

Caribbean Academy of Sciences (CAS)
Seminar on Organic Agriculture-The food System of
the Future

Introduction to Organic Production Systems

December 11, 2014

Joseph I. Lindsay

Consultant/Soil Scientist

jlindsay05@gmail.com (770-5868)

WHAT IS ORGANIC AGRICULTURE?

Organic Agriculture

- Organic agriculture is a holistic production system in which the production site used for crop and animal production is viewed as an “organism” in which all components are interrelated

What is Organic Farming?

A holistic approach to farming.

It aims to create a closed nutrient system.

It takes into consideration the health and well being of the environment, the crop the animals and the people.

Organic farming utilizes natural cycles and processes.
/

Principles of Organic Agriculture

- Organic agriculture is based on:

The principle of health-

The principle of ecology-

The principle of fairness-

The principle of care-

Focus of Organic Agriculture

- Reducing/minimizing or omitting selected technical production aids to agriculture such as :
- **-synthetically produced agrochemicals used for plant protection and mineral fertilizers**

Organic agriculture vs old time farming done by our ancestors

- Some persons may think that organic agriculture is ancient agriculture practiced by our ancestors
- On the contrary **organic agriculture embraces the state of the art technical and biological advances used to provide better understanding of the different facets of agriculture**
- It is also not based on **yield maximisation but yield optimisation** and looks on the total sustainable production of the entire farm components.

Organic Agriculture 101

- Organic agriculture is not based on replacing the prohibited substances (synthetic pesticides and highly soluble mineral fertilizers) with technical aids that are permitted i.e. listed on the materials lists from your organic certification body

BASIC REQUIREMENTS STANDARDS AND CERTIFICATION

WHAT ARE ORGANIC STANDARDS?

Organic Standard

- -the minimum set of practices and requirements for a product to be labeled organic
- Supported by a materials list including materials that are allowed, regulated, prohibited

Organic Soil Management Standards

- Organic standards require producers to assess the resources to which they have access and to superimpose on these, measures which are in line with basic soil management practices.
- Organic farmers may therefore use any combination which meets their production objectives being cognizant of:
 - crop nutrient requirement,
 - need for environment protection and
 - use of available local or off-farm inputs

Soil Management Practices

- In this presentation the following topics will be briefly presented
- Determination of soil texture and physical conditions
- Land clearing
- Soil Tillage (primary, secondary etc)
- Soil preparation for irrigation drainage, additional root room and soil conservation practices

Soil Management Practices

- Soil testing for assessment of nutrient status
- Selection of alternative sources of materials to address particular objective
- Placement/Incorporation of soil amendments

Soil Sources of Soil Nutrients/Amendments

Soil/Rocks	Plants	Animals
Rock phosphate	Compost	Manure
Rock/mineral dust	Vermicompost	Compost/Vermicompost
Limestone	Green manure	Meals –bone, blood, hoof,
Gypsum	Cover crops	Fish meal
Humates	Legumes	Fish emulsion
	Crop residue mulch	
	Agro-industrial byproducts	
	Wood chip	
	Saw dust	
	Plant meals (Alfalfa etc)	

Soil fertility and crop nutrient management practice standard.

- (a) The producer must select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and minimize soil erosion.
- (b) The producer must manage crop nutrients and soil fertility through rotations, cover crops, and the application of plant and animal materials.
- (c) The producer must manage plant and animal materials to maintain or improve soil organic matter content in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances. Animal and plant materials include:

Allowed crop nutrient & Soil Amendment

- (2) A mined substance of low solubility;
- (3) A mined substance of high solubility:
Provided, That, the substance is used in compliance with the conditions established on the National List of non synthetic materials prohibited for crop production;

Manure Use

- (1) Raw animal manure, which must be composted unless it is:
- (i) Applied to land used for a crop not intended for human consumption;
- (ii) Incorporated into the soil not less than 120 days prior to the harvest of a product whose edible portion has direct contact with the soil surface or soil particles; or
- (iii) Incorporated into the soil not less than 90 days prior to the harvest of a product whose edible portion does not have direct contact with the soil surface or soil particles;

Plant Materials

- (3) Uncomposted plant materials.
- (d) A producer may manage crop nutrients and soil fertility to maintain or improve soil organic matter content in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances by applying:
 - (1

Synthetic materials allowed as fertilizers and soil amendments for the commercial organic production of produce (as per label restrictions)

Aquatic plants (alkali extracted

Boron

Fish products (liquid, pH adjusted with acid)

Humic acid (alkali extracted)

Iron phosphate (molluscicide use

Iron sulfate

Lignin sulfate

Micronutrients (such as zinc sulfate)

Magnesium sulfate

Newspaper

Sulfur (elemental)

Sulfurous acid

Vitamin B1, C, E

Crop Production Standards

- All crops can be grown organically
- There is a requirement of a minimum of 3 years to convert from conventional to organic
- Organic crops should be separated from non-organic crops by a buffer zone
- Inputs should be based on those approved in the materials list
- Use of only of untreated and non-genetically engineered seeds
- A minimum of 12 months of organic care before the first harvest can be certified

LIVESTOCK AND LIVESTOCK PRODUCTS

Organic Livestock Production Basic Standards

- Appropriate health and nutritional management system
- Animals for slaughter as organic must have been fed 100% organic feed
- All other inputs used must be approved and be on the materials list of a certifying body
- There must be separation of organic from conventional livestock/farm
- Synthetic hormones and growth promoters are prohibited
- Mandatory vaccinations required by law are allowed
- Strict regulation on use of treatments for pests and diseases

Potential roles of animal/livestock in organic production systems

- Production of wastes (manure/urine) -a major source products used in soil fertility management and renewable energy
- Production of animal protein (meat, milk, egg: by-products)
- Store of wealth
- Weed and pest management (sheep, duck, geese, chickens)
- Consumer of excess crop and by-products
- Security and companion animals (dog, sheep dog, geese, bulls)
- Draft - transport and tillage
- Produced on land unsuitable for select crops
- Cultural and religious celebrations
- Production of by-products –value added-wool, leather, protein supplements, decorations, jewelry, clothing, foot wear, milk by-products

Organic Livestock production

- **Livestock production** (beef and dairy cattle, sheep and goats, pigs, poultry, rabbits, bees, aquaculture) – **is integral to many organic agriculture system as they complement crop production.**

Guidelines for Introduction of Conventional Animals into Organic Production

Livestock/Animal	Conventional Source
Chickens for meat production	2 day-old
Hens for egg production	18 week-old
Other poultry	2 week-old
Piglets	Up to 6 weeks post weaning
Cattle/Calves	Up to 4 weeks old that have received colostrum

Organic Livestock Production Basic Standards –Housing/Grazing

- Cognizant of animal welfare issues
- Ensure ample access to fresh water and feed according to animal needs
- Poultry, rabbits and pigs must not be kept in cages
- Access to free range grazing/pasture during all or a portion of the life of the animal (where weather allows)
- Protection from predators

Table 1. Naturally occurring (non-synthetic) materials allowed as fertilizers and soil amendments for the commercial organic production of produce

- Animal manure
- Blood meal
- Bone (and meat) meal
- Calcium carbonate/ limestone (mined)
- Calcium chloride (restricted under §205.602)
- Compost: animal manure or plant-based
- Decomposing crop residue
- Feather meal
- Fish meal/shrimp
- Fulvic acid
- Guano (mined)
- Gypsum (mined)
- Humates / Leonardite (mined)
- Peat
- Potassium magnesium sulfate, potassium sulfate (mined)
- Rock phosphate (mined)
- Seaweed/kelp
- Worm castings

Prohibited substances

- Sewage sludge (bio-solids) are not used in organic agriculture due to potential dangers from:
 - Industrial pollutants
 - Pharmaceuticals
 - Hormones
 - Heavy metals

WHO SETS ORGANIC STANDARDS

Who sets organic standards

- All stakeholders
- IFOAM holds general assembly during which there is democratic setting and amendments of written rules
- International Federation of Organic Agricultural Movements
- FAO-Codex Alimentarius

WHO DOES ORGANIC CERTIFICATION

Organic Certification

- **Organic certification** is a process for producers of **organic** food and other **organic** agricultural products. In general, any business directly involved in food production can be certified, including seed suppliers, farmers, food processors, retailers and restaurants.

Who Certifies?

- JOAM, NOP, CERES, ECOCERT, SOIL ASSOCIATION
- A certifier is an organization (Certifying Body) which is accredited to provide organic certification.
- Certification is based on a national or internationally accepted standards

Certification Process

- Producer grows products using organic standards
- Operator identifies suitable certifier and applies for inspection
- Pays fees, fills application
- Facilitate visit and inspection of operation providing access to an accredited inspector
- If all requirements are met an organic certificate is issued
- All inspection bodies are members of CODEX

The Organic Label

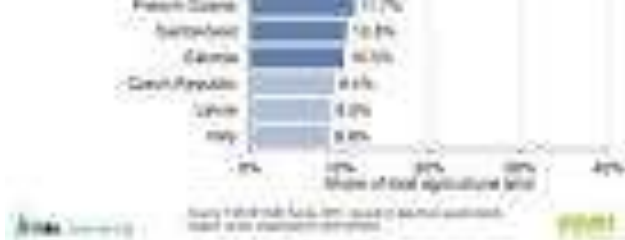
- An organic label indicates that a product has been inspected and certified against specific organic standards.
- The label carries the name of the certification body and the standards with which it complies, (e.g. USDA-NOP, JOAM).
- . The label of a given certification body, therefore, informs the consumer on the type of standards complied with during production and processing as well as on the type of recognition granted to the certification body.
- Many certification bodies operate locally or worldwide

JOAM LOGO



Organic Certificate Label





WHO IS DOING ORGANIC AGRICULTURE TODAY?

Countries with the highest shares of organic agricultural land (2011)

Country	Organic share of total agricultural land (%)	
Falkland Islands	36	
Austria	20	
French Guiana	18	
Sweden	16	
Samoa	12	
Switzerland	12	
Czech Republic	11	
Jamaica	??	

Source: BioFach 2013 - Congress World of organic agriculture

The ten Countries with the most organic agricultural land in 2011

Country	Hectares (000)	
Australia	12,000	
Argentina	3,800	
United States	1,900	
China	1,900	
Spain	1,600	
Italy	1,100	
India	1,100	
Germany	1,000	
France	1,000	
Uruguay	900	
Jamaica	??	

(Source: Bio Fach 2013 Congress World of organic agriculture)

The ten Countries with the most organic producers in 2011

Country	Number of producers	
India	548,000	
Uganda	189,000	
Mexico	170,000	
Tanzania	145,000	
Ethiopia	122,000	
Turkey	44,000	
Peru	44,000	
Italy	42,000	
Spain	32,000	
Dominican Republic	24,000	
Jamaica	??	

(Source: Bio Fach 2013 Congress World of organic agriculture)

Share of organic agriculture land by regions in 2011

Continent	Organic agriculture land (ha)	Share of total agriculture land (%)
Africa	2,074,000	0.1
Asia	3,706,000	0.3
Europe	10,637,000	2.2
Latin America	6,578,000	1.1
Northern America	2,790,000	0.7
Oceania	12,186,000	2.9
Total	37,246,000	0.9
(Countries used in survey only)		

(Source: Bio Fach 2013 Congress World of organic agriculture)

WHO IS DOING ORGANIC AGRICULTURE/FARMING IN JAMAICA

Who is doing organic agriculture/farming in Jamaica ?

• Sample Listing	Location
• Rowan's Royale	Portland
• Woodford Market Gardens	St. Andrew
• Zionites Farm	St. Ann
• Green Castle Estate	St. Mary
• Nelson's Super-farm Jamaica	St. Mary

HISTORICAL ROLE OF JOAM IN ORGANIC MOVEMENT IN JAMAICA

JOAM detail and activities in Jamaica and the Caribbean

- Sensitization programmes on organic agriculture
- Training of consultants, inspectors, farmers, public and students on organic agriculture in Jamaica and the Wider Caribbean
- Development of JOAM Organic Standards (Currently being adapted as organic standard for Jamaica and CARICOM/CROSQ)
- Production of an organic farming handbook
- Maintenance of the JOAM website (www.joamltd.org)
- Provision of an organic certification service
- Provision of organic agriculture consultancy services
- Establishment of demonstration/research plots

CROPS AND CROP PRODUCTS

- **Any crop/products that have been produced in an area/farm that has been certified organic can be considered organic.**
- Cereals-corn, sorghum, sugar cane
- Root crops-yam, cassava , potatoes
- Vegetables
- Legumes-peas, beans, peanuts
- Beverage crops-cocoa, coffee
- Fruit crops/tree crops

CROPS AND CROP PRODUCTS

- Herbs and spices
- Medical marijuana
- Wild-crafted bamboo
- Lumber
- Fibre
- Bio-fuel crops-jatropha, castor, sunflower
- Oil crops- coconut, oil palm, sunflower
- Ornamentals-flowers, foliage, shrubs, palms
- Fodder/livestock feed
- Cover crops/green manure crops

Livestock and Livestock products

- Thank You

- Joseph I. Lindsay
- jlindsay05@gmailcom
- Lime 770-5868
- Digi 359-4341