YOUNG TREE DECLINE FROM A GROWER VIEWPOINT

John C. Norris
District Manager
The Coca-Cola Company Foods Division
Stuart

Abstract

Young tree decline is a condition that affects scion varieties principally on rough lemon rootstock. It normally affects trees that have reached five years of age or more and that are apparently healthy and vigorous.

Symptoms normally start with a severe wilt, followed by leaf patterns that resemble zinc and manganese chlorosis, a general thinning of foliage, long growth shoots in the center of the tree, and small, off center fruit.

The condition was first noticed in sizable acreage on the east coast near Fort Pierce and in Hardee County, but is now being found in other portions of the state.

To date, with the cause and cure unknown, the grower is faced with monumental decisions in regard to future production from this acreage.

Introduction

Young Tree Decline, as this writer knows it, was first observed in a six year old grove of pineapples on rough lemon rootstock near Wauchula in 1964. Similar symptoms were soon noticed in trees on the new East Coast plantings near Fort Pierce. At that time it did not seem to be a serious problem, and in many cases it was passed off as "blight". It was soon realized that there was a potential threat to production, and as a result records were kept in certain blocks as to the number of trees that were going out of production and were being replaced. Various means were tried to correct the situation, all to no avail. At present there are hundreds of acres of groves throughout the state, principally pineapples and valencias on rough lemon rootstock, that are in a state of decline due to this disease. Growers, as well as research personnel, now recognize this as a serious threat to citrus production in Florida and an all out effort is being made to find the cause and cure of this problem.

While this is being done, the grower is faced with questions that must be answered immediately. I will attempt to give some of my views on this subject.

Results and Discussion

Young Tree Decline seems to be more of a problem on rough lemon rootstock and on trees planted on the poorer drained soils. However, there are many similar symptoms now being seen on other rootstocks and on the well drained sandy soils throughout the state. It seems to attack the healthier, more vigorous trees and does not ordinarily follow a given pattern in the grove. It seems to be sporadic in nature, and apparently it is not influenced by factors such as soil, budwood or source of rootstock. Normally the first recognizable symptom is the wilting of a portion or all of a tree, along with a general lack of vigor as compared to other trees in the vicinity. From this point some of the symptoms that might be noticed would be a dull appearance with a premature drop of leaves and a general lack of new growth, small, speckled leaves showing zinc or manganese chlorosis, a thin canopy, small upright twigs with die back, and small, off-center fruit, generally with higher acid, higher solids, and a lower ratio. The tree normally declines over a period of twelve to eighteen months, and will go into and remain in a non productive state. It is important to note that all of the symptoms do not necessarily appear, and that it is quite possible that some symptoms may come and go. With experience in seeing these symptoms it is easily recognized in the early stages.

Many approaches have been taken to correct this problem, but apparently none have been successful. Efforts to find solutions that have been made by production personnel include the topping and pruning of the trees to various degrees in an effort to balance the tree top with the root system, application of various elements such as zinc, manganese, iron and potash in excess amounts, drenching of the soil with various fungicides and increasing the fertilizer levels, along with many everyday production practices. Research personnel in the state are conducting more scientific and exacting trials in an effort to find the cause.

One of the blocks in Hardee County
the problem was first noticed in 1964 has been showing an annual tree loss of approximately 7%. Some of the resets planted in 1964 and 1965 are presently showing suspicious signs of having the decline. At this rate, the grove would be totally replanted every 14 to 15 years. A four row bed containing 327 trees on a Fort Pierce grove planted in 1959 has shown a decrease in healthy trees from 283 in 1966 to 39 in March, 1970, or a loss of good trees of 86% in four years. This is an indication of the rate that these trees are declining. Needless to say, this creates a situation in which the grower can not exist.

For some time we were reluctant to remove these decline trees from the East Coast groves, continually feeling that a cure could be found. In the summer of 1970, it was decided to remove these trees in order to prepare for replacements. In some eight to ten year old blocks over 50% of the trees were removed. This represents a loss that developed over a four to five years period. If these trees had been replaced during this period of time, it would of course average 10% per year. Assuming one hundred trees per acre, this would represent over $30.00 per acre per year for out of pocket replacement cost in addition to the loss of revenue that would have been generated.

The grower must decide if it is in his best interest to continue to replant at these excessively high levels or to write the block off and replant with something else. When fifty percent or more of a block is removed, and it is anticipated that the incidence of young tree decline will continue at the same rate as in the past, consideration must also be given to the possible removal of all of the remaining trees and replanting on a solid basis.

The big question to be answered is “What do we replant with?” Upon analyzing rootstocks for possible replacement purposes, the stocks that are available to replant with present a very frustrating situation. Sour orange rootstock is probably the more common one that growers will replant with due to its success on the East Coast in the past. However, it has some shortcomings, such as lower pounds solids per acre than rough lemon and susceptibility to tristeza. Tristeza is in the area and there is a big question as to when and if it will become an economic factor. Cleopatra is a possible replacement for pineapples, but it is generally a slow grower and usually doesn’t do well with valencias. Carrizo is a potential stock if the proper precautions are taken in regard to exocotis. This rootstock however, still has many unanswered questions. Tri-foliata is another potential stock with many limitations. Another rootstock that is being watched is Macrophylla. It is a stock that has been in use in California and resembles the rough lemon in many of its characteristics. It first came to our attention as a potential rootstock for lemon trees due to its vigor and resistance to footrot, but we soon began to feel that it had possibilities for other varieties. The fruit from these trees on this rootstock have many of the characteristics of fruit from rough lemon rootstock. The major drawback of Macrophylla is its susceptibility to tristeza. Macrophylla is a new rootstock to Florida that has a lot of unknowns, but one that deserves serious consideration.

A person’s first reaction is to eliminate rough lemon as a possible replacement, but upon closer evaluation we realize that there are many different strains of rough lemon. It is quite possible that during the late fifties and early sixties, when there was a scarcity of rough lemon seed in this state, many inferior strains of lemons were propagated. I feel that it is very likely that through careful screening of rough lemon selections we can come up with a resistant rootstock that will enable us to carry on the characteristics of rough lemon when the grower’s needs, the soil, and the climatic factors are favorable. Of course there are many other rootstocks that deserve attention, but the ones mentioned are some of the ones that are more frequently considered. Some of the research personnel in the state feel that it would be wise to plant several rootstocks and not put all the eggs in one basket. This is a middle of the road approach that I have to agree with at this time. It is a decision that each grower must make after analyzing his own requirements and conditions.

Our plans are to replant a large portion of the valencias and pineapples with Macrophylla, but we also will plant some sour orange and rough lemon using seed purchased from California. To date young tree decline has not been found on grapefruit and lemon scion varieties in our plantings.

**Conclusion**

In my opinion, Young Tree Decline is a very serious threat to the Citrus Industry in Florida.
With approximately sixty percent of the state's citrus being grown on rough lemon rootstock, production could be sharply curtailed if what we are calling Young Tree Decline on the Coast is the same as what is being observed on the interior. It is my personal opinion that it is the same. Although many of the state's top scientists are diligently working to find a solution to the problem, there is no solution at present.

While we may have a problem of over supply or under demand at this time, this is hardly the way to correct it. The growers who have a large percentage of rough lemon acreage could find themselves in a disastrous position.

Acknowledgments
The author wishes to acknowledge the assistance and works of the staff of the Horticultural Research Department of the Coca-Cola Company Foods Division.