Organic Vegetable Production

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Key Points

- Overview of organic production
- Soil amendments
- Crop rotation
- Cover crops
- Pest control
- Variety selection

The Organic Approach

- Recycles nutrients and waste
- Minimizes external inputs
- Accept some damage
- More time conditioning soil and scouting
- Should use a balanced approach
- Start small

Soil

- Soil is the key!
- Benefits of organic matter
  - Improves soil structure
  - Improves water and nutrient holding capacity
  - Supports biological activity
  - Contributes nutrients, both minor and major
  - Help veggies survive nematode stress

Soil: What to do?

BUILD SOIL ORGANIC MATTER

- Minimum of 4” in top 12” of soil
- Amendments as soil builders, not fertilizers
- Be generous with organic amendments
- Raised beds = better drainage & easier to amend

Soil Amendments

Composted Manure
- Best source of fertilizer and organic matter
- Aged for at least 30 days.

Raw manure
- 120 days between application and harvest if the edible portion of the crop comes into direct contact with the soil.
- 90 days if the edible portion never touches soil.
- Do not apply raw manure close to harvest
- Raw manure may burn plants
How much manure and when?

Before planting:
- Cow, horse, hog — 25 lbs per 100 sq/ft
- Poultry, sheep, rabbit — 2 lbs per 100 sq/ft

After planting:
- Cow, horse, hog — 5 lbs per 100 sq/ft of row
- Poultry, sheep, rabbit - 3 pounds per 100 sq/ft of row

Soil Amendments

Compost
- Decomposes, combines, and yields artificial manure.

How much and when?
- Broadcast three weeks or more before planting.
- 25 pounds per 100 square feet, or 1/4 pound per square foot.
- Larger amounts are even more beneficial, up to 200 lb/100 sq ft. (2 lb/sq ft.)

Lime ➔ raises pH (6.0)
Bone Meal ➔ Source of calcium
Blood Meal ➔ Source of nitrogen
Milorganite ➔ source of nitrogen
Fish Emulsion ➔ source of nitrogen
Chitin ➔ decreases soil borne diseases

Sources of Mulch

- Newspaper/ wheat straw
- Pine straw
- Hardwood mulch
- Chopped leaves
- Plastic
- Cover crops

Crop Rotation is Important!

Why?
- Dispersal ability of pest disease
- Host specificity
- Manage weeds
- Manage nutrients and build soil

Rotations based on:
1) Nutrient needs
2) Vegetable families
**Crop Rotation to Manage Nutrients**

<table>
<thead>
<tr>
<th>Heavy Feeders</th>
<th>Light Feeders</th>
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<tbody>
<tr>
<td>Corn</td>
<td>Peas</td>
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<tr>
<td>Spinach</td>
<td>Peppers</td>
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<tr>
<td>Squash</td>
<td>Radish</td>
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<tr>
<td>Tomatoes</td>
<td>Beans</td>
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<tr>
<td>Broccoli</td>
<td>Radish</td>
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<tr>
<td>Cabbage</td>
<td>Onion</td>
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<td>Mustard greens</td>
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For a complete list visit: [http://ag.arizona.edu/pubs/garden/mg/vegetable/fertilizing.html](http://ag.arizona.edu/pubs/garden/mg/vegetable/fertilizing.html)

**Crop Rotation is Important!**

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
<th>Group 5</th>
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<tbody>
<tr>
<td>Beans</td>
<td>Peas</td>
<td>Potatoes</td>
<td>B. Sprouts</td>
<td>Cantaloupe</td>
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<tr>
<td>Peas</td>
<td>Eggplant</td>
<td>Tomatoes</td>
<td>Cauliflower</td>
<td>Cucumber</td>
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<td>Peppers</td>
<td>Leek</td>
<td>Honeydew</td>
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<td>Pumpkin</td>
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<td>Turnips</td>
<td>Watermelon</td>
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<tr>
<td>Beets</td>
<td>Carrots</td>
<td>Garlic</td>
<td>Onions</td>
<td>Shallots</td>
</tr>
</tbody>
</table>

**Irrigation**

- Thoroughly wet the soil once a week unless sufficient rain falls.
- Use efficient methods of irrigation
  - Drip or soaker hoses
- Wet foliage = disease problems

**What is a Cover Crop?**

- Benefit soil and/or other crops, but is not intended to be harvested for feed or sale.

**Types of Cover Crops**

Legumes and Grasses

*Fixers and Lifters*

**Why Use Cover Crops**

- Weed suppression
- Nitrogen management
- Improve soil quality
- Erosion control
- Insect Management

**Nitrogen Lifters**

- Grown to retrieve available nutrients still in the soil following a harvested crop
- Prevents nutrient leaching
- Species differ (most grass or grain)
- Can lift 90% of N
- Examples
  - Rye
  - Wheat
  - Ryegrass
  - Sorghum-Sudan
  - Millet
Nitrogen Fixers

- Help maintain soil organic matter and add nitrogen to the system
- Incorporated into soil or killed on the surface before they are mature
- **LEGUMES**
- **Examples**
  - White or Red Clover
  - Southern Peas
  - Velvet Bean

Cool Season Cover Crops

- **WHITE CLOVER**
- **LUPINE**
- **OATS**
- **RYE**
- **WHEAT**
- **HAIRY VETCH**

Warm Season Cover Crops

- **SORGHUM/SUDAN**
- **SOUTHERN PEA**
- **HAIRY INDIGO**
- **PEARL MILLET**
- **SUNNHEMP**
- **VELVET BEAN**

Pest Control Materials

- **Neem**
  - Aphids, whiteflies, armyworms
- **Pyrethrin**
  - Many pests (toxic)
- **Bt**
  - Caterpillars
- **Insecticidal soaps**
  - Soft bodied insects (aphids, spider mites, thrips, etc)
- **Diatomaceous earth**
  - Soft bodied and ground crawlers

Variety Selection

- **Resistance**
- **Tolerance**
- **Susceptible**
- **Key to Success**
  - Especially Important in Organics
  - Viruses — only option most of the time

Keep Things Clean!

- Remove old crops after they finish
- Pick off damaged or diseased fruit
- Remove plants with viruses immediately
- Do not smoke or use tobacco near garden
- Turn soil frequently
- Use certified seed
http://duval.ifas.ufl.edu/agriculture_production_agriculture.shtml