

Avocado Sun-Blotch in Florida

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This disease has been known in California for a number of years, where it is widely distributed in the avocado-producing sections of the State. It is recognized as a troublesome problem in avocado production and is considered to be a disease of virus origin. Characteristic symptoms occur on leaves and fruits, and the branches are affected in size and habit of growth. Badly affected trees are dwarfed and may exhibit a drooping or willowy type of growth. While the natural mode of dissemination of the disease is not yet fully understood, it is chiefly spread in commercial plantings through propagation by budding and grafting. This fact has aided materially in controlling the disease and in the isolation and elimination of diseased trees as factors in spreading sun-blotch.

SIMILAR TO CALIFORNIA SUN-BLOTCH

Definite cases of sun-blotch were observed recently in a commercial avocado planting near Avon Park, Florida. In June, 1938, the writer found a peculiar condition on leaves, twigs, and fruits of an avocado tree located in this grove. This tree was stunted and abnormal in shape and size, compared to surrounding trees in the grove. Specimens of leaves and fruits were collected at the time. Their subsequent examination showed a striking similarity between these specimens and the illustrations of sun-blotch as reported in California by Home. (2)

The grove was visited later and a more careful examination was made of the same tree and surrounding trees. It was found that 30 trees in two rows across the grove were all more or less affected by the same trouble, with characteristic markings on leaves and fruits similar to those observed on the first tree a month before. Two varieties were concerned—the Nabal and Taylor. The degree of infection varied with the individual trees. Some were slightly affected, with symptoms barely noticeable except in reduced size of the tree. Others were more severely affected, the symptoms appearing chiefly on leaves and fruits. The Nabal tops appeared to be more severely affected than the Taylor tops. All trees in these two rows were smaller than those on either side; many of the Nabal trees were more dwarfed or stunted than the Taylor trees. It was learned that the trees in these two rows were originally planted to the Taft variety, budded on West Indian seedling roots. The Taft trees failed to produce satisfactorily and the tops were cut back and reworked to Nabal and Taylor varieties. No evidence of the same trouble was found at this time on any of the adjacent trees or other trees in this block, though Nabal, Taylor, and other varieties were present on either side of the two affected rows.

Affected leaves and fruits from the diseased trees were sent by the owner to Prof. W. T. Home, in California, who identified the specimens as sun-blotch, as it is known in

California. Photographs of affected leaves and fruits were later sent by the writer to Prof. Home, and he stated they were undoubtedly representations of the disease known as sun-blotch. All affected trees in the two rows were immediately dug up by the owner and destroyed.

HISTORY OF DISEASE

Having confirmed the identity of the disease as sun-blotch, an effort was made to trace its entry, history, and distribution in Florida. In the printed literature available no mention was found of sun-blotch occurring in Florida other than a reference by Wolfe (3) of a single case observed in 1933. He, however, gave no details as to location, extent, or type of infection noted. Schroeder (4) later cited this same reference in the Yearbook of the California Avocado Association, 1935. Inquiries were addressed to the Florida State Plant Board, Gainesville, Florida, and the Mycological and Disease Survey, U. S. Department of Agriculture, Washington, D. C., to learn whether or not sun-blotch had been definitely reported as occurring in Florida previous to this time. Erdman West, mycologist of the Florida State Plant Board, replied that they had no report of its incidence in that State. Dr. H. A. Edson, U. S. Department of Agriculture, wrote that a careful search of the records of the Plant Disease Survey failed to show any report of sun-blotch of avocados in Florida.

FIRST REPORTED IN 1932

The specimens found in June were the first observed by the writer over a period of more than 20 years of observation and study of avocado diseases within the State. That the disease did occur in sporadic and isolated cases prior to this was evident from information received by questioning various growers. Nineteen hundred and thirty-two is the first definite date reported.

An avocado grower at Homestead, Florida, reported two sporadic cases of sun-blotch that developed on widely separated trees in 1932 and 1933. The history is as follows: The first case noted was a single tree in the Homestead area. A West Indian seedling avocado was topworked to the Carlsbad variety, the scions having been obtained from a nurseryman of Carlsbad, California. The crop that matured on this tree in 1932 showed typical specimens resembling sun-blotch. The Carlsbad top was later removed and the stump grafted to a West Indian seedling. These grafts died, and the stump was allowed to sprout and develop into a tree, the original West Indian tree. No evidence of sun-blotch has occurred on the leaves or twigs, but the tree has not fruited since.

The second case was a single tree in a nursery several miles distant. A Collinson scion was grafted on a Mexican stock in 1928. The origin of the Collinson scion is unknown. A severe case of sun-blotch appeared on the tree in 1933 affecting the foliage and fruits. The tree was later destroyed.

The same avocado grower also reports having seen in 1933 a tree at Coconut Grove, Florida, affected with what was taken to be the same disease. The tree was described as a seedling. This case was investigated. Specimens of the disease were sent to Washington, but the trouble was not definitely identified as sun-blotch. This tree was

apparently discarded.

The interesting and unusual history of the infected trees at Avon Park may indicate that certain avocado varieties might be hidden carriers of the sun-blotch disease. It was learned that the 30 trees in question were budded by the owner from scions of the Taft variety, obtained from a tree located in a grove near Lake Wales, Florida. This tree was apparently a highly productive strain of that variety and undoubtedly came ultimately from bud-wood or graftwood received from California, its place of origin.

Tip buds from the Taft tree in the Lake Wales grove were worked into West Indian seedlings in the Avon Park grove by the owner in 1924 or 1925. The resulting trees were later planted in the two adjacent rows in the grove. These trees, proving unsatisfactory, were afterwards topworked to Nabal and Taylor varieties, the buds or grafts being placed in the Taft trunks. The Nabal scions used in topworking the trees came directly from two reliable sources in California, the dealers stating that the budwood came from trees free from sun-blotch infection. All trees resulting from Nabal and Taylor scions placed in the Taft wood developed symptoms of sun-blotch in 1938 on fruit and foliage. The owner states that scions from this same lot of Nabal and Taylor budwood were placed in West Indian seedling and other stocks in this same grove and no sun-blotch has developed on these trees up to the present time.

The Taft stocks in these trees were suspected of being responsible for the development of sun-blotch in this case. It was learned, however, that no symptoms of the disease were recognized on the Taft foliage or fruits before the trees were cut back and reworked, and no recognizable symptoms were observed on a few remaining branches of Taft that were left on scattered trees.

The Taft tree at Lake Wales, whence the budwood was first obtained, was later visited and thoroughly examined for symptoms of sun-blotch. This is a large productive tree, planted 22 years ago. It has made a normal spreading growth and exhibits none of the dwarfed or drooping-branch symptoms characteristic of sun-blotch. No visible indications of the disease on leaves or fruit could be found. Other Taft trees in this same planting were examined but no symptoms could be detected. The large tree appeared perfectly normal and bore a fair crop of fruit. As the tree had not been sprayed this season, the fruit was severely affected with scab, and much of the foliage was attacked by *Cercospora* leaf spot.

This tree was one in a lot of 50 budded Taft trees obtained by the owner, in 1916, from a nursery in southern Florida. It is not known where the budwood for these trees came from, but, presumably, from California. The , buds probably were placed in West Indian seedling rootstocks, as most of * the local nurserymen made use of such stock at that time. Growth of trees in the grove was normal and healthy. Only two of the lot were satisfactory producers from the standpoint of crop production, i.e., the large tree referred to and another nearly as large and adjacent to it. The original planting still remains, but most of the Taft trees show severe decline and have failed to produce fruit the past few years. Some have been severely pruned, but have failed to develop new vigorous growth. None has yet been topworked to other varieties.

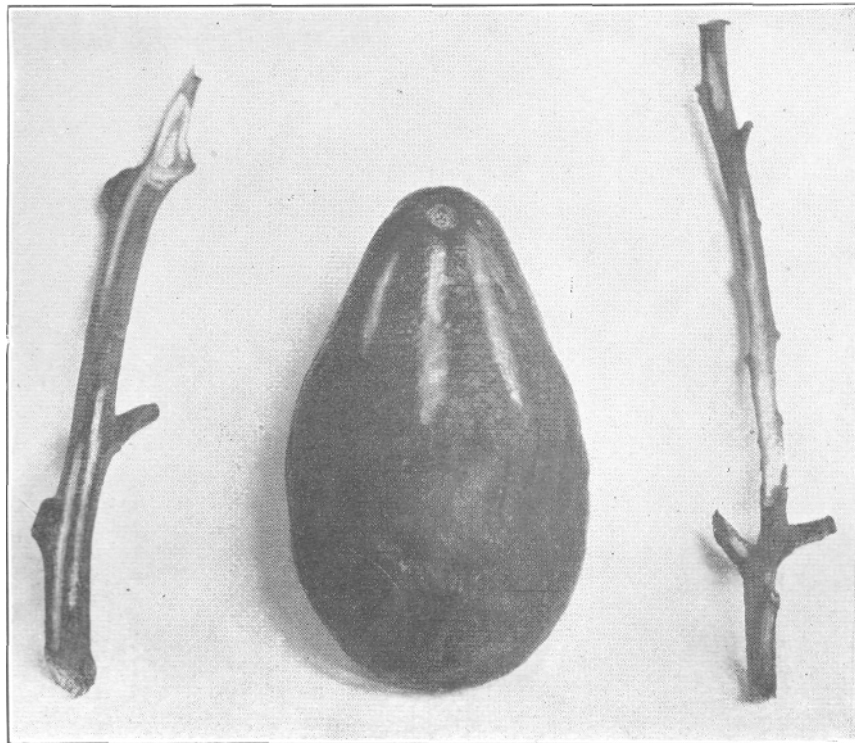
SUMMARY

Definite cases of avocado sun-blotch have been observed in a single grove in Florida on Taylor and Nabal varieties topworked on Taft trees.

It is not possible at present to trace the infection back to any definite source. The Nabal scions were obtained from California, where the disease occurs on the Nabal in that State. It has not appeared in this grove on trees other than Taft, topworked simultaneously with the same budwood. Furthermore, other Taft trees reworked to Taylor developed typical symptoms of sun-blotch. The only infected trees found in the planting were those topworked on Taft wood. This indicates a possible relationship between the reworked Taft trees and the later appearance of the disease. No recognizable symptoms, however, were observed on a few remaining branches of Taft among the reworked trees.

It is generally known that an infected scion may transmit sun-blotch to the stock on which it is grafted; and this stock, if later re-budded or re-grafted, may transmit the disease to the new top. Since no sun-blotch was observed on the Taft trees before topworking and no indications of the disease are evident at present on the original Taft tree from which budwood was taken, it is difficult to explain the appearance of the infection in this case unless it was carried in the Taft scions in a latent form.

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Fuerte Avocado fruit and twigs affected with Sun-blotch disease.

1. Senior Pathologist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.
2. Horne, W. T. Avocado diseases in California. Calif. Agr. Exp. Stat. (Berkeley) Bull. 685. 1934.
3. Wolfe, H. S., L. E. Toy and A. L. Stahl. Avocado production in Florida. Fla. Agr. Exp. Stat. Bull. 272. 1934.
4. Schroeder, C. A. Effects of sun-blotch on the anatomy of the avocado stem. Calif. Avocado Assoc. Yearbook 1935: 126-129.