

# Chapters 9 and 10

## Pests

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# Integrated Pest Management

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Accurate identification of the pest is essential because different pests may not be controlled by the same method.

Regular inspection to detect the presence of damaging pests and track their movement.

Monitoring coupled with use of a combination of control methods as needed that are least disruptive to the environment.

# What Is A Pest?

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Any living organism, whether animal, plant or fungus, which is invasive or troublesome to plants.



Let's go scouting in the rose garden!

#1





# Yellow Rose Aphids

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- Can mount a major attack quickly
- Can reproduce **sexually or asexually** and some use both methods depending on their environment. If asexual reproduction, females can give birth to live clones or lay eggs.
- Big nitrogen feeders -- another way to help control aphids on roses is to use slow or time-release (urea based) nitrogen fertilizers.
- A light infestation may be easily controlled with a forceful spray of water to the undersides of the leaves.



#2



# Western and Florida Flower Thrips

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- Tiny, fast moving, rasping-sucking insect
- When feeding, often leaves fecal matter appearing as dark spots on the plant material
- **A browning, noticed on the inside petals caused by the rasping mouthparts of thrips as they suck sap from the petals.**
- **Prefer lighter colored blooms and buds.** Control can be difficult as they hide inside an unopened bloom.



#3



# Two Spotted Spider Mite

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- Spider mites are not insects, but relatives of the spider.
- Especially prevalent in hot dry weather and difficult to control if they get a foothold.
- **Mites suck chlorophyll and juices from the outer cells of leaves.** The first sign will be a lightening of the lowest foliage.
- If the affected leaves are shaken over a piece of white paper the tiny spider mites viewed as small dots.
- A light infestation may be easily controlled with a forceful spray of water to the undersides of the leaves.
- **If not controlled, they can defoliate a plant in days**





#4



# Leafhopper

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- Tiny piercing-sucking insects
- Suck plant juices from the undersides of leaves
- Immature leafhoppers are often found in large numbers, are usually pale white to yellow to green in color
- Damage from feeding shows up with leaves spotted, bronzed, or off color
- Note that damage from thrips, leafhoppers, and mites is generally very similar in appearance



#5





# Rose Scale

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- They are round or oval, hard dirty white, gray or brown shell-covered insects that suck sap from the stems and foliage of roses.
- Eggs are laid under the armor
- Female produces only one batch of eggs before it dies
- Scale insects do not look like typical insects but more like a disease. There are several species that attack roses.



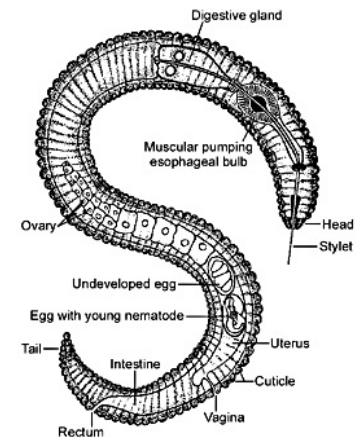
#6



# Nematodes

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- Microscopic, worm-like creatures - serious rose pests
- Plant-parasitic nematodes damage the root system and reduce the ability of the plant to obtain water and nutrients from the soil.
- Roots respond to this feeding damage by forming knots or small galls that limit further development of the root system
- Inspection of root systems may reveal galls about ¼ inch in diameter. Nematode problems can be diagnosed by submitting a soil sample to a nematode assay lab
- Purchase roses grafted onto *Rosa* 'Fortuniana'.



#7



# Cane borer

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- There are several wasps and bees that nest in the pith of cut rose canes. **These insects bore a hole down the middle of the pith in order to make their nests; thus they are often called "cane borers."**
- "Cane borers" are predators of aphids and use them as food for their young in the nest, keeping aphids under control will remove the food source
- Damaged canes should be cut below the nest to prevent a new crop of twig nesting wasps

#8



# Rose Midge

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- Tiny mosquito like flies, feeds on the apical buds of roses
- The telltale sign, a tiny crisp, burnt-like bit of foliage at the tip of new growth, is often the first sign of a midge infestation.
- At the first indication of midge, it is advisable to treat the rosebeds and roses with insecticidal treatments as recommended on the product label for rose midge.



#9





# Rose Slug

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- There are two main members of this family, the bristly rose slug, which is covered with small hair-like bristles, and the European rose slug, which is smooth and greenish-yellow in color.
- Depending on the species they may skeletonize the rose leaves and may chew holes on the leaves when fully grown. They are among the earliest of the insects to emerge in the spring.

#10



# Eastern Lubber Grasshopper and Katydid

- Eastern lubber grasshoppers or katydids are most common on roses
- Chew holes as they feed on new rose foliage.
- Feed on and can destroy blooms
- Grasshoppers are controlled better by hand picking, birds and animals than spraying for them.



#11



# JAPANESE BEETLES

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- The female lives 30 to 45 days, lays 40 to 60 eggs, mostly under grass roots in lawns. The grubs hatch in 10 to 12 days, feed on grass roots until cold weather. Leave brown spots in lawn.
- The beetles are visible during the day, feeding on the foliage and blooms.
- Best control is to eliminate the grubs while they are feeding by the use of grub control. Milky spore has been effective in some areas



#12



Distorted Growth



#12

Leaf Scarring



Dead Branches

# Chilli Thrips

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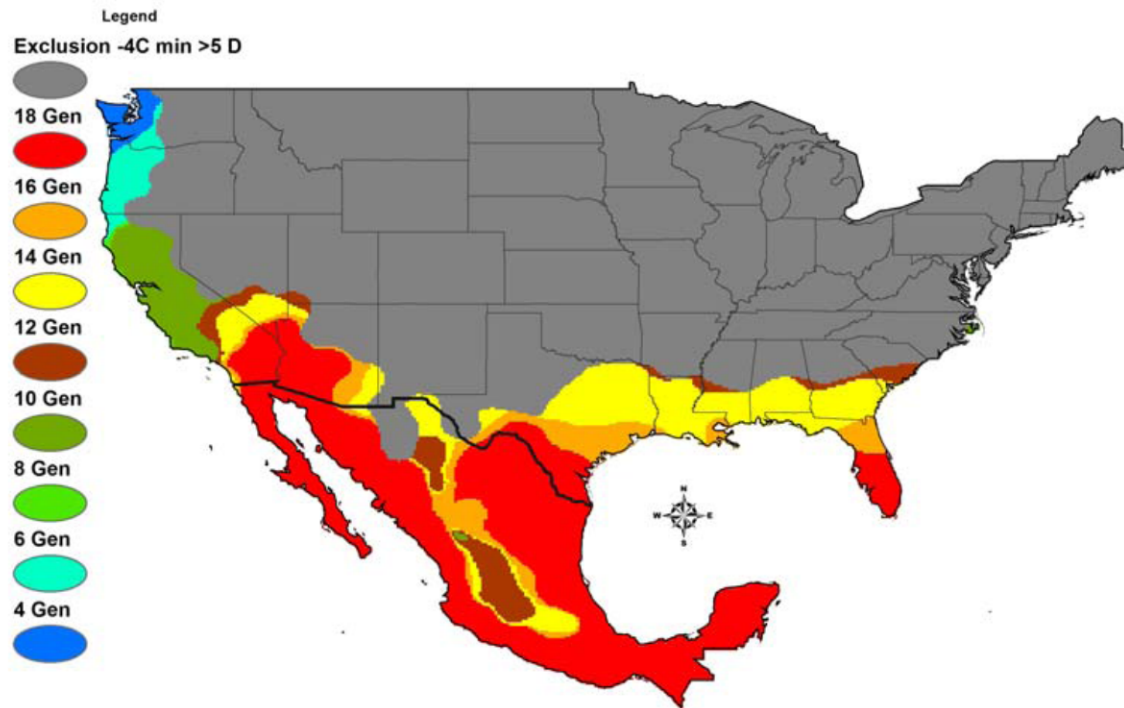
- Feed preferentially on new growth.
- Infested plants usually develop characteristic wrinkled leaves, with distinctive brown scarring along the veins of leaves, the buds of flowers
- Feeding damage can kill plants already aggravated by environmental stress





# Projected Range

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Generational potential outside of the predicted cold temperature exclusion boundary for *S. dorsalis* in the U.S. and Mexico. (Source: USDAAPHIS- PPQ-CPHST 2005).

# Florida Hosts

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Begonia

Celosia

Crape Myrtle

Cucumber

English Ivy

Ficus

Gerbera Daisy

Impatiens

Indian Hawthorne

Ligustrum

Penta

Pepper

Petunia

Pittosporum

Plumbago

Salvia

Strawberry

Sweet Basil

Viburnum

Zinnia



# Leafcutting Bee

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- Number of bee species are known as "leafcutting bees"
- Cut circular sections are the food cells for their larvae
- Often more than one circle is cut from each leaflet.



# Control of Insects

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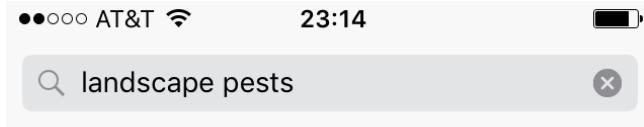
- Establish damage levels for your own garden and  
Correctly identify the pest
- Make observations and record them
- Take the appropriate action; sometimes the  
appropriate action is no action
- Only use an insecticide when damage becomes  
intolerable spray only with the least toxic  
insecticide

# Scouting/ Monitoring

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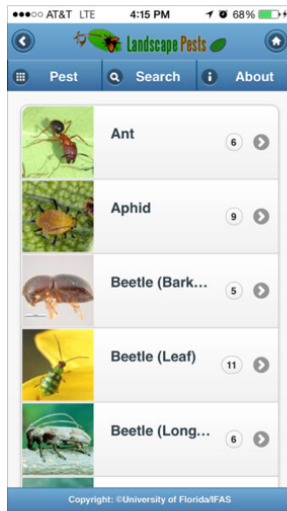
- #2 Flower Thrips
- #3 Spider Mites
- #1 Yellow Rose Aphids
- #7 Cane Borers
- #9 Rose Slugs
- #12 Chilli Thrips
- #8 Midges
- #4 Leaf Hoppers
- #6 Nematodes
- #11 Japanese Beetles
- #5 Scale
- #10 Grasshoppers


# UF/IFAS Landscape Pests

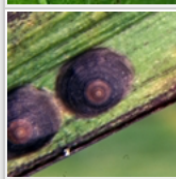



Landscape Pests  
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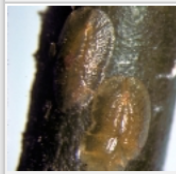
+ OPEN




 **Plant bug** 10 >


 **Scale (Armo...** 11 >


 **Scale (Other)** 6 >

 **Scale (Soft)** 11 >


 **Thrips** 21 >


 **Whitefly** 15 >


 **Chilli thrips** >  
*Scirtothrips dorsalis* (Hood)

 **Citrus thrips** >  
*Scirtothrips citri*

 **Common bloss...** >  
*Frankliniella schultzei* (Tr...

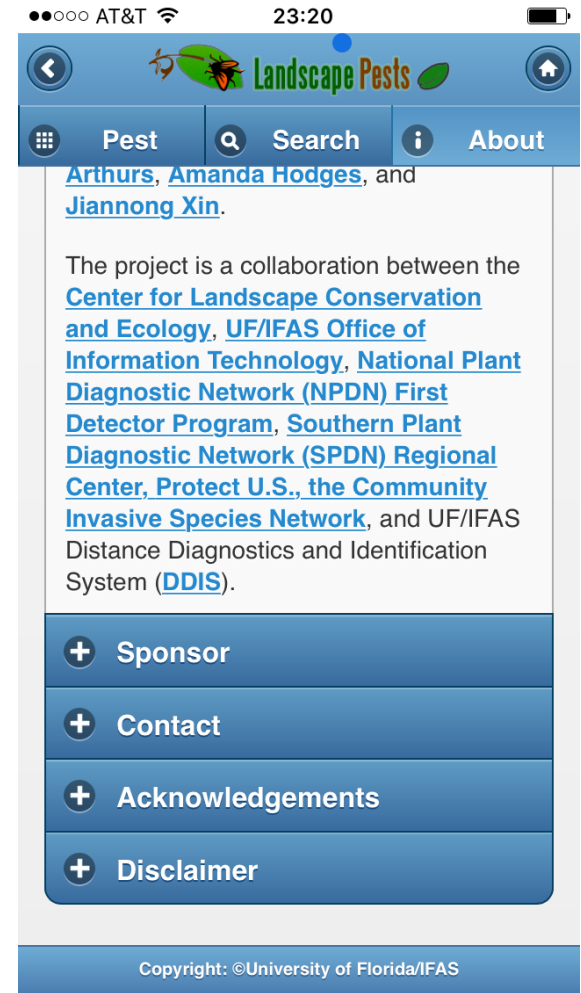
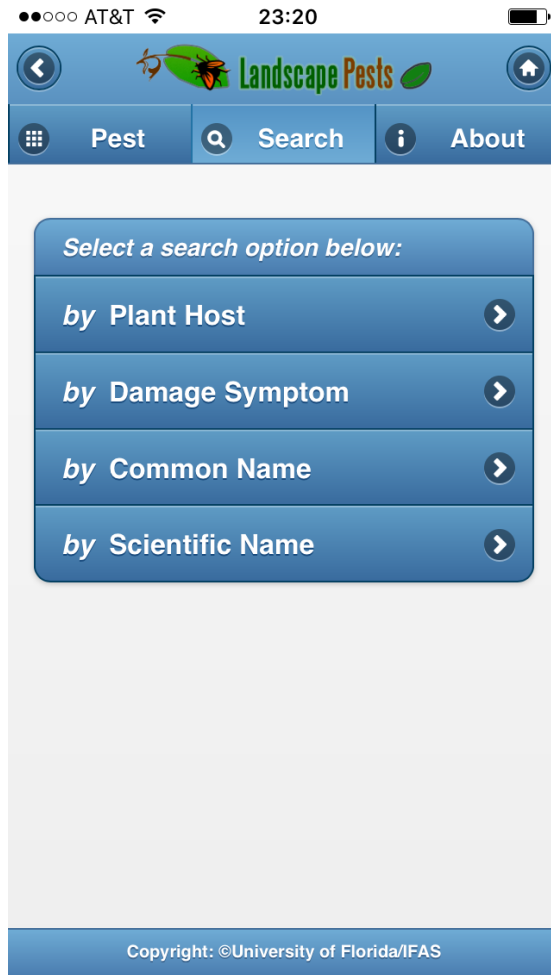
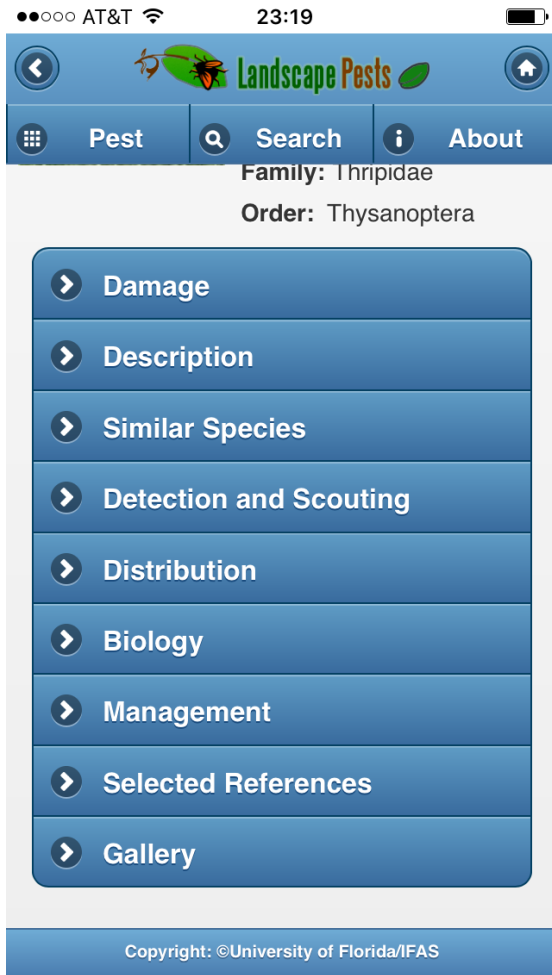
 **Cuban laurel thrips** >  
*Gynaikothrips ficorum* (M...

 **Florida flower thr...** >  
*Frankliniella bispinosa* (M...

 **Flower thrips (ea...** >  
*Frankliniella tritici* (Fitch)

 **Gladiolus thrips** >





# Blackspot/ Cercospora

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Black Spot

Cercospora Leaf Spot

# Blackspot/ Cercospora

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- Cercospora leaf spot
  - Circular spots usually 2–4 mm in diameter, but single spots can be as large as 10 mm in diameter.
  - The size is variable depending on the species or cultivar.
  - When symptoms begin to appear, a small purplish area becomes apparent.
  - In older lesions a small necrotic area develops and increases in size as the disease progress.
- Black spot
  - 2 - 12 mm in diameter usually in the upper surface of the leaves.
  - Irregular shapes - radiate, feathery borders.
  - Severe defoliation occurs in the most susceptible cultivars. While leaves are the most susceptible part of the plant, stipules and pedicels can also be infected.

# Blackspot/ Cercospora

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- Lower areas are more likely to be infected as spores are splashed up on new foliage during rains or irrigation.
- Leaves turn from green to yellow and then drop.
- Very active in a wet environment - temperature around 70°F
- **Spray fungicides on a regular basis to prevent infection.**



# Blackspot/ Cercospora Control

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- Clean up all infected leaves that have fallen to the ground
- Spores can over winter on canes, and the entire cycle will repeat next year. **Spray regularly with fungicide.**
- Prune to allow air circulation
- **Avoid splashing water and soil onto the plant when watering.**
- Buy disease resistant varieties





# Downey Mildew

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- Leaf lesions are often angular in shape.
- Young leaves, stems and flowers may show purple to red or brown irregular blotches that tend to follow the leaf veins
- Advanced infections will have yellowing of leaves
- Favorable conditions =  
humidity => 85%  
temps of 65 - 75° F
- Fungus can winter-over as spores in or on plant parts.



# Downey Mildew

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- Spores may germinate in as little as 4 hours and appear on leaf surfaces in 3 days.
- Can defoliate a plant in about a day.
- Manage with resistant varieties, good air circulation and full sunlight.
- Avoid overhead irrigation during conditions conducive to the spread of the disease.
- Remove all the dead leaves and branches from the plants.
- Sterilize pruning knives to prevent disease spread.



# Powdery Mildew

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- Appears as small patches of white "powder" on leaves, shoots, buds
- Starts on leaves, but spreads to buds and young shoots
- Infections on new growth cause leaves to curl up
- Can overtake an entire plant



# Powdery Mildew

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- When relative humidity is high spore germination generally occurs – Optimum 71°F and 98% relative humidity.
- Over-winters on infected canes, spores move to new leaves in spring to begin disease cycle.
- Aggressive spring pruning will remove a major source of this fungus.
- Plant in open, sunny areas
- Space plants to allow air movement
- A regular fungicide spray program is necessary for prevention.

# Botrytis Blight

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- Light-colored spots on rose petals - turns to brown blotches
- Buds fail to open; flower buds droop turn black at the base.
- Canes may develop dark brown, sunken cankers
- Cool, wet conditions are right for this fungus
- Often on blooming plants during cool weather with high humidity levels
- Occurs throughout the year





# Botrytis Blight

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- Spores are moved to other plants by wind or blowing rain.
- May appear on canes as grayish fuzzy growth.
- Planting conditions that allow air circulation help suppress this disease.
- Fungicide sprays should be initiated if necessary, and different chemistries must be alternated to reduce the chances of fungicide resistance.



# Rust

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- A fungal disease common in many areas, easily identified.
- Appears on the underside of the foliage as red-orange spots
- Thrives in cool, moist weather
- The summer stage is cyclic, and may repeat every 10 to 14 days in favorable weather
- Fungus overwinters on infected leaves and canes
- Spores are wind borne
- Can defoliate the plant



# Rust Control

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- Good sanitation will help to prevent early season infections
- Remove affected leaves and dispose in trash
- Don't water in the evening so that the leaf surface is wet over night
- Fungicide for powdery mildew/ black spot is effective for rust



# Anthracnose

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- Initially spots are small and black - easily confused with blackspot
- Spores carried by water or rain to new leaves and stems
- As disease progresses, spots become purple to brown and centers turn gray or white with dark margin
- This light-colored center best defines the difference with blackspot
- Can be severe under cool, moist spring conditions



# Anthracnose

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- Tissue may drop out of the center of the spots, giving infected leaves its other name of “Shot Hole Fungus”
- Fungus overwinters as spores mainly in old lesions on canes
- Can cause leaf drop that weakens the plant
- In extreme cases, it can result in complete defoliation





# Anthracnose Control

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- Sanitation is best means of control – remove diseased leaves, and dispose in trash
- Plant spacing, use of drip lines or soaker hoses rather than sprinklers should help
- Prune out canes that have infections in fall – dispose in trash, not in compost pile
- Fungicide used for black spot is usually effective



# Stem Canker

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- A fungal disease that can affect any part of the plant, but most common on stems and canes.
- After a cold wet winter, pruned stems provide wound sites for canker causing fungi.
- Canker can also enter thru leaf scars – do NOT tear off leaves during fall pruning!



John Moe

# Stem Canker Control

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- Time fall prune so tips can callus before winter
- Dormant spray can protect pruning cuts
- Disinfect pruners before moving to another bush
- In spring, remove infected canes and spray for fungal disease
- Fungicides that control black spot will also help to control canker



# Bacterial Crown Gall

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- **Caused by a bacterium rather than a fungus.**
- Enters the plant through wounds made during grafting, planting, pruning, or insect feeding
- Can live dormant in the soil for years
- Galls have rough surfaces and may grow up to 6 inches in diameter
- Diseased plants should be removed and destroyed



# Rose Mosaic

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- A viral disease – no chemical remedy available to cure a plant
- Reduces flower production and plant growth and shortens plant lifespan.
- Primarily transmitted by propagation
- Symptoms are highly variable and include chlorotic line patterns, ring spots, and mottling of leaves.





# Rose Rosette Disease (RRD)

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- The foliage looks like witch's broom and has distorted, and wrinkled leaves.
- New growth appears unusually soft and pliable
- RRD is suspected to be carried from plant to plant by the tiny eriophyid mite
- Can be confused with plant damage from chemicals like Roundup®



# Rose Rosette Disease

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- The stems grow slowly and produce excessive thorns -- the stem may not be non-visible!
- Thorns are often red-tinged.
- No cure, fatal to plant.
- **Only control is to remove the diseased plant and root system completely!**

