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DISEASE CONTROL FOR HOME CHERRY ORCHARDS

The diseases that commonly occur year after year in both commercial and backyard plantings of sweet and sour cherry in Connecticut are brown rot, black knot, and leaf spot. 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 cherry 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. 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:

Cherry 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. However, to date, all commercially available cultivars of cherry are susceptible to brown rot and leaf spot although some are more susceptible than others. Breeding programs are currently underway to produce acceptable resistant cultivars for the United States.

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. BROWN ROT-

Brown rot, caused by the fungus *Monilinia fructicola*, is the **most** common and destructive disease of cherry in Connecticut and New England. The disease is especially severe in wet, humid weather. Brown rot causes blossom blights, twig blights, twig cankers, and fruit rots. Infected blossoms wilt, shrivel, and die, becoming covered with a grayish mold. Infection can then spread to the twig and form a brownish oval canker. These cankers can expand and eventually girdle the twig, causing the terminal growth to wither and die. On fruit, symptoms first appear as a small, circular brown spots that increase rapidly in size and eventually result in a soft rot of the entire fruit. Under wet, humid conditions, ash-gray, powdery tufts appear all over the surface of the fruit, a characteristic diagnostic symptom of this disease. Fruit decay is often not apparent on immature fruit but becomes obvious as fruit begin to ripen. Fruit which are wounded (by insects, mechanical injury, bird pecks, etc.) are more readily infected than unwounded fruit. Rotted fruit may fall to the ground or persist as mummies on the tree. The fungus overwinters in fruit mummies on the tree or ground and in twig cankers. In spring, the fungus produces two types of spores; one type is produced on the surface of cankers and mummied fruit on the tree and the other type is produced in mummied fruit on the ground. Both spore types can cause infection under warm, moist conditions.

Sanitation is **essential** to control of brown rot. Any mummied fruit that remain on the tree should be removed and destroyed and all dead and/or cankered twigs should be pruned and removed from the vicinity of the tree or planting. In addition, all mummied fruit on the ground should be raked and removed and/or the ground beneath the tree cultivated to prevent spores from forming on the mummies in the spring. In conjunction with this sanitation program, a season-long fungicide spray program is usually necessary for effective brown rot control. Properly selected and timed fungicide applications should be made to protect blossoms, foliage, and fruit throughout the growing season. Pre-harvest sprays are particularly important as fruit begin to ripen. Refer to spray guide on page 5. At harvest, care should be taken to avoid bruises, punctures, or tears in the skin of mature fruit to prevent sites for potential infection. Additionally, use only clean containers and cool fruit as soon as possible.

B. LEAF SPOT-

Cherry leaf spot, caused by the fungus *Blumeriella jaapii* (formerly *Coccomyces hiemalis*), is also known as “shot-hole” of cherry. This disease is the most important disease of sour cherry in New England although sweet cherry is also quite susceptible. Leaf spot reduces flower bud survival and can decrease fruit set on heavily infected trees. Symptoms first appear on the upper surface of the leaf as small, purple spots. These spots develop definitive margins or borders and gradually turn brown with age. Spots on sweet cherry are often larger and more circular than those on sour cherry. Infected leaves turn yellow and drop, often resulting in premature defoliation. Fruit trees which are repeatedly defoliated year after year have poor vigor and are often susceptible to winter injury and secondary invaders or opportunistic pests. Leaf spot is primarily a disease of leaves but fruit, stems, and petioles can become infected when the disease is severe. Fruit on diseased trees fail to ripen properly and are often light in color, low in

soluble solids, and soft and watery. The fungus overwinters in infected leaves on the ground. In late winter and early spring the fungus produces fruiting bodies in the infected leaves. These fruiting bodies contain one type of spore (primary) which infects newly developing leaves when conditions are warm and moist. Infection from these primary spores can occur any time after the leaves have developed mature stomates (breathing pores). This usually coincides with petal fall although in some years it can occur during bloom. 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.

The incidence of leaf spot on cherry in home plantings can be greatly reduced with a good sanitation program. This involves removing diseased leaves from the ground around the tree in late winter or spring to eliminate the source of overwintering inoculum. However, when disease is severe, a season-long fungicide spray program is also necessary for effective control. Properly selected and timed fungicide applications can be made according to the spray guide on page 5.

C. BLACK KNOT-

Black knot, caused by the fungus *Apiosporina morbosa*, can be a very destructive disease of cherry. It is also quite common on domesticated and wild plum as well as on *Prunus* species in the landscape. The disease affects only woody tissues and can develop on twigs, branches, and scaffold limbs. Losses result from extensive dieback of girdled limbs and stunting of growth beyond the knots. In extreme cases, whole trees can be killed. Symptoms are easily recognized as hard, black, elongate swellings or galls on twigs, branches, and trunks of trees. While knots are most outstanding on dormant trees, newly formed knots are greenish and soft but become hard and black with age. The fungus overwinters on infected twigs and produces spores in spring. New shoots are susceptible and can be infected soon after budbreak and throughout the period of active shoot elongation. However, most infections are thought to occur just before bloom or after petal fall. Wet spring weather is favorable for disease since rain is important for discharging the spores from the knots. In addition, wind and rain help to spread these spores to the susceptible tissues. Spores of black knot are capable of penetrating non-wounded tissues so they do not require wounds in order to infect. Most infections occur in spring but symptoms are often not visible until fall when they appear as small swellings on the twigs. These knots gradually enlarge, mature, and take on their diagnostic rough, black appearance during the winter and the following spring.

Control is best achieved using a combination of pruning and sanitation, properly timed fungicide sprays, and resistant varieties. **Pruning and sanitation are essential** to any control program since fungicide sprays are relatively ineffective unless old knots are pruned and removed from the vicinity of the tree. Infected tissues should be pruned *before budbreak* and cuts made at least 6-8" below any visible swellings or knots. In addition, any wild plums, cherries or ornamental *Prunus* species with symptoms should be pruned or removed within 600 ft. of the orchard. These trees can be important sources of inoculum. In conjunction with pruning and sanitation, a fungicide spray program is necessary for effective black knot control. Properly selected and timed fungicide applications should be made to protect developing twigs. Refer to spray guide on page 5.

III. SPRAY GUIDE:

A. PESTICIDES-

A **general purpose tree fruit spray**, available under a variety of trade names, is effective for control of many of the common diseases and insect pests of cherry. This mixture usually contains captan as the fungicide component and methoxychlor and malathion or carbaryl as the insecticide component. However, captan may result in leaf injury on sweet cherry cultivars “Schmidt”, “Emperor Francis”, and “Giant” when applied between petal fall and harvest.

Alternative fungicides for control of brown rot and leaf spot can be used to supplement or can substitute for the general purpose mix. These include:

1. **chlorothalonil**- use alone; cannot be used after shuck split;
2. **ferbam**- use alone or in combination with sulfur for control of brown rot and leaf spot;
3. **thiophanate-methyl**- use alone or in combination with captan; fungicide resistance has been reported in populations of the causal agents of brown rot and leaf spot and can lead to control failure;
4. **sulfur**- use alone; has a short residual and must be applied frequently in wet seasons;
5. **iprodione and myclobutanil**- these fungicides are mainly for commercial use but if available, are very effective for both brown rot and leaf spot;

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

B. SPRAY SCHEDULE-

<u>GROWTH STAGE</u>	<u>DISEASE</u>	<u>MATERIALS</u>
WHITE BUD- just before first blossoms open	Brown rot and black knot	General purpose mix or alternatives
BLOOM- when 70 to 90% of the blossoms have opened	Brown rot and black knot	Fungicides for brown rot; DO NOT APPLY GENERAL PURPOSE MIX OR ANY INSECTICIDE to avoid harming pollinators.
PETAL-FALL- when most petals have fallen	Brown rot, black knot, and leaf spot	General purpose mix or alternatives
SHUCK-FALL- when shucks begin to fall from fruit	Brown rot, black knot, and leaf spot	Same as above but do not use chlorothalonil after this stage
COVER SPRAYS- begin approx. 10 days after Shuck Fall and repeat at 7-10 day intervals until harvest depending upon the weather. Refer to “days to harvest interval” on fungicide label.	Brown rot, black knot, and leaf spot	Same as above
POSTHARVEST- if leaf spot was a problem, one postharvest spray may be necessary 14 to 21 days after harvest	Leaf spot	Captan, , chlorothalonil or thiophanate-methyl
