

Organic Gardening 101



Regina M. Dlugokencky
Seed + Reference
Librarian

Main Concepts in Organic Growing



- Fertility Management (Soil Building)
- Weed Management
- Pest Management
- Disease Management

Intro - History



History of Non-organic practices

- Recent - Green Revolution
- Surpluses of War Industry (1940's)
 - Pesticides from poison gases
 - Fertilizers from petroleum products

Intro - History

Prior to WW2 ALL practices were:



Source:spartacus.schoolnet.co.uk. Accessed 11/11/11

ORGANIC!

Intro - History

Organic growing popularized by

- Lady Eve Balfour (*The Living Soil*)
- J.I. Rodale (Rodale Institute Founder)
- Sir Albert Howard (India Composting)



Source: Wikipedia.com (accessed 11/2/11)



Equilibrium of soil

- Slow release of nutrients to plants when needed
- Building + maintaining balanced, living ecosystems



Benefits

- Economical
- Composted food waste = free Herbivore animal manures*
- High in organic matter and nutrients + often free

*Restrictions Apply!



Benefits

Nutrition

Evidence of higher nutritional value

- Absence of insecticide and herbicide residues

Benefits-Landfill Reduction



Used with Permission:

† Seppo Leinonen, www.seppo.net



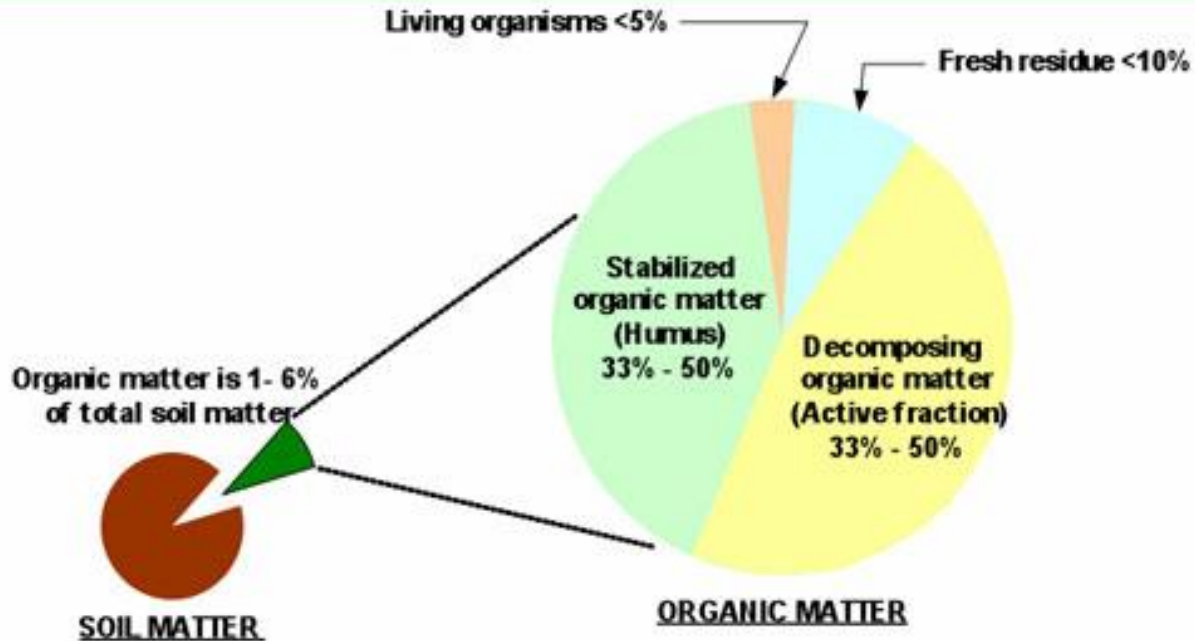
Benefits

Environmental

- Soil Building vs. soil erosion
- Protect water aquifers, etc.
- Protect wildlife
- Reduced petroleum dependence

Intro - Soil Testing

Components of Soil Organic Matter

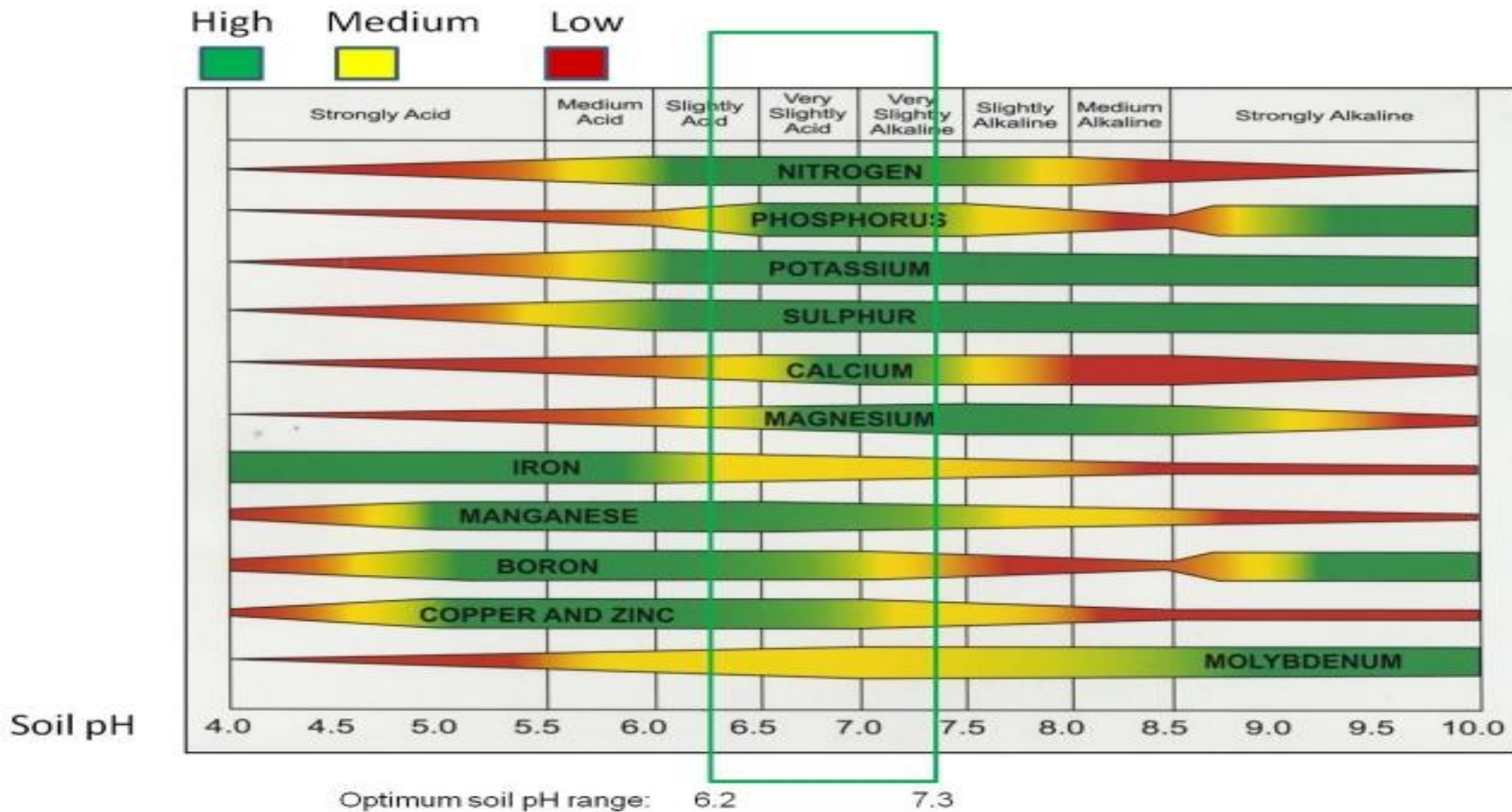


First Important Step

- Organic Matter
 - ~2 - 10%
- PH (6.0 - 7.0)
 - Important for Nutrient availability

Intro - Soil Testing

How soil pH affects availability of plant nutrients





Intro - Soil Testing

- Resources
 - Cornell Cooperative Extension
 - pH, Recommendations
- Dairy One (Dairyone.com)
 - pH, Organic Matter, Macronutrients, Recommendations
- Alternative Independents

Soil Fertility

Main Principle:

Feeding the soil (slow)

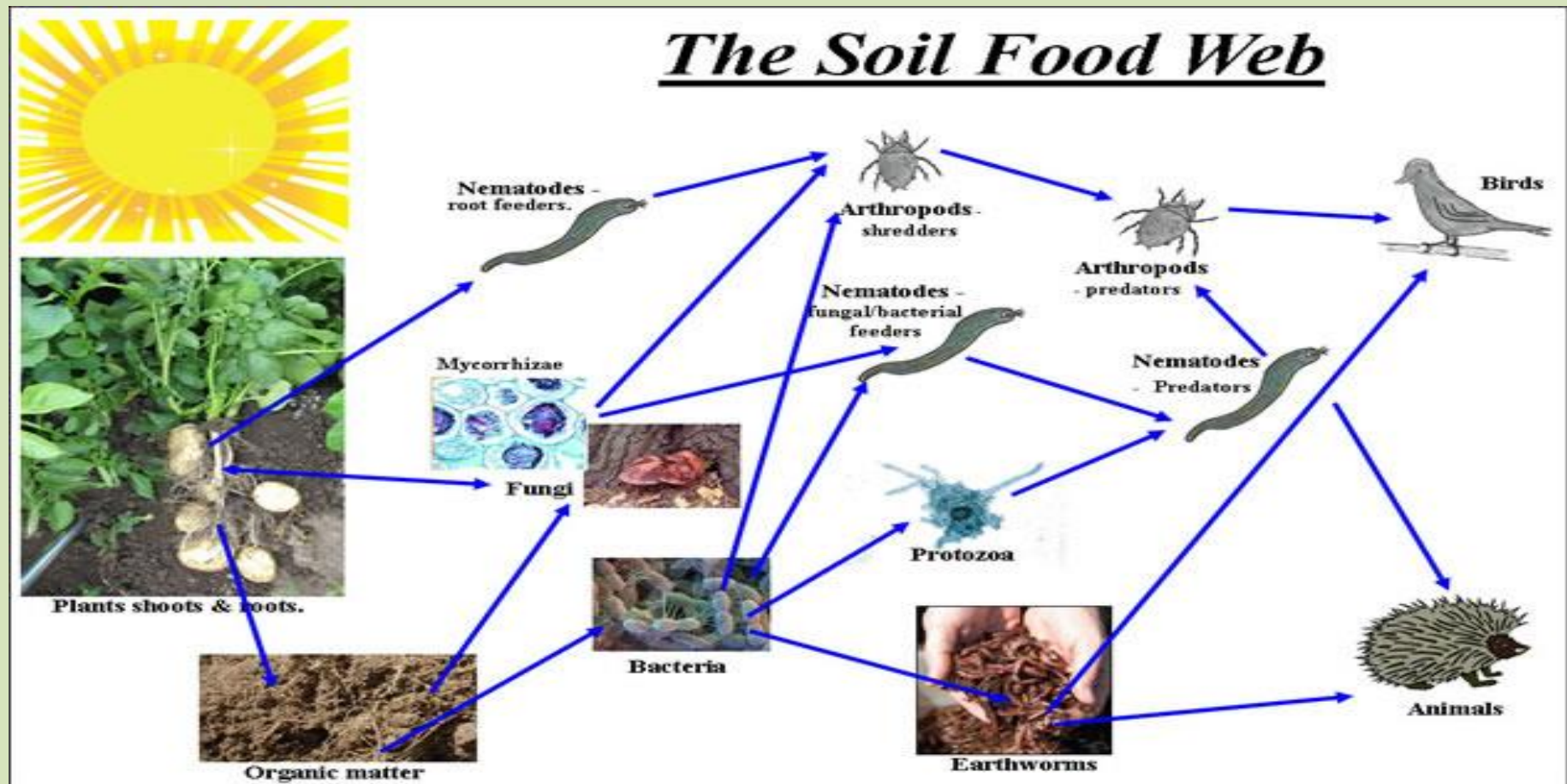
vs.

Feeding the plant (fast)



Soil Fertility

Increasing organic matter:



Source: <http://www.independentsoils.co.uk/arable/understanding-your-soil/>

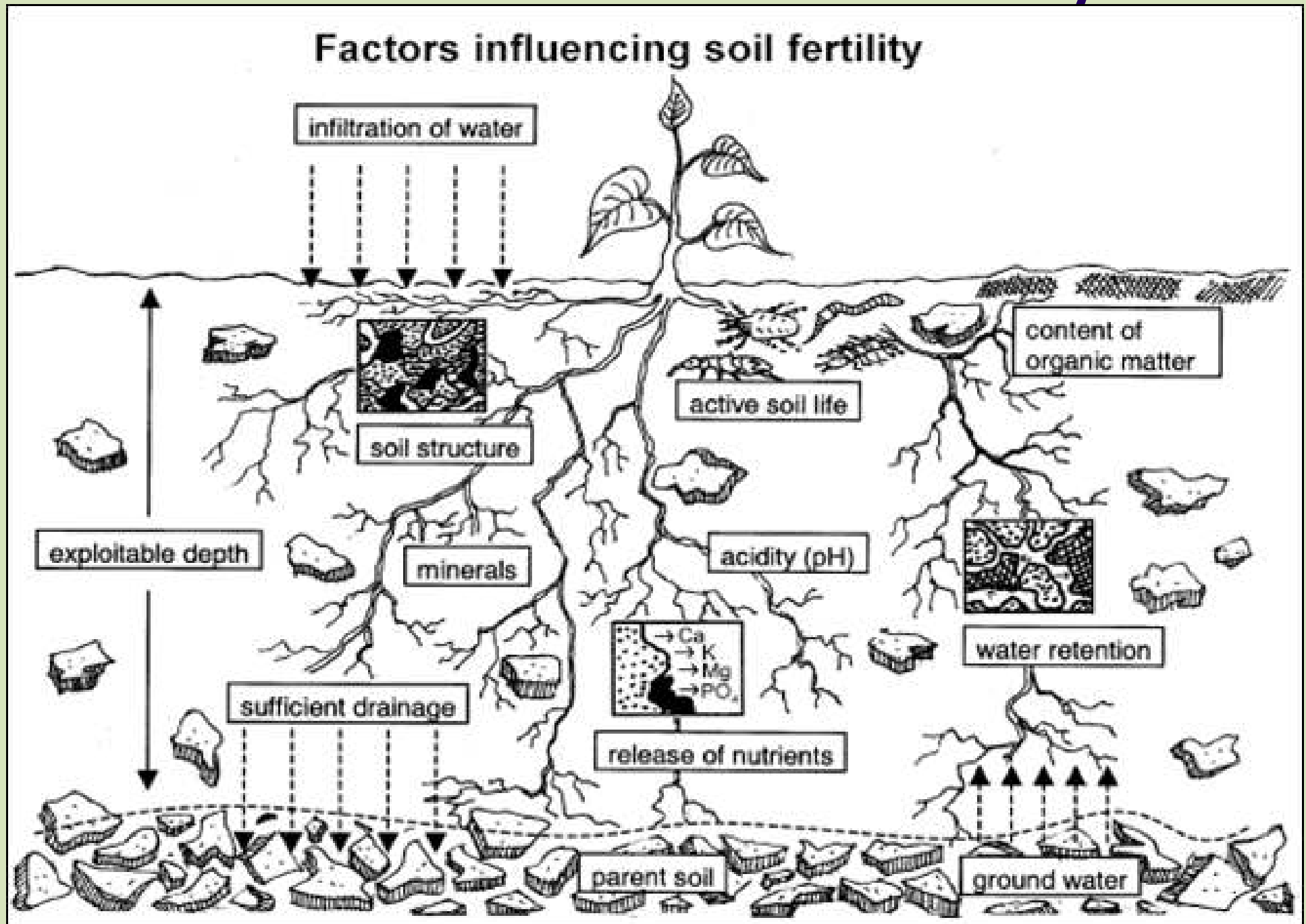
- Increases beneficial macro & micro-organisms
- Increases nutrient retention

Soil Fertility

Increasing organic matter:

- Increases water retention
 - Reduces frequent irrigation
 - Slows down erosion
- Binds nutrients for long-term use

Factors in Soil Fertility



Soil Fertility

Organic Inputs

- Animal Manures *
- Compost **
- Organic Matter
- Formulated/pasteurized fertilizers
- Worm Castings, Emulsions, Meals
- Mineral Rocks
- Green Manures (Cover Crops)



Weed Management

Why not weeds?

- Compete for light, water, nutrients
- Increase pest/insect habitat
- Increase weed seed “bank”

Roundup, Preen, or any herbicides NOT allowed in organic growing

Options:

- Cultivation Practices
- Prevention



Weed Management



Cultivation practices

- Hoeing small weeds
 - white thread stage
- Hand weeding (between rows in a bed)
- Mulch to prevent light from reaching weed seeds
- Prevent weeds from going to seed (pull & compost!)

Pest Management



Source <http://chopwoodcarrywaterplantseeds.blogspot.com>

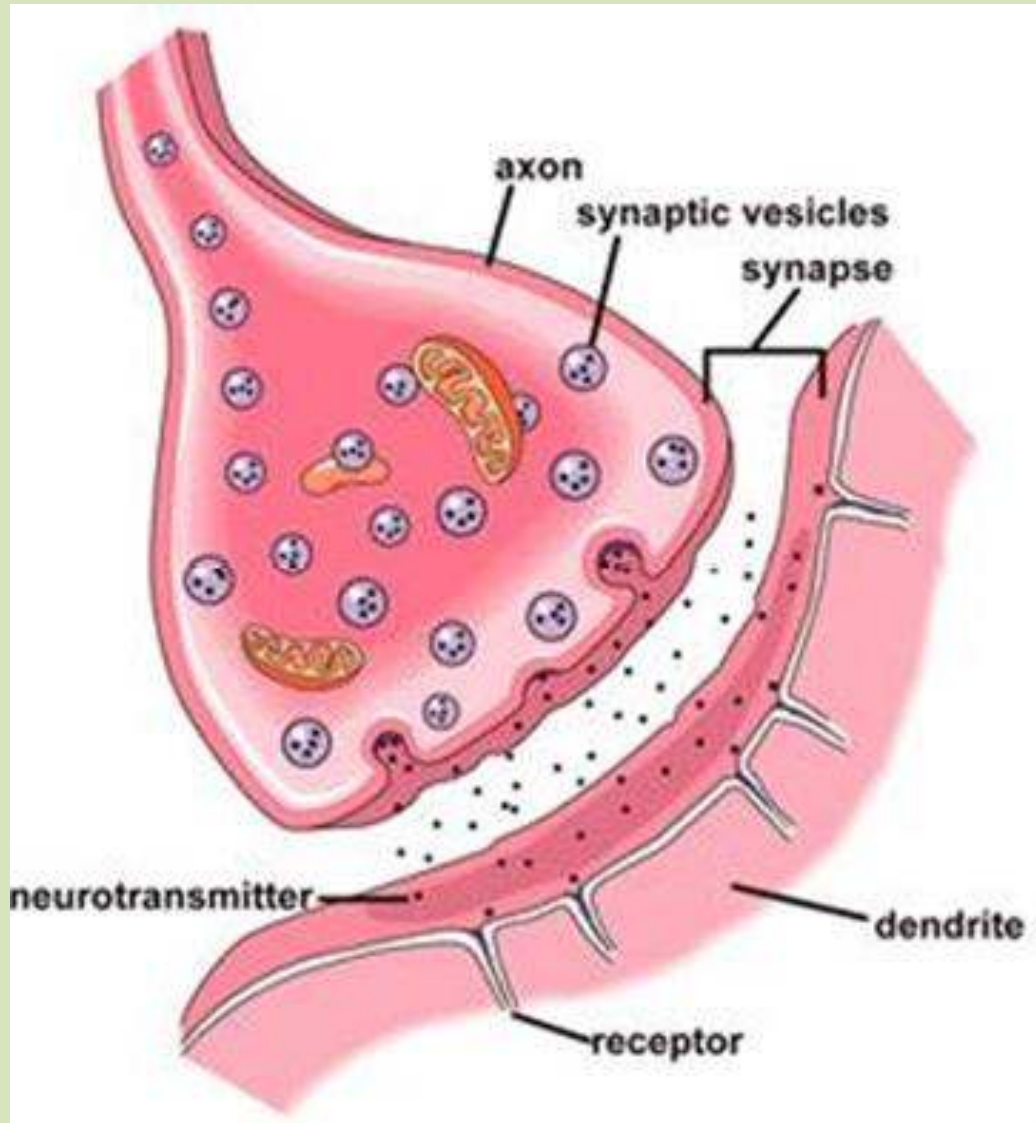


Insecticides work in two ways:

Axon poisons – affects the axon so that a message can't be passed.

Synapse poisons – turns off the signal to release Acetylcholinesterase

Pest Management



Insecticides work in two ways:

Axon poisons – affects the axon so that a message can't be passed.

Synapse poisons – turns off the signal to release Acetylcholinesterase

Pest Management

KINGDOM
(Animalia)



PHYLUM
(Chordata)



CLASS
(Mammalia)



ORDER
(Primates)



FAMILY
(Hominidae)



GENUS
(*Homo*)

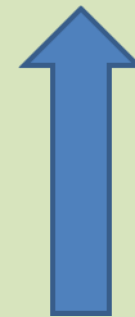


SPECIES
(*sapiens*)



Figure 1-4 Biological Science, 2/e © 2005 Pearson Prentice Hall, Inc.

Pest Management



Pest Management The Good



Parasitic Wasp Eggs



Parasitic Wasp

Pest Management The Good



Lacewing Larva preying on Aphid



Soldier Bug with Colorado Potato Beetle Larva

Pest Management

The Bad



Large Milkweed
Bug

Harmful insects:

- Destroy crops
 - Diminish photosynthesis processes
 - Suck sap
- Transmit disease

Pest Management

The Ugly



Lady Beetle Larva



Lady Beetle

Pest Management



Familiarize yourself with beneficial and harmful insects in their various lifecycle stages

- Egg
 - Easiest control
- Larval
 - Active feeding
- Adult
 - Reproductive
- Knowledge is power!
Work with nature!

Pest Management



- Destroy the bad/Invite the good
- Companion plantings
- Rotate plantings
- Scouting

Pest Management



Destroy the Bad

- Handpick
- Squish or drown in soapy water
- High pressure water spray
- Insecticidal soap or soapy water

Pest Management

Invite the Good:



Plant an inviting habitat for beneficials with a variety of plants

- Bee Balm - Hoverfly, Predatory Wasp
- Parsley-Hoverfly, Tachinid Fly
- Sunflowers-Lacewings, Lady Beetle
- Buckwheat-Parasitic Wasps, Lady Beetle

Pest Management



Companion Plantings confuse or distract bad insects

- Beans with potatoes confuse bean beetles and potatoes beetles
- Marigolds or basil with tomatoes deter Tomato Horn Worm

Pest Management

Rotate Crops

- Many pathogens infect all crops in the same family
- Some pathogens infect crops from several families
- Rotate between families at least every 2-3 years



Rotating Plantings:

- Deprive over-wintering larva of a food source for next year
- Deprive over-wintering adults of the perfect place to lay eggs
- Reduces stress on plants from soil-borne diseases or nutrient deficiency

Pest Management

Rotate Crops

- Many pathogens infect all crops in the same family
- Some pathogens infect crops from several families
- Rotate between families at least every 2-3 years



Disease Management



Options

- Cultural practices
- Diversity
 - Plant Families
 - Varieties
- Crop Rotation
- Disease resistant varieties
- Scouting

Disease Management



Cultural Practices

- Water in a.m.
- Water deeply
- Mulch to minimize splashing, drought stress
- Adequate Spacing = good air circulation

Disease Management



- Plant Diversity
- Mix it up!

Polyculture
NOT
Monoculture!

- Crop Rotation
- Make a plan

The End?



The Beginning!



Thank You!