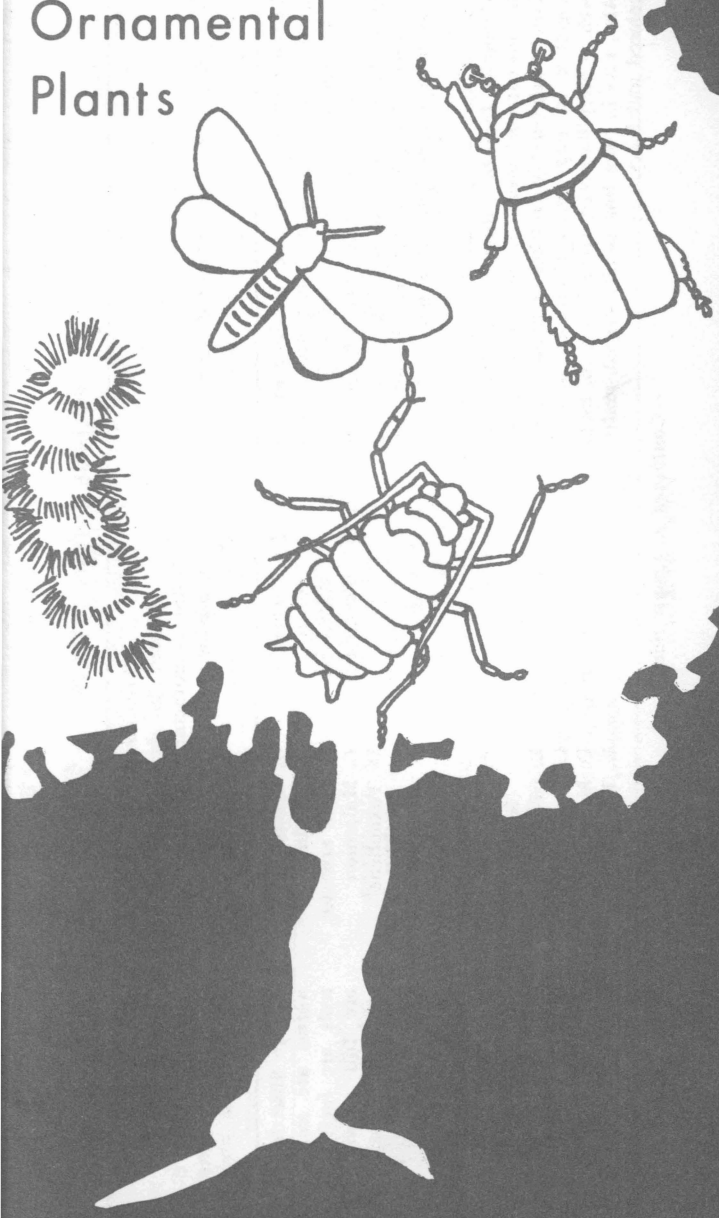
Texas Guide for Controlling Insects on Ornamental Plants



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TEXAS GUIDE FOR CONTROLLING INSECTS ON ORNAMENTAL PLANTS

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VARIOUS SPECIES of insects attack ornamental plants and often the use of insecticides is the only means of control. In other cases, cultural practices, such as proper pruning, fertilizing and watering, play important roles in preventing or suppressing insect infestations.

HANDLING AND STORING INSECTICIDES

All insecticides are poisonous and require careful handling. If insecticides come in contact with the skin, remove the residue immediately by washing with soap and water.

Store insecticides in a safe place out of reach of small children and irresponsible persons. Keep materials in their original, properly labeled containers, away from human food or animal feed and where there is no fire hazard.

INSECTICIDE FORMULATIONS

Most insecticides are available in several forms. Dusts, wettable powders, liquid emulsifiable concentrates, aerosols and granules are the most common formulations. *Dusts* are applied directly to the plant in the form purchased. *Wettable powders* and liquid *emulsifiable concentrates* are mixed with water and applied as a spray. *Aerosol* formulations are sold in a pressurized can and are released as a mist through a finger-tip valve. *Granules* are used as soil or surface treatments to control soil-inhabiting pests through contact. Also, granular formulations of certain insecticides are taken into the plant through the roots and act as a systemic insecticide to control sucking pests on stems and leaves.

Commercial preparations of spray or dust materials containing two or more insecticides and perhaps a miticide can be purchased under various brand names. These mixtures control a wider variety of sucking and chewing insects than single materials, but are more expensive than single insecticide or

miticide formulations. The wider range of effectiveness may be preferred when pest identification is uncertain, however. Mix and apply according to manufacturer's directions.

MIXING AND APPLYING INSECTICIDES

Insecticides are sold under many brands or trade names. Always refer to the statement of active ingredients on the label to determine the specific insecticide in the formulation. Mix and apply the material exactly as directed on the label.

Certain insecticide formulations may injure some tender ornamental plants. The manufacturer generally includes precautions on the label when possible phytotoxicity may occur. *To avoid damaging valuable plants, apply the material only to plants specified on the label. Mix according to directions and apply only the recommended dosage.*

GALL-FORMING PESTS

Many species of insects and mites cause abnormal growths or galls on ornamentals and shade trees. The attack of each species results in a distinctive deformity which develops on the plant's leaves, twigs or stems. Depending on the type of gall formed, immature stages of the pest often can be found within the developing gall. The more important gall-forming pests include mites, plant lice (aphids and phylloxera), midges (tiny flies), cynipids (tiny wasps) and psyllids (jumping plant lice).

Since little is known about the life history of gall insects, it is difficult to outline a completely satisfactory control program. During the growing season, usually before the leaves are developed fully, eggs are laid in the tissues of the leaf, stem or twig. Egg laying and hatching stimulates the plant to form an abnormal growth at the point of attack, inside which the immature pests develop. Elimination of galls or the pest responsible is impossible after the galls begin to form since the immature pest is inside the gall, away from insecticidal contact.

Most ornamental plants and shade trees can tolerate a great number of galls without apparent injury. But, under certain conditions, gall insects build up in sufficient numbers to damage plants. Unhealthy trees are damaged more by galls than trees which are in a vigorous state of growth. Fertilize and water shade trees as needed to keep them in a healthy condition. These practices also minimize damage from wood-boring insects.

Spray treatments early in the growing season may lessen gall infestations. Applications of chlordane or endosulfan plus malathion, beginning when new growth starts in the spring and continuing at weekly intervals until the leaves are developed fully, will be of some benefit. Many common gall-forming pests are active during this period and can be eliminated before they deposit their eggs. Use a mixture of 2 quarts of 25 percent endosulfan or 1 quart of 45 percent chlordane emulisifiable concentrate plus 1 quart of 50 percent malathion emulsifiable concentrate per 100 gallons of water. This rather expensive spray program is practical only on more valuable shade trees.

TREE BORERS AND BARK BEETLES

Shade Tree Borers

Several species of borers attack shade trees. The most important species are known as roundheaded and flatheaded borers. The life cycle or developmental stages vary widely. Some species emerge as adults in early spring and begin laying eggs while others emerge and deposit eggs during the summer. Some species have more than one generation a year while certain species may require 1 or more years to complete a life cycle.

The larvae of *roundheaded borers* make galleries beneath the bark and also tunnel into heartwood. Entrance holes can be detected by the frass pushed out by the feeding larvae. The larvae of *flatheaded borers* tunnel beneath the bark, making long, shallow, winding galleries packed with frass. These borers usually are beneath the bark and have no exit holes to the outside.

With few exceptions, most wood borers attack only above-ground portions of the tree and generally feed in the trunk and larger limbs. Several other insects, such as shot-hole borers, bark beetles and moth larvae, attack a large variety of trees. In most cases, borers attack devitalized, diseased or transplanted trees. Proper tree care is important in promoting healthy, vigorous, growing trees.

A few management practices for protecting trees against borer attack follow:

1. Wrap trunks of young or transplanted trees with nursery wrapping paper to prevent egg laying by adult borers. Wrapping also may prevent sun scald. These areas are subject to borer attack.

2. Stimulate vigorous growth by properly fertilizing and watering the tree.

3. Prune all dead or dying tree branches and paint wound with an approved tree paint.

Spraying trees with lindane helps prevent borers from becoming established in the tree. Apply spray before the young borers gain access to the tree. Mix 2 gallons of 20 percent lindane emulsifiable concentrate in 100 gallons of water. To prepare spray, use 8 tablespoons of lindane plus water required to make 1 gallon. Spray the trunk and lower limbs to the point of run-off. Make first application in early spring, soon after the leaves appear. Make two additional applications at 3-week intervals. This treatment is suggested as a preventive measure and does not control borers already feeding inside the tree at the time of spraying.

If only a few trees are involved, *roundheaded borers* can be controlled successfully by hand methods. Carbon disulphide or an approved commercial borer chemical may be injected into the holes to kill the larvae. After the material has been applied, plug the hole with mud, putty or any similar material.

Bark Beetles and Shot-Hole Borers

Both adult beetles and larvae bore into the trunk, branches or twigs. Adults are about 1/10 inch and larvae are about 1/8 inch long. These insects prefer weakened or unhealthy trees and make holes about the size of "BB" shot. There may be several generations per year.

Keep trees growing vigorously through proper management practices. These pests are rarely the primary cause of death of the tree but act as secondary invaders after the tree has been weakened from other causes. Preventive treatments, as suggested for shade tree borer control, can be used if the tree is susceptible to injury.

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LAWN INSECTS

Insects	*Description and type of damage*	*Treatment* (Listed alphabetically) (Follow manufacturer's directions for mixing and applying sprays) Dusts:	Sprays:	*Remarks*
White grubs (larvae of May beetles)	White with brown head and 6 legs. One to 1½ in. long. Grubs feed upon roots and underground tender parts of plants.	Wettable powders— 6 oz. of 25% aldrin; or 10 oz. 40% chlordane; or 4 oz. 25% dieldrin; or 5 oz. 25% heptachlor per 1,000 sq. ft.	A. Aldrin B. Chlordane C. Diazinon D. Dieldrin E. Heptachlor	Apply wettable powder to lawn and irrigate lawn heavily with sprinkler to soak into soil. Apply spray directly onto soil at rate of 25 gal. per 1,000 sq. ft. and follow with thorough sprinkler irrigation.
Pillbugs or sowbugs	These pests are not insects but often cause damage to tender plants. Light-gray to slate-colored and about ½ in. long. Roll up in shape of pill when disturbed.	A. 5% Carbaryl (Sevin) B. 5% Chlordane C. 2% Lindane	A. Carbaryl (Sevin)	Apply dusts and spray directly to feeding area. Commercially prepared baits may be used where populations are light or following insecticide use. Broadcast baits in early morning or late evening.
Snails and slugs	Grayish to grayish-brown, legless, slimy and soft-bodied slugs ½ to 4 in. long. Snails are made up of spirally coiled, conical shells about 1 in. long.	Use commercially prepared baits containing *metaldehyde.* A. 5% Carbaryl (Sevin)	A. Carbaryl (Sevin)	Broadcast bait in late evening or early morning.
Termites	Small trees sometimes are attacked by termites. They burrow into roots and crowns of plants. Worker termites are wingless, soft-bodied and white with dark jaws.	A. 10% Chlordane B. 2½% Dieldrin	A. Chlordane B. Dieldrin	Dust soil surface around plant with wettable powder. Water plant to soak insecticide into soil.
Chiggers (Redbugs)	The younger chigger is a very small, pale yellow, six-legged mite which attaches itself to the skin of man or other animals. It inserts its mouthparts in the skin and injects a fluid that causes painful swelling and itching. It becomes engorged in about 4 days, drops off, changes to a nymph and finally adult, neither of which is parasitic.	A. 10% Chlordane B. 1% Lindane C. Sulfur D. 10% Toxaphene	A. Dieldrin B. Lindane C. Toxaphene	Apply dusts or sprays of wettable powders or emulsifiable concentrates to grass and ground litter where chiggers are present. Sprays generally are more effective. For small areas, use a compressed-air or knapsack sprayer and apply 2½ to 3 qt. per 1,000 sq. ft. If dusts are used, apply 10% chlordane or 10% toxaphene or 1% lindane at 20 to 25 lb. per acre (approximately 1 to 1¼ lb. per 1,000 sq. ft.). Apply sulfur at rate of 10 lb. per 1,000 sq. ft.
Ants	Several species may invade home lawns. Size of ants varies according to species — fire ants may be as small as ⅛ in. long; agricultural (red) ants, as large as ⅓ in. long.	A. 5% Chlordane B. 2½% Dieldrin C. 2½% Heptachlor Mirex "150" bait (for fire ants only) Mirex "450" bait (for town ant or Texas leaf-cutting ant only)	A. Chlordane B. Dieldrin C. Heptachlor	These materials also are available in granular formulations. Use all formulations according to directions on manufacturer's label.
Fall armyworm, Sod webworm	Damage lawns by feeding on leaves and stems of grass. Fall armyworm has distinct, inverted white Y on front of head. Damage first appears as whitish patches in lawn where leaves have been skeletonized. The sod webworm is a dingy white larvae about 1 in. long when grown and is marked with prominent black spots. Silk-lined tunnels of earth near the soil surface are indications of the presence of this pest.	A. 5% Carbaryl (Sevin) B. 5% Chlordane C. 2½% Dieldrin C. 10% Toxaphene	A. Carbaryl (Sevin) B. Chlordane C. Dieldrin D. Toxaphene	Repeat application if new infestation develops.

	the presence of this pest.			
Chinch bug	Primarily a pest of St. Augustine lawns in southern and eastern areas of Texas. Adult is 1/6 to 1/5 in. long with black body, reddish-yellow legs and fully developed wings. Each front wing is mostly white, but is marked with an irregular black patch at the middle of the outer margin. Newly hatched nymph is bright red and has a whitish band across the back. Adults and nymphs suck the plant juices, resulting in browned areas in the lawn. Injured areas frequently are first noted along edges of the lawn.	Granules: A. 2½% Aspon B. 50% Carbophenothion (Trithion) C. 14% Diazinon D. 5% Ethion	Sprays: A. Aspon B. Carbonphenothion (Trithion) C. Ethion	Granular materials are preferred for home owner use. Cyclone-type lawn fertilizer applicators work well in applying granular insecticides. Water lawn thoroughly following granular application. Sprays are effective, but require more time and effort. Irrigate lawn thoroughly before spraying. Use 15-25 gal. of spray mixture per 1,000 sq. ft. Make applications about May 1 and repeat about July 1. Apply 0.2 lb. actual insecticide per 1,000 sq. ft.
Bermudagrass mites	These microscopic, eight-legged pests have caused considerable damage to bermudagrass lawns in West and Northwest Texas. Stunted internodes are characteristic symptoms of injury. Lawn develops a generally unhealthy appearance and makes slow growth.	A. Sulfur (10 lb./1000 sq. ft.)	A. Carbophenothion (Trithion) B. Diazinon C. Ethion	Two applications 10-14 days apart may be necessary for most effective control. Use 5 gal. of spray mixture per 1,000 sq. ft. of lawn area.

Caution: ALLOW LAWN AREA TO DRY THOROUGHLY AFTER SPRAYING BEFORE ALLOWING CHILDREN OR PETS TO PLAY ON THE GRASS

SUCKING INSECTS

See remarks at end of table.

Insects	*Description and type of damage*	*Treatment* (Listed alphabetically) (Follow manufacturer's directions for mixing and applying sprays) Dusts:	Sprays:	*Remarks* (See other remarks at bottom of table)
Thrips	Minute insects, 1/40 to 1/10 in. long. Several species vary from yellow to dark brown or nearly black. Very slender bodies and fringed wings. Their feeding causes tops of leaves to wither, curl up and die, and failure of buds to open normally.	A. 5% Carbaryl (Sevin) B. 2½% Dieldrin C. 1% Lindane D. 4% Malathion E. 10% Toxaphene	A. Carbaryl (Sevin) B. Dieldrin C. Dimethoate D. Lindane E. Malathion F. Meta-Systox-R	Begin applications as soon as buds appear on plants normally having blossom damage. Repeat applications every 7-10 days during flowering period. Injured buds and flowers of plants should be removed and burned. Reinfestation of thrips is common on flowering plants. Repeat applications of insecticides as often as necessary for foliage or bulb protection.
Aphids or plant lice	Soft-bodied, pear-shaped sucking insects, 1/8 to 1/5 in. long which causes leaves to curl. Varying colors; yellow, green, bluish-green, reddish-brown and near black.	A. 4% Diazinon B. 1% Lindane C. 4% Malathion D. 2% Nicotine sulfate	A. Diazinon B. Dimethoate C. Lindane D. Malathion E. Meta-Systox-R F. Nicotine Sulfate	Aphids secrete honeydew which attract large numbers of flies to trees and shrubs. Increased dosages of nicotine dusts and sprays may burn tender plants. After eliminating the aphid population, it may be necessary to wash the plant with water to remove excess honeydew and sooty mold from foliage.
Lace bugs	Tiny, mottled, brownish to black and gray insects about ⅛ in. long with lace-like wings. Suck sap from underside of leaves causing leaves to become gray or brownish splotched.	A. 5% Carbaryl (Sevin) B. 4% Diazinon C. 2% Lindane D. 4% Malathion E. 2% Nicotine sulphate	A. Carbaryl (Sevin) B. Diazinon C. Dimethoate D. Lindane E. Malathion F. Nicotine sulphate	Underside of leaves discolored by a black or brown varnish-like excrement. Repeat applications as necessary to control this pest. Direct spray or dust to underside of leaves.

Spider mites	Small, about 1/60 in., yellowish or reddish mite which sucks juices from undersides of leaves. Causes pale blotches on upper and lower surfaces of foliage. Webbing often present. Plants gradually lose vigor and die.	A. Cholorbenzilate B. Diazinon C. Dicofol (Kelthane) D. Dimethoate E. Ethion F. Malathion G. Meta-Systox-R H. Tetradifon (Tedion)	Usually a second application 7 days later is necessary to obtain control.
Scales: San Jose Oyster shell Pine-needle Obscure Euonymus Soft Brown Mealy bugs, et al.	Suck sap. Small, attached insects covered with shell or armor. Most of them lay eggs that hatch into active crawlers. Infestations build up primarily during growing season. Inconspicuous; usually go unnoticed until plant is severely damaged.	A. Diazinon B. Dimethoate C. Dormant-oil D. Malathion	Scales spread from plant to plant in crawler stage on birds, insects and other animals, and by wind. Two or more applications should be made at 2-week intervals. Dormant oil may be used on trees and woody shrubs after the plants have gone into complete dormancy. For particularly hard to control scale problems add *summer* oil to diazinon or malathion.
Whiteflies	Adults small, snow-white, four-winged "flies," nymphs small, oval, flat, pale green or yellow; less than 1/30 in. long. Suck sap from plants causing them to wilt, turn yellow and die.	A. Diazinon B. Dimethoate C. Lindane D. Malathion E. Meta-Systox-R F. Nicotine sulphate	Two or more applications at weekly intervals may be necessary. A common pest of gardenia and related plants.

For control of thrips, aphids, spider mites, scales and white flies, granular systemic insecticides, usually containing 2% disulfoton (Scope®, Syston®, Systemik®) are effective. Follow manufacturer's label recommendations for working into the soil and watering into the root zone.
CAUTION: *Some ornamental plants are sensitive to certain insecticides. Do not apply more material than is recommended. Use only on ornamental plants listed on the label.*

FOLIAGE-EATING INSECTS

Insects	*Description and type of damage*	*Treatment* (Listed alphabetically) (Follow manufacturer's directions for mixing and applying sprays) Dusts:	Sprays:	*Remarks*
Bagworms	Larvae feed on foliage after hatching in late spring or early summer. Young worm spins silken sac and attaches bits of leaves as it feeds. The worm carries bag wherever it goes. Full-grown worm has bag 1½ to 2½ in. long. Wingless female crawls out and dies after laying eggs inside bag.	A. 5% Carbaryl (Sevin) B. 4% Malathion C. 10% Toxaphene	A. Carbaryl (Sevin) B. Lead arsenate C. Malathion D. Toxaphene	Apply insecticides early while worms are small. Chemical controls are ineffective when worms are full grown. The winter is passed in egg stage within the bag; hand picking and burning of bags during the winter will help reduce or eliminate infestations.
Caterpillars eating foliage: Webworms Tent caterpillars Walnut & pecan caterpillars	Generally feed by eating leaves, sometimes in concentrated areas. Some web within, or build "web-tent" in crotches of limbs or feed together in large groups without making web. Caterpillars vary from 1 to 2 in. long. Also, vary in color but usually striped, multicolored and hairy.		A. Carbaryl (Sevin) B. Chlordane C. Lead arsenate D. Malathion E. Toxaphene	If webbed branches are present, small infestations may be destroyed by cutting out and burning webs or by other mechanical means. There are 1 to 3 generations per year. Some pass winter as eggs in clusters on limbs; others hibernate as pupae in the ground.

— Continued on reverse side —

Foliage-Eating Insects, Continued

Insects	*Description and type of damage*	*Treatment* (Listed alphabetically) (Follow manufacturer's directions for mixing and applying sprays) Dusts:	Sprays:	*Remarks*
Grasshoppers and crickets	Several species of grasshoppers and crickets are general feeders upon plants. Crickets often migrate into homes and other buildings during mid- and late-summer and fall. Check nearby grassy areas in spring for signs of small grasshoppers.	A. 5% Carbaryl (Sevin) B. 10% Chlordane C. 2½% Dieldrin D. 3% Lindane E. 20% Toxaphene	A. Carbaryl (Sevin) B. Chlordane C. Dieldrin D. Lindane E. Toxaphene	Apply controls when insects are small. Controlling infestations of grasshoppers and crickets will prevent their laying eggs in the ground which may result in large populations the following year.
Other leaf-eating insects: May beetles Climbing cutworms Armyworms Leaf beetles Pine tip moth Leaf rollers and others	Damage varies but generally is caused by worms or beetles eating the leaves of many plants. Observe plants at frequent intervals during the growing season. Apply controls when damage or insects are first noted.	A. 5% Carbaryl (Sevin) B. 5-10% Chlordane C. 2½% Dieldrin D. 10% Toxaphene	A. Carbaryl (Sevin) B. Chlordane C. Dieldrin D. Lead arsenate E. Toxaphene	Apply insecticides early to prevent damage. Young worms are easier to kill than older ones. For pine tip moth, make first application in early spring. Apply 3 or more treatments at monthly intervals.

Combination sprays or dusts are effective in controlling all of the above pests except grasshoppers and crickets. Mix and apply the combination materials according to the manufacturer's directions. In most instances, sprays are preferred over dusts.