

# The Bug Book

a garden field guide



A publication of the



**Southside  
Community  
LAND TRUST**

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## NOTES

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## About this guide...

This guide is intended for backyard gardeners, community gardeners, and small-scale farmers, to serve as a resource in helping you to identify both good (beneficial) and bad (damaging) bugs that you might find in your garden. This guide will offer tips on how to control bad bugs and ideas for how to attract good bugs.

Good and bad bugs can be different sizes, shapes, and colors. This book has pictures of the damage caused by bad bugs to help you identify which bugs are causing the problem and learn how to control them. This book also has pictures of good and bad bugs so that you can identify different bugs in your garden and make sure you are only killing bad bugs!

The best way to control bugs is to walk through your garden each day and look for signs of bugs or bug damage. As you try different methods to get rid of bad bugs, make sure to keep notes of what you did: if you used one of the sprays on pages 46-47, if good bugs solved the problem, or if another gardener gave you a new idea! Writing good notes will help you remember what worked if you have a bug problem again. This book has space to write notes at the end.

# Signs of Damage



Photo Credit: Whitney Cranshaw,  
Colorado State University

**Aphids .....Page 9**



Photo Credit: Russ Ottens,  
University of Georgia

**Cabbage  
Loopers.....Page 11**



Photo Credit: USDA APHIS PPQ Archive, USDA  
APHIS PPQ

**Colorado Potato  
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Photo Credit: Whitney Cranshaw,  
Colorado State University

**Cucumber  
Beetles..... Page 15**

# Signs of Damage



Photo Credit: Clemson University, USDA Cooperative Extension Slide Series

Cutworms .....Page 17



Photo Credit: David Cappaert, Michigan State University

Flea Beetles .....Page 19



Photo Credit: Alton N. Sparks, Jr., University of Georgia

Garden Webworms.....Page 21



Photo Credit: Forest & Kim Starr, U.S. Geological Survey

Lace Bugs.....Page 23

## Signs of Damage



Photo Credit: Whitney Cranshaw,  
Colorado State University

**Leafhoppers.....Page 24**



Photo Credit: Merle Shepard, Gerald R. Carner,  
and P.A.C Ooi, *Insects and their Natural Enemies  
Associated with Vegetables and Soybean in  
Southeast Asia*

**Leafminers .....Page 25**



Photo Credit: David Ferro, UMASS

**Mexican Bean  
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# Signs of Damage



Photo Credit: R.J. Reynolds Tobacco Company  
Slide Set, R.J. Reynolds Tobacco Company

**Slugs.....Page 29**



Photo Credit: Whitney Cranshaw, Colorado  
State University

**Squash Bugs .....Page 31**



Photo Credit: Whitney Cranshaw, Colorado  
State University

**Thrips.....Page 33**



Photo Credit: David Jones, University of Georgia

**Tomato  
Hornworms.....Page 35**

## The life cycle of bugs...

These next pages describe what bugs look like at different stages in their lives. All bugs hatch from eggs, which usually live on the undersides of leaves or in hidden spots on plants. The eggs hatch into larvae (also called caterpillars, grubs, or maggots), which will later become adults. Adult bugs lay eggs and usually have wings.

Bad bugs can eat plants or cause damage at different stages in their lives, so make sure you are getting rid of the bad bugs when they are causing the most damage. Most of the time it is when they are larvae: hungry and growing fast like young people! Good bugs are usually easiest to attract when they are adults, since they can fly to your fields to feed on nectar or pollen. Good bugs also lay eggs, so you want to make sure that you aren't squishing their eggs or larvae!

Many bad bugs in your garden will come in cycles: Flea Beetles, for example, might do a lot of damage, and then move on to another area. Using row cover (page 44) and planting new plants after the number of bad bugs goes down will help make sure that you have a long, healthy growing season!

# Aphids

bad bug!

## Favorite Plants:

Most small fruits  
Vegetables



Photo Credit: David Cappaert,  
Michigan State University

## Why am I bad?

I suck the juices from the leaves of many different plants. When I am done sucking the juices from the leaves, the leaves curl up or fall off of the plant. Sometimes I also spread plant diseases.

## What Aphids look like:

Adults: We are small, pear shaped bugs. We can be green, pink, black, or gray. Sometimes it looks like we are wearing a fluffy white coat.

## How to control Aphids:

- Spray plants with a strong stream of water to knock the Aphids off of your plants.
- Plant “trap crops” like calendula, nasturtiums, and dill. Aphids like to eat these plants even more than your vegetables, so you can attract aphids away from your other plants!
- Try planting Pollen & Nectar Producing Plants (see list, page 48) to attract good bugs that will eat the Aphids.
- Spray plants with the Garlic and Chili Pepper Spray (page 46).
- Try using Safer Insecticidal Soap on plants.



Photo Credit: David Ferro, UMASS

# Cabbage Loopers

bad bug!

## Favorite Plants:

Cabbage  
Heads of Lettuce  
Celery  
Tomatoes  
Collard Greens



Photo Credit: Frank Pears,  
Colorado State University

## Why am I bad?

I chew big holes in leaves and leave my sticky spit on the leaves. Sometimes I chew holes in lettuce heads and tomatoes.

## What Cabbage Loopers look like:

Eggs: We are light green and live on the undersides of leaves.

Larvae: We do most of the damage. We are green caterpillars with a white line on each side of our bodies.

Adults: We grow into gray moths with one silver spot in the middle of each of our wings.



## How to control Cabbage Loopers:

- Try growing Pollen & Nectar Producing Plants to attract good bugs that will eat Loopers (see list on page 48).
- Use your hands to pick the Loopers off of your plants and drop them into soapy water. Or squish them!
- After you pick the Loopers off the plants, use the Garlic and Chili Pepper Spray (see page 46) to keep any other Loopers away.
- Use row cover (see Glossary, page 44) to stop adults from laying eggs under leaves.
- For farmers working on larger fields, Bt can also be used for Cabbage Loopers (see Glossary for more info on Bt, page 44).

# Colorado Potato Beetles

bad bug!

## Favorite Plants:

Potatoes  
Tomatoes  
Eggplants



Photo Credit: David Cappaert,  
Michigan State University

## Why am I bad?

I like to chew leaves on plants, especially young leaves.

## What Colorado Potato Beetles look like:

Eggs: We are tiny, bright yellow bunches of eggs. You can find us on the undersides of leaves.

Larvae: We are dark orange beetles with black dots down the sides of our backs. We help the adults chew leaves.

Adults: We are light yellow (sometimes orange) beetles with 10 black stripes down our backs. We do most of the damage along with our larvae.

## How to control Colorado Potato

### Beetles:

- Use your hands to pick beetles off plants and then drop the beetles into soapy water. Look for beetles on your plants in the early morning.
- After you pick the beetles off, try spraying the plants with the Garlic and Chili Pepper Spray (see page 46).
- You can also use your hands to rub the Colorado Potato Beetle eggs off of the undersides of leaves.
- Try planting Pollen & Nectar Producing Plants (see page 48) near potatoes, tomatoes or eggplants to attract good bugs that will eat beetles.



Photo Credit: David Cappaert,  
Michigan State University

# Cucumber Beetles

bad bug!

## Favorite Plants:

Squash  
Melons  
Tomatoes  
Eggplant  
Peas  
Cabbage



Photo Credit: David Cappaert,  
Michigan State University

## Why am I bad?

I eat the leaves and flowers of many different vegetable plants. I also eat stems and roots, and sometimes chew holes in fruit.

## What Cucumber Beetles look like:

Eggs: We are small yellow-orange eggs. Adult Cucumber Beetles lay us in the soil or near stems of plants.

Larvae: You probably won't ever see us. As soon as we hatch from our eggs, we dig under the soil to eat the roots of plants.

Adults: We do the most damage. We are shiny with black heads, and can be striped or spotted. The Striped Cucumber Beetle is yellow with 3 wide black stripes down its back. The Spotted Cucumber Beetle is light yellow with black spots down its back.

## How to control Cucumber Beetles:

- Use your hands to pick Cucumber Beetles off plants and then drop the beetles in soapy water.
- After you pick the beetles off the plants, try spraying the plants with the Garlic and Chili Pepper Spray (see page 46).
- Take all weeds and dead plants out of the garden at the end of the season and do not leave piles in the garden during the winter. Cucumber Beetles like to live in these areas.
- Try putting row cover (see Glossary, page 44) over the plants in the spring and the fall to protect them from Cucumber Beetle damage.



Photo Credit: Scott Bauer, USDA  
Agricultural Research Service

# Cutworms

bad bug!

## Favorite Plants:

Young vegetable plants



Photo Credit: Russ Ottens,  
University of Georgia

## Why am I bad?

At night I chew through the stems of plants close to the soil, which makes the plants fall over. Usually the stems look like someone cut them with a knife.

## What Cutworms look like:

Eggs: You can find us in groups on plant stems and on leaves near the ground.

Larvae: We do the most damage. We are dull brownish caterpillars and we curl into a C-shape when we are scared. Look for us eating stems at night.

## How to control Cutworms:

- Keep weeds out of the garden and make sure to move dead or sick plants out of the garden. Cutworms like to live on weeds and sick plants.
- Cutworms chew stems mostly at night, so look for them with a flashlight. Look for plants that have been cut, and dig around near the roots to find Cutworms. Then squish them!
- Sometimes you can avoid Cutworm damage by transplanting young plants to the garden rather than planting seeds directly.
- Stems of young plants can be protected from Cutworms by placing cardboard "collars" 1 inch into the soil around stems, with about 2 inches of the cardboard sticking out of the ground. You can also make "collars" by cutting toilet paper or paper towel rolls into 3-4 inch tubes!
- The Toothpick Trick: after planting a seedling, push 2 toothpicks into the soil on opposite sides of the stem. Toothpicks will stop cutworms from wrapping around the plant.

# Flea Beetles

bad bug!

## Favorite Plants:

Tomatoes  
Potatoes  
Eggplants  
Peppers  
Turnips  
Radishes



Photo Credit: David Cappaert,  
Michigan State University

## Why am I bad?

I chew tiny round holes in the leaves of many different plants. Sometimes I even spread diseases from plant to plant as I chew.

## What Flea Beetles look like:

Eggs: You won't see us! We live on the roots of plants.

Larvae: We don't cause serious damage to plants, but we usually eat parts of the roots.

Adults: We do all of the damage even though we are as TINY as fleas! We are dark brown or black, and we jump when we get scared, just like fleas.



## How to control Flea Beetles:

- Use row cover (see Glossary, page 44) in the fall to keep Flea Beetles off of plants.
- In the spring, you can plant some of the plants Flea Beetles like to eat, wait until the Flea Beetles move on, and then plant the rest of the tomatoes, eggplants, or peppers that you want.
- Beer! Put small bowls or tops from old jars near plants that are being eaten by Flea Beetles and fill with beer. Flea Beetles will fly in and drown.
- Compost weeds and crops in the fall after the last harvest. Flea Beetles (and other bad bugs!) like to live in piles of weeds, so make sure to keep your beds clean!
- Try spraying Garlic and Chili Pepper Spray (page 46) on plants early in the morning.

# Garden Webworms

bad bug!

## Favorite Plants:

Beets  
Beans  
Corn  
Strawberries  
Peas



Photo Credit: Ruth Hazzard,  
UMASS

## Why am I bad?

I eat leaves of plants and make webs that look like spider webs! After I make a web that is attached to leaves or stems, I live inside of it.

## What Garden Webworms look like:

Eggs: You can find us in groups or alone on the undersides of leaves.

Larvae: We do all of the damage. We are usually dark colored caterpillars with a stripe and dark spots down our back. If you look closely, you can see spiky hairs that grow out of each of our spots.



## **How to control Garden Webworms:**

- Keep pigweed and lambsquarters (weeds) out of your beds. Webworms like to live on these weeds.
- Look for really thick webs that are left on branches or leaves and clip these off of the plant. Webworms live in these webs...which is also where they get their name!
- If you see any Webworms, squish them or drop the Webworms into soapy water.

# Lace Bugs

bad bug!

## Favorite Plants:

Flowers

Vegetable plants



Photo Credit: Pest and Diseases Image Library

## Why am I bad?

I suck the juices from the undersides of leaves. After I am done sucking the juices, the tops of leaves look blotchy with gray or white specks on them.

## What Lace Bugs look like:

Adults: We are oval or rectangle shaped with big wings that look like white lace.

## How to control Lace Bugs:

- Try using the Soap Spray (see page 47) on plants.

# Leafhoppers

bad bug!

## Favorite Plants:

Flowers

Vegetable plants



Photo Credit: Whitney Cranshaw,  
Colorado State University

## Why am I bad?

I suck juices from the stems and undersides of leaves. My spit is poisonous and makes the tips of leaves turn brown or yellow and curl up. As I suck juices, I also spread plant diseases.

## What Leafhoppers look like:

Adults: We are thin, brown or green bugs. Sometimes we have brightly colored stripes on our wings. If you shake the plant that we are feeding on, we will quickly fly away, and then come right back to eat more.

## How to control Leafhoppers:

- Spray plants with a strong stream of water.
- Try using the Soap Spray (page 47).

# Leafminers

bad bug!

## Favorite Plants:

Beets  
Cabbage  
Chard  
Leafy greens  
Lettuce



Photo Credit: Central Science Laboratory, Harpenden Archive, British Crown

## Why am I bad?

I eat tunnels in leaves. The damage does not kill the plants, but the leaves look less appealing to eat, especially if you are selling them or giving them away to friends!

## What Leafminers look like:

Eggs: We are small, round white bunches of eggs, and live on the undersides of leaves.

Larvae: We do most of the damage. We are light green maggots that live in (and eat!) leaves. We make curvy, winding tunnels in leaves, so sometimes it looks like we are drawing on leaves.

Adults: We are small, black and yellow flies, and we lay eggs under leaves of plants.

## How to control Leafminers:

- Remove the leaves that show the first signs of “tunnels” before they spread.
- You can use your hands to rub the Leafminer eggs off of the undersides of leaves.
- Use row cover (see Glossary, page 44) to stop adults from laying eggs under leaves.
- Most plants can still live with damage from Leafminers, but keep plants healthy with regular water and compost or organic fertilizer (see Glossary, page 44).



Photo Credit: Howard F. Schwartz,  
Colorado State University

# Mexican Bean Beetles

bad bug!

## Favorite Plants:

Any kind of beans



Photo Credit: Central Science Laboratory, Harpenden Archive, British Crown

## Why am I bad?

I hide on the undersides of leaves and chew on leaves, making the leaves look like lace.

## What Mexican Bean Beetles look like:

Eggs: We are tiny and yellow and live close to each other on bean plants.

Larvae: When we hatch from our eggs, we are fat orange grubs with little spikes on our backs.

Adults: We are pale yellow or light brown beetles with black dots on our backs. Sometimes people think we look like Lady Beetles (page 41), so make sure that I am a Mexican Bean Beetle before squishing me!

## How to control Mexican Bean Beetles:

- Use your hands to pick beetles off plants, then drop the beetles in soapy water or squish them.
- You can also use your hands to rub the eggs off of the undersides of leaves.
- After you pick the beetles off the plants, spray the plants with the Garlic and Chili Pepper Spray (see page 46).
- Try planting herbs or flowers in the same rows with the beans to attract good bugs that will eat the beetles (see Pollen & Nectar Producing Plants list, page 48).



Photo Credit: Whitney Cranshaw, Colorado State University

# Slugs

bad bug!

## Favorite Plants:

Many vegetables and flowers

Many seedlings!



Photo Credit: Cheryl Moorehead, Insect Images

## Why am I bad?

I eat large holes in the leaves of big plants, and both the leaves and stems of seedlings.

## What Slugs look like:

Eggs: We look like little piles of white jelly balls, and usually live under rocks or logs.

Adults: We look like snails without the shell, and we are gray, black, brown, or green. We leave slimy silver trails wherever we go!

## How to control Slugs:

- The best way to get rid of slugs is with your hands. Look for slugs in areas that are dark and cool (under rocks or logs), and drop slugs into a bucket of salt water or soapy water.
- Since slugs love dark and cool places, remove all hiding places (pieces of wood, stones, trash cans) from your garden. You can also spray these areas in the morning with white vinegar.
- Beer! Put small bowls or tops from old jars near plants that are being eaten and fill with beer. Slugs will climb in and drown.



Photo Credit: Gary Bernon, USDA APHIS

# Squash Bugs

bad bug!

## Favorite Plants:

Winter Squash

Cucumbers

Pumpkins



Photo Credit: Whitney Cranshaw,  
Colorado State University

## Why am I bad?

I suck plant juices from vine crops. After I suck all of the juices out of a plant, the leaves and vines turn black and die.

## What Squash Bugs look like:

Eggs: We live in shiny yellow bunches on the undersides of leaves.

Nymphs: We do most of the damage. We are light green or gray with flat backs. Usually it looks like we are covered with a white powder.

Adults: We also do a lot of damage. We are a dark brown or black color with flat backs. If you look closely, you will see tiny dark hairs all over our bodies.

## How to control Squash Bugs:

- Use your hands to take any Squash Bugs or eggs off of your plants and squish them! Make sure to look under the leaves.
- Use trellises or stakes to keep vines off of the ground.
- Try planting Pollen & Nectar Producing Plants to attract good bugs that will eat Squash Bugs (see list, page 48).



Photo Credit: Ruth Hazzard, UMASS

# Thrips

bad bug!

## Favorite Plants:

Many Vegetable Plants



Photo Credit: Whitney Cranshaw,  
Colorado State University

## Why am I bad?

I leave brown or white marks on leaves or fruit. Some people think these marks look like scars.

## What Thrips look like:

Adults: We are thin and tiny bugs! We are usually so small and dark that many people never see us. They only see the damage we cause.

## How to control Thrips:

- Try spraying plants with a strong stream of water to knock the Thrips off of plants.
- Keep plants healthy and watered! Thrips will not cause a lot of damage to strong and healthy plants.
- If the Thrips start causing a lot of damage to your plants (leaves falling off or fruit rotting), try using Safer Insecticidal Soap on plants.



Photo Credit: Whitney Cranshaw, Colorado State University

# Tomato Hornworms

bad bug!

## Favorite Plants:

Tomatoes  
Peppers  
Eggplants  
Potatoes



Photo Credit: Susan Ellis, Insect Images

## Why am I bad?

I eat small stems and whole leaves. Sometimes I even bite large holes in green tomatoes.

## What Tomato Hornworms look like:

Eggs: We are smooth, round, light green eggs and we live on the tops of leaves.

Larvae: We are one of the biggest caterpillars you will see in the garden. Our slanted stripes and dark spots make it hard for you to find us, but when you do see us, you will see the big horn at our rear end.

## How to control Tomato Hornworms:

- If a lot of whole leaves are being eaten, look for Hornworms. Large black droppings on the ground under tomato plants usually mean that Hornworms are eating your plants.
- Use your hands to pick Hornworms off plants and squish them or drop them in a bucket of soapy water.
- Plant Pollen & Nectar Producing Plants (page 48) to attract Braconid Wasps (page 38). The larvae of Braconid Wasps grow on the Hornworms and eat them!
- After you harvest all of the tomatoes and pull out the plants, tilling the soil will kill most baby Hornworms.
- For farmers working on larger fields, Bt can also be used on young Tomato Hornworms as a last resort. (See Glossary for more info on Bt, page 44).

# Assassin Bugs

good bug!

## Favorite Bad Bugs:

Flies

Caterpillars



Photo Credit: Joseph Berger,  
Insect Images

## Why am I good?

I eat many different bad bugs. I come out to the garden in June and stay all summer.

## What Assassin Bugs look like:

We are flat, brown bugs with long, narrow heads. If you look closely, you might see our curving beaks.

## How to attract Assassin Bugs:

- Assassin Bugs naturally live in most chemical-free gardens: the less pesticides or sprays you use, the more Assassin Bugs you will see in your garden.

# Braconid Wasps

good bug!

## Favorite Bad Bugs:

Aphids

Tomato Hornworm



Photo Credit: David Cappaert,  
Michigan State University

## Why am I good?

I lay eggs in bad bugs, and my larvae eat these bad bugs from the inside as they grow bigger!

## What Braconid Wasps look like:

We are small wasps, but we don't sting. We are black or brown, and have a skinny middle section. Our larvae look like little white tubes, and grow attached to bad bugs!

## How to attract Braconid Wasps:

- Plant Pollen & Nectar Producing Plants in your garden (page 48).

In the picture below, Braconid Wasp larvae are growing on (and eating!) a Tomato Hornworm.



Photo Credit: David Cappaert,  
Michigan State University

# Damsel Bugs

good bug!

## Favorite Bad Bugs:

Aphids  
Leafhoppers  
Caterpillars  
Thrips



Photo Credit: Whitney Cranshaw,  
Colorado State University

## Why am I good?

I eat many different bad bugs and stay in the fields during the winter.

## What Damsel Bugs look like:

We are fast moving and we have long bodies.  
We are a dull brown or black color.

## How to attract Damsel Bugs:

- Damsel Bugs really love to live near alfalfa fields. So plant some alfalfa! Or if you know where alfalfa is planted, take a butterfly net, scoop up some Damsel Bugs, and bring them back to your garden plot!

# Lacewings

good bug!

## Favorite Bad Bugs:

Aphids

Mites

Eggs of Bad Bugs



Photo Credit: Sonya Broughton,  
Department of Agriculture & Food,  
Western Australia

## Why am I good?

I eat many different bad bugs and I am easy to attract to the garden.

## What Lacewings look like:

Eggs: We live on stems. A flexible stalk or string attaches us to plant stems, and we blow in the wind.

Adults: We are thin and long with a bright green body and see-through wings.

## How to attract Lacewings:

- Plant Pollen & Nectar Producing Plants in your garden (page 48).

# Lady Beetles (Ladybugs)

good bug!

## Favorite Bad Bugs:

Aphids  
Mealybugs  
Spider mites



Photo Credit: Johnny N. Dell,  
Insect Images

## Why am I good?

I eat many different bad bugs and I can be easily attracted to fields with Pollen & Nectar Producing Plants (see list, page 48).

## What Lady Beetles look like:

Eggs: We are little bunches of yellow or white eggs. We live on top of, or under, leaves.

Larvae: We look like mini-alligators because of our long, black, spiny backs. We eat a lot of bad bugs in the garden.

Adults: There are many different kinds of good Lady Beetles, but most of us are shiny red or orange with black dots on our backs.

## How to attract Lady Beetles:

- Plant Pollen & Nectar Producing Plants (page 48).

# Praying Mantids

good bug!

## Favorite Bad Bugs:

All bad bugs.



Photo Credit: Chris Horne, Insect Images

## Why am I good?

I eat all bad bugs! I actually eat any bug I can catch, even other Praying Mantids!

## What Praying Mantids look like:

We are long, skinny, green bugs with big, bright green eyes. We have really long arms and legs. Our front arms are extra long and bent and make us look like we are praying.

## How to attract Praying Mantids:

- Avoid using chemicals.
- Try planting perennials or permanent plantings around the edges of your farm or garden plot. Praying Mantids like to live in these areas during the winter.

# Soldier Beetles

good bug!

## Favorite Bad Bugs:

Aphids  
Cucumber Beetles



Photo Credit: Jim Occi, BugPics

## Why am I good?

I eat many different bad bugs. I really love to live near plantings of goldenrod, milkweed, catnip or hydrangeas.

## What Soldier Beetles look like:

Larvae: We usually have a red head and a dark, flat body.

Adults: We look a lot like the larvae Soldier Beetles, but sometimes you might notice that our backs look shiny like leather.

## How to attract Soldier Beetles:

- Try planting goldenrod, hydrangeas, catnip or milkweed in your garden.

## GLOSSARY

### **Bt**

Bt stands for *Bacillus thuringiensis*, a bacteria that lives in soil. It is used on large organic farms as a liquid spray to kill bad bugs, but is not used very much on small garden plots. Bt will kill insects only in the larva stage, so it is only good for killing some kinds of bugs. There are many different kinds of Bt, so make sure to talk to a gardening expert or a farmer that has used it before trying it on your own plot. And make sure to follow the directions carefully!

### **Row Cover**

Row cover is a material that covers plants, keeping them warmer and also stopping bad bugs from eating plants and laying their eggs. It is sometimes called garden fabric, garden blanket, or Reemay. Row cover can be used in the spring and the fall to keep plants warm at night, and to protect plants from bad bugs.

### **Organic Fertilizer**

Fertilizer gives your plants extra nutrients so that they can grow healthy. Organic fertilizers are made only from other plants or animals, not from chemicals. Most gardening stores sell many different kinds, but a good organic fertilizer to use is one made from fish waste (fish emulsion). Make sure to follow the directions, because too much fertilizer can attract bad bugs to your plants, or can “burn” plants and make them die!

## BUG CONTROL TIPS

- Keep notes of what is happening in your garden and what you use for getting rid of pests. Using your notes from year to year will help you identify the first signs of bug trouble and stop them from turning into major problems.
- Crop rotation means that you grow plants in your garden in different places each year. Moving your plants around can trick bad bugs by making them have to find their favorite plants each year. It will also make sure that the same kinds of plants will not take the same nutrients from the soil year after year.
- Organic pesticides or sprays are still poisons: they can kill both bad and good bugs. Use them carefully!
- The spray recipes are best to use early in the morning or late in the afternoon. Bad bugs are hard at work at these times, and plants will not be tired from the heat. Do not use the sprays on windy or rainy days.
- Keeping your garden clean is very important! Bugs can live and hide under piles of weeds, bricks, logs, or wooden boards. Get rid of these hiding places.

# RECIPES

## Garlic and Chili Pepper Spray

Wear rubber gloves and eye protection when mixing and spraying!

1. Crush 6 cloves of fresh garlic.
2. In a glass jar, mix the garlic with 1 tablespoon of powdered cayenne pepper and 1 quart of warm water.
3. Put the cover on the glass jar and shake it. (Wear gloves and eye protection!!)
4. Keep the cover on the jar and put it in a sunny spot (inside or outside) for 2 or 3 days.
5. Strain the mixture through a coffee filter or cheesecloth into a spray bottle.
6. The spray works best if used in the morning (after you water). Spray plants well and make sure to spray under the leaves.

## Everything Spray

1. Chop or grind up 1 whole garlic bulb and 1 small onion.
2. In a glass jar, add 1 teaspoon of powdered cayenne pepper, the chopped up garlic and onion, and 1 quart water.

## RECIPES continued

3. Let the mixture sit for 1 hour.
4. Strain the mixture through a coffee filter or cheesecloth into a large spray bottle.
5. After the mixture is strained, add 1 tablespoon of liquid soap and mix well.
6. Use this spray in the morning (after you water) and make sure to spray the plants everywhere, especially under the leaves!
7. Any extra Everything Spray can be kept for up to 1 week in a labeled, covered container in your refrigerator. After 1 week, throw away any extra spray.

### Soap Spray

1. Mix 2 tablespoons of liquid soap and 1 quart of water in a spray bottle.
2. Spray plants well, and make sure to spray under the leaves.

# PLANT YOUR WAY TO A HEALTHY GARDEN!

## POLLEN & NECTAR PRODUCING PLANTS

(We attract good bugs!)

Yarrow	Alfalfa
Goldenrod	Daisies
Dill	Parsley
Sunflowers	Zinnias
Marigolds	Calendula
Coriander	Fennel
Hollyhocks	Anise
Morning Glory	Angelica
Lemon Balm	White Clover

## COMPANION PLANTING

Many vegetable and fruit growers believe that planting different vegetables and herbs together can attract good bugs and repel bad bugs...and even make some crops taste better! A good book about companion planting is Carrots Love Tomatoes, by Louise Riotte. Some examples of companion plantings:

- Basil planted with Tomatoes will help keep away aphids.
- Marigolds will help keep away many different bad bugs like Mexican Bean Beetles.

# RHODE ISLAND RESOURCES

## Information:

**Southside Community Land Trust**  
109 Somerset Street, Providence, Rhode Island  
[www.southsideclt.org](http://www.southsideclt.org)  
401-273-9419

Informational brochures, workshops, and staff who can recommend where to find products and how to solve bug problems.

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**University of Rhode Island**  
**Master Gardener Program**  
[www.urimga.org](http://www.urimga.org)  
1-800-448-1011  
**(Master Gardener Hotline)**

Experts who can answer many different questions about plants, bugs, and gardening.

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**Northeastern Organic Farming Association**  
**(NOFA) RI**  
[www.nofari.org](http://www.nofari.org)  
401-523-2653

Experts who can answer many different questions about plants, bugs, and gardening.

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# RHODE ISLAND RESOURCES

## Supplies:

### **Adler's Hardware**

**173 Wickenden St., Providence, Rhode Island**

**[www.adlersri.com](http://www.adlersri.com)**

**401-421-5157**

Organic fertilizers, potting soil and mulches,  
Insecticidal Soap and more.

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### **Arlington Farm & Pet Supply**

**5 Depot Avenue, Cranston, Rhode Island**

**401-942-6720**

Straw mulch, organic fertilizers, Insecticidal Soap,  
Bt and more.

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### **Gillette's Home and Garden Center**

**716 South County Trail, Exeter, Rhode Island**

**401-295-2770**

Organic fertilizers, Insecticidal Soap, row cover, Bt  
and more.

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### **The Good Earth Organic Gardening Center**

**1800 Scituate Avenue, Cranston, Rhode Island**

**[www.goodearthorganicgardencenter.com](http://www.goodearthorganicgardencenter.com)**

**401-826-3130**

Organic compost, potting soil, mulches and  
fertilizers, as well as Insecticidal Soaps, Bt, and much  
more.

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# NOTES