

Insect Pests and Diseases of

CURRANTS and GOOSEBERRIES

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Illustration on Cover—

Gooseberry mildew readily controlled. On left, branch from unsprayed bush showing berries ruined by mildew. On right, branch from a bush of the same variety sprayed with lime sulphur showing complete control.

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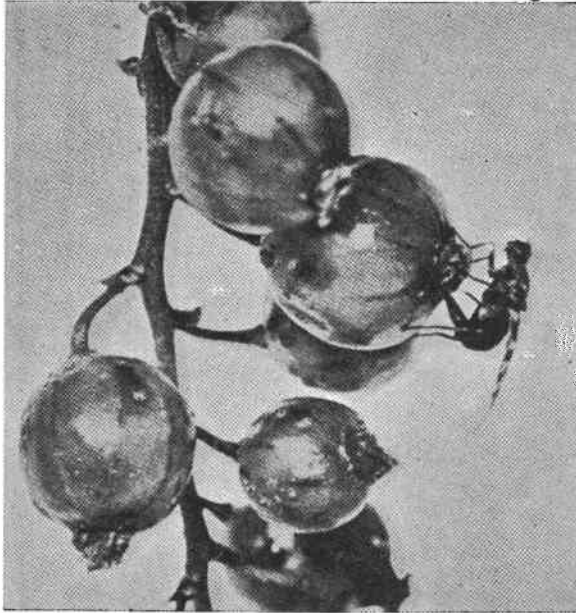
CURRENT AND GOOSEBERRY INSECTS

By

DON C. MOTE, Entomologist

THE CURRENT AND GOOSEBERRY MAGGOT OR YELLOW FRUIT FLY*

Description. Small, white, cylindrical maggots, blunt behind and tapering to a point at the head end, found inside the fruit of the currant and gooseberry. The adult is a rather small ($\frac{1}{4}$ inch long including wings), attractive, lemon-yellow fly, the wings crossed by smoky bands.



TOO LATE!

Figure 1. Sprays must be applied before flies lay their eggs in currants or gooseberries.
(Photograph by J. H. Paine, *Psych*, XIX: 5, 1912.)

are by this time of a fair size, laying their eggs under the skin of the fruit. The young maggots hatch in 3 to 8 days and work their way through the flesh

Life history and habits. Winter is passed in the soil, under and immediately adjacent to the bushes, at a depth of from $\frac{1}{2}$ to 3 inches below the surface. The insects occur at this time as small, brownish, capsule-like cases, not unlike grains of wheat.

The flies come out during April, usually from April 10 to May 1. They sport about on the foliage for a few days, lapping up moisture and bits of honeydew from the surface of the leaves. After a short time they commence stinging the berries, which

* *Epochra canadensis* Loew.

to the seeds. They feed on the seeds, later webbing several of them together and eating out the interior.

The maggots are full grown in mid-June, crawl out of the fruit, drop to the ground, and enter the soil. Their tendency is to move about very little after dropping, hence by far the majority of them enter the ground under or immediately adjacent to the bushes. Here they change over into the little brown case and so remain until the following spring.

Control. A sweetened poison spray consisting of lead arsenate (2 ounces), cheap molasses (1 quart), and water (3 gallons) is attractive to the flies and will kill them when sprayed lightly on the foliage during April while the flies are out. Interplanted trees and shrubs and trees along neighboring fence rows should also be sprayed.

Taking into account the fact that for nearly 11 months of the year the insect occurs in a helpless state in the first few inches of surface soil beneath the plants, any practice that will disturb or destroy these resting forms is of value in control. Frequent stirring of the surface soil under and immediately adjacent to the bushes during late summer, fall, and early spring will expose many of these pupae to adverse weather conditions, to attacks by birds, etc.

Poultry allowed to run in the yards just after harvest will destroy many of the pupae. Their interest should be aroused by raking the surface trash and debris from under the bushes to the center of the row. After they once discover the dainty titbits they will search out a goodly share for themselves.

Harvest early to avoid infestation. Planting early varieties of gooseberries and harvesting the fruit as soon as possible will assist in reducing wormy fruit.

Cover plants to avoid infestation. Growers who have only a few bushes of gooseberries or currants can protect these by covering them with cheesecloth to keep out the flies. This must be done before the flies begin to emerge. The cheesecloth should be tied to the crown of the bush above the soil and the entire plant covered in such a manner that the flies will not have access to the berries.

DEFOLIATING CURRANT AND GOOSEBERRY WORMS

Two kinds of worms attack the foliage of currants and gooseberries. Usually defoliation becomes serious just about the time the fruit is maturing.

Description. The native currant worm is the common defoliating worm in Oregon. This is a velvety green caterpillarlike worm found feeding on the foliage of both currant and gooseberry. The other worm is of a general greenish color with small black spots over the body, giving a dappled or mottled effect. The adult, in both cases, is a small, black, robust, wasplike insect, usually occurring in numbers about the foliage at blossoming time.

Life history and habits. The life history will vary somewhat for the two species, but in general winter is passed in or on the surface soil in parchmentlike cocoons; adults plentiful in the field during blossoming; eggs deposited within the tissue of or along the main veins of the leaves.

Eggs hatch in about 10 days, and young worms attack the foliage. They feed sparingly at first, but as they increase in size they eat voraciously, and where numerous can strip a plant of foliage in a few days. The worms become full grown in 2 to 3 weeks. They drop to the ground and spin their cocoons, within which they slowly change to the adult sawfly stage. There is another brood of adults and worms soon after the first brood of worms ceases feeding.

In extreme cases we have records of two successive defoliations of the bushes in a season.

The injury. As indicated, the injury is due to the feeding of these worms on the foliage. They work rapidly and not infrequently the grower's first intimation of their presence is the stark, defoliated bushes with their shriveling crop of nearly mature berries.

Control. Lead arsenate, 1 pound to 50 gallons water, will control these worms. The ideal time to spray is about 2 to 3 weeks after blossoming. Direct the solution as an under spray, coating the under surface of the leaves with poison. An angle nozzle attachment will assist materially in this. Lead arsenate dusts, carefully applied, are equally effective and could be applied to the nearly mature fruit without unduly splotching it up.

Where sprays are applied late, so that the fruit might be rejected because of the spray blotches, or the possible danger of residues causes the grower to hesitate to spray with lead arsenate, substitute white hellebore powder (obtainable from your insecticide dealer), using it at the rate of 1 ounce to 3 gallons of water. This is a practically colorless powder, practically nonpoisonous to human beings. It kills the worms both by contact and as a poison. Apply as directed above for lead arsenate.

THE CURRANT APHID*

Description. The foliage of red currants distorted and highly colored. Small yellowish, soft-bodied aphids or plant lice clustered in the "galled pockets" on under surface of leaves.

Life history. Winter is passed as small, cucumber-shaped black eggs on the bark of the new canes. Aphids hatch in the spring as the leaf buds open. The young aphids crawl to the unfolding leaves and begin to feed. These aphids are full grown in about 12 days and begin giving birth to living young. All the aphids occurring during the spring and summer are these "stem mothers" capable of giving birth to living young. There are no males until autumn. All summer long they multiply rapidly in this unusual, but very efficient manner. During the spring nearly all the aphids are without wings, but as the season advances winged forms appear and fly to other bushes. In the fall the true sexed aphids appear. Eggs are laid on the bark, and as eggs the winter is passed.

The injury. Common on red currant. May occur on black currant and gooseberry. The foliage is cupped, galled, distorted, and discolored, the upper surfaces of the leaves usually becoming highly colored and malformed. The aphids excrete honeydew in abundance and this sticky substance covers foliage and fruit with a smeary coating.

Control. Lime sulphur 1 to 20 plus nicotine sulphate 40 per cent, 1 to 800 is the standard currant aphid spray. (This equals: lime sulphur concentrate, 2 quarts; black leaf 40, 3 tablespoonfuls to 10 gallons of water.) Apply in late March as the leaf buds are opening. An aphid spray is seldom required on gooseberry. For later summer sprays substitute $\frac{1}{2}$ pound of soap dissolved in hot water for the lime sulphur in the 10 gallons of spray.

Commercial nicotine dusts for summer infestations were more satisfactory than the liquid sprays. Dusts must be applied during a warm, still period.

* *Myzus ribis* Linn.

Apply lightly through a cheesecloth bag, or for commercial plantings use a knapsack duster.

ROOT AND CANE BORERS

There are three borers found working on the canes, crowns, and roots of currants and gooseberries. Not a great deal is known about the habits of these insects and no control measures are known aside from a few precautionary measures and the cutting out of infested parts.

THE CURRANT CANE-BORER*

Description. Canes discovered in early summer or autumn with the foliage wilting. Interior of cane with tunnels and medium-sized white borer, the body pinched in or constricted beneath, the head brown. Adults are showy, clear-winged, blue-black moths with yellow markings.

Life history and habits. Winter is passed as full-grown borers in the canes. The moths emerge in June and fly from plant to plant. The eggs are deposited singly on the bark of the canes. The young borers, on hatching, burrow within the canes and proceed to tunnel up and down. Full grown by fall, they hibernate over winter as grubs in the canes.

The injury. Infested canes appear devitalized in the late summer and fall, but usually have sufficient vitality to put out sickly foliage in the spring. The infested canes are sickly and weak.

Control. No sprays effective. Cut out infested canes as soon as discovered and destroy.

FLAT-HEADED BORER†

Description. Occasionally the borer found working in the canes, crown, and root is distinctly different in appearance from the regular currant cane-borer. The borer worms are elongated and slender except at the head end, where they are broad and flattened.

The adult of this borer is a small grey, flattened, rather boat-shaped beetle.

Life history and habits. Not at all well known. The beetles are in the field during the summer months laying eggs. The borers hatch and tunnel more or less in the fall, pass the winter in the plant, and probably require most of the following summer to grow to maturity.

The injury is more general in character, all parts of the plant being attacked. In respect to distribution and prevalence of injury, this borer is only occasionally serious. Both currants and gooseberries are attacked.

Control. No sprays effective. Cut out and destroy infested canes or plants.

THE BLACK GOOSEBERRY BORER‡

Description. Borer worm is similar in appearance to the currant cane-borer. It is whiter in color, cylindrical, without constricted effect and works

* *Sesia tipuliformis*, Clerck.

† *Chrysobothris mali* Horn.

‡ *Xylocrius agassizii* Lec.

in the root and crown and at the base of the canes, rather than entirely in the canes. Probably does not attack currant. The adult is a black beetle instead of a moth.

Life history and habits. The winter is passed as adults in the burrows in the plant. During March and April the adults come out and mate and lay their eggs on the crown and canes of the plants. The eggs hatch in 3 weeks, and the young larvae bore into the plants at the place where the egg was laid. The second winter is passed in the larval stage, and pupation takes place in August of the second summer. There are two broods of these insects in Oregon. The adults of each brood emerge in alternate years, and lay eggs that produce young borers each spring. Both adults and larvae can be found in the plants each winter.

The injury. This pest has become so injurious in gooseberry plants that the life of the patch is cut down from 12 to 6 years, and even within 6 years many plants are devitalized to such an extent that the fruit developed is small and inferior. In the older fields the entire plant is often killed. There are often many borers in a single plant, their burrows so numerous as to give more or less of a honeycomb effect to the interior of the crown.

Control. Practical control for this pest is not known. In considering new plantings, examine the cuttings carefully for evidence of the borer, and either discard infested plants or carefully remove borers. Insist, if possible, on cuttings from borer-free plantings. Older fields, where heavily infested, should be destroyed during the winter. In younger plantings, dig and burn the occasionally infested plant.

MINOR INSECT PESTS

Red spider-mites may occasionally, particularly in dry seasons, become injuriously abundant on currant and gooseberry.

They manifest themselves as minute spiderlike creatures, yellowish in color, hurrying about over gauzelike webs on the under surface of the leaves. The infested foliage appears devitalized, yellow in color, and with a general lack of thrift.

Control by dusting or spraying with superfine dusting sulphur.

The cottony scale. The canes are sometimes infested with large, soft, brown scales. The side of the scale is often raised, and masses of cottony, waxy threads are protruded.

Oil sprays during the dormant season will control. Lime sulphur is not equally effective. Oil sprays may be used during the growing season to check the scale, if serious. Dilute a light miscible oil 3 to 100 for summer use.

Big bud. Rarely in Oregon we find cases where the buds of currant are galled and enlarged to an abnormal degree. This is the work of a microscopic mite. Very little is known of the insect. Dormant lime sulphur spray, very thoroughly applied, should control.

The bud midge. This insect belongs to a group known as the gall midges. The larvae apparently work on the interior of the dormant buds, causing them to blight and scale off the bushes. A hymenopterous parasite apparently is preventing this pest from doing excessive damage.

DISEASES OF GOOSEBERRY AND CURRANT

By

C. E. OWENS, Plant Pathologist

The two most troublesome diseases of gooseberry and currant, for which control measures have been worked out, are powdery mildew* and leaf 'spot'† (anthracnose). Other troubles that occasionally attract some attention are: die-back caused by two species of fungi,‡ mushroom root rot,§ and a weakening or killing of the plants due to high water table and poor drainage.

POWDERY MILDEW

On the gooseberry the fungus causing this disease appears as a white, powdery growth on the surface of the leaves, green shoots, and particularly the

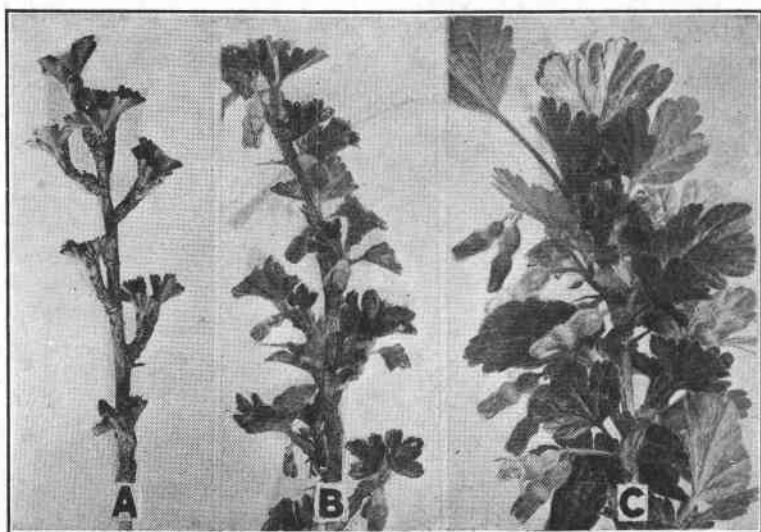


Figure 2. Spraying stages for control of gooseberry mildew. When disease is severe all three sprays may be required. When under good control the last can often be safely omitted. C: Stage of growth when first maggot spray is applied.

fruits (see front cover). The latter are conspicuously stunted and the white covering of mildew, as the fruit matures, changes to a dark brown coating that renders the berries unmarketable. On the currant, the mildew is mostly confined to the leaves.

Control. This disease can be controlled very effectively by lime sulphur sprays. Where powdery mildew alone is concerned, the following schedule is recommended:

* Caused by *Sphaerotheca mors-uvae*.

† Caused by *pseudopeziza ribis*.

‡ *Plowrightia ribesia* and *Botrytis* sp.

§ Caused by *Armillaria mellea*.

1. *Late dormant spray.* (Figure 2, A.) Lime sulphur $3\frac{1}{2}$ gallons to 100 gallons of spray. Apply in late dormancy just before the buds open. (If dry lime sulphur is used, employ at the rate of 4 pounds to 30 gallons of water.)
2. *Preblossom spray.* (Figure 2, B.) Lime sulphur $2\frac{1}{2}$ gallons to 100 gallons of spray. Apply just as blossoms are ready to open but before more than 10 per cent of them have opened. (With dry lime sulphur use 4 pounds to 40 gallons.)
3. *After-blossom spray.* (Figure 2, C.) Repeat, if necessary, using about the same strength, when 90 per cent of the blossoms are set. (At this time, if the weather is warm, a fine dusting sulphur may be used instead of the liquid spray.)

NOTE: Varieties that are severely injured by lime sulphur may be sprayed with wettable sulphur or dusted with a fine dusting sulphur.

NOTE: Where both mildew and leaf spot are prevalent, *use the schedule on page 11.* This schedule gives a combination program designed for control of both mildew and leaf spot as well as insect pests.

CAUTION: If the berries are to go to the cannery, no sulphur should be applied after blooming, since sulphur on the fruit is undesirable because of its harmful effect on the cans.

ANTHRACNOSE OR LEAF SPOT

This disease causes very small leaf spots (see Figure 3) which, when abundant, may result in yellowing and dropping of the foliage in midseason. This greatly reduces the vitality, growth, and productiveness of the plants. On currants the fruits as well as the leaves may show spotting. The disease is

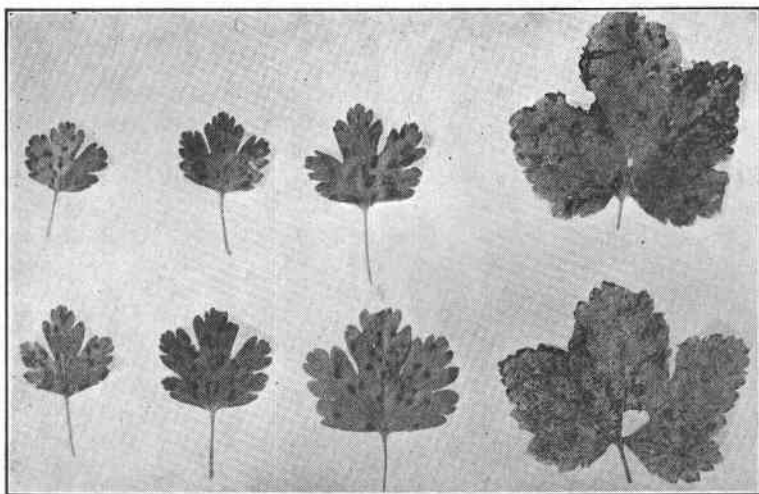


Figure 3. Gooseberry and currant leaves showing leaf spots due to the anthracnose disease. Bordeaux spray is the best preventive.

carried over winter on the old, fallen leaves, and spreads from them to the new growth the next spring.

Control. Since the disease overwinters on old, dead leaves, these should be plowed under or destroyed in some way before the new leaves come out.

Where leaf spot alone is present, the best remedy is bordeaux spray applied as follows:

First spray. Bordeaux, 8-8-100, applied when the first leaves approach full size.

Second spray. Bordeaux, 8-8-100, applied just after the fruit is picked.

NOTE: Since both mildew and leaf spot sometimes occur together in the same planting, it is better to use the first two sprays of lime sulphur as suggested for powdery mildew. Then change to bordeaux for the after-blossom sprays. This is the program most likely to control both mildew and leaf spot. *See the Combination Schedule on page 11.*

DIE-BACK

The die-back trouble caused by species of *Botrytis* and *Plowrightia* are usually of minor importance, appearing most often on plants already weakened from other causes. If the regular mildew and leaf spot spray program is followed, these die-back diseases should cause little trouble.

MUSHROOM ROOT ROT

Mushroom root rot is caused by a mushroom, sometimes called the "Oak Fungus," or "Shoe String Fungus." It occurs naturally on oak trees, particularly on oak stumps and roots in clearings. This fungus frequently kills fruit trees and may attack the bush fruits such as gooseberries and currants. The symptoms and signs consist of a sickly or dying condition of the plant accompanied during autumn months by the appearance of groups of honey-colored mushrooms or toadstools at the base of the sick plant. When sick plants are dug up, black, shoestringlike strands of fungus "roots" may be noticed clinging to the roots. If the bark of the infected roots is peeled off, a white film of fungus growth may be noticed between the bark and the wood.

Control. Diseased plants should be taken out and burned. New plants should not be set in the vacant spots for a year or two.

TROUBLES DUE TO POOR SOIL AND DRAINAGE CONDITIONS

Gooseberry plants are very sensitive to soil conditions brought about by high water table and poor drainage. Under these conditions, stunting, dying back, or complete death of the plants may result. The same type of damage may result from planting in too heavy soils.

Sites for gooseberry plantings should be selected so as to avoid such unfavorable soil conditions.

SPRAY PROGRAM FOR INSECT PESTS AND DISEASES
OF GOOSEBERRIES AND CURRANTS'

Time of application	Insect or disease	Spray material
1. Delayed dormant. As buds first begin to show green tips. (See Figure 2, A.)	Currant aphids	Black-leaf 40 — 1 pint added to mildew spray
	Powdery mildew	Lime sulphur—3½ gallons to 100 gallons spray
2. Preblossom spray. As blossoms are ready to open. (See Figures 2, B.)	Powdery mildew (if needed)	Lime sulphur—2½ gallons to 100 gallons spray
3. After blossom spray. When most of fruit is set. (See Figure 2, C.)	Defoliating currant and gooseberry worm. Currant and gooseberry maggot	Lead arsenate — 1 pound added to 50 gallons bordeaux spray
	Leaf spot and powdery mildew	Bordeaux 8-8-100
4. After fruit set, usually second week in April. Repeat at weekly intervals until 1 week before harvest.	Currant and gooseberry maggot. (See Station Circular 121 for additional information.)	Lead arsenate, 2 ounces Sirup, 1 quart Water, 3 gallons
5. Summer applications.	Aphids (whenever they appear)	Black-leaf 40—½ pint to 50 gallons spray, or a nicotine dust may be used
	Leaf spot (if needed)	Bordeaux 8-8-100