

WEEDS and TURF

PEST CONTROL

A SECTION OF PEST CONTROL MAGAZINE

DECEMBER 1962

Control of Insects and Mites on Ornamentals

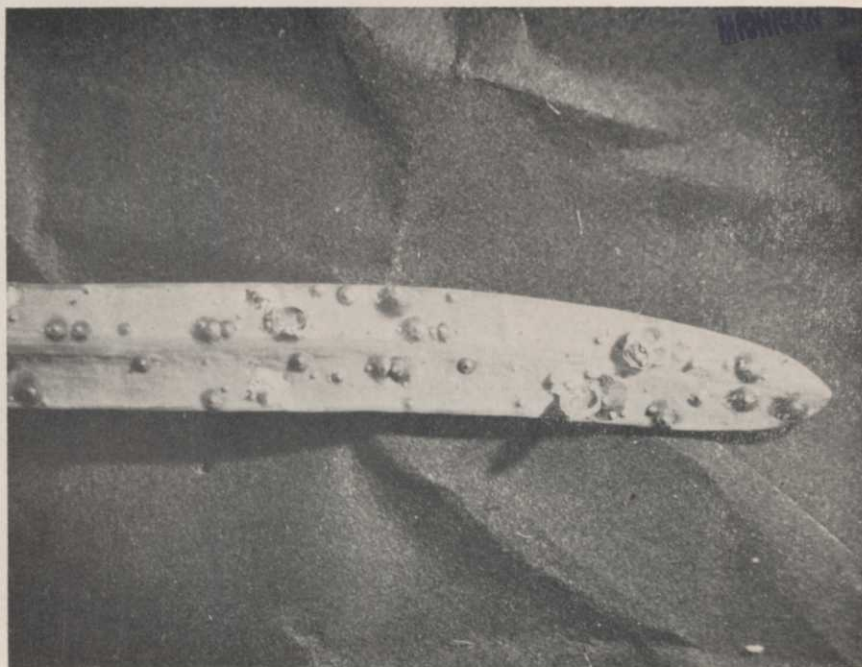
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PRESENT INTEREST in growing ornamental plants has created a demand for information on the control of the insects, mites and other pests attacking them. Requests for this information come from home gardeners, florists, nurseries and contract applicators. Until recently very little attention was given the problem since there was no satisfactory way of estimating monetary losses of ornamentals due to insect depredations.

Ornamental plants are subject to attack by many species of insects. To maintain shrubs and trees in a healthy, attractive condition it is usually necessary to protect them from insect pests. Because many of the newer insecticides are often specific in controlling insects it is important to learn how to recognize the specific pest. This is helpful to understand the actual importance of the insect and to decide on the best measures for control. The following information is intended to serve only as a guide to help combat some of the general insect problems. It is not possible to include a long list of specific insects or the list of host plants.

Whenever ants are observed in numbers on a plant one should suspect the presence of soft scales, mealybugs, aphids or whiteflies. These sucking insects excrete a sweet liquid called "honeydew" which is attractive to ants. This sticky material is unsightly and makes an excellent medium for the development of a black fungus called "sooty mold." The presence of this fungus also should cause one to suspect that the plant is infested with one of these insects. This fungus retards the growth of the plants to some extent by reducing light, thus interfering with



Armor has been removed from some of these Florida red scales shown here on podocarpus.

Armored scales, like those on this rose twig, secrete a waxy coating resembling "armor."



Aphids, often called "plant lice," also infest roses and are important to CAs.



photosynthesis. Sooty mold usually weathers away following control of insect infestations.

THE INSECTS

Scale Insects

Scale insects are serious pests of many ornamental trees and shrubs. Scales are so different from the usual concept of insects that they are often mistaken for fungus growths. Scale insects have sucking mouthparts and feed on plant juices. They are quite small and occasionally become so numerous that they literally coat the leaves and twigs. Heavily infested plants appear unhealthy and produce very little new growth. The foliage develops chlorotic areas and may drop prematurely and portions of twigs and branches may be killed. Scales may be divided into the armored scales and soft scales for convenience.

Armored scales secrete a waxy, hardened, protective covering called a scale or armor which is not an integral part of the insect's body. The tiny scale may be circular, semicircular, oblong or pear-shaped. Adult females vary from about 1/12 to 1/8 inch in diameter or length. In the soft scales the waxy secretion is an integral part of the insect's body. Some of the soft scales are covered with a waxy, cottony material while others are naked. These scales are larger than the armored scales and vary from 1/12 to 1/3 inch in length.

In some species of scale insects a single female may deposit several hundred eggs. The young scale, known as a crawler, is usually broadly oval in shape, flattened,



Cottony cushion scales are also known as mealybugs, attack such plants as this pittosporum.

and bright yellow. This stage has the ability to crawl and move about freely. The crawler moves out over the plant to the succulent new growth, selects a place to settle, inserts its mouthparts into the plant tissue and, in the case of the female, remains there for the rest of its life. Usually there are several overlapping generations a year. Due to the waxy protective covering and the sedentary habit it is essential that insecticidal sprays be applied thoroughly and completely.

Mealybugs

Mealybugs are soft-bodied insects closely related to the scale insects and are usually covered with a powdery or cottony, wax-like material. They have sucking mouthparts and are important pests of annuals and perennials as well as the woody ornamentals. They vary from 1/5 to 1/3 inch in length when mature. With a few exceptions mealybugs retain the ability to move about throughout their lives.

Whiteflies

Whiteflies restrict their feeding to foliage, and nearly always are found on the lower surface. Both adult and immature stages suck plant juices. Heavy feeding sometimes gives the infested leaves an unhealthy appearance and may cause the leaves to turn yellow and die.

Adult whiteflies are tiny creatures about 1/16 inch in length and resemble tiny white moths. They have 4 wings which, with

the top of the body, are covered with a white, powdery wax giving the insects their common name. The immature stage looks somewhat like scale insects and they remain attached to the leaf until the adult emerges. They are about the size of a small pinhead, oval, flattened, and light green in color.

Aphids

Aphids, or plant lice, are well-known insects that infest nearly all ornamentals. They are soft-bodied insects about 1/8 inch in length and injure plants by sucking the juices. They are most commonly found in colonies on the new growth; their feeding causes the leaves to curl and become distorted and the buds and flowers to be malformed. Aphids are usually most abundant in the spring but may be present throughout the growing season. Aphids usually are easily controlled; however, the adults are good flyers and they can readily reinfest plants, making repeated applications necessary on occasion.

Thrips

Thrips are important pests of quite a few trees and shrubs. They are slender, very small insects about 1/25 inch in length. Thrips

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Another important pest is the "oyster shell" scale, pictured here on a camellia leaf.

feed by puncturing the leaf surface and then sucking the juices. Their feeding results in a stippling of the leaf surface. This may be accompanied by premature defoliation. Feeding in flowers causes a blotching and streaking on the petals. The presence of thrips on foliage also may be recognized by the small brown or black varnishlike spots of excrement which they leave where they feed.

Leaf Miners

Leaf miners, such as the azalea leaf miner, holly leaf miner, and serpentine leaf miner, although not usually serious pests, tunnel within the leaves and render foliage unsightly. The azalea leaf miner is a yellowish caterpillar about 1/2 inch when grown. The young caterpillar feeds between the leaf surfaces while the older larva folds over the tip or edge of the leaf and feeds in this protected area, leaving a brownish blister. The adult is a small moth. The holly and serpentine leaf miners are maggots and also feed between the leaf surfaces. The adults are tiny black flies. Usually leaf miners appear only when the new foliage develops.

Lacebugs

Lacebugs infest the foliage of a number of plants but particularly andromeda, azalea, sycamore, oak, hawthorn, and other thorns. These beautiful insects are 1/8 inch in length, flat, and have transparent wings with a lacelike effect. They insert their needlelike mouth parts into plant tissues, usually on the underside of leaves, and suck sap. Lacebug injury can be iden-

Whiteflies restrict their feeding to foliage. This is the immature stage on hibiscus.



tified by the stippled appearance of the upper surface, and the brown and black varnishlike spots of excrement and white cast skins on the lower surface.

Grasshoppers

Grasshoppers, katydids, and tree crickets occasionally become numerous enough to be pests of some shrubs and fruit trees. These insects have chewing mouthparts and eat holes in the leaves. Damage is rarely severe although the numerous holes in the foliage are unsightly.

Caterpillars

Caterpillars are the immature stage of moths and butterflies. All caterpillars have chewing mouthparts and although only a few species are destructive, they are among the worst pests of trees and shrubs and include the bagworms, cankerworms, cutworms, tent caterpillars, and fall webworm. Caterpillars have three pairs of jointed, true legs on the front of the body and usually four pairs of unjointed soft, fleshy projections called "prolegs" on the abdomen, with a fifth pair at the end. The body is usually cylindrical and with a slender or robust shape. The large number of variations found within this group precludes a discussion of the various representatives. Because of their habits and control they can be grouped into three categories: leaf eating caterpillars, underground caterpillars and leaf miners. The latter group is discussed in the section on leaf miners.

Beetles and Grubs

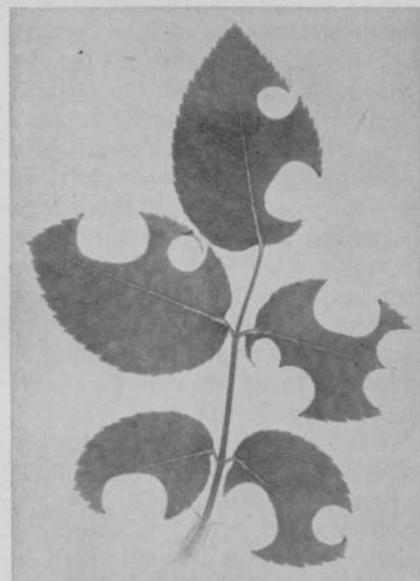
Frequently beetles cause injury to trees and shrubs. Both adult and immature or larval stages are injurious and both have chewing mouthparts. Adult beetles have a hard shell and vary from 1/10 to 2 inches in length.

The immature stage of most beetles is known as a grub. Usually adults feed on foliage, flowers, and fruits, while the grubs feed on foliage or roots or bore through stems. Many beetles are beneficial, the lady beetles being predacious on a variety of pests.

MITES

Spider mites, commonly called "red spiders," are frequently serious pests of woody plants. Mites are not insects but are sufficiently

like them to be included here. Mites have 4 pairs of legs and are closely related to the spiders, ticks, and scorpions. The name spider mite originated from the fact that fine strands of silk similar to that of spiders are spun by many mites,



Leaves almost chewed away are typical of damage caused by leafcutting bees.

although the webs may not be detected readily.

Spider mites are extremely small; many of them being less than 1/50 inch in length. They are soft-bodied, oval-shaped, and colored yellowish, greenish, or reddish. Many species are so small that they cannot be seen without the aid of a microscope. Often their presence is not detected until they become very numerous and cause obvious plant damage. Mites have needlelike mouthparts with which they puncture the leaf and suck up plant sap and chlorophyll. Withdrawal of the chlorophyll results in a russeted or stippled condition which reduces the beauty and commercial value of the plant. Plants, such as roses, heavily infested with mites, will frequently drop an appreciable amount of foliage.

INSECTICIDES AND MITICIDES

Oil Emulsions

Use of oil emulsion sprays has been an accepted practice for control of many insects infesting trees and shrubs. Since most contract applicators are familiar with oil emulsions, only a few general comments will be made on their use for controlling pests of ornamentals.

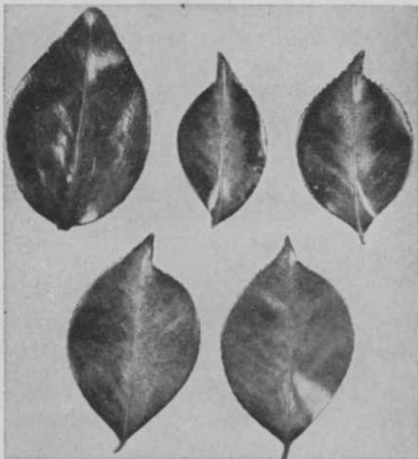
Oil emulsions should be used in

concentrations of at least 1.2% to be effective against the pests but not more than 1.6% to avoid plant injury. Oil emulsions have certain limitations and should not be applied when temperatures are likely to exceed 87-88° F., and they should not be used on plants having considerable new tender growth. The more refined oil emulsions or mayonnaise type emulsions are preferred as horticultural sprays since they are less injurious to plants.

In many instances oil emulsions are applied to shrubs and trees during the dormant season. The dormant miscible oils when diluted with water form a milklike spray mixture. Since the oil content of the miscible oils may vary they should be used as directed by the manufacturers. Oil sprays must be thoroughly mixed and continually agitated to prevent accumulations of free oil on the surface. Do not apply dormant oil sprays when the temperature is below 40° F. or when there is a possibility of freezing temperatures during the next day or two following application.

Phosphatics

Several phosphatic insecticides have appeared on the market during the past few years. In many



These camellia leaves have been damaged by mites. Upper center and right leaves show moderate to severe damage.

instances they have surpassed the oil emulsions in effectiveness and in addition have the following advantages: they can be used during periods of high temperature and can be applied to tender foliage without danger of plant injury.

Parathion is extremely effective against whiteflies, aphids, cottony cushion scales, mealybugs, thrips,

lacebugs, and a broad spectrum of other horticultural pests including mites. The greatest disadvantage when compared to oil emulsion, however, is its extreme toxicity to mammals including man. It is very dangerous to handle and apply. The operator of the sprayer should follow all rules prescribed by the manufacturer when using this material.

Malathion is another phosphatic compound which is effective against a broad spectrum of insect pests. This material is much safer to handle than parathion although it is not quite as effective and must be used in substantially greater concentrations. This material is effective against some mites but is not considered to be a good miticide.

Demeton (Systox). — This material is effective against many of the sucking insects and mites infesting ornamentals. It is a systemic compound and is absorbed into the plant and translocated by the sap into all portions of the plant. It is effective for extended periods, usually three to six weeks. The systemic qualities eliminate the necessity for thorough and complete spray coverage. It is not effective against most chewing insects or the insects which feed in the flowers.

Ethion is an effective insecticide which is appreciably less toxic to mammals than parathion. This material has given outstanding control of a wide range of insects and mites attacking ornamental trees and shrubs.

Chlorinated Hydrocarbons

Lindane is the essentially pure gamma isomer, almost odorless form of benzene hexachloride. It is effective against a broad spectrum of general insect pests. It is relatively nontoxic to mammals and humans. It is not effective in controlling mites.

DDT is our best known chlorinated hydrocarbon insecticide. It has performed exceptionally well against most of the chewing pests of ornamentals but is almost ineffective against sucking insects and is responsible for mite build-ups in numerous situations. When using DDT as a foliage spray it is best to include a miticide to prevent mite problems.

Dieldrin is especially effective in



Lacebugs on this sycamore leaf have left excrement deposits, (small, round, black spots).

controlling many soil inhabiting insects. This material also is effective in controlling many of the chewing insects such as grasshoppers, tree crickets, immature and adult beetles, and caterpillars. It is a fairly toxic material and should be used with caution.

Miticides

Numerous miticides for use on ornamental shrubs and trees have appeared on the market during recent years. Several of the better materials include the following:

Aramite is only effective for the control of spider mites and is safe to use on a variety of ornamental plants. It is compatible with most insecticides and fungicides.

Ethion is a phosphatic material which is an excellent miticide as well as an insecticide. It has proven effective against a broad spectrum of mites and is safe to use on most ornamental plants. It is compatible with most insecticides and fungicides.

Kelthane is a chlorinated hydrocarbon related to DDT. It is effective in controlling many species of mites on a variety of plants. This material has a long residual action and is relatively harmless to insect predators and parasites.

Tedion is one of the sulfonated materials. It is effective primarily as a mite larvacide and ovicide. It is not effective in reducing adult mite populations quickly; however, it has a long residual effect. Tedion should be used in a

BERMUDAGRASS

(*Cynodon dactylon*)



Bermudagrass, sometimes called devil grass and wire grass, is an aggressive perennial, reproducing by seeds, by rooting at the joints of stolons (creeping stems), and by rooting from the extensive rhizome system (underground stems). Due to persistent "runners," Bermudagrass forms a dense sod mat.

A weed pest in lawns, fields, and waste places, especially on sandy soil, Bermudagrass was introduced from Eurasia, where it is a forage crop, sometime before 1807. It is a major pest and pasture plant in southern United States, and is extending its range northward where it is susceptible to winter killing.

It flowers and sheds seed throughout the summer months, being somewhat similar to crabgrass in this respect. Bermudagrass differs from crabgrass in having the much more persistent stolon and rhizome systems.

Stems are flattened, gray-green, short, smooth, and creeping, becoming erect near the tips, 6 to 18 inches tall. Leaves are flattened with a fringe of whitish hairs where the leaf blade joins the sheath (the part of the leaf that encloses the stem). Flowers are borne on 3 to 5 spikes that radiate from the end of a flattened stem. Spikelets (clusters of flowers) are pressed closely together on one side of the spike. Seeds, one in each flower, are about 1/20 inch long, oval, and orange-red in color. Rootstocks are hard, scaly, sharp-pointed, and spreading.

Selective control against Bermudagrass in turf has not been developed. Certain herbicides have proved moderately effective against this serious pest, if proper timing and repeated applications are used. They are: trichloroacetic acid (TCA), Vapam, and mylone. Soil fumigation with methyl bromide under an airtight cover eradicates Bermudagrass and allows reseeding within 48 hours.

Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland.

DRAWING BY REGINA HUGHES, USDA, BELTSVILLE

preventative program by making application before many mites have become adults. It is compatible with most insecticides and fungicides.

Combination Sprays

Phosphatic insecticides, as additions to oil sprays, are becoming widely used for insect control on trees and shrubs. Data from recent tests show that these combinations provide control equal or superior to the straight oil sprays while retaining the advantages and minimizing the disadvantages of both. In combination sprays the materials are used in concentrations approximately one half that when used alone. Combinations of ethion and insecticidal oils have given outstanding results under a variety of conditions.

Phytotoxicity

Plant injury caused by horticultural sprays has been observed in a few instances. Since injury occurs following application of some sprays to certain rose varieties and does not injure others, for example parathion, it is suggested that information on phytotoxicity be obtained from local sources such as county agents.

There is considerable evidence which indicates that plants growing under dry conditions are more susceptible to injury from sprays. In a number of instances the amount of plant injury observed correlated very well with the turgid condition of the foliage. Plants to be treated with pesticides should have ample soil moisture available several days prior to treatment.

Low Limbs Hurt Grass Growth

Although all grass needs light, it is often not necessary to remove trees to get enough light in shady areas, a scientist at North Carolina State College reports. Dr. John H. Harris recommends removing limbs up to a height of 10 feet or more to allow light to come through.

Various types of grass are suggested by Dr. Harris. Zoysia Matrella is preferred for light soil, Tiflawn and Tifgreen when the grass is to be planted in the spring, and red fescue or bluegrass when planted in fall.