The MSU Student Organic Farm
A ten year review
and
A look at what’s new
Consider Multiple Perspectives
Farming Perspectives

Over time the boundaries disappear and things just are.
Guiding Principle

A Vision and A Task

A vision without a task is a dream.
A task without a vision is drudgery.
A vision and a task Are the hope of the world.
Guiding Principle

Integral Agriculture

Farmers, friends and families using facts and feelings to physically, faithfully and fearlessly farm front yards, forests and fields for food, feed, fodder, fiber, fuel, flowers, fertility, fun, freedom, fairness and the future.

John Biernbaum
Presentation Themes

• Perceptions of the farm – do people in MSU know what we do at the Student Organic Farm?
• What is Organic Farming?
• Students, staff and faculty working together in a culture of mutual caring and support
• Personal, community and ecological sustainability
• Diverse partnerships and connections
• Catalyzing and cultivating growth and development
• Engaged and experiential learning through daily process and “struggle” (resiliency)
• Becoming native to a place
• For the Health of it!
• Integrated teaching outreach, research & service
• Integrated academics and operations – in class and out of class learning through engagement with daily activities.
Working and Learning Together

Every Saturday for 10 weeks, 10 to 30 students working to build three hoophouses. Fall Semester, 2002
Continued strong interest in hoophouse production systems.
Organic Farming
Goal: Practice organic farming methods and maintain annual organic certification.
- Living Soil/Feed the Soil
- Compost Production and Use
- Insect, Disease, and Weed Management
- Whole Farm Management

Local Food
Goal: Expand and refine year-round local food production, harvest, storage and marketing methods.
- Hoophouses
- Storage and preservation
- Community Supported Agriculture (CSA)
- Seasonality

Diversity
Goal: Increase the diversity of organisms, people, and food on the farm.
- Crops
- Animals
- People
- Food

Experiential Learning
Goal: Develop an experiential learning curriculum for students and people of all ages and learning styles.
- Living Classroom
- Farming
- Environment
- Sustainability

Core Values
Diversity, Trust, Love, Curiosity, Awareness and Oneness

Mission
To cultivate a sustainable community supported student farm.

2003-2005
2000 Early planning and discussions in MSAN RSO, What would a student farm look like?

2001 Salad Greens project - first 2 greenhouses at farm site, SOFI RSO formed, “What is Organic” class.

2002 Vision of year-round CSA funded farm, soil building started, W.K Kellogg grant - 3 more greenhouses built.

2003 “What is CSA” class, CSA initiated with 25 members and ~ 1 acre, USDA grant, RISE & tours.

2004 50 CSA members, ~ 3 acres, many tours, soil building continued, EFFS RSO started.

2005 CSA Core Group, EMLL Dorm, ~7 acres planted, perennial (fruit) planting initiated for biodiversity, purchased tractor, greenhouse barn, OFCP Planning Started.

2006 Permaculture/polyculture plot planted; new greenhouse, OFCP and new course development

2007 Start OFCP with 10 students, regular campus farm stand, farmer outreach, on-line courses, teaching building at HTRC

2008 OFCP with 20 students, Begin closed nutrient cycle.

2009 ?????????????

2010 Initiate Plan for the next decade.

Past

Present

Future

Many Possibilities for the Future:

Office space - straw bale construction
Increase emphasis on Permaculture and Biointensive methods
More perennials (fruit, herb, flowers) in the rotation
Emphasis on energy efficiency to address decreasing fossil fuels
More mechanization and alternate bed rotation system
Use of woodlot.
Build a pond or constructed wetland
Teaching certificate program or undergrad specialization
Coordination of CRAFT internship program in Michigan
Introduction of animals
Greater participation by other CANR departments
Integration of “production”, “policy”, “environment”, “people”
Mission
To cultivate knowledge and human capacity in organic and sustainable agriculture for students, farmers and educators.

2008 Strategic Planning
Phases of Development

1994-1999  Preparing the Soil

1999-2002  Sowing the Seeds

2002-2005  Developing Roots and a Healthy Plant

2005-2008  Flowering

2008-2010  Fruiting and Dispersing Seeds.
Perspectives

- Purpose and Priorities
- People
- Place
- Process
- Programs
- Partnerships
- Power
To cultivate knowledge and human capacity in organic and sustainable agriculture for students, farmers, and educators.
People
People
People
The Hoophouse Gala Scholarship Fundraiser
People
Student Centered Learning
People
Meaningful Work
Land was in fruit trees from 1965 to 1995.

Start was hoophouse research in 2001.
Student visualization of the farm painted on a wall in the central farm “work house”.
The Place – About 15 acres
Seven Fields at 0.5-0.6 acres
Additional Hoophouses 2006 & 2008
Common Curriculum (Programs)

- Build Soil Organic Matter
- Cultivate Diversity
- Balance the Farming Seasons
- Diversify Marketing Opportunities
Living Soil – Billions of Organisms
The Soil Food Web

First trophic level: Photosynthesizers
Second trophic level: Decomposers, Mutualists, Pathogens, parasites, Root-feeders
Third trophic level: Shredders, Predators, Grazers
Fourth trophic level: Higher level predators
Fifth and higher trophic levels: Higher level predators

Plants
Organic Matter
Shoots and roots
Waste, residue and metabolites from plants, animals and microbes.

Nematodes
Root-feeders
Arthropods
Shredders
Predators

Fungi
Mycorrhizal fungi
Saprophytic fungi

Bacteria
Protozoa
Amoebae, flagellates, and ciliates

Arthropods
Predators

Birds
Animals
Why Organic?

Healthy People

Healthy Animals

Healthy Plants

Healthy Soils
Organic Certification

• Organic Systems Plan describes the process that is certified.
• Initial in 2004 with OGM – Organic Growers of Michigan
• Since 2006 with OEFFA – Ohio Ecological Food and Farming Association
Vegetable Planning:
What to grow?
(diversity/selection)
How much to grow?
(space/plant & total)
When to grow it?
(time and season)
Where to grow it?
(grouping & rotation)
How to grow it?

John Biernbaum, MSU, 2009
# SOF Field Vegetable Rotation

<table>
<thead>
<tr>
<th>Crop Group</th>
<th>Summer Fruit</th>
<th>Early Crops</th>
<th>Corn</th>
<th>Potato</th>
<th>Squash/Melon (vines)</th>
<th>Late(Fall) Crops</th>
<th>Green Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rotation Order</strong></td>
<td><strong>1</strong></td>
<td><strong>2</strong></td>
<td><strong>3</strong></td>
<td><strong>4</strong></td>
<td><strong>5</strong></td>
<td><strong>6</strong></td>
<td><strong>7</strong></td>
</tr>
<tr>
<td><strong>Half A</strong></td>
<td>Tomato, Pepper, Eggplant</td>
<td>Garlic(fall), Onions</td>
<td>Sweet Corn, Pop Corn, Flint Corn, Soybean</td>
<td>Potato</td>
<td>Winter squash</td>
<td>Fall brassicas</td>
<td>oats vetch or sorghsudan;</td>
</tr>
<tr>
<td><strong>Half B</strong></td>
<td>Cucumber, Summer squash, pumpkins</td>
<td>Spring Brassicas Root crops Peas</td>
<td>Leek Celery Green beans</td>
<td>Melons</td>
<td>Melons</td>
<td>Fall root crops</td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Mulch</td>
<td>Buckwheat Late Vetch</td>
<td>Under sown clover</td>
<td>Fall</td>
<td>Fall</td>
<td>SprSum cover crop</td>
<td>Compost?</td>
</tr>
</tbody>
</table>
## MSU SOF Tunnel Rotation

<table>
<thead>
<tr>
<th>Season</th>
<th>Residency</th>
<th>Beds</th>
<th>% Space</th>
<th>Season</th>
<th>Residency</th>
<th>Beds</th>
<th>% Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall Early-long residency</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Spring Early</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Scallions</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>BLSM</td>
<td>32</td>
<td>32</td>
<td>12.1%</td>
</tr>
<tr>
<td>Carrots</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>Lettuce</td>
<td>30</td>
<td>30</td>
<td>11.4%</td>
</tr>
<tr>
<td>Kale</td>
<td>24</td>
<td>24</td>
<td>9.1%</td>
<td>chard</td>
<td>10</td>
<td>10</td>
<td>3.8%</td>
</tr>
<tr>
<td>Chard</td>
<td>14</td>
<td>14</td>
<td>5.3%</td>
<td>kale</td>
<td>10</td>
<td>10</td>
<td>3.8%</td>
</tr>
<tr>
<td>Collards</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>collard</td>
<td>6</td>
<td>6</td>
<td>2.3%</td>
</tr>
<tr>
<td>Parsley</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>spinach</td>
<td>10</td>
<td>10</td>
<td>3.8%</td>
</tr>
<tr>
<td></td>
<td>70</td>
<td></td>
<td></td>
<td>Carrot</td>
<td>10</td>
<td>10</td>
<td>3.8%</td>
</tr>
<tr>
<td><strong>Fall Late-Long Residency</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Spring Late-Summer Residency</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BLSM</td>
<td>60</td>
<td>60</td>
<td>22.7%</td>
<td>radish</td>
<td>6</td>
<td>6</td>
<td>2.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>beet</td>
<td>6</td>
<td>6</td>
<td>2.3%</td>
</tr>
<tr>
<td><strong>Fall Late-Short Residency</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Spring Late-Summer Residency</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lettuce</td>
<td>36</td>
<td>36</td>
<td>13.6%</td>
<td>scallions</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
</tr>
<tr>
<td>Spinach</td>
<td>36</td>
<td>36</td>
<td>13.6%</td>
<td></td>
<td>134</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radish</td>
<td>14</td>
<td>14</td>
<td>5.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turnip</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>Tomato</td>
<td>40</td>
<td>40</td>
<td>15.2%</td>
</tr>
<tr>
<td>Cilantro</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>Pepper</td>
<td>20</td>
<td>20</td>
<td>7.6%</td>
</tr>
<tr>
<td>Choi</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>Eggplant</td>
<td>20</td>
<td>20</td>
<td>7.6%</td>
</tr>
<tr>
<td>Tatsoi</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>Cukes</td>
<td>20</td>
<td>20</td>
<td>7.6%</td>
</tr>
<tr>
<td>Komatsuna</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>SumSquash</td>
<td>20</td>
<td>20</td>
<td>7.6%</td>
</tr>
<tr>
<td>Napa Cabbage</td>
<td>8</td>
<td>8</td>
<td>3.0%</td>
<td>Beans</td>
<td>10</td>
<td>10</td>
<td>3.8%</td>
</tr>
<tr>
<td></td>
<td>134</td>
<td></td>
<td></td>
<td></td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Beds</strong></td>
<td>264</td>
<td></td>
<td>100.0%</td>
<td><strong>Total Beds</strong></td>
<td>264</td>
<td></td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Season Extension
Balance the Farming Seasons

- Field Production Planning
- Hoophouses
- Cold Storage
Spring 2003 – First CSA Day
MSU-SOF 40°F Cooler
Paul and Sandy Arnold in New York State

NOVEMBER 22\textsuperscript{ND}  37 DIFFERENT ITEMS FOR SALE!
2010 Production Stats

• 4.5 acres under cultivation
• 20,000 ft$^2$ passive solar greenhouse space
• ~48,000 lbs of produce harvested in 2010
• 12 organically fed and field raised hogs
• 60 organically fed free range laying hens
Organic egg production initiated by Environmental Studies Specialization and funded primarily by egg sales.
Swine husbandry and pork production funded primarily by sale of meat.
Bee keeping and honey production initiated and funded by the Environmental Studies Specialization.
Food preparation residue worm composting and vermicompost production funded by the Office of Campus Sustainability.
Diverse Markets

• Community Supported Agriculture
  – 70 year round shares (family of 4)
  – 70 summer only shares

• On campus farm stand
  – 7 months
  – Thursdays April through October

• Campus Dining Halls
  – Broady, Yakeley, The Gallery, Food Stores

• $156,000 in total produce sales for 2010
Weekly CSA Distribution and Campus Farm Stand.

05/24/2006
Students

• Undergraduate Farm Crew
  – 8 to 10 undergraduates from across the college and university gaining hands on experience in organic farming
  – Most are CANR majors, but we also have students from other colleges
  – Central to the mission and vision of the farm as a Student Organic Farm

• Ecological Food and Farm Stewardship Registered Student Organization
Education

• Teaching Site for MSU Courses
  – Over 15 MSU courses use the SOF each year for their instruction
  – LCC courses also use the SOF as a field trip site for many of their courses

• Educational Tours
  – Over 1500 people toured the SOF in 2010
Organic Farmer Training Program

• 9 Month non-credit certificate
  – March 1 through November 15.
• 2012 is our 6th year
• Cohorts are limited in size to 16 students
• 60 students have completed the program over 5 years and 16 completing Nov 17.
• 95% of them are employed in the organic field
Outreach for rural and urban growers

- 75 hoop houses built
- 2500 rural and urban growers assisted
- Working with groups in Lansing, Flint, Detroit and other areas on urban agriculture
Outreach Organizational Affiliations

- MOFFA
- MIFFS
- NMSFC
- GLF&VE
- MLUI
- MOSES
- Greening of Detroit
- Ruth Mott Foundation (Flint)
MSU Organic Research Opportunities
People Perspective: Faculty and Staff

*Kellogg Biological Station (KBS)

**Student Organic Farm (SOF)

Horticulture
- Behe
- Beaudry
- Biernbaum*
- Brainard
- Fillius*
- Hanson
- Lang
- Moghtader*
- Montri*
- Ngouajio
- Perry

Entomology
- Bird
- Grafius
- Greishop
- Gut
- Issacs
- Landis, D
- Landis, J
- Tuell
- Whalon

Crops and Soils
- Cotton
- Kelly
- Renner
- Robertson*
- Snapp*
- Sprague
- Taylor

Plant Pathology
- Schilder
- Sundin

Animal Science
- Rowntree
- Rozeboom
- Siegford
- Swanson
- Utsumi*

CARRS
- Bingen
- Hamm
- Howard
- Morrone
- Smalley
- Thorp*
- Thompson

AFRE
- Swinton

FSHN
- Alaimo

Extension
- Himmelman
- Goldy
- Irish-Brown
- Kalchick
- Leep
- Marinez
- Mutch
- Rossman
- Sirrine
- Schwailer
- Pioch

Anthropology
- Delind

Sociology
- Stuart*

55+ Faculty and Staff involved in Organic projects; Not intended as complete.
Organic Research Associated with or Assisted by SOF

- Transplants; Ngouajio et al
- Blueberry; Hanson et al
- High tunnel raspberry, cherry, apple stock; Hanson, Lang
- Cover crops for vegetables; Brainard et al
- Compost and compost tea for plant health; Schilder
- Perennial grain production; Snapp et al
- Greenhouse biocontrol; Greishop et al
- Dry beans; Renner et al
- Compost for carrots; Melakeberhan
- Native plants for beneficial insects; Landis and Isaacs
- Entomopathogenic nematodes for orchard pest management; Whalon
Center for Regional Food Systems

Mott Group for Sustainable Food Systems, Student Organic Farm and affiliates have developed the Center for Regional Food Systems at MSU.
CRFS mission and vision:

• Our mission is to engage the people of Michigan, the United States and the world in applied research, education and outreach to develop regionally integrated, sustainable food systems.

• Our vision is a thriving economy, equity and sustainability for Michigan, the country and the planet through food systems rooted in local regions and centered on food that is healthy, green, fair and affordable.
Function as a boundary organization within MSU

• Boundary organizations straddle the shifting divide between politics and scholarship. They produce outputs for principals in both domains and facilitate the transfer of useful knowledge between scholarship and policy.

MSU Center for Regional Food Systems
Big Hairy Audacious Goals (BHAGS)

1. Achieve the six goals of the Michigan Good Food Charter
2. Serve as a nationally recognized resource for regional food systems research, education, and outreach
3. Develop an international regional food systems portfolio
Vermicomposting of
Campus Food Residuals and Waste
Part 1: Summer 2010 to Fall 2011

Student Organic Farm:
John Biernbaum, Laurie Thorp, Dan Fillius, Brendan Sinclair, Kirk Green, Chris Lamkin, James Manning, Kim Forte, Emily Mckay

Residential and Hospitality Services:
Venie Gore, Diane Barker, Carla Iansiti, Robbia Pipper, Guy Procopio

University Office of Sustainability:
Jennifer Battle

Land Management:
Ben Darling

University Recycling Center:
Ruth Daoust
January 2012 – preconsumer kitchen residue is added and covered with precomposted post consumer residue.
MSU Hoophouse Herbs
Project of Residential and Hospitality Services, Environmental Studies Program and Student Organic Farm

30’ x 72’ Hoophouse
About 4 miles from SOF on south campus
Vermicomposting Campus Food Residue & The Liberty Hyde Bailey GREENhouse
Part 2: Fall 2011- Fall 2012
A Local Food Cycle

The path to prosperity, peace, parity and partnership is the passionate perennial progression from planting, producing, protecting, processing, preserving, purchasing, preparing, partaking and passing pooh to renew the soil and begin anew.

Promote positive personal, public and planetary perspectives and programs with your food practices and purchasing power.

John Biernbaum
Future Opportunities
Place, People, Programs

- MSU Neighborhood Connections
- Teaching Building at HTRC?
- Cold Cellar? – to go with hoophouses
- Program and Activities Specialist?
- For credit practicum for degree students?
- Applied Plant Science in Ag Tech?
- Aquaponics, mushrooms, rabbits for meat
- No limits to possibilities
Aquaponics
Student Submitted Be Spartan Green Grant
Cold Cellar Combined with Hoophouse

Use of air tubes for cooling and heating. Photovalactic energy for fans.

Air tubes can be under or along side of the root cellar.

Can also use biodiesel or biogas (biochar) to power a refrigeration unit for cooling. Exhaust heat can possibly be stored – or used for drying herbs, fruit or vegetables or heating a hoophouse.

Soil at 6' to 8' Depth
40-45°F at start
Gradually cooled to freezing
Increased efficiency?

Cold Outside Air – 10-20°F
Warmed Air – 40-45°F
7’ to 8’
30’ to 40’
30’ wide
15’
Outer Air Lock
Door
Door
Door
Door
Probable Location
Aligned with House 4

Easy Access from Wash Pack.
Easy access from road.
Slope to aid in access from one end.
Grow Green! For the Health of it!

First soil seeds and roots then leaves flowers and fruit. Food, friends, freedom and fun from earth, air, water and sun.

John Biernbaum
www.msuorganicfarm.org

STUDENT ORGANIC FARM
Michigan State University