the last week in January made further observations for the present unreliable. No striking difference in cold resistance appeared between the plots.

To supplement the tests and observations made in 1938, a zinc sulfate spray test was applied to another group of mangos near South Miami. The trees, varying from two to five years old, were in rows bordering the north and south sides of a solid planting of avocados. These trees, on a Rockdale type of soil, received ample quantities of complete fertilizer. Fifty-one trees exhibiting moderate to acute symptoms of little-leaf were chosen for the test. Of this number, 42 received a spray containing 10 lbs. zinc sulfate and 5 lbs. hydrated lime in 100 gals. of water, on November 1939. Fluxit was added as a spreader. The other nine trees scattered well over the rows were marked as check trees.

A check of the trees was made during the second week in January. Scattered new growth and bloom was in evidence. The new growth was confined to the zinc-sprayed trees and seemed quite normal. Bloom spikes on the check trees were mostly distorted, multiple and weak. Those on the sprayed trees were normal and somewhat more profuse. The freeze of January 28 eliminated further observations, as the trees were all severely hurt by the cold.

Conclusions

Spray applications of zinc sulfate and lime to the foliage will correct little-leaf conditions in the mango. Normal flushes of growth and normal bloom spikes will develop on trees with little-leaf symptoms following a zinc spray, provided other conditions of growth are also satisfactory. The results indicate that little-leaf of mango can be considered a zinc deficiency disease comparable with frenching in citrus, rosetting of pecans and bronzing of tung trees. Zinc sprays of 5-2½-100 strength is tentatively recommended until more information is obtained from tests now in progress.

Literature Cited

1. Camp, A. F., and B. R. Fudge. Some symptoms of citrus malnutrition in Florida. Fla. Agr. Exp. Sta. Bul. 335. 1939
2. Camp, A. F., and Walter Reuter. Studies on the effect of zinc and other unusual mineral supplements on the growth of horticultural crops. Fla. Agr. Exp. Sta. Ann. Rep. 1937: 132-135. 1937.
3. Finch, Alton H. Pecan rosette, a physiological disease apparently susceptible to treatment with zinc. Proc. Am. Soc. Hort. Sci. 29: 264-266. 1932.
4. Floyd, B. F. Some cases of injury to citrus trees apparently induced by ground limestone. Fla. Agr. Exp. Sta. Bul. 137: 161-179. 1917.
5. Peech, Michael. Chemical studies on soils from Florida citrus groves. Fla. Agr. Exp. Sta. Bul. 340. 1939.

EXPERIENCES IN THE PROPAGATION OF SOME SUB-TROPICAL FRUITS

HORACE M. SHERWOOD

Fort Myers, Florida

The speaker for a good many years, practically as long as his residence in Florida, going on twenty-one years, has been interested in the propagation of tropical fruits. This interest has been occasioned probably from the fact that it has been evident for some time that the orange and grapefruit industry, especially in South Florida where it is possibly less suited than in other sections, has been on a more or less gradual decline. And further, because of the fact that in certain sections of South Florida tropical fruits seem to

flourish, because of the equable climate and especial cold protected areas. These areas being rather small in extent as compared to the areas further north which were suited to orange and grapefruit culture, the thought came to mind that for this reason it would be many years before the growing of sub-tropical fruits would, or could, be overdone on the scale that orange and grapefruit culture has come to.

With these thoughts in mind, the speaker set about to find out something of mangos, planting a large quantity of seed from Turpentine and Apple, the common varieties. Later when these plants attained a caliper of possibly 3-8 of an inch in diameter and a height of three feet above the ground, we hunted around to find someone capable of budding these seedlings to the varieties that were free from strings and fiber such as Haden, Cecil, Mulgoba, Sandersha, Pakeri, Lyons and others. Shortly, we located the best and only mango budder in Florida, at least to hear him tell it. His fee being $6.00 per day

be green where the bud is to be inserted and of approximately the same diameter as the bud shield. This means that one cannot take a row of seedlings and go right down the row inserting buds as one comes to them for mango seedlings do not put out growth uniformly as citrus seedlings do. One should be careful to have the seedlings to be budded just at the aforementioned stage.

Secondly, but probably of as great importance as the condition of the seedling, is the stage of development of the bud wood from which the eye is to be cut. One should select this bud wood with the greatest of care for herein lies a main fault, if the development of the bud-eye is not just at the stage before the actual bud comes out. Right here let me say that I have inserted buds after the bud-eye had broken and I could see the bud growth appearing in the eye; buds at this stage seem to live better than any other. Each bud inserted should be at least swelled to the utmost preparatory to its bursting forth, and contrary to the belief of a good

little, with complete plant foods and making an application at least once a year of manganese, magnesium, copper and zinc in minute quantities to each tree.

It is the speaker's opinion that fertilization is not the entire cause of this trouble, but that the speed of the assimilation of available plant foods is more nearly the actual root of the trouble. To slow this assimilation up, or rather to make it more even, the speaker has found that an even constant supply of moisture not only helps in this regard, but tends to keep the trees in a constant healthy green color without so much fluctuation between a sickly yellowish green and a bright healthy green as when growth comes out.

These facts have been observed over a period of about five years and I am frank and honest in the statement that I have out rows of trees in my grove which have received no fertilization whatever over a period of three years or more, but have received a constant supply of adequate moisture continuously, and these trees or rows have proven to be the best in the grove. The trees are the healthiest, hold a constant green color, and in every way show that their handling is better suited to their well being than where moisture conditions are less even and where it is felt that possibly more fertilization is necessary.

The speaker does not feel that the Perrine lemon is the ultimate lemon for Florida, but at the same time he does feel it is the best lemon that we have up to this time and that considerable profit can be made if growing conditions can be conquered that will relieve the trees of unevenness in their assimilation of available plant foods.

Points Regarding Lime Culture On The Southwest Florida Coast

Contrary to the growth processes of Perrine lemons, it has been found the limes will withstand and assimilate large quantities of fertilizer where there is sufficient humus in the soil, and therefore, bacteria to work it up, the soil not being too acid to begin with; and will respond from excessive feeding by quick growth and quantities of fruit, and are much less susceptible to the vine-like, straggling growth than the Perrine lemon. However, it has been found without question, as one would naturally expect, that the more even the supply of moisture is with limes as well, the better results in tree growth and fruiting will be obtained.

Further, it seems to the speaker that blossom end rot is less prevalent when even and adequate moisture prevails. A great many growers have told the speaker that their troubles from gumming and Diplodia were nearly as great on Persian limes as on Perrine lemons. The speaker having attempted to keep moisture conditions on his Perrine lemons at an even stage, has found that this practice has entirely eliminated any gumming conditions on Persian lime trees since the trees were very small.

In the limited time allowed we have presented herewith a few of the thoughts that come to mind from experiences in the propagation of some sub-tropical fruits, and we hope that they will be helpful to others that are interested in the possibilities along these lines in South Florida.

Business Session

Chairman: We will have nominations for vice president representing the Krome Memorial Institute.

Mr. H. C. Henricksen moved that the present vice president be continued.

Motion was seconded.

Vice President Wolfe: There was a time when I used to try to do something about this. I have now grown sort of calloused.

MOTION CARRIED.