

Phomopsis Canker of Fig

fig tree canker caused by wound parasite
can be controlled by proper treatment

H. N. Hansen

Control of fig canker can be effected by new pruning and cutting methods.

In Kadotas, with the present system of pruning, the canker disease is of great economic importance, and unless effective control measures are taken, it may well prove to be a limiting factor in the production of this important canning variety. In the early 1930's cankers were present in nearly every tree of several hundred acres of Kadotas which had been abandoned some years earlier.

In California it is likely this disease will not be of economic importance so far as Black Missions, Adriatics, and Calimyrnas are concerned.

This disease of fig trees was first discovered in Italy in the early 'nineties. Later it was observed in England, France, North Africa, South Africa, and Brazil. It was seen for the first time in California in 1918 on a much-neglected backyard tree of the Adriatic variety.

All reports agree that this canker disease affects only weakened or neglected trees.

Wound Parasite

The causal fungus—*Phomopsis cinere-scens*—is strictly a wound parasite. This means that it cannot invade healthy, uninjured plant tissues, but must always gain entrance through open wounds or through cracks in the bark killed by frost or sunburn. The cankers themselves enlarge rather slowly.

The visible growth of the causal fungus are small string-like bodies, known as spore horns, and each horn is composed of many thousands of spores. During rainy weather the spores are washed down along the branches and trunk of the tree, and wherever they come in contact with an unhealed wound or a patch of frost-killed or sun-killed bark, they can germinate and start a new canker.

A pair of pruning shears cutting through such a canker may become so smeared with spores that for several succeeding cuts the fungus will be placed directly in an open wound, with resulting infection. The spread of the disease from tree to tree is largely by contaminated pruning shears, although various kinds of insects also may act as carriers of spores.

In trees less than ten years old it should

be possible to eradicate the fungus completely by cutting out all cankered limbs and twigs at pruning time. Following and within 24 to 28 hours after pruning, the trees should be sprayed with 6-6-50 Bordeaux mixture plus a sticker. Application of this spray should be thorough enough so that all surfaces, including the pruning cuts, are completely covered. When applied so soon after pruning, it should destroy any infective material that might have been carried by the pruning tools

well below the lowest canker and covering large wounds with waterproof antiseptic.

Regenerated trees should then be handled in the same way as trees less than ten years old.

Disposal of Prunings

For some time it has been the custom of many fig growers not to remove from the orchard the small prunings—those less than two inches in diameter—but to disc



Two-year-old canker resulting from infected pruning wound. Left: Enlargement of canker shows spore horns, which contain spores that germinate in the bark.

and should also serve as a whitewash to prevent sunburn on exposed branches. In this respect a good sticker is important so that the cover may last for a long time. The spraying immediately after pruning might well be made an annual practice.

In old orchards that have been under attack for several years, there may be up to a hundred or more separate cankers in individual trees. In such cases complete eradication or effective control could be attained only by cutting the tree back to

them under to reduce labor costs and also to increase the humus content of the soil. From the standpoint of canker control this practice is to be deplored, for this woody material decays at such a slow rate that the larger pieces may last for four years or longer. The canker fungus is able to live for an indefinite period on these pieces of dead wood and to produce a crop of spores each season for as many years as the material remains unrotted. This debris also harbors other fungi, such

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TORTRIX

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Two pickings of fruit were made—July 18th and August 9th—from the experimental plots, and a random sampling

Percentage of Tortrix Injured Fruit at Harvest Following Spray Treatments

Plot Section 1				
First spray	Second spray	Fruit counted	Tortrix infested	Infested fruit
DDT	Lead arsenate	3894	452	11.6%
DDT	Methoxychlor	3748	400	10.7
DDT	Cryolite	3514	182	5.2
DDT	DDD	3479	149	4.3
DDT	Parathion	3634	83	2.3
Plot Section 2				
Lead arsenate	Lead arsenate	3876	21	0.5%
Methoxychlor	Methoxychlor	3651	104	2.9
Cryolite	Cryolite	3033	51	1.7
DDD	DDD	3240	4	0.1
Parathion	Parathion	3450	10	0.3
Control Section				
Unsprayed trees		3446	719	21.0%

Significant difference at 1% level in the first plot is 5.7% and in the second plot, 1.3%.

of about 3,500 fruit was carefully inspected for tortrix and other insect injury from each of the treatments. The control obtained is shown above.

When DDT was used in the petal fall

Spray Residue Analysis

Plot Section 1	
ppm (parts per million)	
DDT—lead arsenate	1.25 as arsenic trioxide
DDT—methoxychlor	1.2 as methoxychlor
DDT—cryolite	2.1 as fluorine
DDT—DDD	1.6 as DDD
DDT—parathion	0.07 as parathion 0.51 as DDT
Plot Section 2	
Lead arsenate—lead arsenate	3.5 as arsenic trioxide
methoxychlor—methoxychlor	1.6 as methoxychlor
cryolite—cryolite	3.6 as fluorine
DDD—DDD	1.8 as DDD
parathion—parathion	0.03 as parathion

period and followed by one of the insecticides for the control of the orange tortrix, the results were not so good as when the same materials were used in both sprays. Considering that all of the materials used in the second plot are fairly effective in the control of codling moth as well as orange tortrix, any one of the materials should prove effective against either pest.

The codling moth population in this plot was too low to give significant differences in the control of this pest.

In orchards where spider mites are a problem, the use of a suitable acaricide in combination with these materials may be required.

Fewer woolly apple aphids were found on the fruit and trees sprayed with parathion, cryolite and lead arsenate. Aphids were noticeably heavier on unsprayed, DDD and methoxychlor sprayed trees.

Spray residue analysis of fruit from each of the treated plots at harvest gave the results shown in lower table.

There is apparently no danger from spray residues following these treatments when the last application is made six weeks before harvest.

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See "Orange Tortrix on Deciduous Fruits," page 13, CALIFORNIA AGRICULTURE, August, 1948.

CITRUS

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any given element is deficient, the direction of change of the other elements is fairly well known in many instances. Knowledge of the usual range of values for healthy leaves provides a somewhat broader base for evaluating the leaf analysis.

In another example case, the nitrogen might turn out to be around 2.75%, but phosphorus might be less than 0.08%. Under these conditions it might reasonably be suspected that phosphorus is lacking, and it would be worthwhile to try out phosphorus fertilizer in the orchard.

Data given here—while for orange leaves of a given age range—suggest that these values may be used on similarly aged lemon and grapefruit leaves even though the certainty be somewhat less.

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LIVESTOCK

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evidence is available, however, suggests that the deficit in sheep and lambs came during the World War II period. Although California has been a deficit area for dairy products as a group over the period under review, in recent years it has been a surplus state in the production of evaporated and dried whole milk. In the poultry products group a deficit position in chicken meat production has persisted throughout the period. In egg production a change from a surplus to a deficit state occurred around the middle 1930's. The state has been a surplus area in turkey production since the late 1930's. Commercial turkey production did not really get under way in this state until the early 1930's. Thus turkeys constitute the only product in the entire livestock group in which California has established a surplus position relatively early in its production history and maintained this surplus position continuously throughout the recent period of very rapid population growth.

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POULTRY

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ing of turkey poults is also practiced commercially. Schools teaching the cloacal sexing method have been developed, and associations of trained sexers formed for the promotion of commercial employment of sexers by hatcherymen. Certain problems still remain in the use of this method, since breeds and strains differ in the ease with which the sexes can be identified accurately. Future breeding work may prove that the accuracy of sexing of a strain can be improved by selecting for well-defined copulatory organs in males and their absence in females at hatching.

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CANKER

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as smut and molds, that may be carried by insects to the fruit and there result in spoilage and additional loss. For these reasons all prunings should be removed every year from the orchards and destroyed by burning.

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