Low-Cost Organic Gardening

Michael Bomford
Kentucky State University
College of Agriculture, Food Science and Sustainable Systems
Sir Albert Howard inspired by ‘Eastern’ agriculture

- Small farms
- Mix of people, plants and animals; wastes recycled as nutrients
- Human and animal labor, not machines
- Food crops, not cash crops (subsistence)
- Nitrogen fixed by legumes
- Reduced cultivation
- Composting
- Mimic natural ecosystems
Howard contrasted ‘Eastern’ and ‘Western’ models

- Large, growing farms
- Monocultures
- Mechanization
- Synthetic fertilizer dominates
- Increasing crop disease
- More processed and preserved foods
- Success judged by profit
- Too much food (low prices force farmers off land and into cities)
Organic Production Standards

Organic agriculture is “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”
Organic Production Standards

Organic agriculture is “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”

**Site specific conditions**
- not a cookbook
- plans reflect unique characteristics of each operation
Organic Production Standards

Organic agriculture is "a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity." 

Cultural practices *(how you grow)*

- crop timing
- crop selection
- resistance
- interplanting
- spacing
- orientation
- etc...
Pest management: Resistant varieties
Pest Management: Farmscaping
How hard to grow in KY?

• Some crops are harder to grow organically than others.

• Easy:
  – Okra, radish, garlic, beets

• Moderate:
  – Cabbage, onion, potato, bean

• Difficult:
  – Muskmelon, eggplant, cauliflower
Organic Production Standards

Organic agriculture is “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”
Organic Production Standards

Organic agriculture is “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”

**Biological practices** (use your friends)
- release biocontrols
- develop beneficial habitat
- livestock grazing
- rhizobial inoculation
- etc...
Organic Production Standards

Organic agriculture is “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”
Organic agriculture is “a production system that is managed to be in harmony with nature and that contributes to biodiversity, rather than depleting it.”

Mechanical practices (use tools)
- till
- weed
- mow
- flame
- fence
- etc...

USDA ORGANIC

Organic Production Standards

Organic agriculture is managed in accordance with the Act and regulations, with the aim of responding to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.
Organic Production Standards

Organic agriculture is “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”
Organic agriculture is “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”

Cycling of Resources
- Re-use on-farm resources
- Avoid inputs and waste
"Take care of the waste on the farm and turn it into useful channels' should be the slogan of every farmer."

– George Washington Carver, Inventor and Educator, Birmingham, Alabama, 1936
Organic Production Standards

Organic agriculture is “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”
Organic Production Standards

Organic agriculture is "a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity."

Ecological Balance

- achievement of steady state by ecosystem
- dynamic equilibrium between organisms and environment
- reduced outbreaks / extinctions (symptoms of imbalance)
Organic Production Standards

Organic agriculture is “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.”
Organic Production Standards

Organic agriculture is "a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity."
What is soil?

- Water: 25%
- Minerals: 45%
- Air: 25%
- Organic matter: 1-5%
  - Living organisms: <5%
  - Fresh residue: <10%
  - Stabilized organic matter (humus): 33% - 50%
  - Decomposing organic matter (active fraction): 33% - 50%
Soil Organic Matter

• Fresh
  – incompletely decomposed
  – adds bulk
  – food for soil organisms

• Humus
  – decomposed
  – dark brown or black
Humus

- Stores nutrients
  - 30-70% of CEC
  - 90-95% of soil N
  - 15-80% of soil P
  - 50-70% of soil S

- Makes nutrients available

- Holds water

- Aggregates soil

- Buffer
  - stabilizes pH
  - protects against high salt levels and toxic ion levels

- Moderates temp.

- Holds water

- Stimulates soil life
Why Mulch?

- Weed management
- Moisture retention
- Add O.M.

What Mulch?

- Organic
  - wood chips, shredded bark, chopped leaves, straw, grass clippings, compost, sawdust, pine needles, paper

- Inorganic
  - gravel, stone, black plastic, landscape fabric
Organic Mulch

- 4”-6” to completely discourage weeds
- mulch next to stems invites slugs, rodents
- slows warming in spring
- adds O.M.

Plastic Mulch

- Warms soil, radiates heat at night
- Protects fruit from rotting
- Conserves moisture
- Non-renewable, non-biodegradable
- Organic standards require complete removal each year
• Eighteen raised beds, 6’ x 36’
• Five mulch treatments in four replicate blocks:
  – Bare control
  – Black Plastic
  – Silver Plastic
  – Black Landscape Fabric
    (2 reps only)
  – Hay
Monitoring

- Soil moisture
  - June 22 – Sept. 29
  - Field Scout TDR-300

- Soil temperature
  - June 30 – Aug. 10
  - Temp. recorded hourly 2 cm below soil surface
  - Probes attached to CR-1000 datalogger

- Yield
  - All fruit harvested Sept. 16 and Sept. 29
  - Counted, graded & weighed
Results – Soil Temperature

- Temperature lowest at sunrise; highest mid-afternoon
- Hay moderates daily temperature flux
- Black plastic maintains warmer temperature throughout day

![Graph showing temperature variations across different treatments]

- **Temp. (°C)**
- **Midnight**
- **Noon**
- **Midnight**

Legend:
- **Bare**
- **Black**
- **Fabric**
- **Hay**
- **Silver**
Results – Soil Moisture

- Higher soil moisture under landscape fabric than other mulches
Results - Yield

- Yields higher with hay mulch than with no mulch or landscape fabric
Conclusions

- Advantages of hay:
  - Moderates soil temperature
  - Maintains soil moisture as well as plastic, but not as well as landscape fabric
  - Contributes organic matter to soil
  - Improves yield of summer-grown heirloom tomatoes
It’s the Law:
Who can sell farm products labeled “organic”?

<table>
<thead>
<tr>
<th><strong>Organic Exempt</strong></th>
<th><strong>Certified Organic</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Those who can answer ‘yes’ to ALL of the following can legally sell ‘organic’ products without certifying.</td>
<td>Those who answer ‘yes’ to ANY of the following must certify in order to sell products as ‘organic.’</td>
</tr>
<tr>
<td>I sell less than $5,000 worth of organic product each year.</td>
<td>I sell more than $5,000 worth of organic product each year.</td>
</tr>
<tr>
<td>I sell directly to the consumers.</td>
<td>I sell to wholesalers or resellers.</td>
</tr>
<tr>
<td>I have read, understand, and comply with national organic program standards.</td>
<td>I sell feed for organic livestock.</td>
</tr>
<tr>
<td>I have registered my farm as ‘exempt’ with the KDA.</td>
<td>I sell ingredients for organic processed foods.</td>
</tr>
<tr>
<td>I do not use the USDA organic seal.</td>
<td>I use the USDA organic seal.</td>
</tr>
</tbody>
</table>
GOLD New Potatoes
$1.50 per pound
Scott County from our farm

Fayette Co.
$1.50
Heirloom Tomatoes
100% Chemical Free
Organic Certification Requirements

1. Management plan, approved by certifier
   – Required:
     • Boundaries, buffer zones separate organic from conventional
     • Organic seed, transplants
     • Maintain/improve soil fertility, organic matter
     • Rotation
   – Prohibited:
     • Synthetic fertilizers and pesticides
     • Genetically modified organisms
     • Sewage sludge
     • Burning (some exceptions)

2. Record keeping
Organic Program

Kentucky Organic Program

Kentucky Certification Procedures  (doc)

Approved Organic Product Materials  (484kb)

2011 Organic Farm/Crop Certification Application  pdf (432 kb) UPDATED

2011 Organic Livestock Plan Application  pdf (80 kb)

2011 Organic Process/Handling Plan Application  pdf (628kb)

Organic Product Profile  (pdf)

2011 Fee Schedule  (pdf)

Exempt/Excluded Registration Form  (pdf)

Organic Certification Withdrawal Notification  (pdf)

National Organic Program
Frequently Asked Questions

Organic Farming Links

National Organic Program Home

ATTRA - Appropriate Technology Transfer for Rural Areas

Alternative Farming Systems Information Center

Center for Sustaining Agriculture and Natural Resources

IFOAM/International Federation of Organic Agriculture Movements

Organic Farming Research Foundation

Organic Trade Association

Willing Workers for Organic Farms (WWOOF)
Certification Paperwork

• General
  – Name, address, farm type

• Land
  – Crops, fields, 3 years of organic management

• Seed, seedlings, planting stock
  – Source, organic availability, treatments, GMO free

• Soil & fertility management
  – Composts, manures, fertilizers, irrigation

• Crop management
  – Rotation, weeds, pests, diseases

• Organic integrity
  – Buffers, barriers, handling, storage, transport

• Records
  – Maps, history, management, inputs, harvest, sales
Fees (KDA Organic Program)

• In state
  – $125 to file plan
    • Crop Production
    • Livestock Production
    • Processor/Handler
  – Free inspection
  – Eligible for 75% federal cost share, reducing fee to $31.25
  – $25 to register as exempt
  – Lowest price in USA?

• Out of state
  – $250 to file plan
    • Crop Production
    • Livestock Production
    • Processor/Handler
  – Additional fees for inspector mileage, expenses, and any necessary out of state travel
  – Eligible for 75% federal cost share
Organic and CNG Farms in KY, 2009

Annual market growth ranged from 5-21% over past decade, averaging 16%.

Organic proportion of sales, 2010:
- All food - 4%
- Dairy – 6%
- Produce – 12%

Organic Trade Association, 2011
Certified Naturally Grown

- “Grassroots alternative to certified organic”
- Participatory Guarantee System of certification
- Requirements largely based on USDA National Organic Program standards
  - Separate apiculture standard, since NOP doesn’t have one
- Can’t market as organic in USA, unless exempt from USDA standard
- Volunteer inspectors work through checklist, post report online
  - Mostly other CNG farmers
- Minimal record keeping requirements
- Fees voluntary, $50-$200

See http://www.naturallygrown.org/
PURPOSE

OAK is a member-driven nonprofit organization. Members work together to:
- Promote Kentucky’s organic farms and farmers
- Share information with one another
- Guide research programs related to organic agriculture
- Educate consumers about organic food and farm products

Membership is open to anybody willing to be involved, and does not require attending meetings.

MISSION

OAK produces and distributes organic food and promotes education and awareness, with an emphasis on fruit and vegetable production and distribution.

FORMATION

During 2001, a group of organic farmers and retailers, along with the Green Valley Organic Farmers and Gardeners Association (Vegetable Certification Program) joined together to form OAK. The organization strives to promote natural agriculture and sustainable practices that strengthen communities by providing clean, safe, and nutritious food.
RESOURCES

KENTUCKY

- **Kentucky Department of Agriculture Organic Program**
  - Essential documents from Kentucky’s organic certification agency:
    - Certification procedures
    - Forms
    - Fee schedules

- **Kentucky State University Organic Agriculture Working Group**
  - Information generated by a group of researchers, teachers, and extension staff at Kentucky State University conducting projects related to organic agriculture
  - Updated schedules for [free sustainable agriculture workshops](http://example.com) held at the Kentucky State University farm on the Third Thursday of every month
  - 'Ask an Expert' service

- **University of Kentucky New Crop Opportunities Center**
  - Factsheets:
    - Organic transitioning and certification
    - Organic horticulture and field crop production
    - Organic sweet corn and asparagus production

- Higher education opportunities in Kentucky
  - Berea College [Agriculture and Natural Resources Program](http://example.com)
    - Bachelor degrees with opportunities for applied work on certified organic land
Growing Appalachia Workshops, April 14th in Prestonsburg

Published by Michael Bomford under Farm Topics, Happenings

The Floyd County Chapter of Kentuckians for the Commonwealth and M.A.C.E.D. (Mountain Association for Community and Economic Development) have worked together for the last several years to offer a full day of presentations on sustainable agricultural and energy topics. This year the event is scheduled for April 14th from 9am to 4pm at the Jenny Wiley Convention Center in Prestonsburg, KY. The keynote speaker will be Anthony Flaccavento.

Each session is 50 minutes and there are four scheduled in the day plus lunch and keynote—it’s a full day. The hard part is choosing which sessions to pick. Here are the sessions and presenters.

Continue Reading »

Anthony Flaccavento, conference keynote and founder of Appalachian Sustainable Development (ASD) sells his produce at the Abingdon Farmers Market in Abingdon, Va.

Save on Organic Produce: Shop at a Farmers Market

Published by Michael Bomford under Farmers Markets, Research

No responses yet
Organic Association of Kentucky

Community Page about Organic Agriculture

OAK promotes organic production and consumption in Kentucky as part of a food and farming system that strengthens communities by being economically viable and environmentally sound.

Growing Appalachia Workshops, April 14th in Prestonsburg

The Floyd County Chapter of Kentuckians for the Commonwealth and M.A.C.E.D. (Mountain Association for Community and Economic Development) have worked together for the last several years to offer a full day of presentations on sustainable agricultural a ...