

SCALY BARK DISEASE OF CITRUS.

By H. S. Fawcett.

Mr. President, Ladies and Gentlemen:

Scaly bark, a recently discovered disease of the orange tree, is becoming a serious menace to many growers in that part of Hillsboro county which is known as the Pinellas peninsula. The year before last it was estimated that from 35 to 75 per cent. of the fruit in many old groves was injured by the spotting due to this disease, and this was in addition to the injury to the limbs and trunks by the killing of the bark. Last year the disease was not so severe on the fruit. Scaly bark has been known to the Experiment Station for not more than three years, and the serious nature of the disease has been recognized for scarcely more than a year and a half. According to the older growers in the Pinellas peninsula, however, it has been known there to some extent for many years. Whether it occurs in any other part of Florida, or in any other part of the world, I have as yet been unable to determine.

About a year and a half ago I was delegated by the Experiment Station to take up, along with other plant disease work, the investigation of this trouble; in order to find the cause, if possible, and also a practical remedy. When I first took up the work the older growers told me that the disease was thought to have originated near Safety Harbor, on Old Tampa Bay, in what is known as the Phillippi hammock. In following up these reports I found that nearly all the older groves in which the disease was worst could be traced back as coming from trees that had first grown in a nurs-

ery owned by Mr. Phillippi. It was in a large tree next to this nursery as reported by Mr. Phillippi's grandson, that the disease was first noticed at about the year 1860. These trees had been planted about 1840, and were twenty years old when the disease was first noticed. Just how the disease got into the grove and where it came from, no one knows.

As to the varieties affected, I find it is only serious on the sweet orange. Grapefruit is very resistant. Tangerines are almost immune, as is also the Mandarin. I found Tangerine trees surrounded by diseased sweet orange trees, but could find no trace of the disease upon them.

This disease has three fairly distinct appearances on the tree:

(1). On the bark of the trunk and larger limbs there appear roughened, ruptured areas, in which the old bark cracks and scales off with more or less gumming, and a new bark forms under the old; and this again cracks and scales off in the same way later on. This appearance has suggested the name Scaly Bark.

(2). Another manifestation of the disease is apparent on the small branches and twigs. Small lemon-colored areas on the bark are first noticed. They turn reddish-brown, and the bark becomes brittle and cracks. They develop quite slowly, and scarcely ever appear on wood that is less than nine months to one year old. New spots form between the old ones, until in a year or two the limb becomes girdled at some point. As the

limb weakens, the ever-present wither-tip fungus comes in and kills it back very rapidly.

(3). A third manifestation of the disease is seen on the fruit, on which there appear, usually in July or August, faint rings. These rings slowly become colored and sunken, while in many cases the interior of the ring remains green and apparently uninjured. The fruits so attacked color prematurely, and many of them drop before picking time.

About a year ago I began experiments on a grove near Bayview on about 175 trees, with the view of getting some definite information that might lead to a remedy. It is too soon to report definitely on these experiments, as they must be continued another year before any conclusions can be drawn; but I might say that experiments with Bordeaux mixture were made every two months through the year, in addition to other experiments of a different nature.

I found that the spraying diminished the amount of spotting on the fruit to some extent; but that where it was used every two months three times or more in all, the Purple Scale increased so rapidly that it was a question whether these scale insects did not do more harm than

the disease would have done if let alone.

Considerable progress is being made in learning how the disease develops and spreads, and it is hoped that in time we shall have worked out a remedy for the trouble. Such scientific work is usually quite slow. As you know, the die-back of the orange was fifteen years under investigation before a practical way of controlling it was worked out. The Federal Government has spent \$30,000 to \$40,000 in the investigation of the blight of citrus; and although considerable progress has been made in finding out the nature of this disease, no practical remedy has as yet been found. In most diseases it requires years for such investigations. In rare instances a remedy may be worked out in a short time. Professor Rolfs worked out a remedy for the phytophthora of potatoes in ten days, and this remedy has never been improved upon; but this is a rare case. It cannot be known in advance whether it will require ten days or ten years to find a remedy for any given disease.

FIG. 1. Scaly Bark disease on orange limb severely affected.

FIG. 2. Orange showing rings and spots due to Scaly Bark disease.