

PLANT DISEASE CONTROL NOTES

EXTENSION DIVISION • VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

FRUIT DISEASES APPLE SCAB AND ITS CONTROL IN VIRGINIA

Revised May 1978

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Control Series 64

MAY 1 1978

BLACKSBURG, VIRGINIA

Apple scab, a fungus disease of apples, is found in all countries where apples are grown. This disease causes almost as much loss to apple growers as all the rest of the apple diseases put together. The scab fungus attacks leaves, stems of the fruit and fruit. Losses result from a reduction in yield, reduced value of the fruit, defoliation that weakens the tree and an increase in production cost.

The apple scab fungus, which is called *Venturia inaequalis*, overwinters in the dead apple leaves under the trees. During the winter months the fungus forms small, black, flask-like structures in the leaves called perithecia. The mature perithecia are filled with minute spores called ascospores. Spring rains cause the perithecia to discharge ascospores into the air where they are carried by the air current to the new green leaves and opening fruit buds of the apple tree. Once an ascospore lodges on a young leaf or apple and if the climatic conditions are warm and humid, it sends out a germ tube that penetrates through the cuticle and causes an infection between the cuticle and the epidermal cells.

The first visible sign of infection is a light brown or olive colored spot. Depending on the temperature, first visible symptoms may show as soon as 8 days after the initial penetration by the ascospore. Hundreds of new spores called conidia or summer spores are formed in the infection lesion. Rain disperses the conidia or summer spores from the infection lesion to healthy leaves and to the young developing fruit, where they start a secondary infection.



Apple scab lesions (spots) on small fruit on the left and on a leaf at the right.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. W. R. Van Dresser, Dean, Extension Division, Cooperative Extension Service, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

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Apple scab thrives in cool, wet weather. Optimum temperatures for spore germination and infection are from 50 to 70°F. Infection may be expected to develop when the trees remain wet for as little as 8 hours at 60°F. Infections develop more slowly at lower temperatures, about 24 hours of continuous wetting being required when temperatures are in the mid-forties. Infection may occur at any temperature above freezing if the trees remain wet long enough.

RECOMMENDED CONTROL

Once the primary infection gets started, apple scab is difficult to control. The production of fruit that is free of scab requires a carefully planned and executed fungicide protection program.

The apple scab control program will be given separately for fresh fruit, processing fruit and non-bearing orchards, respectively.

FRESH FRUIT

The program for fresh fruit includes materials, rates of usage and sequences which are designed to give maximum degree of control of apple scab with a minimum of adverse effects upon fruit finish. Properly applied they will produce clean fruit under most situations. In those orchards, however, that have had a past history of extensive scab losses it may become advisable to plan the scab protection program with the assistance of the State Fruit Disease Extension Specialist or an Extension Agent in Agriculture.

DODINE (CYPREX): Use 0.5 lb. dodine 65% WP (wetable powder) per 100 gals. or 1 teaspoon for each gallon of spray. Apply 300 to 400 gals. of spray per acre or 5 to 8 gals. per tree (depending on tree size) every 7 days from the time first leaves appear until petal fall, then at intervals of 10-days to 2-weeks for the remainder of the season. The most critical period is during the pre-bloom, bloom, and early post-bloom periods. Fruit and foliage must be completely covered with the fungicide to prevent scab infection. Allow 7 days from last dodine spray to harvest. The residue tolerance for dodine is 5 ppm. Do not graze treated orchards.

CAUTION: Dodine may russet yellow varieties. It has sometimes caused injury to the fruit of Stayman, McIntosh, and other red varieties. Injury may also result from its use following cold injury. Do not use pomace from treated apples for livestock feed.

OR

CAPTAN: Use 2.0 lbs. of captan 50% WP per 100 gals. or 2 tablespoons for each gallon of spray. Apply 300 to 400 gals. of spray per acre or 5 to 8 gals. per tree (depending on tree size) at 7 day intervals from the time first leaves begin to show until petal fall, and at 10-day to 2-week intervals thereafter. It is important that all fruit and foliage be kept protected against scab spore invasion. The residue tolerance for captan is 25 ppm.

CAUTION: Captan should not be combined with oil or applied within 4 days of an oil application. Captan fungicides have sometimes produced a frog-eye-like spotting on Delicious, Stayman and Winesap foliage. This injury has most frequently resulted from sprays made in the petal fall and first cover spray periods. Sulfur in combination with captan may increase the injury. Captan injury may also be more prevalent when the spray is applied following several days of cloudy weather.

OR

DIKAR: Use 2.0 lbs. of Dikar 80% WP per 100 gals. or 2 tablespoons for each gallon of spray. Apply 300 to 400 gals. of spray per acre or 5 to 8 gals. per tree (depending on tree size) at 6-day intervals from the time the first leaves begin to show until petal fall, then at 10-day to 2-week intervals for the remainder of the season. The residue tolerance for Dikar is as follows: Dikar = dithane M-45 with a tolerance of 7 ppm; Karathane has a residue tolerance of 0.1 ppm. Dikar has a 21 day waiting period.

CAUTION: Do not use Dikar with oil or within 7 days of an oil application. Do not graze treated areas.

OR

POLYRAM: Use 2.0 lbs. of Polyram 80% WP per 100 gals. or 2 tablespoons for each gallon of spray. Apply 300 to 400 gals. of spray per acre or 5 to 8 gals. per tree (depending on tree size) at 7 day intervals from the time the first leaves begin to show until petal fall, then at 10-day to 2-week intervals for the remainder of the season. The residue tolerance for Polyram is 2 ppm. There is a 15-day waiting period before harvest. Do not graze treated areas.

OR

FOLPET (Phaltan): Use 2.0 lbs. folpet 50% WP per 100 gals. or 2 tablespoons for each gallon of spray. Apply 300 to 400 gals. of spray per acre or 5 to 8 gals. per tree, depending on tree size, at 7 day intervals from the time first leaves begin to show until petal fall, and at 10-day to 2-week intervals thereafter. Fruit and foliage must be completely covered with the fungicide to prevent scab infection. The residue tolerance for folpet is 25 ppm.

CAUTION: Folpet should not be combined with oil or applied within 4 days of an oil application. Folpet has been reported to cause injury to fruit finish on the Golden Delicious variety when applied early in the season. However, full season usage may be necessary for maximum protection against the fruit rots.

Note: FERBAM OR THIRAM: 2.0 lbs. ferbam 76% WP or 2.0 lbs. thiram 65% WP per 100 gals. of spray can be substituted for any of the above fungicides in the first 2 pre-bloom sprays. Both of these fungicides mix fairly well with oil. The residue tolerance for ferbam and thiram is 7 ppm, respectively.

FOR PROCESSING FRUIT

Scab control in processing fruit is usually not as exacting as in fresh fruit. Thus, a slight saving is made through reduction in concentration of the scab fungicide knowing there is a risk of incomplete scab control. This program is primarily for the York variety but is applicable to other varieties of similar disease susceptibility.

DODINE (Cyprex): Use 0.4 lb. dodine 65% WP per 100 gals. of spray. Apply 300 to 400 gals. per acre, depending on size of trees, at 7 day intervals from the time the first leaves begin to show until petal fall and at 10-day to 2-week intervals thereafter. Allow 7 days from last dodine spray to harvest. The residue tolerance for dodine is 5 ppm. Do not graze treated orchards.

CAUTION: Do not use pomace from apples treated with this fungicide mixture for livestock feed.

OR

CAPTAN: Use 1.6 lbs. of captan 50% WP per 100 gals. of spray. Apply 300 to 400 gals. per acre, depending on size of trees, at 7 day intervals from the time the first leaves begin to show until petal fall and at 10-day to 2-week intervals thereafter. The residue tolerance for captan is 25 ppm.

CAUTION: Captan should not be combined with oil or applied within 4 days of an oil application.

Note: Dikar 80 WP or Polyram 80 WP can be substituted for captan at the same rate and application time. Do not graze areas treated with either Dikar or Polyram.

FOR NON-BEARING ORCHARDS

REMARKS: This recommendation is for young growing trees but may be used on mature trees without fruit.

DODINE (Cyprex): Use 0.4 lb. dodine 65% WP per 100 gals. of spray. Apply 50 to 150 gals. of spray per acre, depending on size of young growing tree, and 300-400 gals. per acre, depending on size of mature tree, at 7 day intervals from the time first leaves begin to show until petal fall and at 10-day intervals for the remainder of the season. Do not graze treated orchards.

CAUTION: Small trees are difficult to spray to obtain adequate coverage. Complete coverage is necessary to protect the young succulent leaves from apple scab.

OR

FERBAM: Use 1.6 lbs. ferbam 76% WP per 100 gals. of spray. The number of gals. per acre and the time of application is the same as for dodine.

Note: For non-bearing home orchards use 1.5 tablespoons of ferbam for each gallon of spray. Spray the trees thoroughly to the point that the spray material drips off the leaves. Captan 50% WP, Dikar 80% WP or Polyram 80% WP can be substituted for ferbam at the same rate.

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KEYS TO PROPER USE OF PESTICIDES

1. Read the label on each pesticide container before each use. Follow instructions to the letter; heed all cautions and warnings, and note precautions about residues.
2. Keep pesticides in the containers in which you bought them. Put them where children or animals cannot get to them, preferably under lock and away from food, feed, seed, or other material that may become harmful if contaminated.
3. Dispose of empty containers in the manner specified on the label.

SEE YOUR DOCTOR IF SYMPTOMS OF ILLNESS OCCUR DURING OR AFTER USE OF PESTICIDES.