

## Introduction to Organic Production



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## Intro to Organic Production: An Overview



- What is “organic”?
- Origins of Organic Agriculture
- Organic Certification in TN
- Principles & Elements of Organic Production
- UT Organic and Sustainable Crop Production Program
- Future Workshops
- Meet the Growers



## What is “organic”?

The USDA National Organic Program (NOP) defines organic agriculture as:

*An ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity... based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony.*



## Foundations of Organic Agriculture

- J.I. Rodale (1940)
  - “Good farming practices without using synthetic chemicals”
- Masnobu Fukuoka
  - *The One Straw Revolution*
- Albert Howard “Father of Organic Agriculture”
  - Opponent of the reductionist approach
  - Natural approach to building soil and fertility
  - Books: *An Agricultural Testament & Soil and Health*



## Reasons to Become Certified

- Consumer demand
- Access to premium prices
- Promotes trust between producer and consumer
- Third party verification that a product has originated from an agricultural system using organic production methods



## Organic certification *is not*:

- a content claim - it does not represent that a product is “free” of something.
- a food safety claim or judgment about the quality and safety of any product.
- assurance that a product is superior, safer, or more healthful than conventionally produced food.



## U.S. number of organic acres farmed per state, in thousands of acres:



2005 Data  
USDA ERS:  
Operations:  
8 farms  
Cropland & Pasture:  
727 acres

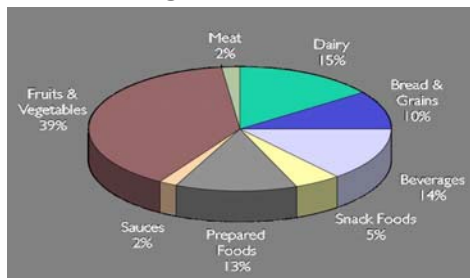
Little variation in 2000-2006 data for TN, ranges from 8 to 12 operations

## The community of U.S. organic operations: Distribution of certified organic operations around the U.S.



2006 USDA NOP Data, 27 certified operations in TN  
12 farm operations  
15 processors/handlers

## Organic Food Sales



Organic Trade Association's 2006 Manufacturer Survey

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## Who gets certified?

- USDA regulates the term "organic"
- All operations that produce or handle agriculture products that will be sold, labeled or represented as "organic" must be certified
- Only exemption: producers who sell less than \$5,000 annually in organic products
  - May identify their products as "Organic"
  - May not use the label "Certified Organic"
  - May not use the USDA Organic seal
  - Must still comply with the NOP production standards
- Penalty for misuse of the Organic label, \$11,000

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## Is it possible to be certified in TN?



- Yes!
- While no certification agency is physically present here in TN, several national and regional agencies operate in the state
- Complete list of accredited certifiers available online: <http://www.accreditedcertifiers.org/index.htm>
- Comparison of services/fees available online: [http://www.rodaleinstitute.org/certifier\\_directory](http://www.rodaleinstitute.org/certifier_directory)

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## Certified Organic Farms in TN



- 20 certified organic farms in vegetable & fruit production



Distribution across the state: Blount, Coffee, Davidson, Greene, Hamilton (2), Henry, Jefferson, Lincoln, Macon, Maury, Monroe, Polk (2), Robertson, Shelby, Stewart, Williamson (2)

- 2 Dairies: Chillhowee Dairy (Polk) & Skipping Rock Dairy (Loudon)
- 1 Egg Operation: Tennessee Valley Eggs (McMinn)
- Additionally, 5 certified handlers and 4 certified processors

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## **About Organic Operations in TN:**



- **Majority are fruit & vegetable farms**  
✓ 2 Dairy Farms, 1 Meat Operation, 1 Egg Operation
- **4 to 6 additional farms in TN certified through growers group**  
✓ Appalachian Harvest based in Abingdon, VA
- **~10 certified organic processors/handlers**

## **Common Certifying Agencies Used in TN**



- **QCS (Quality Certification Services):**
  - [www.qcsinfo.org/](http://www.qcsinfo.org/)
- **Kentucky Department of Agriculture:**
  - [www.kyagr.com/marketing/plantmktg/organic/index.htm](http://www.kyagr.com/marketing/plantmktg/organic/index.htm)
- **North Carolina Crop Improvement Association**
  - [www.nccrop.com/programs.php/Organic\\_Certification/8](http://www.nccrop.com/programs.php/Organic_Certification/8)
- **Oregon Tilth:**
  - [www.tilth.org/](http://www.tilth.org/)

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## **How much does certification cost?**



- Varies depending on fee schedule of certifier
- Often based on factors such as farm size, gross farm sales, distance traveled by the organic inspector
- Producers must re-certify each year and pay annual application/inspection fees
- In TN, annual certification costs generally range from \$500 - \$700

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## **TDA Cost Share for Organic Certification**



- Don't let cost be a barrier to organic certification
- TDA administers a cost share program funded by the USDA that reimburses **75%** of certification expenses for eligible producers, handlers and processors, **up to \$750**
- Contact Jon Frady at (615) 837-5344 for more info or download cost share application on the web at:
  - [www.pickitupproducts.org/food/orgcert.html](http://www.pickitupproducts.org/food/orgcert.html)

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## **Requirements for land to be eligible for certification:**

- No prohibited substances applied to land for period of 3 years.
  - For newly purchase land, affidavit from previous owner
- Managed according to NOP regulations
- Distinct defined boundaries and buffer zones that identify area in organic production

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## **Steps for Certification**

1. Understand USDA NOP regulations
2. Contact certification agency for application
3. Submit application (organic system plan)
4. Application is reviewed by agency for NOP compliance
5. Farm inspection
6. Certification Agency makes a decision re: certification
7. Certification agency notifies the producer

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## Highlights of NOP Crop Production Standards

- Must implement the use of crop rotations, including the use of cover crops
- Organic seeds and planting stock required; exception if not commercially available (must be documented)
- Regulations for composting animal manures
- Regulations for application of raw manure

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## Highlights of NOP Crop Pest, Weed and Disease Management Standard

- First, use management practices to prevent pests, weeds & diseases
  - Crop rotation, variety selection, sanitation
- Then, control problems through mechanical or physical methods
  - Augment pest predator, mechanical cultivation, use of mulches, culling
- Finally, if these methods are insufficient an allowed input can be used
  - Biologicals, botanicals, minerals or a substance from the approved national list of materials

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## Production Inputs

- Information about Allowed/Prohibited materials:
  - NOP rules (§205.601, §205.602)
  - OMRI



<http://www.omri.org/>

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## What is not allowed:

- Substances not included on the National List of allowed synthetic substances
  - Chemical fertilizers, pesticides, herbicides
  - Treated seed
- Sewage sludge/Biosolids
- Genetically Modified Organisms (GMOs)
- Ionizing radiation

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## Principles of Organic Production

- Biodiversity
- Integration
- Sustainability
- Integrity



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## Biodiversity

- Farms with a diverse mix of crops generally support more organisms in their agroecosystems
- Above ground:
  - Beneficial insects (pollination & pest management)
- Below ground:
  - Microorganisms, insects, earthworms (better nutrient cycling, disease suppression, till & nitrogen fixation)

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## Biodiversity

- Practices that encourage biodiversity include:
  - Rotation
  - Green manure
  - Cover crops
  - Composted animal manure
  - Intercropping
  - Biocontrol
  - Farmscaping
  - Buffers

## Integration

- Utilize on-farm inputs to maximize crop benefits
- Are there animals on the farm?
  - Recycle and conserve nutrients
- Practices that foster integration of farm enterprises:
  - Rotation
  - Composting animal manure
  - Intercropping
  - Farmscaping
  - Mulching

## Sustainability

- Energy consumption
- Environmental protection
- Practices that enhance sustainability:
 

▪ Rotation	Farmscaping
▪ Green manure	Composting
▪ Cover crops	Mulching
▪ Intercropping	Buffers
▪ Biocontrol	

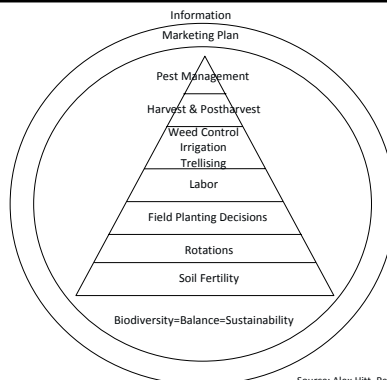
## Integrity

- Assures consumers of organic products get what they pay for
- Practices that demonstrate integrity:
  - Buffers
  - Records

## Key Elements of an Organic System

- |                  |                   |
|------------------|-------------------|
| ▪ Marketing Plan | ▪ Crop Decisions  |
| ▪ Choosing Land  | ▪ Labor           |
| ▪ Soil Fertility | ▪ Weed Control    |
| ▪ Rotations      | ▪ Pest Management |

*Courtesy of Alex Hitt, Peregrine Farm*



Source: Alex Hitt, Peregrine Farms

## Marketing Plan

- Affects everything!
- Decide *where* to market and why
- Decide *what* to market and why
- Decide *when* to market



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## Choosing Land

- Start small!
- Find best soil
- SE-SW orientation
- Slight slope
- Consider potential for drift



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## Soil Fertility

- Two phases:
  - Soil building
  - Maintaining soil health
- Sources of fertility:
  - Rotation
  - Green manure
  - Composting
  - Foliar fertilizers
  - Natural fertilizers
- Healthy soil:
  - Protects soil microorganisms
  - More balanced nutrition
  - Supplies nutrients when plants need them
  - Reduces soil decline



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## Green Manures and Cover Crops

- Green manure is a crop grown specifically for the purpose of turning it under to improve the soil
- Cover crops are grown for the purpose of soil and nutrient conservation

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## Manuring and Composting

- The NOP does not restrict the source of manure
- Best to compost manure before field application and incorporation
- Compost stabilizes nutrients, builds populations of beneficial microorganisms and in some cases shown to suppress disease

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## Crop Rotation

- The sequence of crops grown in a specific field
- One of most important pest management tools
- Provide fertilizer
- Suppress weeds
- Naturally till soil
- Interrupt pest cycles



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## Crop Decisions

- Spacing
- Timing
- Interplanting



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## Intercropping & Companion Planting

- Planting two or more mutually beneficial crops in close proximity



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## Labor

- Limiting factor
- Most expensive input
- Use efficiently



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## Natural Pest & Weed Management

- Pests and weeds are indicators in an agroecosystem
- Practices employed for natural pest management:
  - Rotation
  - Green manure
  - Cover crops
  - Composting
  - Intercropping
  - Biocontrol
  - Farmscaping
  - Sanitation
  - Tillage
  - Fire
  - Natural pesticides

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## Biological Pest Control

- Keeps levels of pest insects under control or at manageable level
- Beneficial insect pest predators and parasites
- Pest disease agents
- Insect eating birds and bats

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## Sanitation

- Removal of crops residues that could carry plant diseases or insect pests
- Destruction of weedy borders that may harbor pests
- Cleaning farm equipment from one field to another
- Sterilizing pruning and other tools

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## Tillage & Cultivation

- Can be used as a tool for weed control, crop residue management, soil aeration, conservation of compost, hardpan reduction and sanitation
- However, every tillage operation aerates the soil and speeds the decomposition of the organic fraction

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## Mulching

- Helps regulate soil moisture and temperature
- Suppresses weeds
- Provides organic matter to the soil
- Small-scale: Straw bales, woodchips
- Large-scale: Winter killed or rolled cover crops

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## Creating an Organic Farm Plan

- Description of practices used on the farm
  - Crop Rotation
  - Soil Fertility & Crop Nutrient Management
  - Irrigation & water quality
  - Seeds/Planting stock
  - Pest, Weed and Disease Management
  - Conservation of Biodiversity
- List of inputs used on the farm
- Description of record keeping systems
- Description of management practices and physical barriers to prevent contamination and commingling in order to maintain organic integrity

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## Record Keeping



- Good record keeping is essential!
- Not a prescribed system, based on what best fits the operation
- Types of records:
  - Farm & field maps
  - Field history
  - Activity log
  - Input records (including receipts and labels)
  - Harvest records
  - Storage records
  - Sales records
- Maintain all records for 5 years

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## USDA NOP Regulations



[www.ams.usda.gov/NOP/](http://www.ams.usda.gov/NOP/)

## Organic Crop Production Information Resource



National Sustainable Agriculture  
Information Service  
<http://attra.ncat.org/>

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## UT Organic Initiative

- **Funded by the TDA**
- **5 year project**
- **Commercial vegetable & small fruit production**
  - Emphasis on helping traditional TN farmers increase farm income by capitalizing on organic market demand
- **Support for organic extension activities, organic research & developing and connecting organic efforts in the state**
- **Farm to Market connections**
  - Supporting networks that link producers of both organic and conventional products to buyers



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## UT Organic Research

### Organic Research Farm



- 90 acres, 21 acres in production
- 14 acres transitioning to organic
- Greenhouse
- 3 High Tunnels
- Located in Knox County, off John Sevier Highway

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## Cover Crops & Green Manures

- Evaluating the performance of different warm season and cool season cover crops
  - Green manures for organic matter & nitrogen
  - Attracting beneficial insects for pest management
  - Smothering weeds
  - Improving soil structure



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## Cover Crops & Green Manures

- Evaluating equipment for managing cover crops
  - Roller Crimper
  - Flail mower
  - Spader



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## Cover Crops & Green Manures

- Current experiment looking at:
  - 5 grains
    - Winter Wheat
    - Winter Rye
    - Oats
    - Triticale
    - Barley
  - 5 legumes
    - Crimson clover
    - Red clover
    - Ladino clover
    - Austrian winter pea
    - Vetch
- Single species/bicultures, 35 treatments
- Planting dates: Sept. 15, Oct. 15, Nov. 15
- Evaluating biomass & nutrient availability



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## Specialty Crops – Warm Season

- Evaluating performance of specialty vegetable varieties
- Eggplant, tomatoes, potatoes, carrots, peppers, melons, beans, greens, herbs
- Identifying challenges with weed, disease & insect management



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## Specialty Crops – Cool Season

- Variety trials of hybrid and heirloom varieties in high tunnels and grown outdoors under winter row covers
  - Lettuce, Spinach, Swiss Chard, Kale, Parsley, Leeks, Cauliflower, Broccoli, Kohlrabi, Beets, Peas, Beans, Radishes
  - Evaluating for yield, color, taste, texture, and incidence of disease, insect and weed problems.



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## Sustainable Tillage Methods & Living Mulches

- Evaluating the effect of different tillage practices—rototilling, disking, rotary spading and no-till—on soil quality for organic vegetable production
- Soil quality measures include:
  - % organic matter
  - aggregation
  - compaction
  - water holding capacity
  - total and available nutrients
  - weed suppression
- Evaluating living mulches for reduced till tomato production



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## Crop Pollination in East TN



- Researching the populations and efficiency of native pollinators on cucurbit flowers in relationship to the availability of beneficial habitat



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## Cucumber Beetle Management



- Planned for 2009
- Low-input organic insect management systems for melon production: trap cropping for cucumber beetles & squash bugs using Hubbard squash and other crops
- Evaluating the efficacy of an early registration biopesticide for cucumber beetle management on pumpkins and melons



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## Future Workshops

- ✓ Building Soils & Managing Soil Fertility (March 9)
- ✓ Crop Rotations & Cover Crops (April 13)
- ✓ Planting: Seed Sources & Transplants (May 11)
- ✓ Identifying and Managing Weeds (June 8)
- ✓ Identifying and Managing Pests (July 13)
- ✓ High Tunnel Production (August 10)
- ✓ Identifying and Managing Diseases (September 14)
- ✓ Developing an Organic System Plan (October 12)
- ✓ Marketing Organic (November 9)

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## OSCP Website

- <http://organics.tennessee.edu>
- Information on organic crop production in TN
  - UT Organic & Sustainable Crop Production Program information
  - Educational and networking events
  - Extension publications
  - Research findings
  - Links to informational websites



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# Questions?



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Organic Crops Field Tour: May 15

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