



Organic Gardening

The Master Gardener Perspective

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What is Organic Gardening?

- “Organic gardening avoids the use of manufactured pesticides, herbicides, and mineral or synthetic fertilizers. The soil is kept healthy, rich with nutrients and, most important, it is kept alive with a high content of microorganisms. The essence of all organic techniques is to work with nature, not against it. All refused products in the kitchen and garden is recycled back into the soil. Organic gardening is a sustainable activity: the soil is fed by the gardeners; the soil feeds the plant; the plants feed the gardeners.”

(Organic Gardening for the 21st Century, by John Fedor)

What is Organic Gardening to YOU?

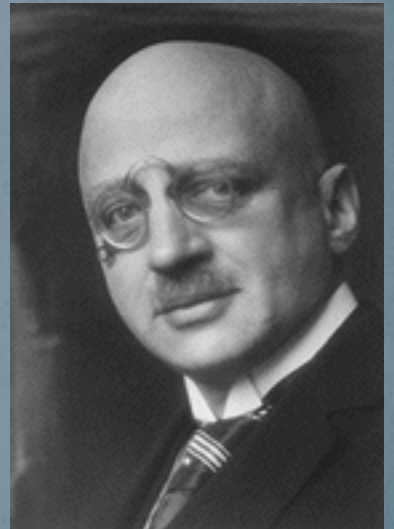


Breaking it down...

- Avoid the use of synthetic pesticides, herbicides, and fertilizers
 - **Synthetic pesticide:** chemically derived, not found in nature
 - **Organic pesticide:** Derived from natural products, often concentrated and refined
 - Neem
 - Pyrethrum
 - Insecticidal soap
 - Bt

Synthetic fertilizers

- Synthetic Nitrogen: **Haber–Bosch process**, is the nitrogen fixation reaction of nitrogen gas and hydrogen gas, over an enriched iron or ruthenium catalyst, which is used to produce ammonia.
- Ammonia is broken down into nitrate and nitrite forms of nitrogen—useful to plants.
- Process uses fossil fuels



Organic Amendments: Manures

| Manure | % N | % P | % K | Amt. to supply 5 lbs N |
|---------|-----|-----|-----|------------------------|
| Chicken | 1.7 | 1.8 | 1.3 | 290 lbs |
| Sheep | 1.3 | 0.9 | 1.9 | 380 lbs |
| Dairy | 0.8 | 0.4 | 1.7 | 625 lbs |
| Cattle | 0.8 | 0.6 | 1.1 | 625 lbs |
| Pig | 0.6 | 0.5 | 0.6 | 830 lbs |
| Horse | 0.4 | 0.3 | 0.7 | 1250 lbs |

Source: Fertilizing Gardens in South Dakota (Ex B744)

Additional Organic Amendments

| Material | % N | % P | % K | Amt. to supply 5 lbs N |
|-------------------------|------------|-------------|------------|---------------------------|
| Blood Meal | 13.0 | 0.9 | 0.5 | 38 lbs |
| Fish Meal | 10.0 | 6.0 | 0.0 | 50 lbs |
| Bone Meal | 3.0 | 22.0 | 0.2 | 165 lbs |
| Moist compost | 1.0 | 0.4 | 0.6 | 500 lbs |
| Leaves | 0.7 | 0.3 | 0.6 | 715 lbs |
| Fresh Lawn clippings | 0.6 | 0.3 | 0.8 | 835 lbs |

Source: Fertilizing Gardens in South Dakota (Ex B744)

Breaking it down...

- The soil is kept healthy, rich with nutrients and, most important, it is kept alive with a high content of microorganisms.
 - Organic fertilizers feed the soil
 - Tillage practices promote healthy biological activity
 - Diversity of crops promotes a balance of organisms.

Organic Pest Control

1. Identify the problem
2. Determine what level of control is needed/desired
3. Determine what control measures are available
 - Physical
 - Chemical
 - Biological
 - *Timing*



Physical Controls

- Exclusion (netting, row covers)
- Kaolin clay
- Trapping

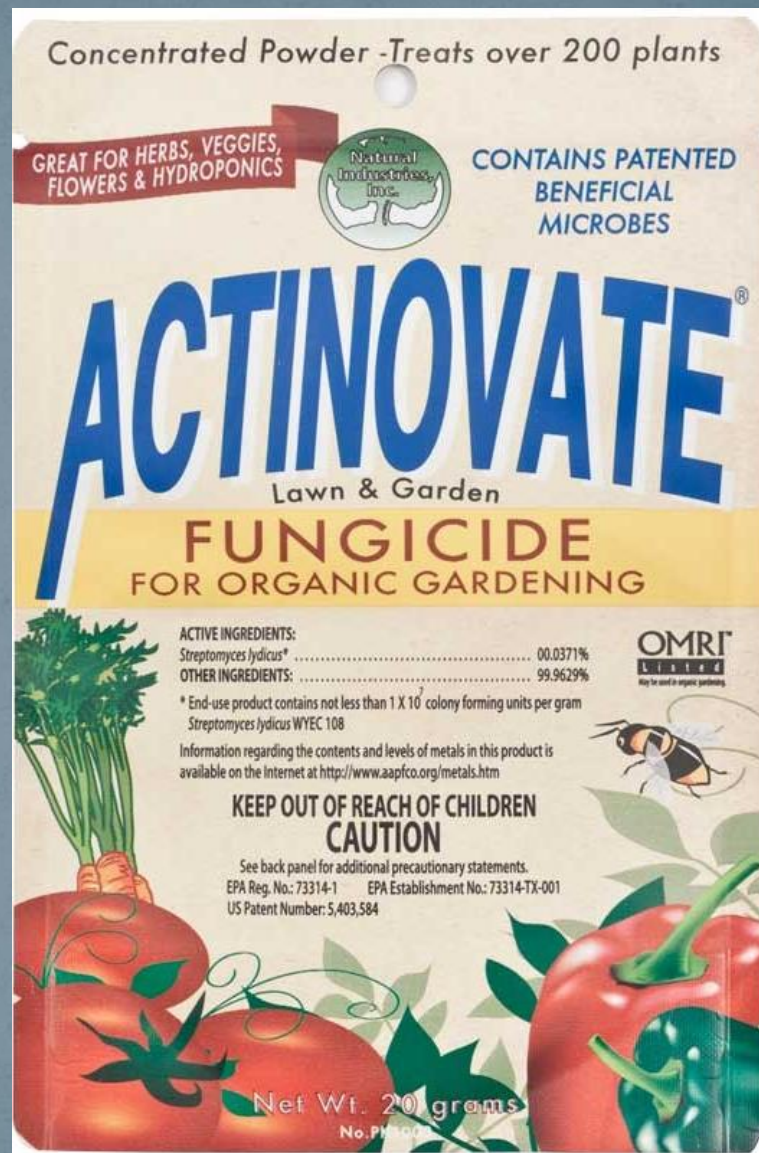


Chemical Controls

- **Fungicides:** Change environment on leaf surface
 - Home-made baking soda mixtures
 - Copper mixture (store-bought)
 - Lime-sulfur mixture
 - **Can be harmful to humans!**
- **Insecticides:** Often act similarly to their synthetic counterparts
 - Neurotoxins, endocrine disruptors, etc.
 - **Can be harmful to humans!**

Biological Controls

- Either strengthen the plant or change the environment of the pest



Timing

- Each pest will have a weakest point in its life cycle
- Each plant has stronger and more vulnerable points in its life cycle
- Promote the plants' strong points and target the pests' weak points!



Examples of Organic Gardening

- Situation one: You receive a call from a gardener who is being overrun by flea beetles. How might you recommend organically solving this problem?



Resources for you to use

- <http://cuaes.cornell.edu/organic/>
 - Cornell Organics Homepage
- <http://cuaes.cornell.edu/organic/>
 - Organic Guides for Fruit & Vegetables
- <http://web.pppmb.cals.cornell.edu/resourceguide/>
 - Organic Resource Guide for Insect & Disease Management
- <http://plantdiagnostics.umd.edu/>
 - Plant diagnostics problem solver



Flea beetle solutions

- Row cover
- Trap crop
- *Microcotonus vittage* Muesebeck, a native braconid wasp, parasitizes and kills the adult flea beetle.
- Commercial formulations of insect-eating nematodes are effective agents for controlling flea beetles. Applied to the soil, the nematodes attack the beetle's larval stage, reducing root feeding and helping to prevent emergence of the next cycle of adults.
- Rotenone/insecticidal soap

Example 2:

- A homeowner calls you because their pine tree is turning yellow and needles are falling off. They want to know what they should spray to fix it. What do you tell them?



Pine Dropping Needles:

- Seasonal needle drop
- No need to spray anything
- Root cause: plant needs to shed old needles and make new ones.
- Solution: None!

Example 3:

- A homeowner calls you because her peony keeps dying from “a fungus” during the late summer. What can she do to save it?

-You go look at the peony, and it appears to have verticillium wilt, a soil borne fungus that causes individual stems to wilt.

Based on this diagnosis, what would you recommend to the homeowner?

Peony solutions

- Don't spray foliage for a soil borne problem
- Proper sanitation
- Plant resistant plants