

# Solving Summer Garden Problems



Master Gardener Program

WASHINGTON STATE UNIVERSITY  
EXTENSION

# Problems: If you plant, they will happen!

- Growing problems
- Common sense approach to problem solving
- Insect Problems
- Plant disease and disorders

# Growing problems

- Soil--
  - get a baseline soil test--
    - Proper pH (5.5 to 7 ) is critical for plants being able to use the nutrients in the soil.
    - Nitrogen (N) is the nutrient most needed in our soil.
    - Soil test will tell you if phosphorus (P) and potassium (K) need to be added.
  - Well draining
- Water--consistently moist like a wrung out sponge.
- Light-6-8 hours minimum.
- Plant nutrition-your plants and your soil test will tell you what you need.
- Temperature--ideal for most warm-season plants is daytime 70°-80° and 60° and above at night
- Insects and diseases

# Wilting

Moisture: Too much, not enough, inconsistent moisture

Disease

Root rotting fungal disease

Root-infesting maggots

Vascular wilt disease affecting tomato family--(Verticillium)

Root knot nematodes



# Solutions

Solution: Water deeply. When soil is dry three inches deep, water again. Goal is moisture like a wrung-out sponge. MULCH!

Very hot temps can cause temporary wilting that will correct itself overnight.

If soil doesn't drain well, amend with organic matter, or use raised beds.

Plant disease resistant varieties. Rotate your crops. Solarizing soil before planting next year may help to kill soil borne disease.

## *Tomato Disease Resistance Codes*

V - Verticillium Wilt  
F - Fusarium Wilt (FF - Races 1 & 2; FFF - Races 1, 2, & 3)  
N - Nematodes  
T - Tobacco Mosaic Virus  
A - Alternaria Stem Canker  
St - Stemphylium Gray Leaf Spot  
TSWV - Tomato Spotted Wilt Virus

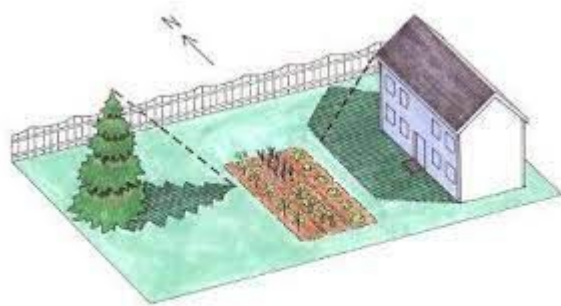
# Spindly/weak

Not enough light

Overwatering

Overcrowding

Too much nitrogen



<https://www.growbetterveggies.com/files/designing-the-perfect-vegetable-garden-5.pdf>

# Solutions

Relocate garden next season. Plant garden rows N to S so plants don't shade each other.



<https://www.gardenersmag.com/vegetable-garden-design-plant-veggies/>

# Stunted growth

(Leaves pale green to yellow)

Not enough light

Temps too cold/

Too much water, poor drainage

Soil nutrition problem

Soil pH too low--common here

Insects or disease (more on that later)

# Solutions

Reduce water and add organic matter to the soil, use a raised bed.

In the absence of soil test results, add a balanced fertilizer, compost.

Thin plants to reduce competition for nutrients.

Add lime in fall to raise soil pH.

# Leaf spots/holes

Fungal diseases

Viral diseases

Chemical burn

homemade "insecticides"

Herbicide damage

Deck cleaner solution

Insect damage

Fungal diseases

Viral diseases



# Solutions

Avoid overhead watering, adequate airflow (spacing, pruning, thinning).

Plant resistant varieties.

Always ALWAYS read the instructions on the label. More damage by homemade concoctions--phytotoxic.

Spray drift--droplet or vapor (increases as temp ↑).

More on specific insect and disease problems.

# No fruit

Temps too cold

Temps too hot

Too much nitrogen

Incomplete or absent pollination

Plants aren't mature enough

Poor fruit yield/poor flavor

Inconsistent soil moisture

Poor soil nutrition

Poor flavor

# Solutions

Temps below 57° delay growth-protect plant.

Over 85°, pollination doesn't occur--will resume when temp.

Stop fertilizing.

Attract pollinators--flowers, avoid overuse of pesticides.  
Hand pollinate squash, melons, if necessary.



Patience!

Water deeply, test soil at 3 inches.

Increase soil fertility in fall and at planting by adding good compost to support growth.

Plant at right time of year, and know when to harvest.



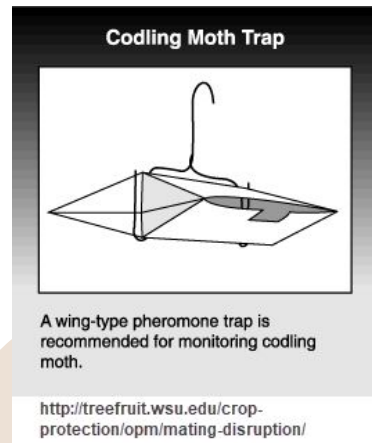
# Common sense approach to plant problems

1. **Monitor** the pest's activity and adjusting methods over time. This means going out into your garden every day. It's easier to stop small problems than to correct large ones.
2. Use a **variety of common-sense methods** to control problems in the garden, not just using pesticides!
3. **Tolerate** harmless pests.
4. **Set a threshold** to decide when it's time to act. Not every problem needs to be "treated."
5. **REPEAT** steps 1-5 all growing season long!



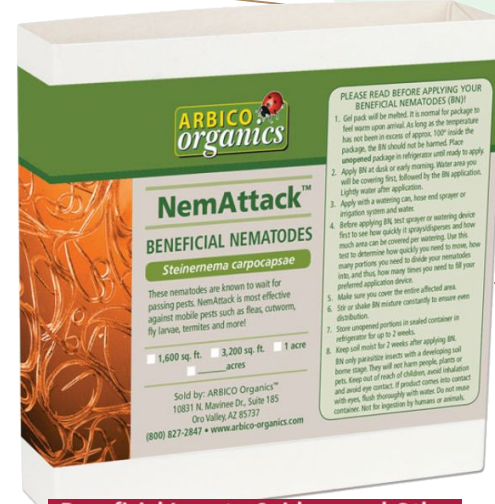
# Common-sense methods to control problems in the garden

- Have a healthy garden
  - Good airflow, fertilize, and water properly.
  - Keep a very close watch for problems.
- Control access to your plants
  - Row cover
  - Crop rotation
  - Mulch
  - Weed control
  - Stem collars
  - Trap crops
- Repellant
  - Diatomaceous earth (crawling insects)
  - Pheromone lures
    - insect specific
    - Monitoring,
    - Mating disruption



# Common-sense methods to control problems in the garden

- FIRST: VISUALLY IDENTIFYING INSECT PEST (Plant and Insect Clinic)
- Use the LEAST TOXIC methods first
  - Best control: Your thumb and index finger, despite the “YUK factor”!
  - Strong spray of water.
- Biological controls.
- LAST RESORT—PESTICIDE.  
Pesticides—\*least toxic\* (spot treat!! The affected plant and shield others
- READ THE LABEL!



## Beneficial Insects, Spiders, and Other Mini-Creatures in Your Garden

Who They Are and How to Get Them to Stay

WASHINGTON STATE UNIVERSITY EXTENSION • EM067E



This manual is part of the WSU Extension Home Garden Series.

# Common-sense methods to control problems in the garden

- Again—ID the insect--READ THE LABEL
- Find the product that solves the problem. The insect will be listed on the label if it's effective for that problem.
- Buy the right amount—label tells how much you'll need, and some won't remain effective if stored.
- FOLLOW DIRECTIONS- when and how to apply, how long before picking fruits/veggies.
- More is not better—you can harm plants, birds, lawn, water supply, and fish!
- Dispose properly.

**Protect Your Health  
Read the Label**

**Top three pesticide safety tips:**

- 1) Read the entire label
- 2) Only apply where the label says it should be applied
- 3) Keep all pesticides in their original containers

**MOSQUITO REPELLENT**

**SIGNAL WORDS**  
Caution - mildly toxic  
Warning - moderately toxic  
Danger - highly toxic

**KEEP OUT OF REACH OF CHILDREN**  
**WARNING:** Read labels on back.  
EPA Reg. No. 100-100000-0000  
NET 5 FL OZ (142 mL)

**ACTIVE INGREDIENTS**  
What is in the product?

**STORAGE & DISPOSAL**  
How does this product have to be stored? What should I do with the leftovers I don't need?

**EPA REGISTRATION NUMBER**  
What is the unique product number showing that the EPA has approved it?

**Blowing Fleas, Gnats, No-see-ums, Chiggers & Fleas**  
**STOP:** Read and follow all directions and precautions on this product label.

**DIRECTIONS FOR USE**  
Use a minimum of 1 ounce per 1,000 sq ft. Use this product in a repeat treatment with re-treating.

**NOTICE:** To the extent consistent with applicable law, buyer assumes all responsibility for safety and use and is in accordance with directions.

**STORAGE AND DISPOSAL**  
Storage: Store in a cool, dry place. **Get out of reach of children.**  
Container Disposal: If empty.

**PRECAUTIONARY STATEMENTS**  
Hazards to Humans and Domestic Animals.

**First Aid - If in Eyes:**  
If swallowed: Call a Poison Control Center or doctor immediately for treatment advice. Do not induce vomiting unless told to do so by a Poison Control Center or doctor.  
If you suspect a reaction to this product: Discontinue use. Stop all contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a Poison Control Center or doctor for treatment advice.

**QUESTIONS:** For non-emergency information concerning this product, call the National Pesticide Information Center (NPIC) at 1-800-858-7378. For emergencies, call the Poison Control Center 1-800-222-1222, view the product container or label with you when calling a Poison Control Center or doctor, or going for treatment.  
EPA Reg. No. XXX-XX-XX

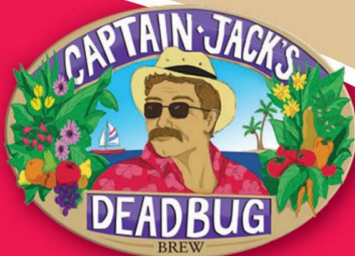
**DIRECTIONS FOR USE**  
How and where should I use this product? How much is okay? Not following the product's instructions is not only dangerous, but it is illegal!

**PRECAUTIONARY STATEMENTS**  
How can the product be used safely?

**FIRST AID**  
What should I do if it gets in my eyes, mouth, lungs, or on my skin?

**npic**  
National Pesticide Information Center  
1-800-858-7378  
For general questions about pesticides, including the material on this banner, page, or the attachment, call NPIC at 1-800-858-7378.

**POISON HELP**  
1-800-222-1222  
If someone becomes ill, unconscious, or gets pesticide in the eyes or on the skin, call a poison control center 24/7 at 1-800-222-1222.



TRUSTED SINCE 1926  
**BONIDE**

For vegetables,  
apples & citrus trees

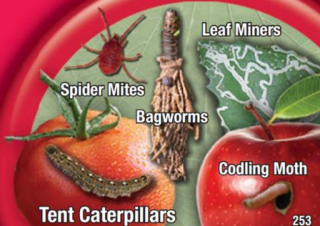
Concentrate 

Kills bagworms, borers, beetles,

caterpillars, codling moth, gypsy moth,  
loopers, leaf miners, spider mites,  
tent caterpillars, thrips and more!

ACTIVE INGREDIENT: spinosad (a mixture of spinosyn A and spinosad D) ..... 0.5%  
OTHER INGREDIENTS: ..... 99.5%  
TOTAL: ..... 100.0%  
Contains 0.04 lb of active ingredient per gallon.  
EPA Reg. No. 4-471 EPA Est. No. 4-NY-1

Keep Out Of Reach Of Children  
Net Contents 32 FL. OZ. (946 mL)



Tent Caterpillars

FOR ORGANIC  
GARDENING

# Label example

## HOW TO MIX

Add the required amount of this product to the specified amount of water, mix thoroughly, and apply uniformly to both upper and lower surfaces of plant foliage. Mix only as much spray as needed for a single treatment. In vegetable gardens, for best results, do not use more than 3 gallons of spray for 1000 sq ft of area. Do not use kitchen utensils for measuring. Keep measuring utensils with product and away from children.

Unit of Measure <sup>1</sup>	Amount of this product to Use per Pint, Quart or Gallon of Spray		
	Per Pint (16 fl oz) of Spray	Per Quart (32 fl oz) of Spray	Per Gallon (128 fl oz) of Spray
Fluid Ounces (fl oz)	0.25 fl oz	0.5 fl oz	2 fl oz
Tablespoons (Tbs)	½ Tbs	1Tbs	4 Tbs

<sup>1</sup>Conversion factors: 2 tablespoons (Tbs) = 6 teaspoons (tsp)

## HOW TO APPLY

### Shake Well Before Use

This product may be applied with trigger sprayer, hand-held, backpack, or hose-end sprayers. Use a hose-end sprayer that can be adjusted to provide a dilution ratio of about 2 fl oz of this product (4 Tbs) per gallon of spray.

## WHEN TO APPLY

Apply when listed pests are present. Repeat applications may be made as indicated in the Home Gardens section. See your state extension service recommendations for treatment guidelines in your area.

Crops	Pests Controlled	Maximum Number of Applications per Season	Minimum Days to Wait Before Reapplying	Minimum Days to Wait from Last Application to Harvest
cole crops (Brassica vegetables), including, but not limited to: broccoli, broccoli raab, brussels sprouts, cauliflower, cavalo, Chinese broccoli, cabbage, Chinese cabbage (bok choy), Chinese cabbage (napa), Chinese mustard cabbage (gai choy), collards, kale, kohlrabi, mizuna, mustard greens, mustard spinach and rape greens	cabbage looper diamondback moth imported cabbage worm leafminers worms	6	4	1
cucurbits, including, but not limited to: cucumber, edible gourds, muskmelons (cantaloupe, honeydew, etc.), pumpkin, summer and winter squash, and watermelon	leafminers thrips worms (caterpillars)	6	5	all except cucumber, 3 cucumber, 1
fruiting vegetables, including, but not limited to: eggplant, ground cherry, okra, pepino, pepper, tomatillo, and tomato	Colorado potato beetle leafminers thrips worms (caterpillars)	6	4	1

## ENVIRONMENTAL HAZARDS

This product is toxic to bees exposed to treatment for 3 hours following treatment. Do not apply this pesticide to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period. This product is toxic to aquatic invertebrates. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. Rinsing application equipment over the treated area will help avoid run off to water bodies or drainage systems.

# Slugs (non-insect pest)

- Hand-pick and kill slugs when noticed
- Slug killer, but if you do, use one with the active organic ingredient Iron Phosphate.
- ✗ AVOID METALDEHYDE ✗ products—they are very toxic to pets and birds
- Set traps with beer in a shallow pan or place a board where you usually find them, then check under it in the morning and destroy them.
- Encourage predators



# Most common insect problems

Holes, “window panes”



## CHEWING

**Beetles**  
**Grasshoppers**  
**\*Moths**  
**\*Butterflies**  
**\*Flies**  
**\*Sawfly**

**\*Larvae have chewing mouthparts**

## PIERCING-SUCKING

**"Shield" bugs**  
**Aphids**  
**Leafhoppers**  
**Whiteflies**  
**Thrips**  
**Spider mites**  
**Azalea Lace**  
**Bugs**  
**Scale**

Suck leaf tissue-pale discoloration, twisted leaves



Photo 3. Twospotted spider mite injury on soybean. Photo



# Aphids

Prune heavily infested leaves, destroy heavily infested plants.

Squish 'em, wipe off leaves.

Hose 'em down.

Don't over-fertilize.

Plant a trap crop like Nasturtiums to encourage beneficial insects.

Chemical-Examples

- Safer Brand BioNEEM Multi-Purpose Insecticide & Repellent
- Safer Brand Insect Killing Soap



UC Statewide IPM Program  
© 2007 Regents, University of California

Wingless adults and nymphs of the potato aphid



# Spider mites

Keep plants healthy--take care in hot, dry conditions!

Monitor plants for leaf stippling.

Use magnifying glass to look under leaves.

Shake leaves onto white paper to see spider mites.

Hose with water.



Beneficial insects help with control--avoid use of "broad spectrum" pesticides.

Use slow release, lower N fertilizer.

Chemical control-Examples

- **Bonide Mite X RTU**
- **RID-BUGS**
- **Safer Brand Insect Killing Soap**
- **Safer Brand BioNEEM Multi-Purpose Insecticide & Repellent**



# Flea Beetles

Feed on tomatoes squash, beans, corn, sunflowers, lettuce, potatoes and many weeds. beets, kale, collards, radish, and many weeds.

Leaf damage can kill seedlings.

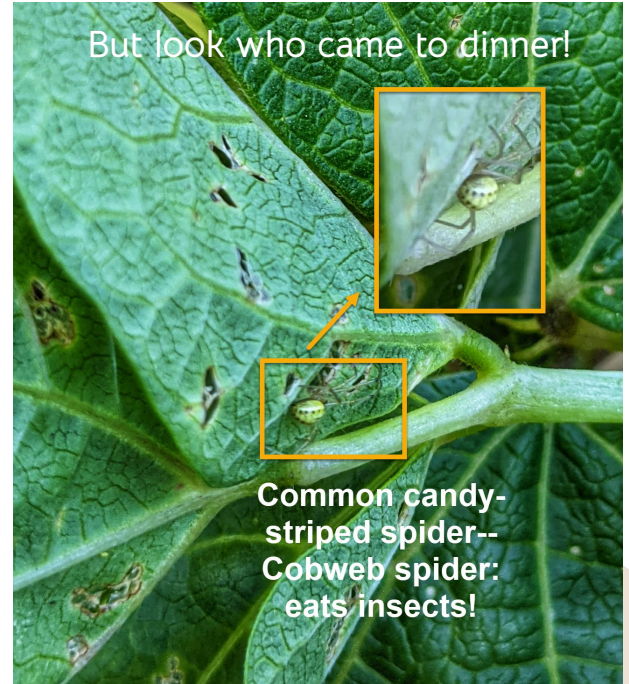
Plant "trap Crops (radish) away from main crops. Chemical management:

Chemical management:

- Bonide Captain Jack's Deadbug Brew (O)
- Bug Buster-(O) (pyrethrins)
- Safer Brand BioNEEM Multi-Purpose Insecticide & Repellent (O)



Crucifer flea beetle damage on turnips



# Caterpillars

Eat holes, skeletonize leaves.

Squish caterpillars.

Row covers are very effective

Predators such as, paper wasps, and parasitic flies and wasps, such as the parasitic wasp, *Cotesia glomerata*, are natural enemies.

Avoid pesticides like broad spectrum pesticides include permethrin, beta-cyfluthrin, and lambda-cyhalothrin.

Treat caterpillars is while they are still small and before they cause too much feeding damage. Pesticides are less effective in killing larger caterpillars.



Whitney Cranshaw, Colorado State University, Bugwood.org  
5443232  
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## Chemical management:

- Bonide Captain Jack's Deadbug Brew [O](spinosad)
- Bonide Thuricide BT
- Bug Buster-O [O] (pyrethrins)
- ferti-lome Dipel Dust (Bt)
- Safer Brand Caterpillar Killer for Trees, Shrubs & Vegetables [Bt] [O]



Caption: Alfalfa looper  
Photo by: A.L. Antonelli  
**Cabbage looper**



Cabbage looper moth



Cabbage looper larva



Caption: Imported cabbage worm and damage  
Photo by: A.L. Antonelli  
**Imported cabbageworm**



Caption: Imported cabbage worm adult  
Photo by: A.L. Antonelli

# Caterpillars

## Climbing cutworms

Squish caterpillars when seen--they're nocturnal, and hide just under the soil.

Use collar around base of plant

Biological controls beneficial nematodes

Avoid pesticides like broad spectrum pesticides include permethrin, beta-cyfluthrin, and lambda-cyhalothrin.

Treat caterpillars is while they are still small and before they cause too much feeding damage. Pesticides are less effective in killing larger caterpillars.

Chemical management:

- Bonide Captain Jack's Deadbug Brew [O](spinosad)
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- ferti-lome Dipel Dust (Bt)
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Caption: Celery looper pupa  
Photo by: A.L. Antonelli

Regulated cutworm larvae  
Antonelli

# Leafminers

Control weeds in and around the garden.

Rotate crops. Do not replant where crops were infested the previous year.

Pinch leaves to kill larvae inside.

Pick out infested leaves when noticed. Discard leaves in garbage.

Screen plants with a floating row cover prior to emergence of flies in spring (April-May). Do not put row covers over soil previously infested with this pest.

Chemical management:

- None recommended



Whitney Cranshaw, Colorado State University, Bugwood.org

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# Cucumber Beetles

Squish 'em.

Use trap crops-- plant some cucurbits early, away from main garden, and kill them with a pesticide when they congregate.

Use a rowcover in June, but remove it when they start to flower--or hand pollinate!

If you find 25% of a plant defoliated, apply pesticides.

Chemical management:

- Bug Buster-O [Organic] (pyrethrins)
- Safer Brand BioNEEM Multi-Purpose Insecticide & Repellent Conc [O]



Feeding damage caused by striped cucumber beetle



Adult striped cucumber beetle



Adult spotted cucumber beetle

# Wireworms

Crop rotation may help reduce damage by wireworms. Or grow in a container.

Grow in in well-drained soil.

More common in gardens that were previously in grass or sod.

Plant resistant varieties of potatoes, and harvest them early—by late July.

\*Planting brassica family vegetables *may* also cut down the population

Cut away damaged portions of tubers before use.

Dry out the solid and dig clumps to expose them. Birds (and chickens!) will eat them

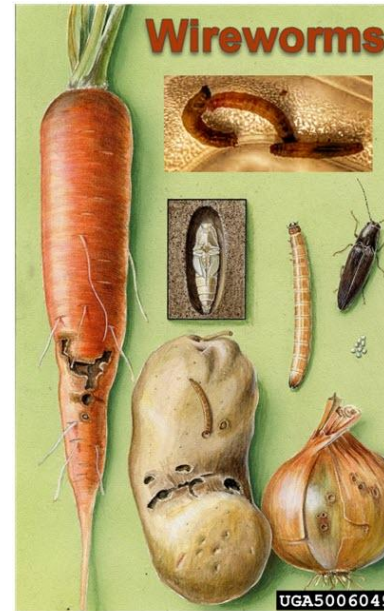
Biological management:

- Some research indicates that beneficial nematodes may help.

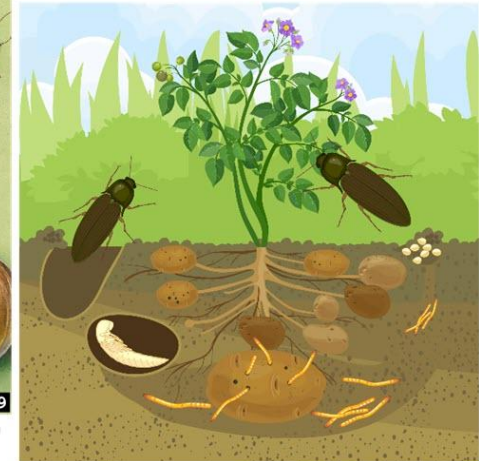


## HELP!

My potatoes/corn/onions/ carrots have holes in them, and I found these "worms."



Art Cushman, USDA Systematics Entomology Laboratory, Bugwood.org  
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# Root attacking insects



**Carrot Rust Fly**





# Brown Marmorated Stinkbug

- Significant damage to apples, beans, eggplants, grapes, peppers, sweet corn, swiss chard and tomatoes, blueberries, strawberries, raspberries.
- Biological control of BMSB-beneficial natural enemy--tiny Samurai wasp lays its own eggs in BMSB eggs.
- Exclude BMSB with fine netting BEFORE you expect the BMSBs..
- Scout for egg masses and nymphs--squish 'em.
- Prevent them from entering homes-seal all the openings with caulking or other material.
- When in the house, vacuuming them is the best way to capture and remove BMSB



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UGA1113010



Kristie Graham, USDAARS, Bugwood.org  
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Figure 2. BMSB nymph feeding injury on bell pepper. (Photo by A. Morehead)



# Corn earworms

Plant resistant varieties with tight husks if you've had problems: (such as 'Country Gentleman', 'Golden Security', 'Silvergent', and 'Staygold')

Place a clothespin at the point where the silk enters the ear can prevent earworm access when the first silk is seen.

Plow or dig up corn plots in the fall to kill overwintering pupae and prevent emergence of adults in the spring.

Peppers, tomatoes, beans, and many other plants are also attacked.

Chemical management:

- Safer Brand BioNEEM Multi-Purpose Insecticide & Repellent Conc [O]
- Bonide Captain Jack's Deadbug Brew [O](spinosad)

Apply first application when silks first appear. Follow label instructions on reapplication intervals. Direct insecticide application to silk.

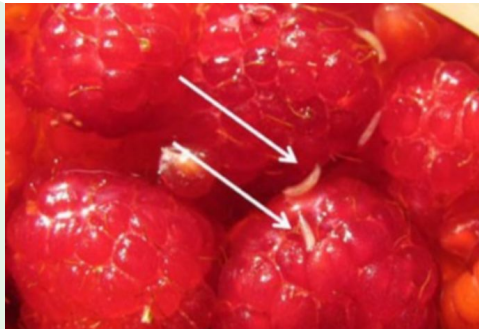


# Spotted Wing Drosophila

- Damage ripe fruit such as cherries, plums, raspberries, strawberries, and blackberries.
- The best way to control them is to monitor for their presence with traps,
- Pick ripe fruit immediately
- Don't allow fallen fruit to remain on the ground.
- Fine netting may help protect the fruit

## Chemical management:

- Apply only during late evening, night, or early morning
- Organic, spinosad
  - a. Bonide Captain Jack's Deadbug Brew R-T-U
  - b. Monterey Garden Insect Spray
- Pyrethrins, piperonyl butoxide:
  - a. GardenTech WorryFree Brand
  - b. Garden Safe Houseplant and Garden Insect Killer

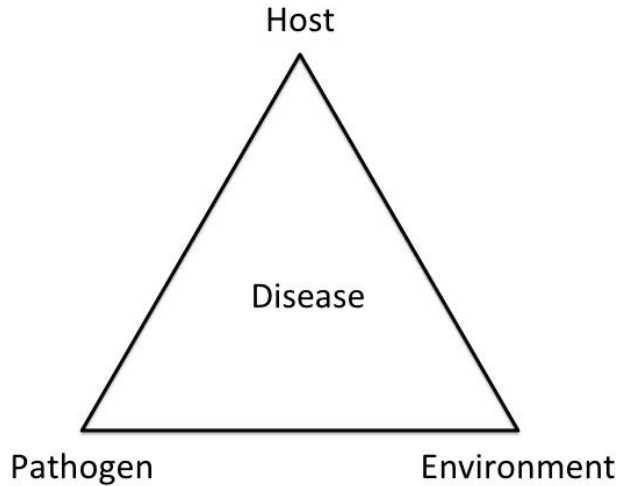


## Important:

- Chemical applications are effective against ADULTS ONLY and will not control SWD eggs, larvae, or pupae in fruits.
- RASPBERRY must be listed on the pesticide label.
- Monitoring for SWD to know when they are present, then apply protective pesticide.
- Good spray coverage of the foliage and ripening fruit is essential to prevent oviposition by the females.

# Vegetable diseases and disorders

Diseases--caused by a pathogen



Disorders--caused by environmental conditions

- Too much/little water
- Too much/little light
- Too cold/hot
- Poor soil conditions
- Poor soil nutrition
- Poor Pollination

# Powdery mildew

- Infects all cucurbits, including muskmelons, squash, cucumbers, gourds, watermelons and pumpkins
- The first sign of powdery mildew is pale yellow leaf spots.
- White powdery spots can form on both upper and lower leaf surfaces, and quickly expand into large blotches
- Space and stake plants to minimize humidity
- Don't over-apply nitrogen
- Plant resistant varieties next year!
- If a severe infection ruined your plants last year, apply fungicide this summer when you first see the pale yellow leaf spots.

## Chemical management:

- Bayer Advanced Natria Neem Oil Conc [Organic]
- Bi-Carb Old-Fashioned Fungicide [Organic] (potassium bicarbonate)
- Active ingredient: potassium bicarbonate | EPA reg no: 54705-10
- Monterey Horticultural Oil [Organic]
- Safer Brand Garden Defense Multi-Purpose Spray Conc [Organic] Neem oil



# Tomatoes/potato-Late blight

- Good air circulation a must
- A couple of drizzly days in summer can set the stage for Late blight.
- If rain is forecasted, spray plants with a copper fungicide



## Chemical management:

- Bonide Copper Fungicide Spray or Dust RTU [O] (copper sulfate)
- Bonide Fung-onil Multi-Purpose Fungicide (chlorothalonil )
- Apply BEFORE the cool humid conditions develop. Repeat application according to label directions



Leaf infections are large brown blotches with a green gray edge

# Verticillium Wilt

- Soil borne-attacks roots and moves upward
- Infected plants wilt, are stunted, and have yellow leaves which tend to roll inward.
- Older and lower leaves are the most affected- Leaves dry out, turn brown, and die.
- Stem tissues have brown discoloration
- Usually doesn't kill tomato plants but reduces their vigor and yield.
- Not much can be done
- Rotate crops if you have a large garden, don't plant tomato family plants in the soil. Try celery, lettuce, peas, beans, and asparagus instead.
- Plant resistant seeds.
- Clean up plant debris and destroy.



# Common Abiotic Tomato Problems



<https://ucanr.edu/sites/sacmg/files/261550.jpg>

## Sunscald



## Blossom End Rot



## Vivipary



## Catfacing



# Tomato Leaf Roll Problems



[https://spokanecountyextension.files.wordpress.com/2013/06/http\\_\\_\\_cru-cahe-wsu.jpg](https://spokanecountyextension.files.wordpress.com/2013/06/http___cru-cahe-wsu.jpg)

**Physiologic leaf roll**



*Caption: Curly top virus symptoms on tomato*  
*Photo by: R.S. Byther*

**Curly top virus**



**Herbicide Damage**

# Potatoes



**Greening**



**SCAB**



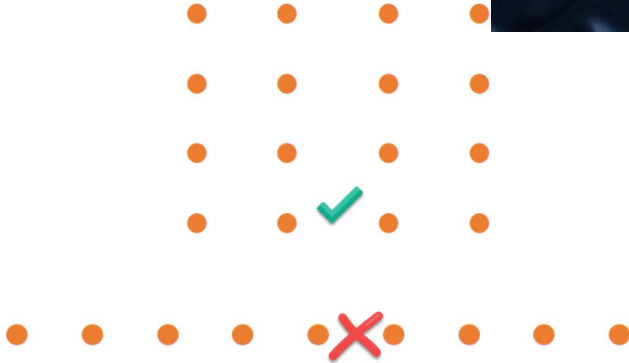
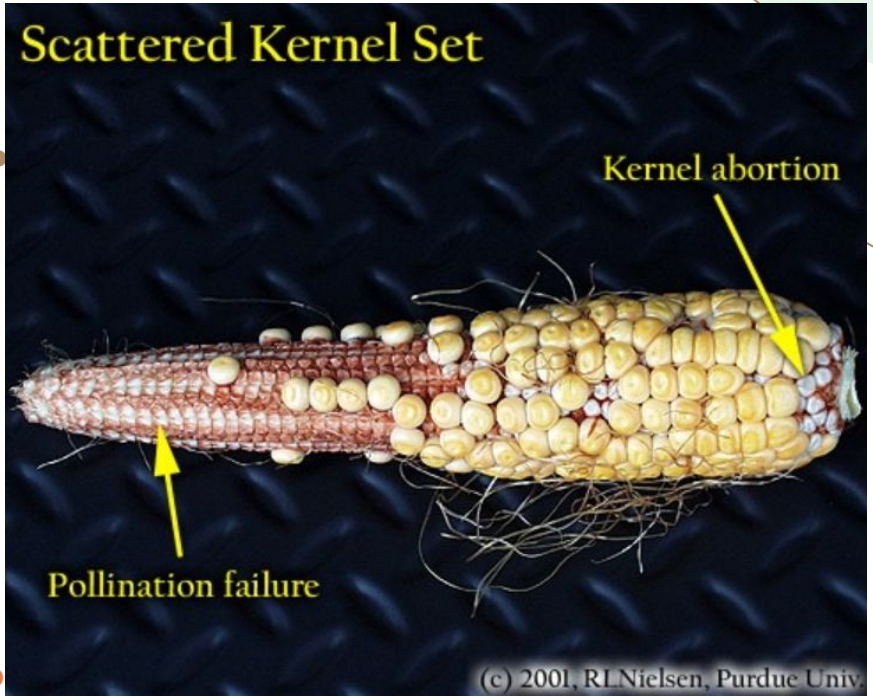
**Bacterial ring rot**



**Potato: Hollow heart. Calcium deficiency**



**Rhizoctonia blight aka "scurf"**



# Sweet Corn

# Onions and Garlic

- Frequent offender--Fusarium Basal Plate Rot
  - pinkish color on root end
  - Seed borne
  - worse in wet springs
  - Gets worse if you re-plant
  - sanitation and rotation
  - Better chance in raised beds
- WORST offender: White Rot
  - Long soil life (10+ years)
  - Moves on plants and/or cloves
  - No treatments
  - Remove all infected plants and the adjacent healthy plants. Remove soil around infected plants when practical. Destroy or discard (do not compost) diseased materials.



# Brassicas (cabbage family)



**Boron  
Deficiency**

Hollow stems and poor heads

- **Clubroot of crucifers**



*Caption: clubroot symptoms on cabbage  
Photo by: L.J. du Toit*

# Carrots--Abiotic problems

- Split Roots



# Curcurbits--Cukes, squash, melons

Poor pollination



Image by Jennifer Martell via GKH Scavenger Hunt



<https://s3.eu-west-2.amazonaws.com/male-and-female-flowers-2x.jpg>



# And for those we didn't cover

## WSU's list of common offenders

Asparagus \*Guide

Lettuce

Bean

Onions, Garlic

Beet, Chard

Pea

Broccoli, Cole crops

Pepper, Eggplant

Cantaloupe, Melons

Potato

Carrot

Radish \*Problem  
solving

Corn

Spinach

Cucumber, Pumpkin,  
Squash

Tomato

Turnip, Rutabaga

## Hortsense

<http://hortsense.cahnrs.wsu.edu>

Search by crop

## Pestsense

Always choose the

**LEAST TOXIC OPTIONS!**

SIMPLE, HOLISTIC, COMMON

SENSE METHOD OF

MANGING GARDEN PESTS &

DISEASES



# Problems: If you plant, they will happen!

- Growing problems
- Common sense approach to problem solving
- Insect Problems
- Plant disease and disorders

# Cheat Sheet: Choose the Least Toxic Pesticide

## Organic- Least to most toxic to beneficials

- **Bt** -caterpillars--little or no toxicity to any other organism
- **Diatomaceous Earth**
- **Neem oil** - azadirachtin
- **Insecticidal Soap** - Potassium salts of fatty acids
- **Spinosad** - E.g., Entrust, Success, Regard, Bonide Captain Jack's Deadbug Brew R-T-U; apply at night
- **Boric Acid** - ants
- **Pyrethrin** - highly toxic--apply at night

## Synthetic Pesticides- ALL highly toxic to bees

- Acetamiprid
- Acephate
- Bifenthrin
- Carbaryl [E.g., Sevin]
- Cyfluthrin
- Esfenvalerate
- Cyhalothrins
- Malathion
- Permethrin

### READ THE LABELS

- How to use
- Target use and insects
- How to dispose
- Protect yourself, the environment, and pollinators

# Resources

Hortsense <http://hortsense.cahnrs.wsu.edu/>

Fertilizing your Garden <https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/ec1503.pdf>

Growing Your Own OSU <https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9027.pdf>

WSU: Garden Vegetables--individual growing guides <http://gardening.wsu.edu/vegetable-gardens/>

OSU Vegetable Gardening Resources: <https://extension.oregonstate.edu/topic/gardening/vegetables/resources>

Territorial Seed Growing Guides <https://territorialseed.com/blogs/spring-growing-guides>

Natural enemy of Brown Marmorated Stink Bug--Samurai Wasp

[https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9164\\_0.pdf](https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9164_0.pdf)

Growing Sweet Corn in Home Gardens <https://extension.tennessee.edu/publications/documents/SP291-E.pdf>

Good look at problems affecting sweet corn in our area

<https://www.skagitmg.org/wp-content/uploads/Public-Pages/Food%20Gardening/Food%20Gardening%20Library/WSU%20Bulletin%20FS104E%20Sweet%20Corn.pdf>

# Resources

Tips and tricks for growing vegetables in our area and on the coast

<https://extension.oregonstate.edu/gardening/vegetables/growing-vegetables-pacific-northwest-coastal-region>

Interesting read about the causes of deformed carrots

<https://gardenerspath.com/plants/vegetables/causes-deformed-carrots/>

Great resource for ALL your gardening and landscape needs--choosed topic from column on left.

<http://gardening.wsu.edu/>

Nutrient deficiencies in crop vegetables <https://crops.extension.iastate.edu/files/article/nutrientdeficiency.pdf>

Photo Gallery of Vegetable Diseases [https://mtvernon.wsu.edu/path\\_team/diseasegallery.htm](https://mtvernon.wsu.edu/path_team/diseasegallery.htm)

National Pesticide Information Center <http://npic.orst.edu/>

Why read labels? [https://www.epa.gov/sites/production/files/2014-04/documents/why\\_read\\_labels.pdf](https://www.epa.gov/sites/production/files/2014-04/documents/why_read_labels.pdf)

# Resources

**Inviting Beneficial Insects to your garden** - Here are a free great little free publications you can download that will help you to get to know who lives in your garden! Search Google for the following:

1.) OSU: What to plant! Encouraging Beneficial Insects in your Garden PNW550  
<https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/pnw550.pdf>

2. ) OSU: Excellent identification guide Common Natural Enemies of Crop and Garden Pests in the PNW EC 1613-E <https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/ec1613.pdf>

3. ) WSU: Beneficial Insects, Spiders, and Other Mini-creatures in your Garden--how to get them to STAY! EM067E  
<http://pubs.cahnrs.wsu.edu/publications/wp-content/uploads/sites/2/publications/em067e.pdf>

Where to get Separate seed packs

“Beneficial Insectary Mix”-[www.outsidepride.com](http://www.outsidepride.com)

“Beneficial Insect Attractant Mix” - [www.johnnyseeds.com](http://www.johnnyseeds.com)