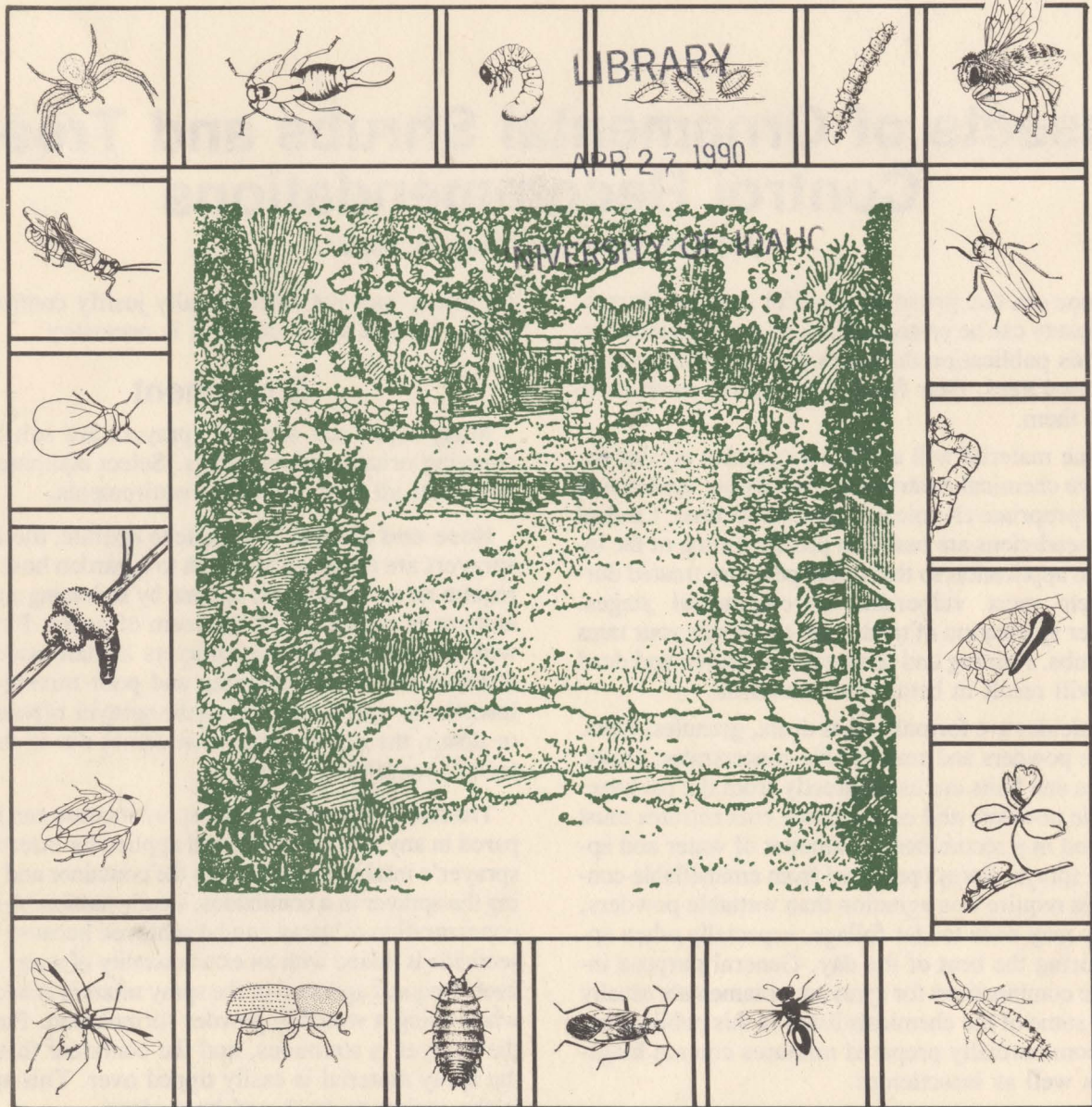
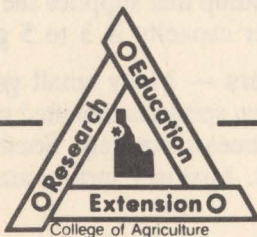


INSECTS OF ORNAMENTAL SHRUBS AND TREES



CONTROL RECOMMENDATIONS

HUGH W. HOMAN AND CRAIG R. BAIRD



Cooperative Extension System

University of Idaho

College of Agriculture

Insects of Ornamental Shrubs and Trees: Control Recommendations

*Hugh W. Homan and Craig R. Baird**

Anyone can feel proud of beautiful shrubs and trees. Their beauty can be protected through proper insect control. This publication describes the common pests of shrubs and trees, their feeding injury and methods to control them.

No one material will adequately control all insects. Effective chemical control requires proper application of an appropriate chemical at the correct time. Control recommendations are based on precise timing of the insecticide application so that insect pests are treated during their most vulnerable developmental stages. Improper application of treatments can injure your trees and shrubs. Pruning and removal of diseased and dead wood will result in better insect control.

Insecticides are formulated as dusts, granules, baits, wettable powders and emulsifiable concentrates. Dusts, granules and baits are used directly from the package. Wettable powders and emulsifiable concentrates must be diluted in a recommended amount of water and applied as sprays. Sprays prepared from emulsifiable concentrates require less agitation than wettable powders, but they may burn tender foliage, especially when applied during the heat of the day. General purpose insecticide combinations for spraying ornamentals usually include some of the chemicals listed in this publication. Many commercially prepared mixtures contain fungicides as well as insecticides.

Proper timing of spray applications and thorough coverage of leaves, stems, branches and trunk are as important as the chemicals used. Remember, leaves have two sides; be sure to wet both. Spray foliage until the spray starts to drip from the leaves. Follow the label directions closely when preparing and applying all sprays.

Your ornamentals can tolerate some insect damage without harm to their beauty. The presence of a harm-

ful insect does not automatically justify control measures. Do not spray unless it is necessary.

Equipment

Many types and sizes of sprayers are suitable for spraying ornamental plantings. Select equipment that will meet all your spraying requirements.

Hose-end sprayer — Simple to operate, these small sprayers are designed to attach to a garden hose. They require no spray tank and operate by siphoning a desired amount of chemical into a stream of water. Problems with some types of these sprayers include poor spray distribution, nozzle clogging and poor mixing of the insecticide with water. When the sprayer is pointed up or down, the siphon tube often comes out of the container, preventing mixing.

Trombone sprayer — The spray mixture can be prepared in any size container and applied by inserting the sprayer's intake apparatus into the container and pumping the sprayer in a continuous, steady motion. A known concentration of spray can be achieved because the insecticide is mixed with an exact quantity of water. However, frequent agitation of the spray mixture is necessary when using a wettable powder formulation. Pumping the sprayer is strenuous, and the container that holds the spray material is easily tipped over. This sprayer is the easiest to wash and keep clean.

Compressed air sprayer — Compressed air sprayers with 1- to 5-gallon capacities are good sprayers for small plantings. A pump compresses air in the tank, forcing out the spray when the nozzle is opened. When using wettable powders, shake the sprayer frequently to keep them in suspension.

Knapsack sprayer — Knapsack sprayers have a hand-operated, piston pump that supplies the pressure for application. Sprayer capacity is 3 to 5 gallons.

Small power sprayers — Many small gas-engine and electric-motor-driven sprayers mounted on wheels can treat medium-sized trees adequately. Some are self-propelled, others are not. Auxiliary sprayer attachments

*Hugh W. Homan is Extension entomologist in the University of Idaho Department of Plant, Soil and Entomological Sciences, Moscow. Craig R. Baird is Extension entomology specialist at the UI Southwest Idaho Research and Extension Center, Parma.

for snow blowers, garden tractors and riding mowers can also be quite effective.

Proper maintenance immediately after use will lengthen sprayer life. Thoroughly wash and dry all sprayers before storing them. Oil moving parts and threads of nozzles.

When practical, prune shrubs and trees to a height at which they can be sprayed adequately with your equipment. If you do not have adequate spray equipment, hire a reputable commercial operator.

Application Rates

The following chemicals and application rates are recommended for most pests. Be accurate in your dilutions; too much chemical may injure the plant; too little chemical will result in poor control.

Rates for different pests vary. See label for correct plant, pest and rate.

Chemical	Formulation	Amount of insecticide per gallon of water
B.t. (<i>Bacillus thuringiensis</i>)	20% WP	2 tsp
Baygon	2% bait	—
Calcium polysulfide	26%	—
	Dormant	10 tbsp
Diazinon	Summer	2 tsp
	4% dust	—
	5% granules	—
	17% EC	1 tbsp
Dimethoate (Cygon 2E)	25% EC	1 tbsp
	23%	2 tsp
Dormant oil	80% purified oil	2/3 cup
	(for scale insects)	2/3 pint
Di-Syston	1% granules	—
Dursban	6% EC	4-8 tsp
Kelthane	18% EC	2 tsp
Lindane	20% EC	2 tbsp
Malathion	57% EC	1 tsp
Mesuroil	2% bait	—
Metaldehyde	10.5% G	—
Metasystox-R	6% EC	2 tbsp
Methoxychlor	12% WP	2 tbsp
Orthene	15% EC	1 tbsp
Pyrethrin	0.2% EC	3 tbsp
Rotenone	0.5% EC	3 tbsp
	1% dust	—
Sevin	5% bait	—
	5% dust	—
	10% EC	2 tbsp
	27% EC	1 tbsp
	50% WP	2 tbsp
Superior oil	98% purified oil	—
	Dormant	5 tbsp
	Summer	2 1/2 tbsp
Thiodan	9% EC	2 tbsp

Note: WP = wettable powder; D = dust; EC = emulsifiable (liquid) concentrate; G = granule; 3 tsp = 1 tbsp; 16 tbsp = 1 cup; 2 cups = 1 pint.

General Warnings

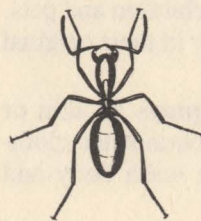



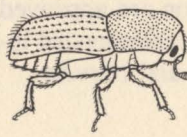
All pesticides are to some degree poisonous to warm-blooded animals. They should be handled cautiously to prevent poisoning pets, livestock, wildlife, children, the user and other adults. When using any chemical, observe the following safe-use procedures:






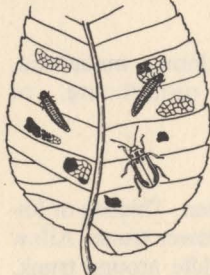

1. Always read the label before using any chemical and carefully follow directions. Before opening the container, always note warnings and cautions.
2. Keep insecticides out of reach of children and pets. Pesticides should be locked away in their original containers, outside the home.
3. Avoid spilling concentrates or sprays on skin or clothing. If they spill, remove contaminated clothing immediately and thoroughly wash body and clothes.
4. Avoid inhaling insecticide mists or vapors. When directed to do so on the label, wear protective clothing and a face mask. Coveralls and gloves will help prevent contact with insecticides.
5. Wash your hands and face and change to clean clothing immediately after spraying. Always wash clothing before reuse.
6. Cover food and water containers when treating around livestock or pet areas. Do not contaminate fish ponds.
7. To avoid accidental injury to susceptible plants from contaminated spray equipment, do not apply insecticides with the same sprayers used for weed killers.
8. Triple rinse empty insecticide containers, wrap them in newspaper and dispose of them in the trash.
9. Follow label directions and cautions to keep undesirable residues off fruits and vegetables.
10. To prevent bee kill, do not apply insecticides to blossoming plants.
11. Do NOT pour excess spray or pesticide into public sewage systems and do NOT dispose of it in the trash. Try to buy no more pesticide than you will use.
12. **The homeowner is responsible** for residues on his plants as well as for problems caused by drift from his property to other properties or plants. If you inadvertently spray fruits or vegetables, check the pesticide label to be sure the fruits or vegetables are listed. If the crops are unlisted, or listed at a different rate of application, do not eat them. If the pesticide and rate of application are approved for the crops, be sure to wait the recommended interval between spray application and harvest.










Common Pests


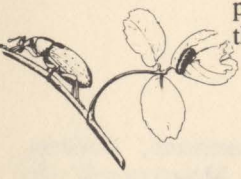

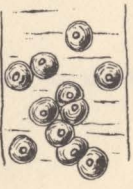

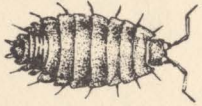


Many different insects attack our shrubs and trees. The following are the common pests. For assistance in control of pests not listed, take pest and damaged plant specimens to your county Extension agent or send them to the Extension entomologist, Department of




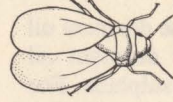

Plant, Soil and Entomological Sciences, University of Idaho, Moscow 83843. These are general recommendations. Before you buy or use a pesticide, read its label to make sure the pesticide may be used on the particular pest and plant.

Pest	Injury description and plants attacked	When to treat	Treatment method
Ants 	Tiny to large, yellow to red to black and bi-colored ants living in garden and lawn soils. Those frequenting shrubs and trees are associated with aphid and scale infestations upon whose sweet secretions they feed. Under these conditions, ants drive off or kill their natural enemies.	Only when ants are determined to be harmful.	Spray diazinon, Dursban or Sevin where ants are found. Repeat as necessary until ants disappear.
Aphids 	Soft bodied, gray, green, red or black insects about 1/8 inch long. Aphids suck plant juices from leaves and new growth of many deciduous and coniferous trees and shrubs. They produce large amounts of sticky honeydew that may eventually turn black and attract ants.	Delayed dormant: After buds swell but before buds break open. Spring and summer as needed.	Delayed dormant: Apply dormant oil or combinations of Superior oil and calcium polysulfide to twigs and branches. In spring and summer, use foliar sprays of malathion, dimethoate, Dursban, Orthene or diazinon or use granular insecticide (Di-Syston). Pour prescribed amount of Di-Syston under the plant's drip line. Immediately work into the top 1 to 2 inches of soil and irrigate.
Apple-and-thorn skeletonizer 	Small, yellow-green caterpillars with black spots and brown heads. They first feed on the leaf surface in groups of 3 to 10 then make shelters by drawing together upper leaf surfaces with silk, gradually causing the leaves to become a mass of webbing and frass. They have several generations a year and feed on cherry, hawthorn and related plants.	When first damage is noticed in late spring and again as needed.	Spray infested foliage with diazinon, Sevin or B.t.
Bagworms 	Bagworms are moth larvae that build snail-like shells to protect themselves. Their feeding skeletonizes the leaves of many different broadleaf ornamentals.	When bagworms are damaging foliage, usually in spring.	Spray foliage with Dursban, diazinon, Sevin, Orthene or B.t.
Bark beetles 	Small, brown to black beetles that attack sick or weakened trees. Small, shot-size holes appear in bark where adults attack and emerge. Larvae feed under the bark. High populations can kill trees.	Late May and mid-June.	The best control is to keep the tree pruned and healthy by fertilizing regularly and watering properly. Healthy trees are usually unattractive to bark beetles. Use 6 tbsp lindane or 25 tbsp Sevin 80 Sprayable per gallon of water. Spray trunks thoroughly, as high as your sprayer will reach, wetting until the spray runs off.

Pest	Injury description and plants attacked	When to treat	Treatment method
Blister mites and rust mites	 <p>Microscopic, pink, four-legged mites that winter beneath bud scales of apple, mountain ash and pear. They migrate in spring to begin feeding inside leaves before they fully open. Infested areas form blisters that are first green, then red and finally brown. Each season there are many generations within the leaf tissues.</p>	<p>Dormant, as buds begin to swell, or delayed dormant, as soon as first green blisters are seen in foliage, or summer, when injury is present.</p>	<p>Use calcium polysulfide or dormant oil for dormant or delayed dormant applications. Use summer sprays of Sevin or diazinon.</p>
Borers	 <p>Large insects, usually beetle or moth larvae.</p>	<p>Control has to be applied to kill the adults before they lay eggs or to kill the tiny larvae after they hatch and before they burrow into wood: mid-June, mid-July and mid-August. For locust borer, apply in late August and early September.</p>	<p>Maintain trees in good health with proper fertilization and irrigation. Healthy trees are less attractive to borers. Apply lindane, Dursban, Sevin or Thiodan spray to larger branches and the trunk.</p>
Boxelder bug	 <p>Adults are 1/2 inch long, brownish black, with the undersides of their abdomens a bright, orange-red. They suck plant juices from trees and fruit. Seldom does their damage justify control.</p>	<p>Early spring when they congregate on buildings and as needed.</p>	<p>Apply residual spray of diazinon to buildings or spray foliage with Sevin or diazinon. Remove unhealthy box elder trees.</p>
Caterpillars	 <p>Larvae of butterflies and moths that usually feed in large numbers, defoliating limbs or entire plants.</p>	<p>When small worms first appear.</p>	<p>Spray Sevin, diazinon, Dursban, malathion, Orthene or B.t.</p>
Cutworms	 <p>Smooth, tan to black worms that feed on foliage, mostly at night. When numerous, they cut off or shred foliage.</p>	<p>In the evening when problem occurs.</p>	<p>Spray or dust at base of plants with Sevin, Dursban, diazinon or B.t.</p>
Elm leaf beetle	 <p>Yellow to orange, 1/4-inch-long beetle with three black lines on wing covers and two black spots behind the head. Larvae up to 1/2 inch long are dark with yellow markings and prominent body tubercles. They eat holes in leaves, and their feeding destroys the lower surfaces of leaves. Elm trees are often completely defoliated by summer generations of beetles. Defoliated trees are then more susceptible to borers and plant diseases.</p>	<p>When the first larval feeding occurs. Control of the second generation may be necessary if your neighbors do not spray.</p>	<p>Spray Sevin, Orthene or methoxychlor. Thoroughly cover leaf surfaces.</p>
European earwig	 <p>Dark, reddish-brown, 3/8-inch-long insect with forceps-like appendages at rear end of body. Eats holes in tender leaves and blossoms at night.</p>	<p>When encountered.</p>	<p>Spray soil and grass with Sevin, Dursban or diazinon. Around trees and shrubs, apply fresh Baygon bait where earwigs aggregate. Spraying the house foundation in early summer will prevent them from becoming a household nuisance.</p>

Pest	Injury description and plants attacked	When to treat	Treatment method
Grasshoppers 	Found on most plants in years when they are abundant.	When abundant.	Spray with Sevin, Dursban or Orthene as needed or apply Sevin bait. Treat adjoining areas as well as the plants you want to protect.
Leafcutting bees 	These bees cut circular holes in leaf margins, causing a ragged appearance. They are very valuable pollinators and should be protected if possible.	When damage is first noticed. Spraying during hot weather could damage foliage.	Repel with calcium polysulfide.
Leafhoppers 	Small, quick-flying, wedge-shaped, less than 1/4-inch-long insects of variable color. Leafhopper feeding causes leaves to appear scratched or stippled and curls them.	Early or late spring.	Apply malathion, dimethoate, Orthene, Sevin, Dursban or diazinon as foliar sprays or apply Di-Syston into soil.
Leafminers 	Leafminers feed between the two leaf surfaces where they make blisters, blotch mines or serpentine tunnels.	Treat foliage when the blotches first appear, usually in mid-May. Retreatment may be necessary in 4 to 6 weeks.	Spray with lindane, malathion, Sevin, Orthene, diazinon or Cygon.
Leafrollers 	Green to brown, active, smooth-bodied caterpillars that feed upon, roll and web new growth in spring and early summer. The later generation feeds upon fruit.	Late spring when problem occurs.	Spray foliage with Sevin, diazinon, Orthene or B.t.
Maple bladdergall mite 	Microscopic mites cause green, red or black bladder-shaped galls on the upper leaf surfaces of silver, red and soft maples. Galls cause little injury to the tree.	Dormant: As buds swell in spring or at leaf drop in fall.	Spray with calcium polysulfide.
Mealybugs 	Small, sluggish, white, soft-bodied insects that cluster on the undersides of leaves, discoloring and deforming them.	In spring or summer.	Spray diazinon, malathion, Dursban, dimethoate or Orthene.
Peachtree borer 	Whitish-yellow larvae mine the crowns of flowering plum, peach and cherry. Blobs of gum and frass at ground level signal their presence. Often, trees are damaged severely or killed.	Early July and early August.	Apply Dursban, Thiodan or lindane to the lower trunk. Allow spray to puddle around trunk. Two applications necessary.
Pear or rose slug 	Larvae are slug-like, light green and make holes in leaves or skeletonize their undersides.	Summer when problem occurs.	Apply malathion or Sevin.

Pest	Injury description and plants attacked	When to treat	Treatment method
Root weevils 	Whitish, legless grubs feed on fibrous roots when small and can girdle the roots to severely weaken or kill the plants. Adults notch the leaves at the plant base in early summer.	Treat soil before planting susceptible shrubs and every June after the problem is noticed.	Before planting, treat soil with diazinon. At planting, apply diazinon mixture to the crown area then water it in. Apply Orthene or diazinon as a foliar spray at the base of plants when leaf notching begins in June.
Rose curculio 	The rose snout beetle injures flower buds by puncturing them so that the petals, when they unfold, are riddled with holes.	Before and during bud formation. Repeat applications as often as necessary.	Apply Sevin dust.
Rose pith borer 	Small, black wasps that hollow the pith out of stems of roses and other soft-pithed plants after pruning. They then provision their stem nests with aphids, small flies and leafhoppers, killing the stem back 4 to 6 inches.	Late spring.	Apply liberal amounts of asphalt or plastic base tree protective seal or thumb tacks to pruning cuts.
Scale insects 	There are many species of scales from 1/20 to 1/4 inch in diameter. They may be cottony, smooth or naked. They may be flat, elongated, round, oyster shell shaped or pimple shaped. Color is from white to dirty brown. Scales suck sap from plants, causing leaves, twigs, branches, limbs or trees to die, depending upon their severity.	Dormant: As buds swell in spring. Important: Do not neglect this spray. Apply summer sprays when immature stages are active during late June and again in early July.	As buds swell, use dormant oil plus diazinon or dormant oil plus calcium polysulphide. For conifers, use Superior oil plus diazinon in early spring. In summer, use foliar sprays of diazinon, malathion or Orthene for immatures.
Slugs 	Several species of slugs and snails are found in damp areas. They feed on foliage and stems.	As needed.	Use fresh metaldehyde or Mesuroil baits or place shallow pans of beer at ground level to trap and drown slugs.
Sowbugs or pillbugs 	Crustaceans that breathe by gills and are found feeding on decaying plant material and tender foliage in damp, protected places.	As needed.	Apply Baygon bait or spray foliage and soil around plants with diazinon, Sevin, malathion or methoxychlor.
Spider mites 	Several different mites feed on the leaves of shrubs and trees, including conifers. They suck juices, giving the leaves or needles a stippled or bronze appearance and causing them to drop prematurely. Mites can be detected by jarring the foliage over a piece of white paper. The mites will appear as tiny, moving specks.	Spring through fall.	Maintain shrubs in good health to prevent mite buildup. When practical, hose damaged foliage daily to wash off mites or spray with Kelthane, Orthene, Dursban or diazinon.
Spiders 	All sizes of beneficial spiders live on ornamentals. Control is not recommended unless their webs are a nuisance.	As needed.	Wash off webs with garden hose daily and keep foliage clean.

Pest	Injury description and plants attacked	When to treat	Treatment method
Spittlebugs 	Heavy feeding of these spittle-covered insects produces stunted growth and loss of plant vitality.	Spring when first noticed.	Spray with Sevin, Dursban or Orthene.
Spruce gall aphids 	The feeding of two different aphids causes abnormal green to brown swellings or pineapple-like galls that usually encompass new growth at the tips of Colorado blue, Engelmann, Sitka, Norway and red spruces. Galls disfigure trees but do not kill them. They also occur on Douglas-fir needles as small, cottony, white spots. Damage to Douglas-fir is minor.	As terminal buds begin to break on spruce; apply a second spray 2 weeks later. On Douglas-fir, spray as needed.	Spray with Sevin or Thiodan.
Thrips 	Slender insects, only just visible to the naked eye, thrips scar foliage and flower petals with their scraping mouth parts.	Just before bloom and as necessary. Dust flower bulbs before storage.	Spray dimethoate, Dursban, malathion, Metasystox-R, Orthene or Sevin.
Whiteflies 	Tiny, powdery adults and small, oval, flat, scale-like green to black nymphs feed on undersides of leaves, sucking sap from plants and causing them to turn yellow, wilt and possibly die.	When damage first appears.	Spray with Orthene, Cygon, malathion or diazinon. Retreat in 5 days if problem is severe.
White grubs 	Shiny, C-shaped grubs with brown heads that feed on roots of grass, trees and shrubs, usually in sandy soil.	Treat soil before planting or treat soil at the base of plants with excessive amounts of water in late June.	Use Dursban spray on soil and lawns.

Pesticide Residues — These recommendations for use are based on currently available labels for each pesticide listed. If followed carefully, residues should not exceed the established tolerances. To avoid excessive residues, follow label directions carefully with respect to rate, number of applications, and minimum interval between application and reentry or harvest.

Groundwater — To protect groundwater, when there is a choice of pesticides, the applicator should use the product least likely to leach.

Trade Names — To simplify information, trade names have been used. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.