think freely, and gain self-confidence. As one student put it, "It



has transformed me into more of an active, intentional, engaged human being." The ability to engage in "real" work emerged as a key theme. Another student said, "that kind of responsibility is very different from writing a paper and it repeatedly helped me create new habits of thinking." This developed sense of responsibility was mentioned both in the context of caring for plants and animals, and also in the sense of caring for and respecting fellow students. Repeatedly students mentioned valuable lessons learned from being a responsible member of a group.

Overall improved health and well-being were also mentioned by numerous students as a result of their time spent at the farm. This included both mental health and physical health. Students spoke of improved eating habits, shifting to more plant-based diets and increased physical activity as outcomes of working at the farm. The farm was frequently described as a place that provides students with a refuge from the stresses of academic life. Nearly every respondent mentioned the farm as providing a much-desired community with a common set of values.

Students at the MSU-SOF organize an end of semester farm graduation and recognitions ceremony. The graduating student testimonials invigorate the Steering Team and make the case for why student farms are so important. They say things like, "I would not have survived MSU if it was not for the farm and all of my friends at the farm." "I learned more at the farm about what is really important than in my classes." "My memories of the farm and all of you that helped me through my MSU years will sustain me as I move on to new challenges." "I hope those of you that are new to the SOF understand how important this place and this program are and that you care for it as passionately as those of us graduating have learned to care for it."

Farming, nurturing plants and animals while learning to manage season and climate variability is an exercise in discipline, wisdom and experience that nurtures self-confidence. Self-confidence and self-respect fosters personal growth. Personal growth fosters personal responsibility and democracy. Food independence is an essential component of democracy.

In the early days of the Michigan Agricultural College (the forerunner to Michigan State University), all students had to work for three hours per day. The 1862 report of the National Commissioner of Agriculture included a report on agricultural colleges in Europe and the US that might serve as models for the emerging land grant colleges. The Michigan Agricultural model of students working alongside faculty in the fields was described as a unique model worth emulating. Based on our experience, this is as true today as it was a century and a half before.

Table 1. MSU-SOF Example Budget Estimates

<b>Income</b>		<b>Dollars</b>	<b>Assumptions</b>	
Carry Over		\$15,700		
Produce and Sales				
	60 membership, 48 wk CSA	\$86,400	\$30/wk	
	40 membership, 24 wk CSA	\$28,800	\$30/wk	
	26 wk farmstand	\$15,600	\$600/wk	
	Campus Dining	\$6,000		
	<b>Total</b>		\$136,800	36%
Outreach				
	Grants	\$100,000		
	Program fees	\$10,000	\$110,000	29%
Training Program				
	15 students @ \$7500	\$112,500	\$112,500	30%
	<b>Total Income</b>	<b>\$375,000</b>		
<b>Expenses</b>				
Personnel				
	Farm Manager	\$56,000	\$40,000 @ 40% fringe	
	Outreach Specialist	\$72,500	\$50,000 @ 45% fringe	
	Training Specialist	\$72,500	\$50,000 @ 45% fringe	
	2nd yr students	\$54,000	three at \$18,000	
	Undergraduate Labor	\$35,000		
	<b>Total</b>		\$290,000	77%
Fees				
	HTRC Fee	\$5,000		
	HRT Office Support	\$1,750		
	1% tax on income	\$3,750	\$10,500	3%
Other				
	Farm Materials and Supplies	\$15,000		
	Infrastructure/Equipment	\$5,000		
	Outreach Materials and supplies	\$10,000		
	Outreach Travel	\$17,500		
	Training Materials and supplies	\$10,000		
	Training Travel	\$2,000		
	Web page, marketing	\$5,000		
	Carry Over	\$10,000	\$74,500	20%
	<b>Total Expenses</b>	<b>\$375,000</b>		

Table 2. Example of MSU SOF crop production and yields.

No.	Crop	Tunnel Yield (lbs)	Field Yield (lbs)	Total (lbs)	Acres	\$/lb (est)	Sales (est)	\$/sqft	Tunnel Sales (est)
1	baby salad greens	1700	0	1700	0.1	\$9	\$15,300	\$3.52	\$15,300
2	Basil	43	130	173	0.005	\$10	\$1,730	\$7.96	\$430
3	Beet	183	516	699	0.01	\$2	\$1,398	\$3.22	\$366
4	Broccoli	0	826	826	0.2	\$3	\$2,478	\$0.29	\$0
5	Brussels sprouts leaves	0	187	187		\$3	\$561	\$0.13	\$0
6	Brussels sprouts	0	400	400	0.1	\$4	\$1,600	\$0.37	\$0
7	Cabbage	227	684	911	0.1	\$3	\$2,733	\$0.63	\$681
8	Cantaloupe	0	411	411	0.05	\$1	\$411	\$0.19	\$0
9	Carrots	470	966	1436	0.2	\$2	\$2,872	\$0.33	\$940
10	Cauliflower	0	380	380	0.1	\$3	\$1,140	\$0.26	\$0
11	Celery	0	323	323	0.05	\$3	\$969	\$0.45	\$0
12	Chard	684	401	1085	0.05	\$3	\$3,255	\$1.50	\$2,052
13	Choi	251	223	474	0.01	\$3	\$1,422	\$3.27	\$753
14	Cilantro	24	0	24	0.005	\$10	\$240	\$1.10	\$240
15	Collards	66	0	66	0.005	\$3	\$198	\$0.91	\$198
16	corn, sweet	0	740	740	0.4	\$2	\$1,480	\$0.09	\$0
17	Cucumber	580	1692	2272	0.2	\$3	\$6,816	\$0.78	\$1,740
18	Dill	9	3	12	0.005	\$10	\$120	\$0.55	\$90
19	Eggplant	182	522	704	0.1	\$4	\$2,816	\$0.65	\$728
20	Garlic	0	250	250	0.1	\$4	\$1,000	\$0.23	\$0
21	green bean	175	650	825	0.05	\$3	\$2,475	\$1.14	\$525
22	Kale	670	230	900	0.05	\$3	\$2,700	\$1.24	\$2,010
23	Kohlrabi	0	232	232	0.01	\$3	\$696	\$1.60	\$0
24	Komatsuna	179	39	218	0.05	\$3	\$654	\$0.30	\$537
25	Leek	0	621	621	0.05	\$3	\$1,863	\$0.86	\$0
26	Lettuce	746	934	1680	0.05	\$4	\$6,720	\$3.09	\$2,984
27	Muskmelon	0	590	590	0.05	\$2	\$1,180	\$0.54	\$0
28	Mustard	38	0	38	0.05	\$3	\$114	\$0.05	\$114
29	Onion	0	737	737	0.2	\$3	\$2,211	\$0.25	\$0
30	Parsley	3	23	26	0.004	\$10	\$260	\$1.50	\$30
31	Parsnips	0	653	653	0.02	\$3	\$1,959	\$2.25	\$0
32	Peas	0	50	50	0.1	\$3	\$150	\$0.03	\$0
33	Pepper	626	743	1369	0.1	\$4	\$5,476	\$1.26	\$2,504
34	Potato	0	6123	6123	0.4	\$1	\$6,123	\$0.35	\$0
35	Radish	419	72	491	0.04	\$3	\$1,473	\$0.85	\$1,257
36	Scallions	213	1	214	0.02	\$3	\$642	\$0.74	\$639
37	soybean edible	0	200	200	0.05	\$3	\$600	\$0.28	\$0
38	Spinach	153	38	191	0.05	\$6	\$1,146	\$0.53	\$918
39	summer squash	256	710	966	0.1	\$3	\$2,898	\$0.67	\$768
40	Tatsoi	87	0	87	0.005	\$3	\$261	\$1.20	\$261
41	Tomato	2322	2824	5146	0.1	\$4	\$20,584	\$4.74	\$9,288
42	Turnip	185	0	185	0.07	\$3	\$555	\$0.18	\$555
43	Watermelon	0	2722	2722	0.2	\$1	\$2,722	\$0.31	\$0
44	winter squash	0	1481	1481	0.4	\$2	\$2,962	\$0.17	\$0
		<b>Tunnel (lbs)</b>	<b>Field (lbs)</b>	<b>Total (lbs)</b>	<b>Acres</b>	<b>\$/lb (est,avg)</b>	<b>Sales</b>		<b>Sales (est)</b>
	Total or Average	10491	28327	38818	4.01	\$3	\$114,963	\$0.66	\$45,908
		27%	73%	100%					40%
Weight data in lbs is compiled from ~2850 measurements taken in 2008.									
\$/lb and total dollars are estimated (CSA sales do not place a value per crop).									
Hoophouse area is just over 0.25 acre which produces +25% of the yield and ~40% of \$'s.									
60% of the hoophouse income from three crops - BLSG, lettuce and tomato, not sure how much space.									
Works out to ~\$4.00 /sqft for 11,500 sq ft and ~6.88 / sqft of actual bed space at 58% bed space.									
Field value works out to about \$0.42 /sqft of field.									
Income is 9x higher per unit area for HH vs field (~\$167,250 /acre vs ~\$18,300 /acre)									

# MSU Student Organic Farm: 2009 Site Layout

