

ROOTSTOCK SHORT COURSE

2:45 Discussion
Monday, September 24

Questions for Dr. J. W. Whiteside, Dr. J. O'Bannon and Dr. H. W. Ford

- question: H. W. Ford:** How far will citrus roots grow? How does this affect the number of rows of Milam trees used as a biological barrier in burrowing nematode control?
- answer:** In one location the roots grew about 50 feet directly into the second row of trees away from the barrier. Therefore, we feel it is necessary when you have a barrier to have it at least 4 rows wide.
- question: J. W. Whiteside:** What is the percentage of foot rot on 'Ridge' pineapple in relation to sour orange or rough lemon and if there is any difference in foot rot on the 'Ridge' pineapple with respect to the scion budded on top?
- answer:** I do not have specific information on that but we do know that the 'Ridge' pineapple is highly susceptible to foot rot.
- question: J. W. Whiteside:** Would it make any difference as to whether the 'Ridge' pineapple was budded with 'Valencia' or back to another 'Pineapple' orange?
- answer:** There are not very large differences in the susceptibility of the various sweet oranges to foot rot.
- question: J. W. Whiteside:** Is there a relation between phytophthora and pH, or phytophthora and calcium?
- answer:** This has been reported from time to time in the literature. There have been reports, for example, that in terms of reduction of tree vigor, trees infected with phytophthora growing in a soil of pH 6.5 to 7.5 were affected more greatly than were trees growing in a pH of 4.5 to 5.5. We have 2 factors here. The effect of pH on tree performance and the ability of the tree to regenerate new tissue.
- question: J. O'Bannon:** Is there any biological control that can slow down the development of the nematodes attacking citrus?
- answer:** Yes, there are a lot of them. Under natural conditions they do reduce the population of nematodes by a good bit but not enough to influence the population remaining in the soil. There are a lot of fungi that are parasitic and predacious on nematodes and there are other nematodes which are parasitic on nematodes. Under greenhouse control conditions they have been found to be very useful for controlling nematode populations but tests in the field have not been successful. Consequently, for all practical purposes we have not yet found any biological control factors which are practical.
- question: J. O'Bannon:** Are you doing any work with the systemic nematicides similar to work being carried on in California and if so what are your results?

2:45 Discussion (cont.)
September 24

answer: Yes, at the present time we have tests in the field utilizing several chemicals. Some of these materials can be applied to the foliage or some applied directly to the tree trunk. The materials are then translocated into the roots and they do control nematodes. Most materials have been proven to be somewhat effective but it is not known at this time whether or not they are economically feasible and of course they are not registered for use on citrus and their use can only be strictly experimental at this time.

question: J. W. Whiteside: What is the degree of resistance of red rough lemon to phytophthora and have you tested any second generation progeny from the red rough lemon for resistance?

answer: I would really want to repeat some of these tests several times before I make any firm statement regarding the outcome. Several of the clones have been tested several times and were found to be moderately resistant to the phytophthora organism. Other clones have varied greatly in their susceptibility. Some clones of rough lemon are just as susceptible to foot rot as are the sweet oranges but there are a good many promising clones that appear to have considerable resistance.

question: J. W. Whiteside: Is there any effective treatment for trees which have developed foot rot?

answer: Once the tree develops foot rot make sure there is no mound of soil resting up close to the tree trunk. In fact, going a bit further than that, washing away soil from the crown roots of the tree. The main thing, of course, is to get the infected area dried out as quickly as possible. Other than that, there is no chemical treatment which is particularly effective. If the trunk is girdled more than 50% we feel the tree should be replaced.

question: J. W. Whiteside: Have you found biotypes of phytophthora which vary in the virulence of their attack?

answer: I have not found this nor has anyone else, really. This is a very difficult thing to determine. What I have found is that different isolates of the fungus vary greatly in their sporangial producing capacity.

question: J. W. Whiteside: Perhaps not everyone here has the problem here that I do but we do have an occasional tractor operator who does hit a tree with the mower. If he hits this tree and knocks the bark off at four o'clock in the afternoon and it rains at five o'clock, what would be the chance of this plant getting foot rot as opposed to say hitting it at one o'clock in the afternoon and it remaining hot and dry so that it could dry out and sort of protect itself against the invasion of the fungus?

answer: The important thing was whether or not the mower or other implement hit the rootstock portion of the tree or the scion portion of the tree. Yes, of course, the tree which was hit and immediately rained upon would stand a greater risk of infection than with one which was hit and allowed to dry out before becoming moist or becoming inoculated with the organism.