

Pests in The Garden

By : Mitch Yaciw

Unity Gardens Manager

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Thank You

KeyBank ®

The Good, The Bad, the Beautiful

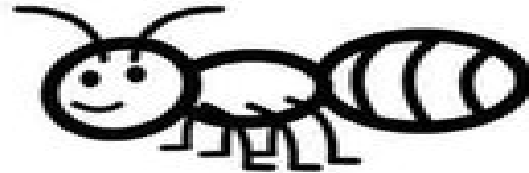
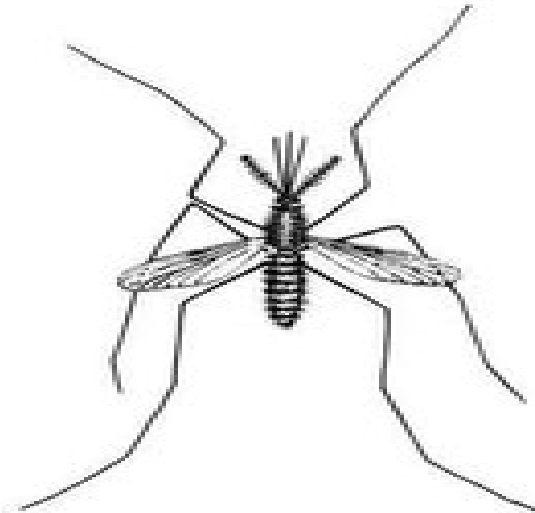
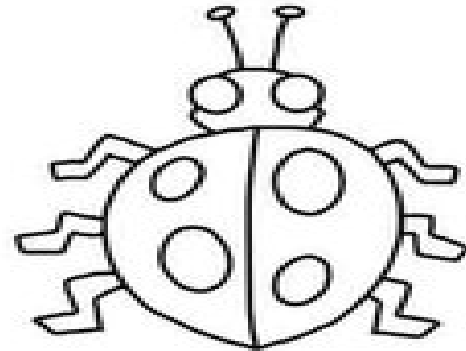
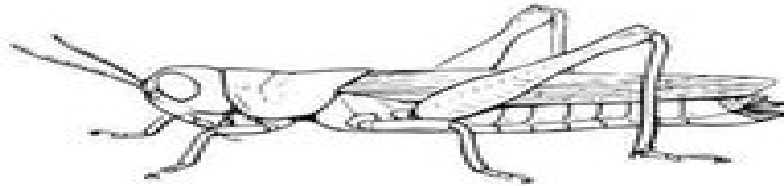
- Pests
- Pollination
- Recyclers
- Food
- More



Ever Have
Nightmares
About This Guy In
Your Garden



I love Bugs!



Know Your Enemy !



Revised and
Updated Edition

All You Need to Know About the Insects in Your Garden

GOOD BUG



Who's Who, What They Do, and How to Manage Them Organically

BAD BUG



Jessica Walliser
Co-Author of *Grow Organic*

The Bad

Colorado Potato Beetle



The Colorado potato beetle was first recognized as a pest of potato in Colorado in 1859

The native host for this insect is a relative of potato, buffalo burr.

Life Cycle of Potato Bug



The Bad



Colorado Potato Beetle

Larvae and adults both feed on foliage and if left untreated, complete defoliation of plants is possible. They also target Tomatoes, Eggplant, Peppers, and other related plants like horse nettle



Control



- Rotate
- Shadow your Garden
- Change Planting Time
- Pick them off Early
- Many Pesticides are ineffective
- Mulch crops with straw or hay before adults arrive. This will significantly reduce and delay infestation
- Row Covers
- Trenching

Control

- **Companion planting-** Coriander, dill, fennel, sweet alyssum, buckwheat and cosmos will attract beneficial insects. Inter-planting catnip or sage supposedly deters the Colorado potato beetle.



Tomato Hornworm



- **Hornworms overwinter as pupa in the soil and become active in July**
- **. The adult is a large moth, which lay pale green eggs on the underside of the leaves.**
- **The larvae are green with eight white stripes and have a horn on their tail end. The larvae feed on both leaves and fruits.**
- **1-2 worms can defoliate a five-foot tomato plant in less than three days. The larva drops off the plant after completing the feeding and pupates in the soil**

Signs of a Hornworm



On Tomato Leaf



Egg

First-instar



Second-instar



Third-instar



Fourth-instar



Fifth-instar



Pupa

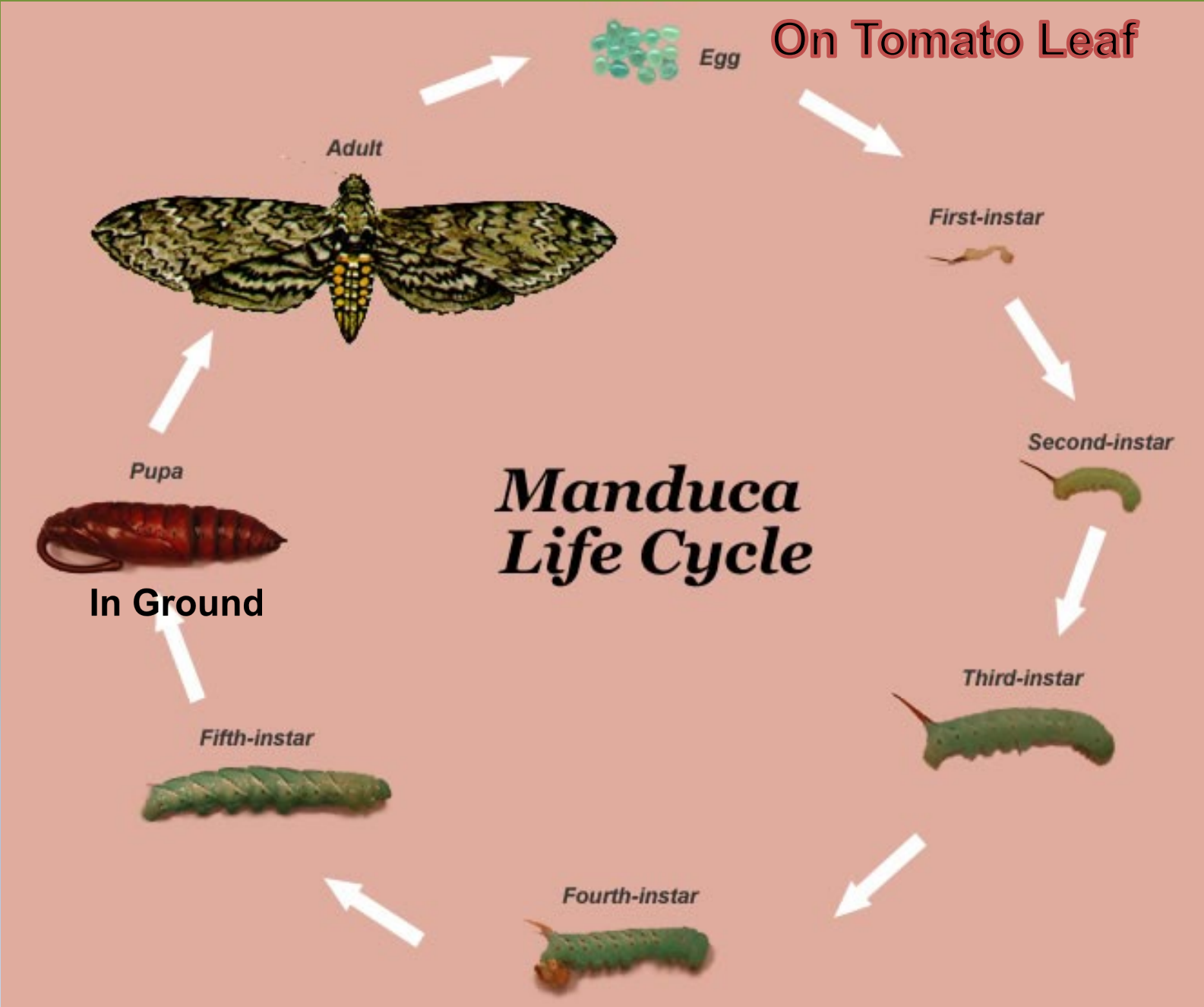


In Ground

Adult



Manduca Life Cycle



Control

- **Predatory bugs and parasitic wasps do attack the larvae and keep their populations under control,**
- **physically remove the larva from the leaves.**



Companion Repels Tomato Hornworm



Borage

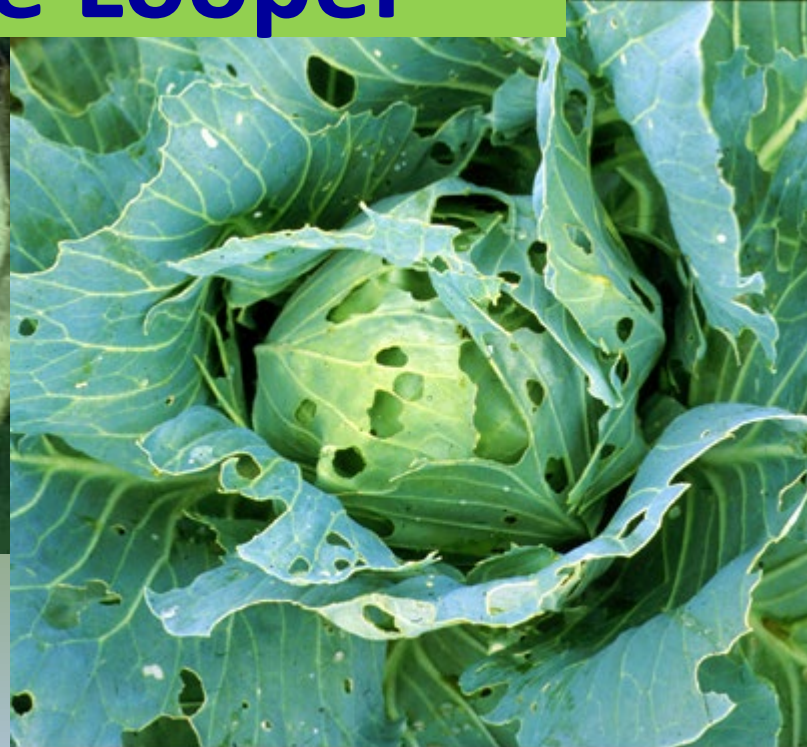
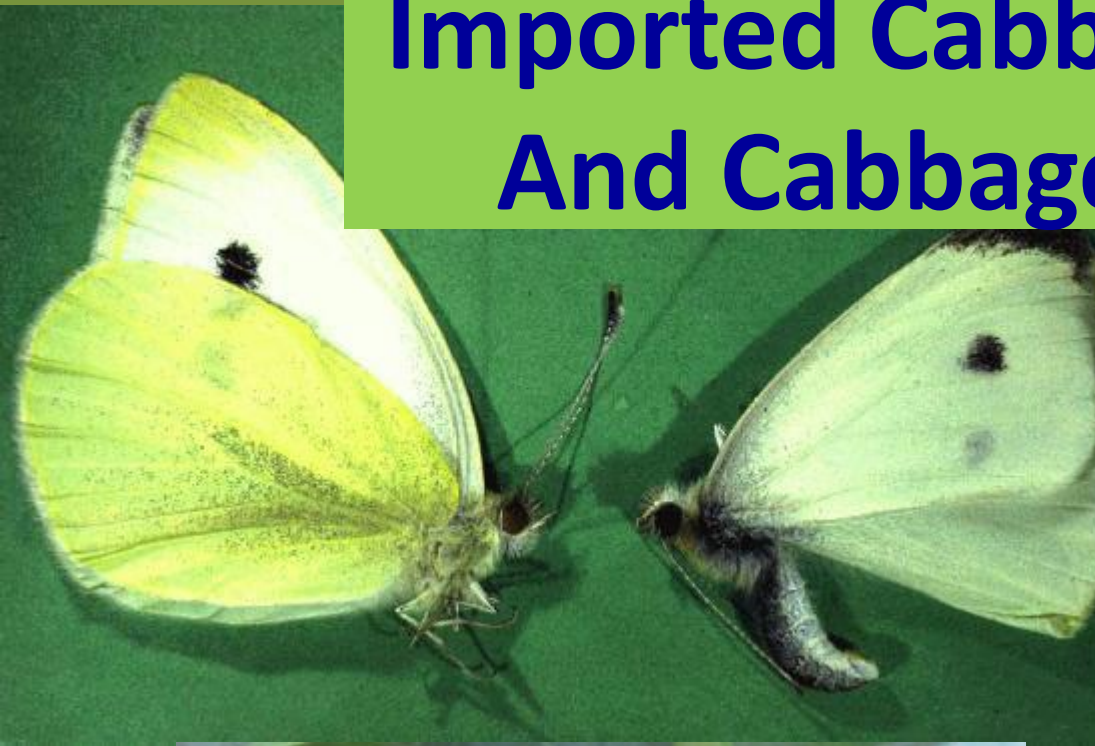
Borago officinalis

Annual herb with
star-shaped blue
flowers. Easy to grow.
Attracts bees. Grows
to height of about 2-3'
and will reseed.
Cucumber-like taste.

Companion
Repels Tomato Hornworm
CALENDULA - Pot Marigold



Imported Cabbage Worm And Cabbage Looper



Imported cabbageworm damage on cabbage
[Picture by R. Foster]



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Imported Cabbage Worm And Cabbage Looper

- Cabbage Worms will attack all members of the Cabbage family including cabbage, broccoli, Brussels sprouts, kale, kohlrabi, turnips, etc.
- Once they appear, hand-picking is best
- . BT (Bacillus thuringiensis) is a naturally occurring bacterium that will kill caterpillars when they eat it.



- **Dusting Plants**

Sprinkle damp leaves with corn meal, rye flour or a mixture of one part salt to two parts flour. Cabbage worms that eat this coating will bloat and die.

- **Pantyhose cover or row covers**

Use the stocking part of pantyhose to cover cabbage heads as soon as they start to form. The nylon stretches as the cabbage grows, allowing air, sun, and moisture in but keeping the cabbage butterfly out.



Companion For Cabbage

- **Geranium** - Repels cabbage worms, Japanese beetles.
- **Dill** - Improves growth. Blossoms attract honeybees



Dill



Geranium

Companion For Cabbage

- **Hyssop** - Improves growth, deters cabbage moth.
- **Mustard** - Plant mustard as a trap crop. It attracts numerous insect pests. Remove and destroy it before your main crops can be harmed.
- **Pennyroyal** - Discourages ants, plant lice, cabbage maggots



Hyssop



Mustard



Pennyroyal

Companion For Cabbage

- **Rosemary** - Repels carrot flies, bean beetles, cabbage moths.
- **Thyme** - Controls flea beetles, cabbage maggots, imported cabbageworms and white cabbage butterflies.



Rosemary

Thyme

SQUASH VINE BORER



- *(Melittia cucurbitae)*
The squash vine borer is found on squash and pumpkins.
- Keep a look out for wilting plant parts that may result from the burrowing of a white “worm” in the squash vines.
- The vine borer is the larva of a moth that lays its eggs at the base of the plant. It overwinters as a larva in the soil.

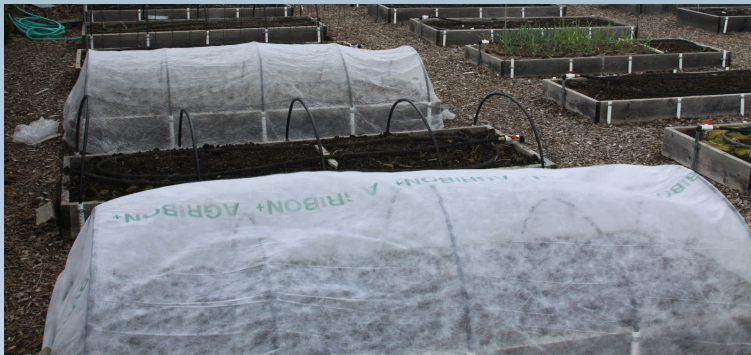
- The adults emerge from mid-June through July from cocoons in the soil.
- They typically lay their small (1/25"), oval, brown eggs singly on stems or leaf stalks towards the base of the plant. Eggs hatch in 7-10 days.
- The larvae immediately bore into the stem, leaving large entrance holes and yellowish frass.
- After feeding for about a month, the borers exit from the stem and burrow into the soil.
- They overwinter in a cocoon and pupate in the spring. There is one generation per year in the upper Midwest.



Control



- Keep floating row covers in place after transplanting or direct seeding until flowering .
- Pull plants as soon as harvest is finished
- Rotate !!
- Remove it
- Pesticides , at base of plant before it infest



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Squash Bugs

- The squash bug sucks sap from the leaves and stems of squash and causes the leaves to wilt and then turn black.
- This insect can also feed on the fruit and cause damage.
- The adults are dark gray and about 5/8 inch in length.



Squash bug adult



Stink bug adult



Squash bug nymphs



Squash bug eggs

Squash Bugs

- They live through the winter in protected areas under debris in the fields and buildings and lay eggs on the underside of leaves in the spring and summer.
- The eggs hatch into light green or gray nymphs that congregate on leaves or fruit.



Control



- Destroy egg masses on the underside of leaves
- During the summer, adults tend to congregate under shelter at night.
- Place boards on the soil surface near the squash in the evening and the next morning collect and destroy the pests

Control



- A parasitic fly, *Trichopoda pennipes*, affects adult squash bugs and several wasps parasitize the eggs. Provide habitat for these in or near the. (Daisy Like Flowers)
- Pyrethrum on young nymphs
- Neem Oil

Control



Diatomaceous Earth :powder made from ground up diatoms. It works by making microscopic cuts in the exoskeleton of insects- drying them out. Get the **food grade** Simply spread a layer of diatomaceous earth at the base of the plant. It doesn't work once it gets wet, so you will have to reapply as

Take care not to get DE on the blossoms, because it will not differentiate between a squash bug and a bee, lady bug or Tachinid fly. So be careful when using it.

Companion plant

Control squash bugs by planting repellent plants with your squashes. Nasturtiums and white icicle radishes are the most common companions. Other plants such as oregano, marigold, and dill can also provide some protection. Plant among squash.



Slugs



- Worse in shaded damp gardens.
- Slugs are generalist and feed on a wide variety of plants and vegetables



Get Rid Of Slugs



- 1. Night-time Slug Hunting: at night or early morning.
- 2. The Beer Trap Method: Another method is to use beer traps. Supplies needed: tinfoil baking container, yeast, and beer. Fill the baking tin with beer and bury it, with the top of it level with the surface of the ground. Sprinkle some extra yeast into the beer as this is what really attracts the slugs to the trap.



Get Rid Of Slugs



- 3. Crushed Egg Shells: This is a fairly effective method and adds calcium and other nutrients back into the soil as the shells decompose. The slugs don't like crawling over the sharp edges of the crushed egg shells.
- 4. Sluggo: This is a product that is safe around pets. It was recently certified to be used in organic gardening.



For raised beds use Copper strip



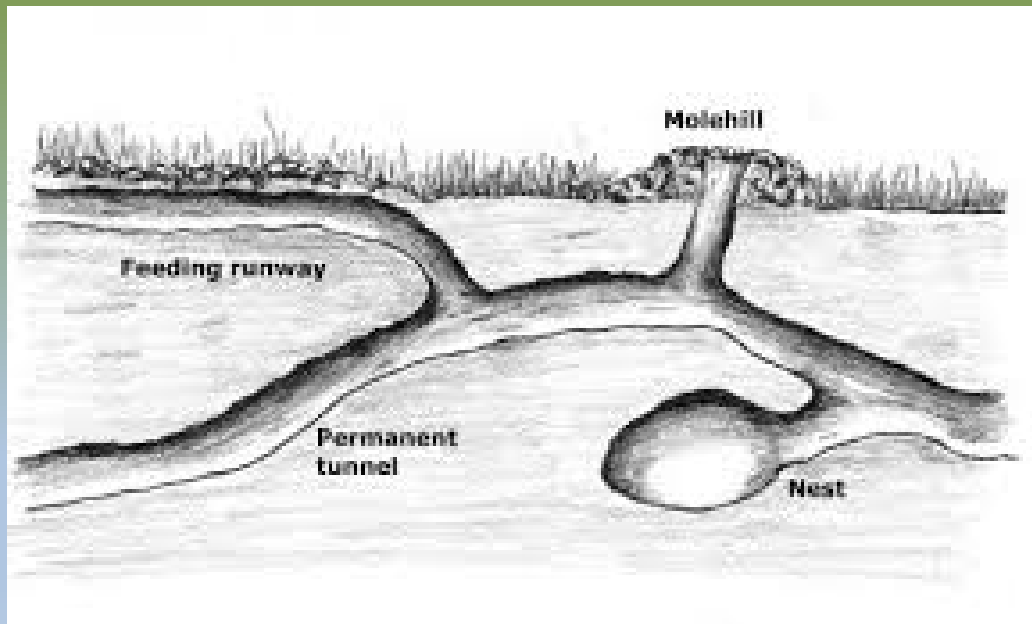
Copper barrier used on a raised garden bed



Moles



- Moles dig underground tunnels.



The Truth About Moles



- Moles are much maligned, delicate creatures that improve the soil, eat many pest insects, and get blamed for damage they do not cause.
- A good strategy is to try to tolerate them. In the long run, they are beneficial to the garden.

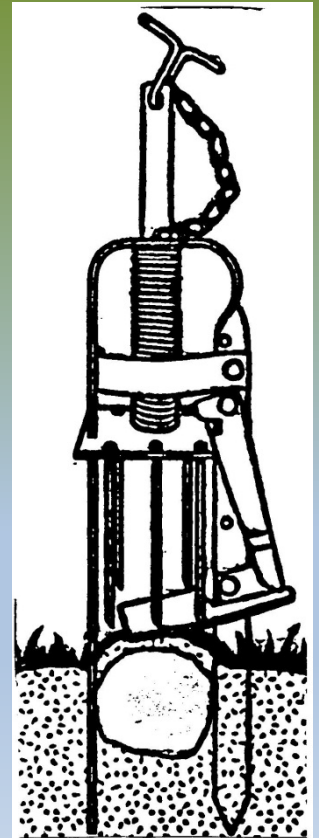
The Truth About Moles

- Moles eat many pests like beetle larvae, or grubs, and other insects
- They also eat earthworms and centipedes and occasionally a small amount of vegetable matter.
- A mole will starve to death if offered only plant food.



Mole Control

- Mole traps work best



Grubs

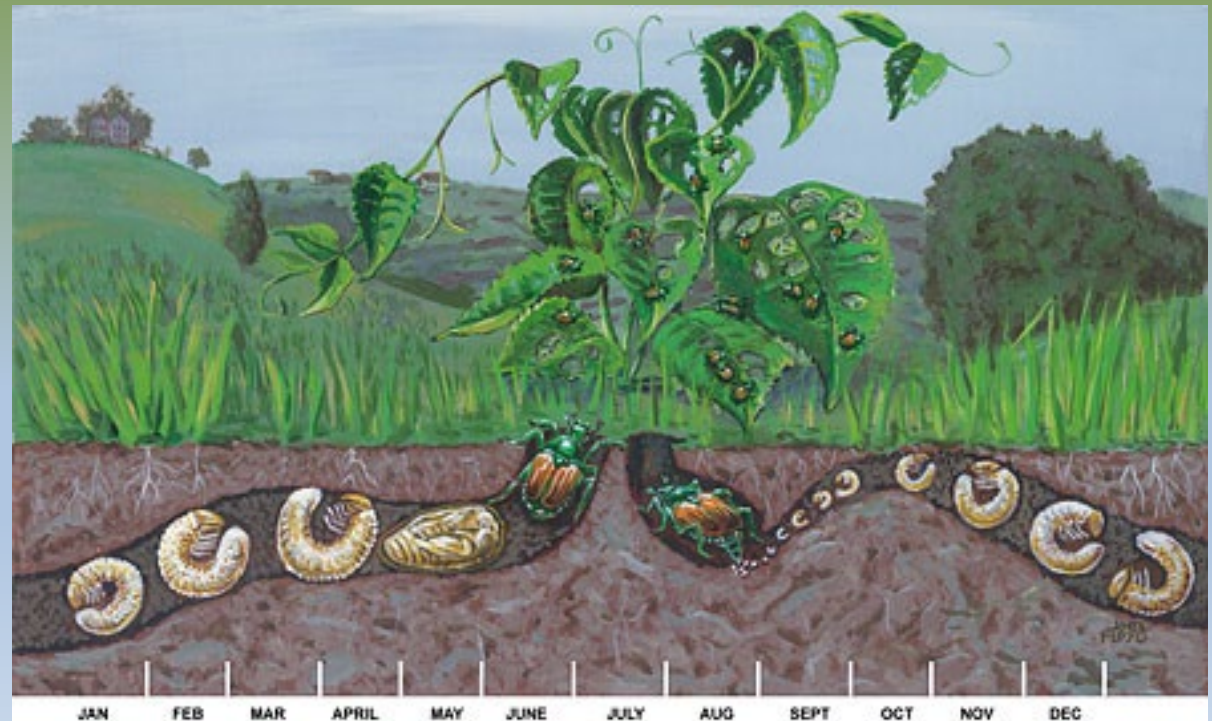
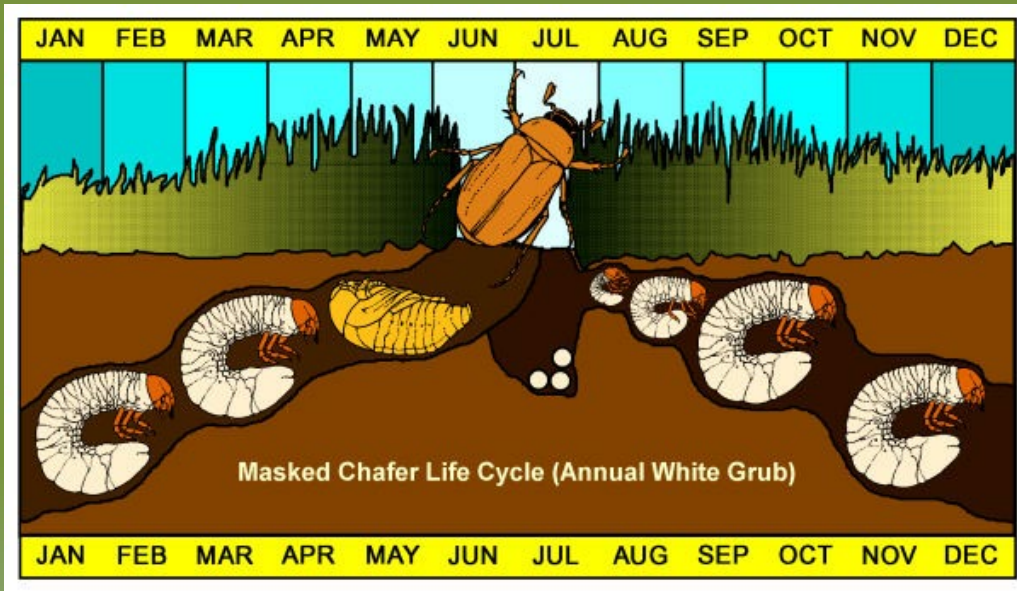
- If less than 5 per sq foot don't worry.



Grub Control

- Lure parasitic wasps to your garden by planting nectar or pollen producing plants.
- Let cilantro and parsley to go to seed, and planting alyssum, scabiosa, lemon balm, statice, yarrow, and cosmos)
- Milky Spore
- Organic Insect Soap
- Knock Beetles off
Into jar of soapy water





Other Critters

- Liquid Fence for Deer & Rabbits
- Spray or Liquid
- www.liquidfence.com



Ground Hogs vs Gophers

Groundhogs hibernate; gophers don't.

Groundhogs swim; gophers don't

Groundhogs are larger than gophers



Gopher or Woodchuck



Groundhog

Ground Hogs

Smoke Bombs / Purdue
Extension \$ 6
Trap and kill





Rabbits



Rabbits can eat their way through a garden.

They are most active in spring when resources are low.



Rabbits Control

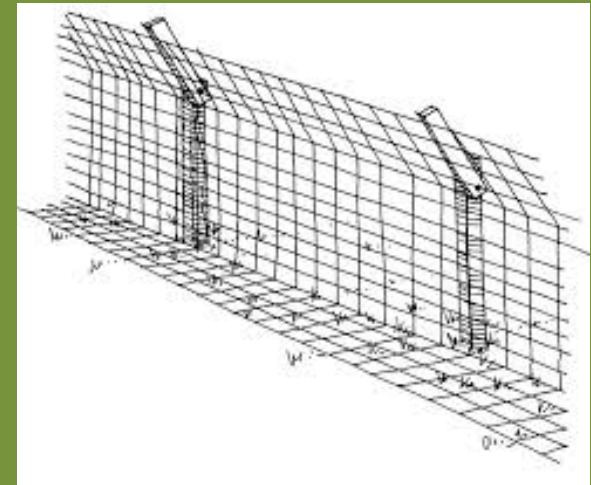


Plant extra greens around edge of garden and live with them.

Get a dog.



Rabbits Control



**28" Rabbit Fence, Bury 4" in ground,
make sure 24" is above ground.**



Repellants

- Marigolds
- Onions
- Garlic
- Sprinkle ground up hot peppers around garden.
- Old clothes, dog hair
- Store bought



Earthbox.com





- Deer Busters
- www.invisible-deer-fence.com
- Repellants

Home Remedies

- Human Hair in Bags Odor Collect hair from local barber shop.
- Put two large handfuls of hair in open mesh bag. Hang bags near crops 28-32 inches above
- ground
- Put 1/2-1 cup of dog poop in cloth bag.
- Hang bags in same manner as hair.
- Bars of Soap Odor Brand makes no difference.
- Use small bars or cut large ones in sections. Hang by wire in same way as hair

Get A Dog





The Good Guys



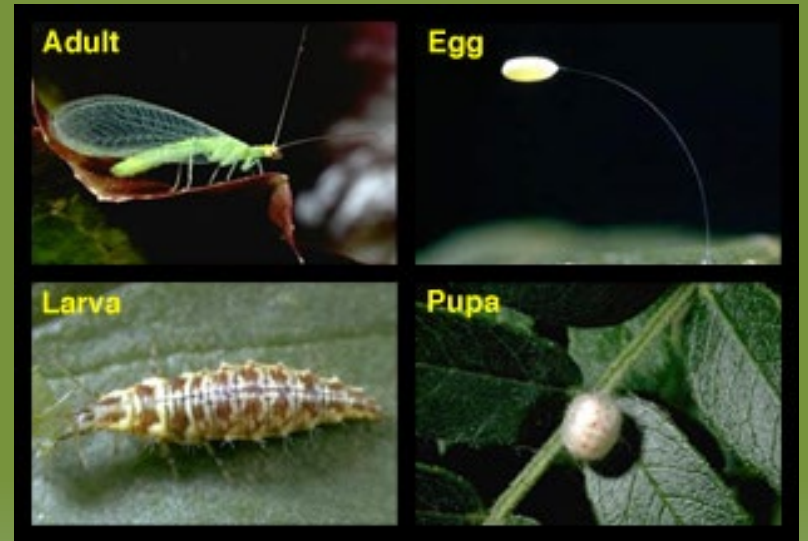
Green Lacewing

- Its a fierce predator larval stage, during which it devours aphids, caterpillars, mealy bugs, leafhoppers, insect eggs, and whiteflies.
- It even eats other lacewings.
- Up close, the larva looks like a tiny (1/2 inch) alligator.
- flowering plants attract adult lacewings
- If you decide to introduce beneficial to your garden, lacewings are the most effective predators you can buy.





G254-37



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Lady Beetle

- Everyone loves a ladybug.
- Lady bugs eat aphids, scale insects, thrips, mealy bugs, and mites – all the pests gardeners despise.
- Lady beetles are great because both the adults and the larvae feed on pests. Lady beetle larvae look like tiny, colorful alligators. Learn to recognize them, so you don't mistake them for pests.





Beetles

- **Ground beetles don't fly much, preferring to run away when disturbed.**
- **You probably won't see them unless you uncover their hiding places. If They're relatively large (about 3/4 inch), and dark, with long, jointed legs.**
- **They're nocturnal hunters, rooting among leaf litter for insect eggs and larvae.**



- Soldier beetles, which show up for the late spring aphid feast.



- mite-and-snail-destroying rove beetles that inhabit piles of decaying organic matter.





Praying Mantis

- Contrary to popular belief, it is not illegal to harm a praying mantis.
- Praying mantis can handle even the largest pests in the garden.
- When the nymphs hatch, they're so hungry they sometimes eat their siblings.
- praying mantis are generalist predators, meaning they're just as likely to eat a helpful lady beetle as they are to catch a caterpillar.



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Assassin bugs



- **Assassin Bugs take care of business.**

These true bugs use trickery, disguises, or just plain brute force to capture a meal. Many assassin bugs specialize in certain kinds of prey, but as a group, assassins feed on everything from beetles to caterpillars. They're fun to watch, but be careful handling them because they bite – hard.

Syrphid Flies

- have bright markings of yellow-orange and black, and can be mistaken for bees.
- Like all flies they have two wings
- Syrphid maggots crawl on garden foliage, searching for aphids to eat.
-
- As an added bonus, the adults will pollinate your flowers. Syrphid flies are also called hover flies, because they tend to hover over flowers.



Attracting Beneficial's

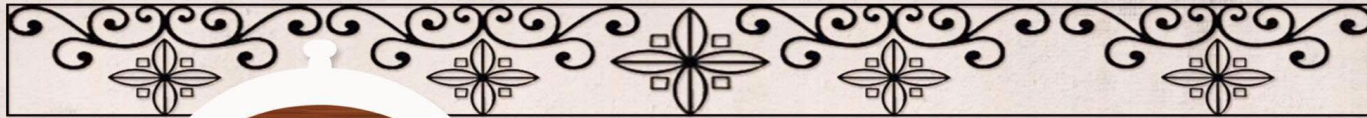
- We're living in a bug-eat-bug world. And we want to keep it that way.
- Make an insectary, a habitat where beneficial insect friends will feel at home.



Attracting Beneficial's

- provide them with food, water, and shelter.
- keep the soil covered with organic matter.
- Avoid putting any harmful chemicals into their habitat.





Sobremesa
By Chef Sergio Torres

In -House Catering Menu

- The menu for beneficials changes constantly as the pest population shrinks and swells, and as different flowers come into bloom.
- Many of the predators and most of the parasites will use pollen and nectar for food.
- Grow a variety of flowers that bloom at different times.

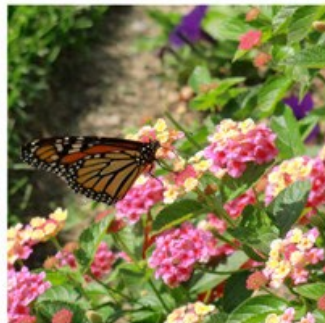
Beneficials also need a reason to stay

- Consider a corner of your yard or garden as a insect habitat.
- As long as there is a place for pests, the beneficial may stay to eat in your weedy refuge rather than head for the neighbor's yard.



Add Color

- Beneficial's are fond of dill, parsley, and cilantro flowers. When you've finished harvesting these herbs, leave the plants in the garden to flower.
- let a small patch of carrots run to flower. Their blossoms are sweetly fragrant; beneficial love them.



Questions?

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Honey Bees

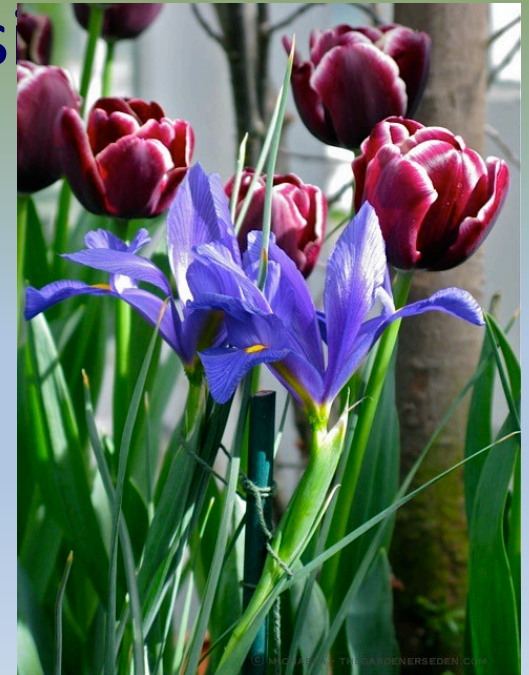


- Plant flowers in colors that bees can see: **Yellow**, **Blue**, **Purple**, and **Orange**, and They cannot see **Red**.





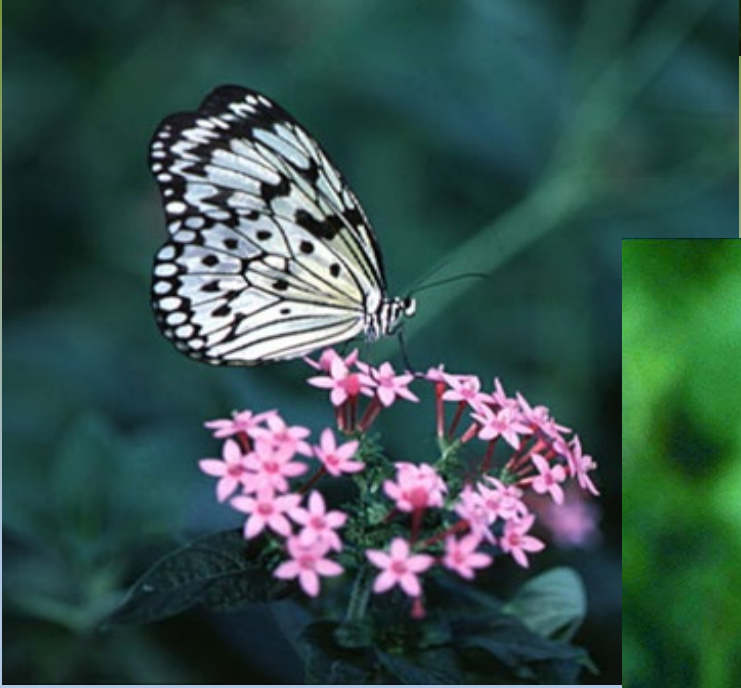
- Honey Bees Like Geraniums, Iris, Foxglove, Cosmos, Zinnia, Sunflowers, Dahlias, Asters, Marigolds, Hyacinths, Crocuses, Daisies, Daffodils, Tulips, or Catnip

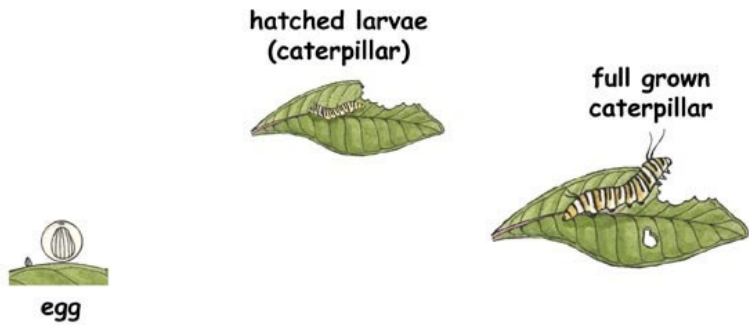


Butterflies

- Monarchs Larvae only eat Milkweed
- Flowers with easy Access
- Purple Cone Flower, Butterfly Bush, Black-Eye Susan, Catnip, Marigold, Dill , Fennel



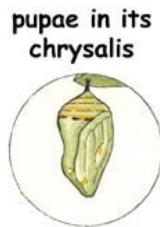




Life Cycle of the Monarch Butterfly



adult butterfly



pupae in its
chrysalis



adult breaking
free of chrysalis



Monarchs

©Sheri Amsel

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