

FARM AND ORCHARD

Notes and Instructions from Agricultural Colleges and Experiment Stations of Oregon and Washington, Specially Suitable to Pacific Coast Conditions

APPLE SCAB AND CODLING MOTH.

By Professors H. S. Jackson and H. F. Wilson of the Oregon Agricultural College.

The time to spray for the apple scab and codling moth is at hand, and since these pests are, generally speaking, the most important troubles of the apple for which spring and summer spraying is necessary, it was thought advisable to issue at this time this bulletin of information regarding their life history and methods of control. The spray for these troubles may be applied in part at the same time, hence for convenience of the growers are treated together.

The proper time for treatment of fungus diseases or insect ravages is always determined by the life history of the organism causing the trouble, hence the life history of each will first be given, followed by the combined method of treatment.

Life History of Apple Scab.

Apple scab is caused by a fungus which attacks both foliage and fruit. On the foliage the spots are at first more or less circular in outline, olive green or brown in color, becoming darker and irregular in shape as they mature. The leaves are frequently more or less curled or wrinkled. When the spots are abundant, the leaves fall prematurely. Considerable defoliation may take place where infestation is abundant.

On the fruit the fungus produces more or less circular spots of the greenish black color. The vegetative stage of the fungus develop under the cuticle of the apple fruit finally rupturing it by the elongation of the threads which bear the spores. The ruptured cuticle may frequently be seen clinging as whitish membranous shreds about the edge of the recently developed spots. As the spots become older all trace of the fungus may become obliterated and only evidence of the former spot is seen in a large or small rough russeted spot. Frequently the fruit is distorted when mature as the result of early scab infections. Where scab spots are abundant the fruit may become cracked. Scab in any degree of severity on the fruit renders it unsightly and unmarketable.

The spores of the fungus are produced in the spots on leaves or fruit in great abundance and are disseminated by the wind, thus spreading the disease to other leaves and fruit, either in the same or other trees. Several generations may thus occur during the season. One finds the scab spots first appearing in the spring on the under side of leaves on the lower branches. Spores produced in these spots serve to spread the disease to young fruit and to other leaves.

The development of the scab fungus is found to be very much influenced by weather condition. Moisture on the surface of leaves and fruit is essential to the germination of the spores and the consequent infection of the plant. On that account scab is found to spread most rapidly in spring, early summer and fall in the Northwest. The disease spreads little, if any, during the dry season. The mycelium of the fungus present on the leaves which fall to the ground in the fall does not die, but develops in these leaves during the winter as a saphrophyte and in the spring produces spores quite different from those borne in the spots on living leaves and fruit, both in the manner of formation and in the shape and size. The spores found in the spots on leaves and fruit are one-celled, rarely two-celled, and are borne on the ends of short threads, while the spores developed on the dead leaves in spring are always distinctly two-celled and are borne in little cylindrical sacs called asci. Eight spores are always developed in each sac. A considerable number of these sacs are borne in hollow more or less pear-shaped receptacles imbedded in the tissues of the leaf. These receptacles containing the asci, known as perithecia, project from the surface of the leaf when mature as little black elevations. These are barely visible to the naked eye. At maturity an opening appears in the projecting elevations. The asci elongate through this opening and the spores are ejected forcibly, and, wafted by currents of air, may be carried to the young leaves of the apple, where they germinate and produce the first scab spots.

This ascus spore stage of the fungus which develops on the fallen leaves is sometimes called the "sexual" or "perfect" stage. The stage which develops on the living leaves and fruit is called the conidial or "summer spore" stage.

The ascus spores are disseminated about the time the blossoms open. So far as is known all primary infection of the leaves and fruit in the spring takes place following the dissemination of the sexual spores.

Life History of Codling Moth.

The codling moth spends the winter in the larval stage within a silken

cocoon under the bark or in crevices of the tree, or under rubbish on the ground. With the warm days of spring they undergo a complete change, and transforming to pupae later emerge as adults. In this stage the insect is seldom seen as it remains quiet during the day and flies about at night depositing eggs upon the leaves and fruit in the evening about dusk.

The eggs of the spring generation of moths are deposited during June and July and the first young larvae hatch out about June 20th to July 1st. As soon as the larvae hatch out they seek an entrance into the fruit, and in the case of the first generation, mostly enter through the calyx end.

They feed and develop for about sixteen to twenty days, until mature, and then pass through the same stages as the over-winter larvae, namely: pupae and adult. In the Willamette valley the earliest individuals of this brood of moths begin to appear about the last of July and deposit their eggs upon the fruit and leaves. The egg deposition continues until late in the fall. The eggs begin hatching about August 1st, and the larvae enter the fruit from the sides. These are the over-wintering forms, and when full grown they leave the fruit, and seeking protected places near by, spin winter cocoons.

Combined Treatment for Apple Scab and Codling Moth.

The first application is primarily an apple scab spray. Use lime-sulphur, diluted 1-30 with water (basis of 30 degree Baume stock solution) and apply just as the buds are separating in the cluster and show color. No arsenate of lead is necessary at this time unless the bud moth is present, in which case add two pounds of neutral arsenate of lead to each 50 gallons of diluted lime-sulphur. If aphids are present add black leaf 40 to the lime-sulphur in the proportion of 1 gallon to 500. When the latter is mixed with the lime-sulphur there will be a small amount of grayish sediment thrown down, which, however, does not affect the value of the spray to any appreciable extent.

The second application should be made just after the petals fall and before the calyx closes. Use lime-sulphur 1-30 to which has been added two pounds of neutral arsenate of lead to each 50 gallons. This is the second scab and the first codling moth spray.

The third application in orchards that are badly infested with apple scab, spray ten days or two weeks after the second with lime-sulphur, summer strength, or with self-boiled lime-sulphur (8-8-50). This is distinctly a scab spray and in regions where scab is not prevalent may be omitted. Where leaf-eating insects are present, two pounds of arsenate of lead should be added to each fifty gallons of spray. In those sections of the state where scab is not present and it is necessary to spray for leaf-eating insects, arsenate of lead may be diluted with water in the proportion of two pounds to fifty gallons.

The fourth application, the second spray for codling moth should be applied at the time the eggs of the first generation moths are hatching or just as the very earliest worms are beginning to enter the fruit. In the greater portion of the Willamette valley this will be usually between June 25th and July 1st, although the dates vary somewhat with the season. This date is also approximately correct for most portions of the Hood River valley, but in Southern Oregon and most portions of the Grande Ronde valley this application should be made somewhat earlier. Use two pounds of arsenate of lead to fifty gallons of water.

The fifth application, an application of arsenate of lead should be applied as a preventive of injury by codling moth about four or five weeks after the fourth. In the Willamette valley this will be about August 1st to 10th. This date, however, varies in different parts of the state as above noted, and the application should be made when the first young larvae are found entering the fruit.

The sixth application, the fourth spray for codling moth, corresponds to the fall spraying for bud moth and should be applied in the Willamette valley about September 25th to October 1st. Use arsenate of lead in the proportion of two pounds to 50 gallons of water. In case the bud moth is not present in the orchard and the previous codling moth sprays have been thoroughly applied this application may be omitted. In case apple scab has been particularly prevalent or the fall rains begin early it would be well to use lime-sulphur 1-30 at this time for the purpose of limiting fall infection. This would also be desirable if the orchard is badly infested with apple tree anthracnose.

Supplementary Methods of Controlling Apple Scab.

Since the fungus causing apple scab winters over in the decaying leaves on the ground, it is advisable to destroy

the leaves by burning or early plowing before the time for the first spraying.

The usual application of bordeaux for apple tree anthracnose just after the fruit is picked may have a beneficial effect in reducing the late spread of the disease on the foliage and hence a reduction of the "sexual" spore stage in the spring.

Codling Moth.

Much good can be done by scraping the rough bark from the trees in the winter, and by the practice of clean culture; especially is this true of old neglected orchards.

Be careful not to carry infested fruits into the store house in the fall, as the larvae find many excellent places therein to spend the winter.

EXPERIMENT STATION NOTES

By R. W. Thatcher, Director, Washington Experiment Station.

The reason for the lack of fertility of pine land soils is not due to the pitch which such land contains, but to an absence of a supply of available nitrogen. The foliage from evergreen trees adds very little to the supply of nitrogen in the soil, while the trees themselves constantly take it from the soil. In soils which have been burned over, the heat burns out a good deal of nitrogen in the upper layers of soil. The ashes are not injurious, but are highly beneficial to the soil.

The real difficulty is that the growing of pine and fir trees on soil poor in nitrogen takes away so large a proportion of the available nitrogen that when the soil is first brought under cultivation it will rarely produce satisfactory crops. After two or three years of cultivation the soil gets into better condition and the nitrogen becomes more available and better crops are obtained. The only remedy for this condition is thorough cultivation supplemented by the use of some fertilizer to put available nitrogen in the soil to start with. For this purpose, barnyard manure is best. Clover would be still better, but clover itself will rarely grow on this soil without artificial fertilizer to start with. The best commercial fertilizer to use on this kind of soil is dried blood, applied either in the fall or early spring. If field peas would grow at all on this soil, they would make a most excellent fertilizer if seeded early in the spring, plowing them under as soon as they have attained their maximum growth.

Repeated attempts have been made to use potassium cyanide as a squirrel poison. The difficulty is to get the odor of the cyanide disguised so that the squirrels will eat anything that has been treated with the chemical. All attempts which I am familiar with have failed. The use of cyanide in the holes late in the season might be effective if some means could be devised for generating the hydrocyanic gas from it. This will require the presence of some acid in the hole to come in contact with the potassium cyanide, or otherwise the poisonous gas will not be given off. The chief difficulty with all these gas poisons is that the holes are so long and crooked that there is difficulty in getting the gas to penetrate far enough to reach the animal before it is absorbed by the soil.

Wherever sagebrush and cactus flourish, there agricultural crops will also grow. If the prevailing vegetation is greasewood or salt grass, the amounts of alkali are sufficient enough to injure most agricultural crops. If the alkali is excessive, however, no vegetation of any kind will grow on the land.

Another indication of alkali is the presence on the surface of the ground of a white crust in the latter part of August. Alkali is simply an injurious excess of soluble salts, and at this season they are brought to the surface by excess of evaporation, and will always appear on the surface in the early fall. White alkali includes any of the soluble salts. "Black alkali," as it is called, is sodium carbonate, and causes the vegetation on the surface of the ground to turn black because of its corrosive effect on vegetation.

Siberian Wild Flowers.

Siberia seems to have a set program for her flowers, which are beautiful in variety and coloring. September gathers the blue flowers to her bosom, and under her languid and caressing touch blossom myriads of dainty bluebells on long and tender stems.

In the rocky soil of the hilltops blue scabiosa shares its playground with drak blue snapdragon, and in the shady spots of the road grow, tall and hardy, purple blue chrysanthemums.

Earlier in summer yellow holds sway—buttercups, daisies and violets, and after them red-pinks and very deep briar roses. Delicious jam is concocted from the seedpods of the wild rose.

When summer comes an array of jars and glasses and a big kettle join hands with hat boxes and shoe bags and travel countryward. A temporary stove is built of stones not far from the house, and here simmers slowly the year's provision of preserves and jams and jellies, absorbing at the same time great doses of sun and fresh air.—America.

A Sharp Thrust.

This is a quotation from a Connecticut woman's diary, dated 1790: "We had roast pork for dinner; and Dr. S. who carved, held up a rib on his fork and said: 'Here, ladies, is what Mother Eve was made of.' 'Yes,' said Sister Patty, 'and it's from very much the same kind of critter.'—Christian Register.

America's Sweet Tooth.

If America's annual candy supply were loaded on one train there would be over eight thousand trucks full of boxes, buckets and glass jars. This load of sweetmeats for the sweet tooth of the American girls costs the consumers about \$135,000,000 every year.

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Lacking Army Qualifications.

"No one knows until he makes the try," said a man who was looking for "something to do," "how hard it is to get into the army. I am down and out, and I thought that would be a good three-year job. On the same day that I tried 32 others did, and not one got in. Bad eyes, bad teeth and all sorts of things are booked against you. One fellow who went with me got 'k' put after his name when they shut him out. We didn't know till the sergeant told us that it meant 'insufficient knowledge of English.'"

Rembrandt Museum.

Within a short time Amsterdam will possess a new attraction to lovers of art. The house where Rembrandt lived from 1639 to 1668, and where he passed the happiest years of his married life with Saskia van Uilenburg, is being restored and arranged as a small Rembrandt museum. The historical building, long much neglected, became the property some time ago of a society and is now being restored under the direction of a famous architect.

A New Jinricksha.

A one-wheeled jinricksha, on the motorcycle principle, is being introduced among the Chinese of the Malay states. It is said to be safe, and to have many advantages over the old-fashioned vehicle. The wear and tear is reduced to a minimum, the work on the pullers reduced and speed increased.

Dr. Pierce's Pleasant Pellets regulate and invigorate stomach, stomach, liver and bowels. Sugar-coated, tiny, granules, easy to take. Do not gripe.

Record Senatorial Career.

Thomas H. Benton's 36 years of continuous service in the United States senate, which ended March 3, 1851, held the record in that respect until Justin S. Morrill of Vermont entered upon his thirty-first year on March 4, 1897. Morrill served 32½ years continuously. John Sherman served 32 years, broken by four years in Hayes' cabinet. Allison of Iowa served 35 years, which is now the record for continuous service in the senate.

Two Trials.

A youth was going out to his first formal dinner party. His mother said: "Now don't forget your manners, James; be sure to say something complimentary when the food is passed." He endeavored to do so. When butter was served he remarked pleasantly: "This is pretty good butter, what there is of it." The remark was not well received; he saw that he had made a mistake, and he endeavored to correct it by saying, "And there's plenty of it, such as it is."

Peculiar Mexican Liquor.

"Comiteca" is the name given to a spirituous liquor manufactured in Comitán, state of Chiapas, Mex. It is an exclusively local product, since in no other part of the country is anything similar produced; the species of maguey or agave from which it is distilled thrives only within a radius of ten or twelve miles.

Examine Signatures.

A number of the larger banking institutions employ from one to half a dozen men whose sole duty is to examine every check that comes in through the clearing house, and vouch for the genuineness of the signatures.

SOUR STOMACH

"I used Cascarets and feel like a new man. I have been a sufferer from dyspepsia and sour stomach for the last two years. I have been taking medicine and other drugs, but could find no relief only for a short time. I will recommend Cascarets to my friends as the only thing for indigestion and sour stomach and to keep the bowels in good condition. They are very nice to eat."

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Causes of Faintness.

Fainting is a loss of consciousness due to the diminution of blood supply to the brain. It occurs most frequently in weak, sensitive women, but may occur also to men as well. It usually occurs in crowds or in crowded halls, theaters and churches where the atmosphere is close and the air foul.

Honesty and Affluence.

"But," protested the plain citizen, "don't you consider honesty a good thing?" "Sure," replied the politician; "but it's like every other good thing—you've got to make money before you can afford it."—Catholic Standard and Times.

The Open Market.

If you have a confession to make, sell it to a magazine.—Aitchison Globe.

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A Rockland traveler lately in France ordered sardines with his dinner, naturally thinking that in France the choicest variety of that delicacy was to be found. An inspection of the labelled tin in which the fish were served disclosed the fact that the sardines were put up in "Eastport, Me., U. S. A."—Ketchikan Journal.

Non-alcoholic Sarsaparilla

If you think you need a tonic, ask your doctor. If you think you need something for your blood, ask your doctor. If you think you would like to try Ayer's non-alcoholic Sarsaparilla, ask your doctor. Consult him often. Keep in close touch with him.

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