

## **MOFGA's *Grow Your Own Organic Garden* RESOURCE LIST**

Please use the resources listed below to help get your garden started!

### **MOFGA**

[www.mofga.org](http://www.mofga.org) 207-568-4142

Event calendar, fact sheets, contact info for Agricultural Services staff

### **Appropriate Technology Transfer to Rural Areas**

[www.attra.org](http://www.attra.org) 1-800-346-9140

Start here – A HUGE library of fact sheets and other publications for farmers and gardeners. See especially the “Resource Guide to Organic & Sustainable Vegetable Production.” For those without internet access, a call to the toll-free number will get you any of their publications for free.

### **Organic Gardening: A Guide to Resources from the National Agricultural Library**

[www.nal.usda.gov/afsic/AFSIC\\_pubs/org\\_gar.htm](http://www.nal.usda.gov/afsic/AFSIC_pubs/org_gar.htm)

A very comprehensive list but poorly organized

### **Rodale's Organic Gardening**

[www.organicgardening.com](http://www.organicgardening.com)

A monthly magazine and book publisher dedicated to organic gardening, with a useful website

### **All Organic Links**

[www.allorganiclinks.com](http://www.allorganiclinks.com)

A well-organized gateway to organic info

### **ACRES USA – a voice for eco-agriculture**

[www.acresusa.com](http://www.acresusa.com) (512) 892-4400

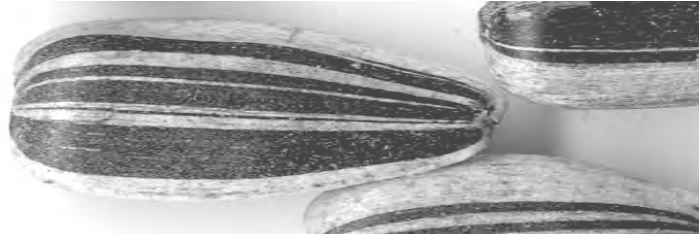
A newsletter and huge book catalog focusing on organic agriculture and rural skills

### **Maine YardScaping**

[www.yardscaping.org](http://www.yardscaping.org)

Maine based site that deals with all aspects of low-input, home landscaping

*Please see reverse side for garden supplies...*



# Maine Seed Companies

**Fedco Seeds**, PO Box 520, Waterville, ME 04903; 207- 873-7333;  
[www.fedcoseeds.com](http://www.fedcoseeds.com)

**Johnny's Selected Seeds**, 955 Benton Ave, Winslow, ME 04901; 1-877-564-6697; [www.johnnyseeds.com](http://www.johnnyseeds.com)

**Pinetree Garden Seeds**, PO Box 300, New Gloucester, ME 04260; 207-926-3400; [www.superseeds.com](http://www.superseeds.com)

**Wood Prairie Farm**, 49 Kinney Rd, Bridgewater, ME 04735; 800-829-9765;  
[www.woodprairie.com](http://www.woodprairie.com)

**Maine Potato Lady**, PO Box 65, Guilford, ME 04443; 207 343-2270;  
[www.mainepotatolady.com](http://www.mainepotatolady.com)

## **Farm & Garden Suppliers**

**Paris Farmer's Union** (locations around the state)  
[www.parisfarmersunion.net](http://www.parisfarmersunion.net)

**Griffin Greenhouse & Nursery Supplies, Inc.** 50 West Gray Road, Gray, ME 04039; 207- 657-5442; [www.griffins.com](http://www.griffins.com)

**Greenhouse Supply Inc** 12 Acme Rd Ste 212, Brewer, ME 04412-1546; 207-989-1585; [www.greenhousesupply.com](http://www.greenhousesupply.com)

**Peaceful Valley Farm & Garden Supply**, 125 Clydesdale Court  
Grass Valley, CA 95945; 1-800-784-1722  
[www.groworganic.com](http://www.groworganic.com)



# Pest Profile



## The Occurrence and Control of Vegetable Pests in Maine

BY ERIC SIDEMAN AND JEAN ENGLISH

The bugs are coming! It's mid-May, you're setting your broccoli plants out, and the flea beetles are hopping with joy. Then the leaf miners worm their way into the spinach. And the cucumbers take flight toward the cucumbers.

One key to controlling these pests—whether insects, diseases or physiological problems—is knowing when to expect them, and the chart below can serve as a guide to their due dates. It also lists the most important organic solution to

these pests. The dates of occurrence are colated from the University of Maine Cooperative Extension Service publication, *Bug Reporter*, from 1987 through 1990. The most important control measures are given by Eric Sideman.

The chart shows that insects begin to threaten plants almost from the beginning of planting, and many of them persist throughout the growing season. Diseases occur later, when the weather is warmer and more amenable to their growth. Coons come the day before you were planning to pick the corn. This chart is not complete—it rep-

resents reported incidences of these pests throughout Maine (mostly in southern and central Maine). Woodchucks, for example, are only listed as pests for four weeks, but we all know how much longer they can do damage. Damping off is another example—it can easily affect seedlings all spring and summer. So use the chart as a guide and fill it with your own observations. It should help you help your garden grow better year after year. If you want more detailed or additional information about these or any other pests, call Eric Sideman at the MOFGA office.

Please note: rotenone, sabadilla and pyrethrum are natural, plant-produced pesticides that are toxic to humans. Be sure to handle them as directed on the package. Although they break down very quickly, they still are environmentally harmful to some extent. They are recommended here only as a last resort. □

	May		June				July				August				September		Most Important Organic Solution
	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	
Frost Damage	✓	✓	✓	✓	✓	✓											Wait for warm weather; use frost protection
Damping off	✓	✓	✓	✓	✓	✓											Wait for warm weather
Flea beetles	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓				Floating row cover early in season
Seedcorn maggot	✓	✓	✓	✓	✓	✓	✓										Shallow planting; wait for warm soil
Seedcorn rot	✓																Wait for warm soil
Imported cabbage worm	moths	eggs	✓	✓	✓	✓	2nd generation	✓	✓	✓	✓	✓	✓	✓		✓	B.t. (Dipel, Thuricide)
Cutworms	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					Fall weed control, collars around seedlings
Cabbage root maggot			✓	✓	✓	✓	2nd generation	✓	✓	✓	✓	✓	✓	✓	✓		Floating row covers
Colorado potato beetle	✓	✓	✓	✓	✓	✓	larvae feeding	✓	✓	✓	✓	✓	✓	✓	✓		B.I. SanDiego (M-One, or Bonide brand)
Slugs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		Dry sand barrier
Garden springtails	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		Clean up weeds and debris
Common asparagus beetles	✓	✓	✓	✓	✓	✓	✓	✓	between generations	✓	✓	✓	✓	✓			Rotenone, if major problem
Striped cucumber beetles	✓	✓	✓	✓	✓	✓	✓	✓	✓	breeding in blossoms	✓	✓	chewing blossoms	✓			Floating row covers until flowers, then pyrethrum
Woodchucks		✓	✓	✓	✓	✓											Dog, keep susceptible crops from garden edges
Cool weather damage			✓														Protect plants
Wireworms on potatoes					✓						✓						Do not plant in newly turned sod
Seed rot					✓												Wait for warm soil
Mexican bean beetles					✓	✓	✓	✓	✓	✓	✓	✓	✓				Clean up crop debris in fall, rotenone
Moles					✓												Control grubs
Spinach leaf miner on spinach, beets, swiss chard				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				Control weed hosts (chickweed, lambsquarters)
Spotted asparagus beetles					✓	✓	✓	✓	✓	✓	✓	✓	✓				Rotenone, if major problem
Nitrogen & phosphorus deficiency in corn							✓	✓	✓	✓	✓	✓	✓				Proper soil fertility
Crows							✓	corn seedlings			✓	cukes & tomatoes					Maybe: scare-eye balloons
European corn borer on corn, potatoes, peppers, beans, celery, tomatoes							✓	✓	✓	✓	✓	✓	✓	✓	✓		Fall clean-up of stalk
Common stalk borer on corn, peppers, tomatoes							✓	✓	✓	✓	✓	✓	✓				Weed control in fields & gardens, mow weeds in fence rows
Onion maggots							✓	Drone				✓					Floating row cover
Earwigs							✓		✓								Home-made traps
Japanese beetles							✓										Milky spore grub control in southern Maine, Rotenone as last resort
Deer							✓					✓	beans		✓	asparagus	Fence
Common armyworm (southern Maine)							✓		✓		✓	✓	✓				Keep fields around corn mowed in fall, well-timed B.L. (Dipel)
Corn earworm							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	No good control, maybe well-timed B.L. (Dipel)
Potato stemborer							←	southern Maine	→	Belfast							Rare
Spotted cucumber beetle (Rare in Maine; same as southern corn rootworm)							✓	York Co.		✓	Dresden			✓	Kittery		Rotenone

	May			June				July				August				September		Most Important Organic Solution
	3	4		1	2	3	4	1	2	3	4	1	2	3	4	1	2	
Lettuce tipburn and bottom rot							✓											For tipburn: do not overfertilize; water evenly. For bottom rot: well drained soil.
Leahoppers (on corn & lettuce in southern Maine)							✓											Floating row cover
Blister beetles								✓	✓									Handpick (wear gloves), Sabadilla
Diamondback moth on cole crops								larvac		larvae & 2nd generation pupae	larvae			✓	✓		✓	B.I. (Dipel)
Angular leaf spot on vine crops									✓	✓	✓	✓			✓	✓		Clean up crop debris after harvest; do not save seed from diseased plants
Powdery mildew on summer squash										✓								Sulfur
White mold on beans										✓	✓	✓	✓	✓	✓			Long rotation; no beans, lettuce or carrots in succession
Halo blight on beans											✓				✓			Do not save seeds from diseased plants
Parsleyworm (larva of black swallowtail butterfly on carrots & dill)								✓									✓	Hand pick
Bacterial wilt on cucumbers										✓				✓	✓			Control cucumber beetle
Leaf spot on beets								✓										Remove first spotted leaves; crop rotation
Aphids									✓	potatoes		✓	✓	potatoes, corn				Insecticidal soap
Fall armyworm on corn									✓	✓	✓	✓	✓	✓	✓	✓	✓	Well-timed B.I. (Dipel) spray
Squash bug									✓	✓	✓	✓	✓					Clean up last year's squash debris
Tarnished plant bug									✓	✓	✓	✓	✓	✓	✓	✓	✓	Floating row cover when appropriate
Cucumber mosaic								✓										Resistant varieties, control aphids
Early blight on tomatoes & peppers									✓	✓	✓	✓	✓					Maintain good fertility, proper light; crop rotation, clean up crop debris
Anthracoze on tomatoes									✓		✓		✓					Crop rotation, clean up crop debris & rotting fruit
Green peach aphids on potatoes									✓		✓	✓						Insecticidal soap
Late blight on tomatoes & potatoes										✓	✓	✓						Clean up all potatoes (culms, too!)
Botrytis on potatoes									✓		✓	✓	✓					Good aeration around plants
Alternaria on cucumbers									✓									Crop rotation, maybe
Fusarium									✓	beans, peas	✓	squash, asparagus, beans						Resistant varieties
Septoria on tomatoes										✓					✓			Clean seed, sterilize flats, crop rotation
Sclerotina on tomatoes, peppers									✓									Sulfur may slow spread, cut off diseased part of stem
Black leg on potatoes										✓								Use certified seed potatoes
Squash borers on squash									✓									Harrow soil in fall, plow deeply in spring
Root rot on cole crops									✓									Avoid waterlogged soils
Cabbage aphids on cabbage										✓								Insecticidal soap
Salt marsh caterpillar on cabbage in Warren										✓								B.I. (Dipel)
Potato leafhopper on potatoes									✓									Floating row cover, pyrethrum
Aster leafhopper on potatoes										✓								Floating row cover, pyrethrum
Nutritional deficiencies on tomatoes										✓								Proper soil fertility
Mites on beans										✓			✓					Rarely a problem on unsprayed crops
Clubroot on broccoll													✓		✓		✓	Raise soil pH above 7.0 and plant no cole crops for 3 to 7 years
Scab on squash										✓								Resistant varieties
Growth cracks on tomatoes; on carrots, radishes & other root crops										✓	✓							Water evenly
Green shoulder on tomatoes										✓	✓							Choose other varieties
Drought										✓								Maintain soil moisture
Corn smut in Belfast										✓								Cut off and destroy bolls before spore release
Gray mold on beans											✓							Good crop aeration
Three-lined potato beetle in Windham											✓							Rarely a problem in Maine
Grasshoppers											✓						✓	<i>Nosema locustae</i>
Raccoons in corn											✓							Dog
Skunks in corn											✓							Fence
Verticillium on eggplant													✓					Resistant varieties
Northern corn rootworm in Kittery													✓					Crop rotation
Hornworm on tomatoes														✓				Hand pick
Powdery mildew on cucurbils														✓	✓			Sulfur
Whiteflies on beans & tomatoes														✓			✓	Sticky traps
Sunscald on tomatoes & peppers														✓				Maintain leaf cover
Onion thrips														✓				Weed control near onions
Head rot on cauliflower & broccoll														✓				Wide spacing
Bacterial soft rot on cole crops															✓			Avoid wounds, crop rotation
Blister beetles on potatoes															✓			Rarely a major problem; if so, pyrethrum
Carrot rust fly maggots																	✓	Floating row cover
Sap beetles on overripe fruits																	✓	Destroy overripe fruit

# 4 Hot Recipes

**T**HE RECIPE QUALITY, LAYERING and type of materials you use in your compost batch will determine the end product of your efforts.

The following recipes or ratios are flexible and can be modified to your own taste. The recipes are listed in descending order from hottest to least hot piles. A pile containing high nitrogen materials (greens) will heat up faster and become compost faster.

## Compost Cookbook

N = nitrogen; NN = higher nitrogen content; NNN = highest nitrogen. C = carbon; CC = higher carbon content; CCC = highest carbon. The ratio of carbon to nitrogen in your soils will vary. In the recipes below where soil is recommended, use any soil in your yard or garden.

### Recipe #1

2 parts	Dry leaves	CC	Browns
2 parts	Straw or wood shavings	CCC	Browns
1 part	Manure	NNN	Greens
1 part	Grass clippings	NN	Greens
1 part	Fresh garden weeds	NN	Greens
1 part	Food scraps	N	Greens

### Recipe #2

3 parts	Dry leaves	CC	Browns
1 part	Fresh garden weeds	NN	Greens
1 part	Fresh grass clippings	NN	Greens
1 part	Food scraps	N	Greens

### Recipe #3

6 parts	Dry leaves	CC	Browns
3 parts	Food scraps	N	Greens
3 parts	Fresh grass clippings	NN	Greens
1 part	Soil		

### Recipe #4

3 parts	Dry leaves	CC	Browns
2 parts	Fresh grass clippings	NN	Greens
1 part	Soil		

### Recipe #5

9 parts	Dry leaves	CC	Browns
1 part	Soil		

... or your own special blend.


## Condiments


The following condiments will spice up your pile. These materials are not required, but can be beneficial to the process. Sprinkle the condiments throughout the pile.


Garden soil (high in microorganisms)	shovelfuls
Finished compost (very high in microorganisms)	shovelfuls
Bone meal (high nitrogen source)	1/4 shovelful
Blood meal (high nitrogen source)	1/4 shovelful
Fireplace ashes (high in potash and carbon)	shovelfuls
Crushed fertilizer rock dust (rich in minerals/feeds microbes)	shovelfuls
Compost starter	per directions

# Comparative Household Composting - NO MORE SMELLY GARBAGE!

## INGREDIENTS

a.  kitchen scraps

b.  garden weeds & clippings

optional  Fall leaves

manure  d.

## METHODS

### (A) The Cool Heap

throw in a, & b. & some c. (as it arrives)



- leave for a year or so & spread under garden plants as a mulch  
- build a new heap every year, just adding as you go.

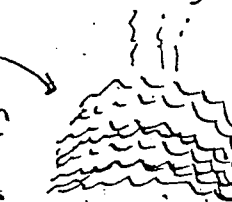
### (B) The Hot Heap

Build heap all at once layer a. & b.

with some manure d. and soil



turn after it cools



turn after it cools

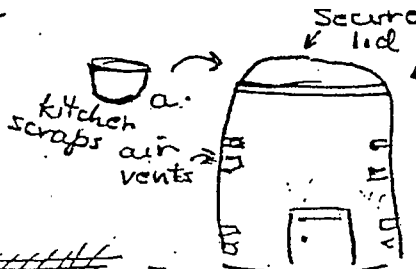


store and mature

can be ready to use in several months (or even weeks)

### (C) The Plastic Household Compost Bin

for small in-town yards) tidy



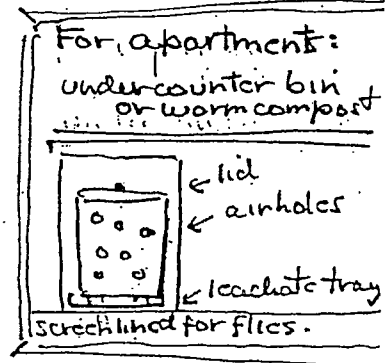
Secure lid

a few garden weeds

1) let it be and harvest compost occasionally

OR

2) aerate with a stick to speed up composting

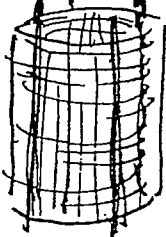


For apartments: undercounter bin or worm compost

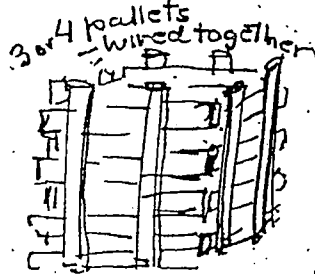
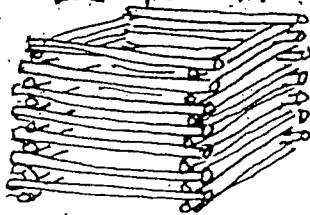
lid  
airholes  
leachate tray  
Screen lined for flies.

### (D) Common Homemade Compost Bins

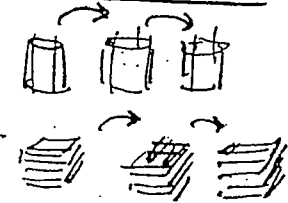
wire cylinder



log cabin style pole bin



### (E) Turning Bins



(for more and faster compost)

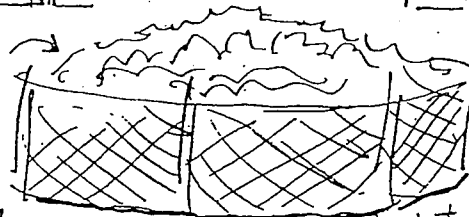
etc any number of bins

### (F) Leaf Bin (for large quantities of fall leaves)



d.

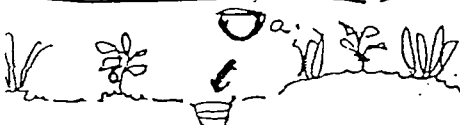
bagged or raked leaves



big wire leaf bin - to let leaves break down slowly

after a year or so use to mulch garden plants  
\* OR add to (B) - layered hot heap for finer compost.

### (G) Trench composting

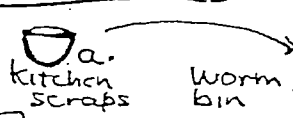


in garden rows or beds



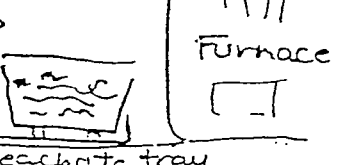
(rotate through garden)

### (H) Worm Composting

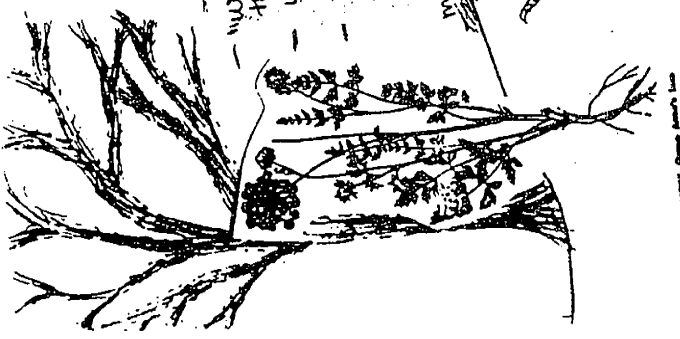


Basement

> 50°F



leachate tray



**Ramial chipped wood**  
 incorporate into soil in fall

Worms want their food on top, and they want to be left alone.  
 Warm pops. can be reduced by 90% by deep + frequent tillage  
 Fields w/ earthworm tunnels can absorb water 4-10x faster than those w/o.

mulch  
 earthworm castings concentrate nutrients, earthworms produce plant growth stimulants

aeration → microbial activity

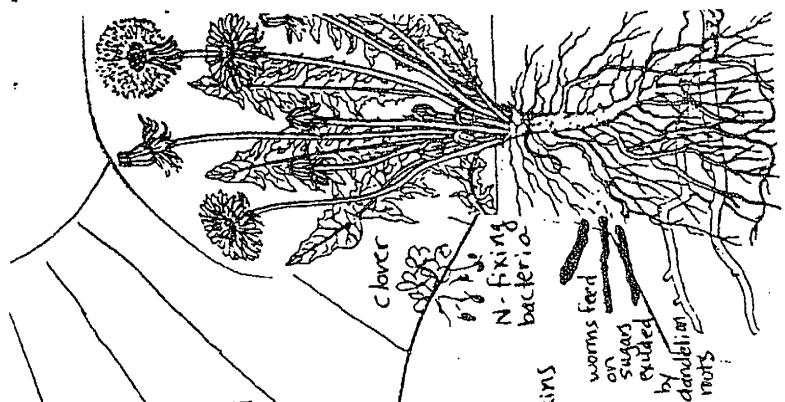
Protozoa feed on bacteria and release N for plant roots

Bacteria + Fungi  
 - cycle nutrients + water hormones  
 - may release plant growth hormones  
 - improve soil structure (secrete glues, waxes, sticky proteins...)

**CRITICAL THINKING WITH SOIL**

- No-till or low-till
- Cover crops + Green Manures
- Mulches
- Biostrips
- Ramial chipped wood
- Compost → food + shelter for soil organisms → activates disease resistance in plants (tea too)

Each 1% increase in O.M. can increase soil water storage capacity by 16,000 gal./A-foot



60% of photosynthates translocated to roots, then feed soil organisms

Mycorrhizal fungi colonize plant roots - hyphae absorb N, P, etc., + water; protect from harmful nematodes

↓ soil insects + root-rot fungi; produce hormones, toxins + antibiotics; bind soil particles

Beneficial nematode feeds root-feeding nematode

Beneficial nematodes are easily killed by plowing. Ouch.

Beneficial nematode feeds on fungus soil fungus → releases N to plants

Beneficial nematode feeds on bacteria + releases N to plants

∴ N fertilizer required!!!

NOT EXACTLY TO SCALE...

Water entering soil in 1 hr.

Manure T/A	Inches Water
0	1.2
8	1.9
16	2.7

1 A: Living topsoil:

900 lbs.	earthworms
2400 "	fungi
1500 "	bacteria
133 "	protozoa
840 "	arthropods + algae

# SOIL: A LIVING COMMUNITY PART OF THE EARTH

**TOPSOIL: THE MOST BIOLOGICALLY DIVERSE**

**SOIL ORGANIC MATTER: A bank account for plant nutrients**  
 ∴ Feed for soil organisms

Soil organisms, rather than machinery, till the soil  
 Soil organisms, rather than synthetic chemicals, feed the soil and protect plants



TABLE III






Crop Name	Seeding Rate (Lbs/Acre)	Seeding Rate (Lbs/100 sq. ft.)	When to Sow	When to Turn Under	Soil
Alfalfa	12	.3	Spring	After two years growth	Fertile loam Well limed Well drained
Buckwheat	50	1.25	Early Summer	Late summer or early fall	Widely adaptable to soil type, fertility and pH
Clover, alsike	8	.25	Spring	Fall	Tolerates acidic and poorly drained soils, but not sandy soils
Clover, red	12	.275	Late spring/summer	Following spring/fall	Fertile loam slightly acid/ neutral
Clover, ladino	12	.3	Late spring/early summer		Sandy loam Medium lime
Millet, Japanese	30	.75	Late spring/early summer	Late summer/fall	Loam relatively fertile, tolerates low pH
Oats	100	2.5	Early spring Late summer/fall	Fall Following spring	Widely adaptable to pH and fertility
Rye, Winter	100	2.5	Late summer/early fall	Spring	Widely adaptable to pH and fertility
Ryegrass, Italian	45	1.0	Spring Fall	Fall Spring	Widely adaptable to pH and fertility
Sudangrass and sorghum- sudangrass hybrids	30	.75	Early summer/summer	Fall	Widely adaptable to pH and fertility
Vetch, hairy	50	1.25	Spring Fall	Fall Spring	Widely adaptable to pH and fertility.





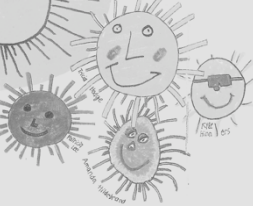
Sponsored by  Maine Organic Farmers and Gardeners Association  
www.mofga.org

## What is MOFGA ?

Organic Certification      Volunteers      Common Ground Fair      Events

For More Information visit: [www.mofga.org](http://www.mofga.org)



## Choosing a Site for your Garden

**Considerations**

- Sunlight
- Wildlife
- Soil Quality
- Drainage









## Sites to Avoid

- Fill Dirt
- Wet Places
- Depressions

## What if I don't have a sunny garden spot?

Beets  
Peas  
Spinach  
Lettuce  
Carrots  
Kale

## Planting Periods

according to frost-free date

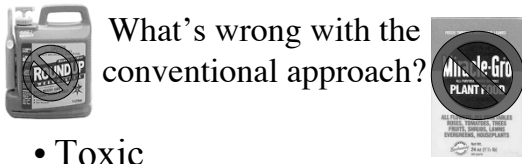
4-6 weeks before	2-4 weeks before	On Frost-Free Date	Summer
Peas Radish Spinach Turnip Parsley	Beets Cauliflower* Celery  Early Sweet Corn Dill Fall Potatoes Parsnips	Chard Beans Sweet Corn  Cucumbers Winter Squash Summer Squash Cucumbers* Tomatoes* Eggplant* Pepper*	<u>Mid-June</u> Beans Sweet Corn Cabbage Carrots Radish  <u>Early/mid-July</u> Broccoli Cauliflower Beets Kale  <u>Late July</u> Lettuce Beets Peas Spinach Radish

\*transplants  
# transplant seedlings started in February

### Plant Response to Transplanting

Tolerant of Transplanting from Flats	Need Individual Containers or cells	Generally Not Transplanted
Broccoli Cabbage Cauliflower Eggplant Leeks Lettuce Onions Parsley Peppers Tomatoes	Corn Cucumbers Melons Squash	Beans Beets Carrots Peas Parsnips Spinach

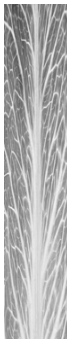
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### What's wrong with the conventional approach?

- Toxic
- Kill Beneficial Insects
- Health & Environment
- Petroleum Based

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### The organic approach

- Mimics nature
- Recycles nutrients and waste
- Minimizes external inputs
- Preserves and enhances soil biological activity
- Conserves soil
- Conserves soil moisture
  - Eliminates the need for toxic chemicals
  - Generally promotes human & ecological health

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### *TAKE AN ECOLOGICAL APPROACH*



- Mimic Nature
- Maximize Diversity
- Balance Systems

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## “Feed the SOIL, not the plant”

*-Robert Rodale*

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### Key To Organic Soil Care

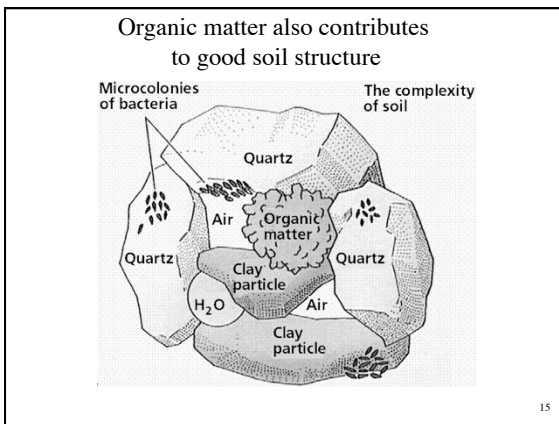
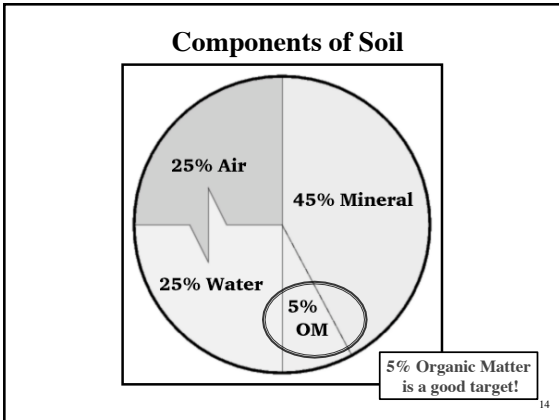
- Build Soil Structure and Encourage Microbial Activity
- Build Reservoirs of Plant Nutrients
- Minimize Environmental Impact

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### Functions of Organic Matter

RAW	HUMUS
<ul style="list-style-type: none"> <li>• Provide Soluble Nutrients</li> <li>• Provide Food for Microbes</li> <li>• Releases glues for Soil Aggregation</li> </ul>	<ul style="list-style-type: none"> <li>• Provides Slow Release Nutrients</li> <li>• Increases Nutrient Holding Capacity (“cation exchange capacity”)</li> </ul>

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### What makes Soil Fertile?

- Plant Nutrients
- pH
- Structure
- Biological activity

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### Building Structure and Fertility Organically: 2 Areas of Focus

<ul style="list-style-type: none"> <li>• Adding Organic matters                             <ul style="list-style-type: none"> <li>- Living</li> <li>- Dead</li> <li>- Very Dead (humus)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Maintaining mineral content with Rock Powders</li> </ul>
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### Meeting Plant Needs with Specific Organic Amendments

**pH:** adjusted by adding ground limestone

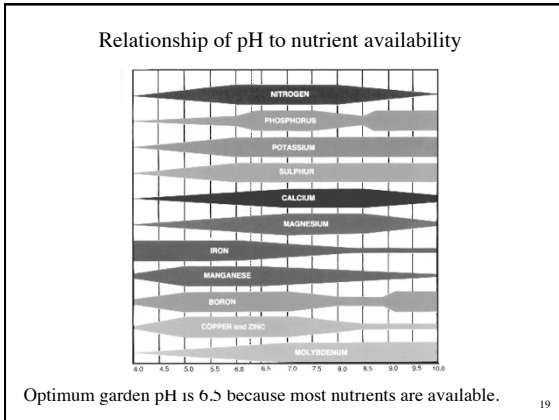
**Phosphorous:** rock phosphate, bone meal

**Potassium:** wood ash (also has a liming effect), sul-po-mag

**Nitrogen:** compost, manure and mulches, legume green manures, blood meal, alfalfa meal

(see handouts for specific application rates)

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### Key Organic Strategies



- Crop Rotation
- Cover Crops
- Green Manures
- Diversity
- Compost
- Observation!

### Crop Rotation: Objectives
















- Control Insects & Disease
- Manage Weeds
- Manage Nutrients
- Build Soil

### Crop Rotation to Manage Nutrients

Rotate Crops w/ Crops

	<b>Heavy Feeders:</b>		<b>Light Feeders:</b>
Corn		Peas	
Spinach		Peppers	
Squash		Radish	
Tomatoes		Beans	

### 3 Year Crop Rotation

Root & Bulb	Fruit & Seed	Leaf & Stem
		
		
		
		
		

### Crop Rotation for Insect and Disease Control

### Cover Crops and Green Manures

Rotate Crops w/ Cover Crops to:

- Replenish/Add Organic Matter
- “Mop up” Soluble Nutrients in fall
- Tap Leached Nutrients w/ Deep Roots
- Scavenge nutrients
- Fix nitrogen with leguminous green manures
- Control weeds



### Good Cover for the Whole Season

Cow peas

Field peas

Hairy vetch with rye

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### Helpful Cover Crops For Home Gardeners

buckwheat

oats

Summer

Fall

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## Compost

- Build Organic Matter
- Nutrients
- Microorganisms

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### Composting = Aerobic Decomposition of organic material

Plus oxygen and water

Microbial Decomposition

CO<sub>2</sub>

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### Energy Flow in the Composting Foodchain

Energy flows in the direction of the arrow

1 = First level Consumers  
2 = Second level Consumers  
3 = Third level Consumers

Organic Residues

Reproduced with permission from Dr. David Diegel, State University of New York, Syracuse. *Organisms not shown to scale.*

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### The Key to Successful Composting:

Cater to bacteria!! Give them OXYGEN, WATER & FOOD  
And let them do the work

### Necessities for Successful Composting

- Feed stocks
- Oxygen
- Moisture
- pH around 7

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## Feedstock C:N ratio -- between 20:1 and 40:1

20-40 parts                      to                      1 part

<u>Carbonaceous Feedstock</u>	<u>Nitrogenous Feedstock</u>
<ul style="list-style-type: none"> <li>• Usually Dry</li> <li>• Low Odor</li> <li>• Low Bulk Density</li> </ul> <p>Examples:</p> <ul style="list-style-type: none"> <li>Hay</li> <li>Sawdust</li> <li>Wood Chips</li> <li>Dead, Dry Leaves</li> </ul>	<ul style="list-style-type: none"> <li>• Generally Wet</li> <li>• Stinky!</li> <li>• High Bulk Density</li> <li>• High in Plant Nutrients</li> </ul> <p>Examples:</p> <ul style="list-style-type: none"> <li>Manure</li> <li>Fish Waste</li> <li>Food Waste</li> <li>Grass Clippings</li> </ul>

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FEEDSTOCKS	C:N
Corn stalks	60-70
Coffee grounds	20
Fish Waste	2-5
Food Scraps	11-13
Glass clippings (green)	9-25
Hay (with legume)	15-30
Leaves (fallen)	40-80
<b>Manure by type</b>	
Chicken	3-10
Cow	13-18
Horse	20-50
Sheep	13-20

**Carbon:Nitrogen**  
ratios for common  
compost feedstocks

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## Managing the Compost Pile

### To Turn or Not to Turn

- Turning will increase oxygen
- Heat kills weed seeds
- Should heat up in 1-2 days
- Monitor the temperature
- After turning- let cure for up to six months

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**Backyard composting containers**

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## Trouble-Shooting the Compost Pile

**Temperature-** Does not heat

- C:N ratio wrong?
- Too wet or dry? (Squeeze Test)
- Improper texture (too coarse or fine?)

**Odor-** Smells Bad instead of earthy

- Ammonia (C:N too low)
- Pungent (too wet)
- Ingredient smell (should be gone in 1 week)

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## Pest Management


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The organic approach to pest management is a **systems-based approach**


Design the system using *cultural practices* to avoid the problem.

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### Weed Control





Cultivation!



Flame weeding




Mulch

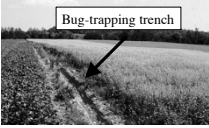
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### Dealing with Insects and Diseases


- Healthy Crops
- Timed Planting
- Sanitation
- Physical Barriers
- Predators and parasites
- Rotation
- Cover Crops
- Weed Control



Parasitic wasp eggs on Tomato hornworm







Bug-trapping trench



Floating row cover

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### Pest Control Materials


- Insecticidal Soaps
- Microbial insecticides
- Botanical insecticides
- Copper and sulfur sprays as fungicides (potentially toxic - use *only as last resort*)

Please note that some of these products are for home gardeners *only*- be sure to check the label

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## **Remember!**


### **Key Organic Strategies**



- Crop Rotation
- Cover Crops
- Green Manures
- Diversity
- Compost
- Observation!

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### **Happy Gardening**



Time to start your seeds!!

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