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DISEASE CONTROL FOR HOME PEAR ORCHARDS

There are a number of diseases that commonly occur year after year in both commercial and home plantings of pears. These diseases do not infect at the same time but appear in a fairly regular sequence depending upon the weather and the development or phenology of the pear host, beginning at dormancy and continuing until fruit are harvested. As a consequence, a season-long program for disease management is often necessary in order to harvest a high percentage of useable fruit. The diseases which are common in pear include fire blight, pear scab, Fabraea leaf spot, and sooty blotch. Weather conditions greatly influence both the occurrence and severity of plant diseases. Consequently, diseases are generally most difficult to control in years of prevailing high temperature, high humidity, and abundant rainfall and cloud-cover.

I. CONTROL STRATEGIES:

Pear diseases can be effectively managed through the combined use of culture, sanitation, resistance, and fungicide sprays. This integrated approach to disease control minimizes the reliance upon one type of control over the others and usually results in a high percentage of quality fruit.

A. CULTURE-

Cultural methods include maintaining tree vigor by proper planting, fertilizing, and pruning and by following general practices that help to minimize tree stress.

B. SANITATION-

Sanitation involves pruning and removing affected or dead portions of the tree and removing diseased foliage or fruit which are often important sources of inoculum for the next season.

C. RESISTANCE-

Resistance involves selection and planting of varieties with genetic resistance to specific diseases. This effectively reduces or eliminates occurrence of the disease in question.

D. FUNGICIDE SPRAYS-

Proper selection, timing, and application of these sprays are important. Thorough coverage of all parts of the tree is necessary and sprays should be applied until run-off. The fungicide label will contain information on plant hosts and diseases, dosage rates, days to harvest interval, and safety precautions.

II. COMMON DISEASES:

A. FIRE BLIGHT-

Fire blight, cause by the bacterium *Erwinia amylovora*, is the most devastating disease of pear. Fortunately this disease is not a problem every year and when it does occur, it is often isolated to specific geographical locations. However, when infection does occur, the disease develops quite rapidly and can destroy individual trees or even orchards in a single season.

The bacteria survive the winter in old cankers on pears and other plants and in healthy pear buds. This disease can occur in four phases: canker blight, blossom blight, shoot blight, and trauma blight. As weather becomes favorable for growth in spring, the bacteria begin to rapidly multiply and can been seen oozing out of tissues. This creamy bacterial ooze is attractive to insects and they pick it up and carry it to open flower buds where infection occurs. The bacteria are also carried by wind and rain to open pear blossoms. Infected tissues are characterized by their blackened, "burned" appearance, hence the name "fire" blight.

The most effective method for control of this disease in home plantings is **sanitation**. Any cankered or infected branches or twigs should be cut back to healthy wood during the dormant season. All pruning cuts should be made at least 8-12 inches below visible symptoms. All tools should be disinfested with 10% bleach (1 part bleach: 9 parts water) or 70% alcohol. Prunings should also be removed from the vicinity of the tree. In addition to these practices, it is important to scout for new infections and remove blighted tissues as soon as they appear. The effects of this disease can also be minimized by maintaining overall tree health by following proper cultural practices that avoid excessive vigor. Pear cultivars vary with regard to their overall susceptibility to fire blight so "less susceptible" cultivars (e.g. Comice, Winter Nelis) can be selected for planting.

B. FABRAEA LEAF SPOT-

Fabraea leaf spot, also known as leaf blight and black spot, is caused by the fungus *Fabraea maculata*. This disease usually appears late in the growing season but can occasionally develop in late May and early June. Fabraea leaf spot attacks leaves, fruit, and twigs of pear. Symptoms first appear as brown to black spots on the leaves. Heavily infected leaves often yellow and drop prematurely. Severe defoliation can substantially reduce tree vigor and yield, especially if trees are defoliated several years in a row. Lesions on fruit appear similar to those on leaves but become slightly sunken as fruit expand. Severely infected fruit may also crack. Once established in a tree or a planting, this disease is difficult to control since significant amounts of fungal inoculum overwinter on infected leaves. Spores of the fungus are easily spread by splashing rain and wind in the spring.

Effective control includes a good sanitation program. Since overwintering infected leaves are a major source of spores in the spring, removal of all fallen leaves during the dormant season significantly reduces the chances for new infection. In addition, properly selected and timed fungicide sprays are important for disease control (refer to spray guide on page 4).

C. PEAR SCAB-

Pear scab, caused by the fungus *Venturia pirina*, is a disease which is quite similar to apple scab. The fungus causes circular, velvety olive-black spots on leaves, fruit, and sometimes twigs. As the lesions age, they become gray and cracked. The fungus overwinters on dead, fallen leaves and produces spores (primary) in the spring which can infect during periods of rain. Infection from these primary spores can take place at any time after pear growth begins until mid to late June if suitable weather conditions exist. During the summer a different spore (secondary) is produced by the fungus which is capable of inciting more new infections when splashed onto leaves and fruits by rain.

This disease is effectively controlled by a good sanitation program in which diseased leaves and fruit are removed from the vicinity of the tree. This significantly reduces sources of inoculum in the spring. Scab can also be controlled with properly selected and timed fungicide sprays (refer to spray guide on page 4).

D. SOOTY BLOTCH-

Sooty blotch, caused by the fungus *Gloeodes pomigena*, is recognized by black, sooty smudges on the surface of pear fruit. This disease is particularly severe when rainy weather occurs early in the season and continues into the summer. Sooty blotch develops gradually during periods of high humidity. It is favored by frequent showers, prolonged cloudy weather, and poor air circulation.

Since the fruit infections are superficial, they can often be removed with vigorous washing and rubbing. In addition, practices which promote air circulation such as pruning and mowing the grass around the tree are usually enough to keep this disease in check. Fungicide sprays can be applied if the tree has a history of severe disease and blemish-free fruit are important (refer to spray guide on page 4).

III. SPRAY GUIDE:

A. PESTICIDES-

Several fungicides are effective for control of many of the common diseases of pear. These include:

1. **ferbam**- used alone or in combination thiophanate methyl for control of scab, Fabraea leaf spot, and sooty blotch;
2. **mancozeb-** for control of scab and Fabraea leaf spot;
3. **thiophanate-methyl-** use in combination with mancozeb or ferbam for control of scab, sooty blotch, and Fabraea leaf spot;

CAREFULLY READ THE LABEL ON EACH PESTICIDE BEFORE USE !!!

B. SPRAY SCHEDULE-

GROWTH STAGE[1]	DISEASE	MATERIALS/CULTURE
DORMANT- during the winter or dormant season	Fire blight	Prune any cankers or infected wood at least 12" below symptoms; disinfest tools;
GREEN CLUSTER BUD- after the blossom buds are fully exposed but before they separate from the cluster	Scab and Fabraea leaf spot	Thiophanate methyl in combination with mancozeb or mancozeb
WHITE BUD- approximately 7 days after Green Cluster Bud	Same as above	Same as above
BLOOM- when 25% or more of the blossom buds are open	Same as above	Same as above
PETAL FALL- when 90% or more of the petals have dropped	Same as above	Same as above
FIRST COVER- 7 days after Petal Fall	Scab, Fabraea leaf spot, and fire blight	Same as above and scout for blighted leaves or twigs
SUMMER COVER SPRAYS- apply on a 10-14 day schedule until harvest depending upon the weather. Refer to "days to harvest interval"" on fungicide label.	Scab, Fabraea leaf spot, and sooty blotch	Thiophanate methyl in combination with mancozeb or ferbam

[1] Refer to page 5 for a pictorial representation of pear growth stages

C. PEAR GROWTH STAGES-

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