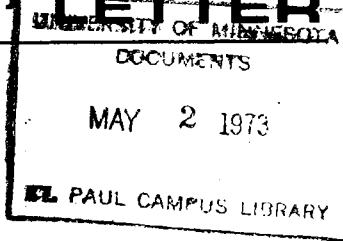


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AGRICULTURAL EXTENSION SERVICE

UNIVERSITY OF MINNESOTA

FRUIT GROWERS' LETTER



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PESTS OF FRUIT CROPS

Troublesome insects and diseases of Minnesota fruit crops are discussed below. Because fruit growers are faced with a wide range of climatic conditions, variety and cultural practices, each grower must examine his own pest problems and make the proper choice of cultural practices and pest control materials for his particular orchard or planting situation.

Commercial growers of fruit crops will want to use the most recent Commercial Fruit Spray Guide, (Special Report 6--revised 1973). Those who grow fruit in their garden will want to use the Home Fruit Spray Guide, (Extension Pamphlet 184--revised 1973).

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APPLE INSECT PESTS AND THEIR CONTROL

European Red Mite

The European Red Mite ranks high as a pest of apple in Minnesota. The adults are elliptical in outline, bright-red to brownish-red, and about 1/75-inch long. Their eggs are spherical and are laid in crevices on twigs and smaller branches of the apple tree. The first eggs hatch just before apple bloom. Time from egg to adult is 20 days at 55° F. and 4 days at 77° F. Seven to eight generations are possible each year. Damage from this pest includes speckled to bronzed foliage; leaves often drop, fruit is undersize, and poor quality and color; fruit buds are greatly weakened or prevented from forming.

To control the European Red Mite use a single 2 percent Superior Oil spray from GREEN TIP TO HALF-INCH GREEN, followed by a miticide in the early cover sprays. Suggested miticides include: Fundal, Galecron, Kelthane, Tedion, or Morestan.

Plum Curculio

Plum Curculio adults (dark brown beetle with a long snout) become active about bloom. They lay eggs in young fruit which nearly always drops to the ground. Injury from egg laying in apples which remain on the tree shows up as small crescent-shaped cuts.

For maximum protection against Plum Curculio, petal-fall, first and second cover sprays of one of the following: Guthion, Imidan, or Gardona, must be applied 7 to 10 days apart.

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Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.

Apple Maggot

The adult fly of the Apple Maggot emerges in early July. Eggs are laid just under the skin of the apple; they hatch and tunnel throughout the fruit.

To control Apple Maggots, all foliage and fruit surfaces must be covered with a suitable insecticide from the time the maggot flies emerge until they no longer are present in the orchard. A threat of severe apple maggot damage requires a series of maggot sprays at 7 to 10 day intervals. The insecticides Guthion, Sevin, diazinon, Gardona, and Imidan are all effective against Apple Maggot.

Codling Moth

Around petal-fall (when 3/4 of petals have fallen) adult moths appear and are active at dusk at temperatures above 55° F. Eggs are laid on the upper side of leaves and twigs. Larvae crawl to fruit and bore to core. In 3-5 weeks the larvae leave the apple, crawl to trunk and pupate. Use one of the following for control of Codling Moth: Guthion, Sevin, diazinon, Gardona, or Imidan.

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APPLE DISEASES AND THEIR CONTROL

The big advancement in the production of top quality apples came with the advent of organic pesticides in the late 1940's and early 1950's. At present, better growers can produce 85 to 90 percent or more of their harvest as "pack-out" fruit.

The USDA estimates that 8 percent of the annual apple crop is lost to diseases. This means an annual loss to Minnesota growers of over \$200,000. Apple scab, fire blight, and cedar apple rust are the principal diseases of Minnesota apples.

Apple Scab

Apple scab is found in Minnesota wherever apples are grown. The scab fungus attacks the fruits, fruit stems, and leaves. On the fruit, small, circular, olive-colored areas develop, which in advanced stages are usually accompanied by a cracking of the fruit. Scab spots appear on the leaves as inconspicuous, olive-colored infection areas and serve as a potential source of inoculum for fruit infections.

Fungicide applications for control of scab are usually made on a set schedule of 7- to 10-day intervals. However, during wet periods this interval should be shortened, and conversely, during dry periods the interval should be increased.

Fungicides for Control of Apple Scab

Captan: is presently the most widely recommended and used fungicide for apple scab control. It gives excellent scab protection and "kickback" (hours from beginning of rain to time spray can be applied and control scab) of 18-24 hours. Its retention on the leaf surface is fair-poor and redistribution is fair-good. In addition to apple scab, Captan will also control many of the summer disease complex. Captan will not control cedar apple rust, powdery mildew, or fire blight.

Difolaton: A liquid formulation registered for apple scab control as a single application treatment (SAT). The single application is made at DORMANT to 1/4 in. GREEN TIP and may control scab up to PETAL FALL. At PETAL FALL standard scab fungicides should be followed.

Cyprex: gives excellent control of apple scab but is not effective against rusts or summer diseases of apple. It has a "kickback" of 18-24 hours at the high rates, and good retention and redistribution. Cyprex will often russet Golden and Red Delicious.

Polyram: is used for scab control in protective type sprays. It also controls cedar apple rust and several summer fruit diseases. Good fruit finish is reported. Its "kickback" is about the same as Captan.

Fire Blight

Fireblight is undoubtedly the most destructive apple disease in Minnesota. Not only the annual loss of blossoms and fruit, but also the destruction of scaffold limbs and often entire trees, makes this the most feared of all apple diseases.

Twig blight is the most common form of the disease in Minnesota. It starts with an infection of the young, succulent, growing tip of the terminal growth. After infection, the disease develops very rapidly; the leaves turn a light to dark brown and remain attached throughout the summer. The end of the terminal bends, resembling a shepherd's crook.

Fire blight, like most bacterial diseases, is difficult to control, but its destructiveness can be greatly reduced with orchard management, sanitation, resistant varieties and the use of Streptomycin sprays. For additional information, see Special Report 6, the "1973 Commercial Fruit Spray Guide."

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STRAWBERRY INSECTS AND THEIR CONTROL

Tarnished Plant Bug (Lygus Bug)

Adult is a flat bug; about 1/4 inch long; brownish, marked with yellowish and black dashes; has brassy appearance. Adults overwinter in weeds, clover, and on other plants. Both adults and young feed on blossoms causing "buttoned" or "nubbed" berries which take on a moody texture and fail to mature.

Tarnish Plant Bugs can be controlled with a mixture of malathion and Methoxychlor, or Thiodan, applied in the hard stage of plant development (before blooms appear).

Cyclamen Mite

Adult is a smooth, very tiny mite; they are not visible to the naked eye. The mites feed on young expanding leaves in crowns of plants and cause severe distortion and stunting. Infested plants often become unproductive within a season. The insecticide Thiodan will control cyclamen mites.

Spider Mites

Adult spider mites are very small (barely visible to the naked eye). They feed on undersides of leaves and suck out plant juices. Plants often become stunted and yield may be greatly reduced. Sprays of Kelthane, malathion, or Tedion give excellent control of spider mites for several weeks.

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STRAWBERRY DISEASES AND THEIR CONTROL

To produce high yields of quality strawberries, a grower must understand the disease problems normally encountered in strawberry plantings. Most of these diseases can be controlled by fungicide sprays.

The most important disease of the fruit is a rot called gray mold or sometimes Botrytis. The infection may start where leaves or berries touch the ground or on injured areas of the blossoms and green fruit. The first symptoms appear on the fruit as light brown, rather soft spots. If moist conditions prevail, a gray powdery mass of spores appear over the surface of the fruit. If dry conditions prevail after infection, the berries may dry out and become tough. The gray mold fungus also attacks the flowers, resulting in a blossom blight. If cloudy, rainy weather persists during the bloom period, a great many blossoms can be infected and lost. Splashing rains and fruit pickers also spread the spores of this fungus, thus adding to the problem of producing quality fruit.

Foliar diseases, such as leaf spot and leaf scorch, often contribute to yield decline of established plantings. Cool, moist weather favors development of these diseases. Heavy spring applications of nitrogenous fertilizers may tend to increase the disease because of the production of succulent foliage. There is little spread of these diseases during the hot, dry summer months.

For control of fruit rot, fungicide applications should begin no later than full bloom and continue on a 7- to 10-day schedule until harvest. The last application is usually applied prior to the first picking; but if weather conditions are favorable for disease development an additional application into the harvest period may be desirable. It is important to apply the fungicide while the plants are in bloom. A pre-bloom spray may be desirable if moist conditions prevail.

Captan 50W is the recommended fungicide, at the rate of 6 pounds per acre of formulated product per application. Thiram (Thylate) is another fungicide which can be used at 4 to 5 pounds of product per acre, but cannot be used within 3 days of harvest.

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RASPBERRY DISEASES AND THEIR CONTROL

Leaf and Cane Blights

Anthracnose and Spur Blight often limit economic raspberry production. Symptoms of Anthracnose include gray to white spots up to 1/4 inch in diameter occurring on the canes. Leaf spots are yellowish white and about 1/16 inch in diameter. The centers of spots on leaves often fall out. The symptoms of Spur Blight include purple spots from 1/2 inch to several inches long on the new canes. Leaf infections include large dead areas, light brown in color, and often covering half or more of the leaf surface. For control of these two diseases apply Captan or Zineb in spring, when overwintering cane leaves are fully expanded, and again at bud stage. If the infections persist additional fungicide applications will have to be made during the growing season.

Virus Diseases

The most distinct symptoms of virus diseases are mottling, yellowing, and crinkling of leaves. The most serious effect is a severe weakening of plants. Once a plant is infected it remains infected; plants propagated from it will probably be infected also.

Insects transmit viruses from infected to healthy plants. Therefore, the only effective control is to remove infected plants as soon as you find them. Remove infected plants, and all plants within 3 feet of them, from certified stocks. Follow this procedure in all plantings where viruses are to be controlled. Insect control helps reduce the spread of viruses from plant to plant.

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RASPBERRY INSECT PESTS AND THEIR CONTROL

The raspberry is comparatively free from insect injury, when compared to other fruit crops. Damage from insects can be kept at a minimum if good pruning practices are followed and timely applications of insecticides for control of the current insect problem are used.

Spider Mites

Mites feed on the undersurface of raspberry leaves. Injury first appears as whitish speckling of foliage. For control, spray with Kelthane when needed.

Sap Beetle

The Sap Beetle is black, about 1/4 inch long, with 4 yellow spots on the wings. It feeds on injured and ripe berries. To control this pest, keep over-ripe and injured berries from accumulating. The insecticide Sevin or malathion reduces Sap Beetle populations.

Cane Borers

To control raspberry cane borers, rednecked cane borers, and tree cricket injury, prune out infected canes in early fall. Raspberry cane borers cause cane tips to wilt; shoots are girdled with two rings an inch apart. Since larvae burrow downward, cut off wilted tips a few inches below the girdle and destroy them. The rednecked cane borer causes a gall-like enlargement on the cane due to a spiral burrowing of the larva. Crickets cause egg-laying scars that weaken canes.

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Trade names are sometimes used in this publication to clearly describe products. The use of a trade name does not imply endorsement by the Minnesota Agricultural Extension Service, nor does omission of other trade names imply nonapproval.

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