

## How Severe Is the Citrus Canker Problem in Florida?

The authors of "Citrus Canker in Florida" (*PLANT DISEASE*, Vol. 71, No. 5, p. 388) have apparently been overcome by the same fears that have bound the Florida citrus industry because they have relied more on "Loucks, unpublished" than on the literature published during the first Florida citrus canker campaign. If they had examined the literature they could have determined:

1. That the disease was not devastating and was not a tree killer.

2. That the disease was spread primarily by infected nursery stock. By 31 December 1916, 99.87% of the infected nursery trees had been found and destroyed, while 89.47% of the infected grove trees had been destroyed. Most of this was accomplished by cooperation among growers without the burden of state and federal regulators and an action plan of 132 pages. After 31 December 1916, only 499 nursery trees were found infected, together with 1,907 grove trees. Only six of the 499 nursery trees were found infected after 1919. Between 1923 and the end of 1926, only 18 grove trees were found infected. These figures are not indicative of a contagious disease.

3. That control of the disease in groves was attained by burning only the "infected tree and [ground trash] three feet around it." Later, some growers "voluntarily" burned the four adjacent trees.

4. That the term "exposed tree" was never defined, nor were experimental data ever produced to support the "exposed tree" concept. In the current campaign, less than a dozen "exposed trees" have developed symptoms of so-called canker from among the several hundred thousand trees moved from nurseries later declared positive. Over 100,000 of these trees have escaped destruction and have never developed symptoms of "nursery canker" or of typical citrus canker.

5. That the many regulations in force in the current campaign are probably unnecessary because the causal organism has no resistant form and is not highly contagious.

6. That fear of citrus canker originated in Florida from careless statements made by less-than-well-trained pathologists writing about a disease they did not know or understand. These statements have

been given the aura of fact in the 50–70 years since the first campaign. This should not have hindered pathologists associated with the current outbreak from reviewing the literature and citing the facts about the disease. The severity of the canker problem has been enlarged by fear, ignorance, and politics.

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*The authors reply:* It is not clear from Dr. Hannon's letter how the fear that he expresses relates to our feature article, "Citrus Canker in Florida." There are at least five statements in the article that describe the consequences of the disease. They range from stating that severe infections result in defoliation, dieback, blemished fruit, and premature fruit drop to stating that a citrus industry can live with canker and remain viable, but the disease can exact a price through new chemical and cultural practices and regulations. These statements are objective and/or accurately reflect the citrus canker disease situation in Florida. Contrary to Dr. Hannon, there are no statements such as canker is a "devastating" disease or a "tree killer."

Dr. Hannon criticizes our not reviewing the literature and citing Louck's unpublished manuscript, but he cites none. Louck's manuscript of 1934 contains 419 references and is a summary of what happened in Florida regarding citrus canker. We are not aware of any published articles during this time that minimize the severity of the disease. The very opposite is true. For example, see F. A. Wolf, 1916, *J. Agric. Res.* 6:69-100.

Dr. Hannon claims that we did not determine from the early literature that the pathogen was spread primarily by infected nursery stock. Statements on pages 388 and 392 of our article make it clear that the pathogen is spread over long distances by movement of infested nursery stock.

While Dr. Hannon's figures on tree destruction are for the most part accurate, his conclusion from these figures that canker is not a contagious disease is not tenable. The early eradication campaign involved more than just burning the infected tree and 3 ft around it. During 1914–1927, 15,243

infected grove trees, 242,489 exposed grove trees, 342,260 infected nursery trees, and 2,721,850 exposed nursery trees were destroyed (see State Plant Board of Florida, 1927 and 1929, 6th Biannual Report, p. 28, and 7th Biannual Report, pp. 13-17). Thus, on the average, 16 exposed trees were destroyed for every infected tree—not four, as Dr. Hannon implies. There was a concerted effort among growers and the regulators not only to destroy inoculum but also to minimize its spread by quarantine. By eliminating one of the three essential components of a disease, namely, the pathogen, there is less and less opportunity for disease in space and time.

The term "exposed" was used and defined in the first report of the state regulatory agency (see State Plant Board of Florida, 1917, Annual Report, 1915, pp. 17-20). Legislative Rule 5 in 1915 addresses exposure in terms of distance from an infected tree(s) and by time. For experimental data on exposure, see Peltier and Neal, *J. Agric. Res.* 14:523-524, 1918. Dr. Hannon states that over 100,000 exposed trees have escaped destruction in the current campaign and have never developed canker. Our article states that 290,000 exposed trees were not destroyed because of changes in policy, and four have developed canker.

Dr. Hannon's fifth and sixth points are retrospective opinions and are not taken in perspective as necessity dictated. Regulations have undergone numerous revisions as new information from observations and experiments have become available. We presented the facts in our article as accurately as possible and have not perpetuated fear.

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