CONTROL OF INSECTS OF ANNUALS, PERENNIALS AND BULBS

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The growing of high quality flowers and plants requires careful attention to a number of factors essential to healthy vigorous plant growth and development. These include proper soil type and preparation, proper use of fertilizers and water, the selection of high quality seeds, plants or bulbs adapted to the area in which they are to be grown and effective control of insects and diseases.

INSECTICIDES

Most insects and mites can be controlled with the proper application and use of several of the relatively newer insecticides and miticides. Many of these materials are available in small package containers for the use of the home gardener. While they may be sold under various trade-names, the label on the container, will list the chemicals and the amount of each in the preparation.

Only a few insecticides are needed to control insects in the home flower garden. They include DDT, malathion, nicotine sulfate, Kelthane, aldrin, heptachlor, chlordane or toxaphene. Metaldehyde, either as a dust, spray, or bait, is recommended for slug control. These materials with the exception of metaldehyde and malathion will last several years if properly stored in a dry, cool place.

DDT will control most of the insects with chewing-type mouth parts and some of those with sucking-type mouth parts such as lygus bugs, leafhoppers and some kinds of aphids. DDT used alone usually results in an increase of spider mites. In most cases it should be used in combination with malathion or Kelthane.

EQUIPMENT

A small sprayer or duster is adequate for applying insecticides to home flower gardens. A 2 3/4 to 3 gallon garden or knapsack sprayer or a rotary-type duster is suggested for larger gardens. A trombone-type sprayer is also very satisfactory for applying insecticides. It has an adjustable nozzle and can be used for spraying flowers, shrubs and small trees. Sprayers and dusters should be oiled and cleaned several times during the season and when they are stored for the winter. Never use weedicides in equipment used to spray or dust for insect control.

TIMING OF INSECTICIDE APPLICATIONS

Proper timing and thoroughness of application is almost as important as the insecticide or equipment used. Examine plants frequently during the season for insects...
or indications of their feeding. Spider mites and thrips are very small and you may fail to detect them unless you examine plants carefully and at frequent intervals. Leafhoppers and aphids are more easily seen but the damage caused by the feeding of only a few of them may not appear serious. Unfortunately leafhoppers and aphids carry viruses and should be controlled even though they are few in number. Control insects when you first notice them and before they have caused damage. Insecticides can only prevent damage and cannot undo injury which has already occurred.

Applying insecticides every week or ten days throughout the growing season is suggested. Spray or dust thoroughly at the proper time and with the proper insecticides.

**INSECT CONTROL**

A number of different kinds of insects attack flowering plants. Some spend a part or all of their life in the soil where they feed on the roots of plants. Others spend a part or most of their time on the soil surface. Among these are earwigs, ants, and sowbugs. The largest number of insects, however, feed on the stem, leaves and flowers.

Insects which feed on the roots of plants should be controlled with soil insecticides applied prior to planting or seeding.

**SOIL PESTS**

**Wireworms, White Grubs, Root Weevils and Symphyllids**

These pests when present can usually be seen when the soil is being prepared for planting. Wireworms are about one inch long, elongated, hard-bodied and yellowish-brown. White grubs, the larval form of June bugs, are white to grayish and about an inch to an inch and a half long when full grown.

Strawberry root weevil larvae are white legless grubs, 1/8 to 3/5 inch in length. Symphyllids, while not insects, are white, about 3/8 inch long, active with twelve pairs of legs when fully grown. When numerous, symphyllids can be very injurious to plants.

Wireworm, white grubs and root weevil larvae can be controlled by treating the soil prior to planting or seeding. Use 4 pounds of 5 per cent aldrin or heptachlor dust to each 1000 square feet of garden area. The insecticide should be evenly broadcast over the surface area and immediately worked into the soil to a depth of six inches. One application should give control for three or four years.

Fair control of symphyllids can be obtained with lindane which may be used in soil where flowers are grown. Use 2 1/2 pounds of the 2 per cent lindane dust to each 1000 square feet of soil surface. Broadcast the lindane as evenly as possible over the soil area prior to planting and immediately work into the soil to a depth of six inches.
Cutworms, Earwigs, Ants and Sowbugs

Cutworms are the larval form of moths. They are smooth plump caterpillars, gray or brownish and 1 to 1 1/2 inches long when full grown. They hide during the day under clods of earth or in the top soil just below the surface. Cutworms become active in the evening and cut off small plants at or near the soil surface. Some species, known as climbing cutworms, climb such plants as chrysanthemums, dahlias and sweet peas, and feed on the foliage or bore into the developing flower buds. Cutworms are usually a problem early in the spring. Apply a 5 per cent toxaphene, aldrin or heptachlor dust to the soil surface and rake in lightly. Poison baits are also effective.

Earwigs and ants can be controlled by surface applications of a 5 per cent chlordane, aldrin or heptachlor dust to the soil. Earwigs and ants become active in early spring and a soil application of insecticide should be made when they become evident. Several applications throughout the season may be necessary. Poison baits also give control.

Sowbugs, which are not insects, are about 1/3 inch long, dark gray and oval in shape. They are prevalent in moist areas and usually hide under some shelter, such as decomposing leaves, or other vegetation. The insecticides suggested for earwigs and ants will also control these pests.

Aphids. There are a number of different kinds of aphids, some of which will feed on many kinds of plants and other which may feed only on one variety or several closely related varieties. Aphids suck juices from the plant and often spread viruses from one plant to another. They also give off honeydew which attracts ants, flies, and wasps.

Malathion or nicotine sulfate sprays will control aphids. Malathion should be used at the rate of 2 tablespoons of 57 per cent emulsifiable concentrate to each gallon of water. Nicotine sulfate should be used at the rate of 1 teaspoon to each gallon of water. Nicotine sulfate should not be used unless temperatures are 70 degrees F. or higher. Spraying at 10-day intervals is usually necessary since new aphid colonies develop rather quickly from winged aphids flying in from untreated areas.

Mites are among the most injurious pests affecting plants. There are several kinds of mites but they are all very small bodied with eight legs when mature. They range in color from greenish to yellow and reddish or olive brown. Several kinds spin a good deal of webbing. The undersides of the foliage should be examined frequently during early summer through fall for the presence of mites. Damage from mites may become severe during late summer and fall. Injured leaves lose much of the green color, turn brown and may drop early.

Kelthane or malathion are suggested for control of mites. Use 2 tablespoons of Kelthane 25 per cent wettable powder or emulsifiable concentrate or 2 tablespoons of 57 per cent malathion emulsifiable concentrate to each gallon of water. Several applications at 10-day to 3 week intervals may be required for effective control.
Caterpillars, Leaf Rollers, and Beetles.
Various kinds of caterpillars, leaf rollers, beetles and their larval forms feed on the foliage and blooms of plants. These insects eat the leaves, buds and blooms of plants and spoil their appearance. DDT as a 5 per cent dust or as a spray at the rate of 2 tablespoons of 50 per cent wettable powder in 1 gallon of water will control these insects. Since mite populations may increase when DDT is used it is suggested that 1 tablespoon of malathion or Kelthane be added with the DDT.

Leafhoppers, Lygus Bugs and Stink Bugs.
These insects feed on a number of different kinds of plants. Leafhoppers suck the juices from the leaves and cause them to turn a whitish green in color. This damage is very common on rose leaves. Several sprays of malathion at the rate of 2 tablespoons of the 57 per cent emulsion to each gallon of water will provide control of these insects.

Gladiolus Thrips.
Thrips are tiny insects which feed on the juices of leaves and flowers. Gladiolus thrips are a very serious pest. They overwinter on the corms and move to the leaf blades when the plants start to grow in the spring. Corms being stored for winter should be dusted with 5 per cent DDT at the rate of 1 tablespoon per 100 corms. The corms should be placed in a paper sack, the DDT added and the sack thoroughly shaken. The corms can then be removed from the sack and stored.

Thrip feeding during the spring and summer results in "silver-like" streaks running lengthwise on the leaf blade. Spray or dust the plants at ten day intervals with DDT or malathion until the blossoms appear. Treating the corms will not prevent spring and summer infestations since thrips fly in from untreated plants.

Narcissus Bulb Fly.
The larva of this fly is a serious pest of narcissus and daffodil bulbs but also attacks tulip, hyacinth and several other kinds of bulbs. They feed on the bulbs and seriously affect the development of the plant. The best way to protect the bulbs is to soak them in an insecticidal solution before planting them. Use 4 teaspoons of 25 per cent heptachlor or aldrin emulsion to 1 gallon of water. Place 40 or 50 bulbs in an open weave bag and soak them for at least 10 minutes, but not more than 1 hour. Bulbs may be planted immediately after treatment. If you are not going to plant them for a day or two, dry them carefully after you have taken them from the emulsion.

Garden Slugs are very injurious to many different kinds of plants. They eat holes in the foliage and their slime trails are quite noticeable. They feed at night and usually hide during the day. Metaldehyde as a spray, dust or in baits is recommended for control. Use 1 tablespoon of metaldehyde emulsion to each gallon of water as a spray or as a 10 per cent dust. Thoroughly spray or dust the plants in the evening. Repeat treatments as needed or following a rain. Slug baits containing metaldehyde should be placed in small piles on the soil around the plants.
Baits should be distributed at weekly intervals while slugs are active. Put out fresh baits following a rain.

**CAUTION:** Insecticides are poisonous. Store them where children and pets cannot reach them. Handle them with care. Follow the directions and carefully read the precautions listed on the container label.