



CITRUS RESEARCH SUMMARIES

J.F.L Childs, PhD., U.S.D.A., Retired, was the Study Director for the various citrus research summarized herein. This research first appeared in the 1981 Proc. Florida State Horticulture Society 94 in an article entitled, *Control of Citrus Blight Disease*.

Citrus Decline Symptoms

The term "Decline" includes a number of other names such as young tree decline, citrus blight, sand hill decline and rough lemon decline. In the order of their development the general symptoms associated with decline are: dehydration, delayed leaf flushes and blooming, deficiency symptoms (especially zinc), defoliation, twig and branch die-back (usually accompanied by vigorous sprout growth from the trunk and lower branches), fruit production declines during the entire decline development period, and the tree dies.

Citrus Decline – Cause Theory

There is a fungus in the vessels of citrus trees as an obligate parasite, which is present in citrus trees throughout the world. The fungus commonly grows in a benign symbiotic relationship with the host. If tree growth is weakened by deficiencies of certain essential trace elements, fungus growth accelerates and becomes actively parasitic on the pectic materials exposed at vessel junctions and at pits in the vessel walls. Colonies of the filamentous fungus accumulate at vessel junctions impeding the flow of moisture and nutrients through the vessels. These "plugs" cause the symptoms called decline.

AZOMITE Mineral Products, Inc. Comment

Researcher's "fungus plug theory" appears extremely logical and credible. There may be a reasonable extension to that theory. Certain fungi, such as some mushrooms and grain molds, produce strong toxins. The fungus colonies in the vessels of the citrus trees could be producing toxins, which might further exacerbate the health of the stricken tree.

Basic Theory Summarized

The lack of certain unidentified trace elements allows a parasitic fungus to flourish in the sap carrying vessels of the tree. Fungus dams or plugs restrict the flow of nutrients and moisture thereby causing the decline symptoms.

Citrus Decline – Cure Theory

Necessary and unidentified essential trace elements are contained in AZOMITE®. Good soil management practices, plus treatment of the soil under the drip line with AZOMITE® will protect against and reverse the effects of citrus decline.