HITAHR BRIEF No. 112

Hawai'i Institute of Tropical Agriculture and Human Resources
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COMMON MISTAKES IN PAPAYA RINGSPOT VIRUS CONTROL

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Introduction

In observing grower practices and after discussions with Hawaii Department of Agriculture personnel, it is obvious that there are many misconceptions among growers as to the proper method of controlling the papaya ringspot virus (PRV). This is a critical problem not only to the affected grower but also his/her neighbors and ultimately the entire papaya industry.

This paper addresses some of the more common problems that we have observed with PRV management:

* Fertilizing infected trees will rid the yellow color.
* Not cutting infected trees to harvest fruits on the fruit column.
* Topping infected trees to harvest additional fruits.
* Cutting infected trees and spraying herbicide later.
* Waiting for the Hawaii Department of Agriculture to mark infected trees.
* Restricting the entry of HDOA motorcycles.
* Transporting seedlings from an infected area to clean area.
* Leaving a grass path between plant rows.
* Planting vegetable crops in papaya fields.

Fertilizing Infected Trees Will Rid the Yellow Color

Some growers feel that fertilizer will cure the yellow color occurring on infected trees. Although tree yellowing can be related to low nitrogen levels, the color change is a general loss of color. It is important to note that before a tree is tagged as being infected with the virus, specific symptoms are first identified. The yellowing associated with the PRV is a veinal chlorosis which is very different from the general yellowing associated with nitrogen deficiency. PRV symptoms are most severe on younger leaves as compared to N deficiency which is most severe on older leaves.

Recommendation: Immediately destroy all tagged infected trees and spray the stumps with Roundup to prevent regrowth.

Not Cutting Infected Trees to Harvest Fruits on the Fruit Column

Although it is a financial loss to growers when they cut down infected trees, it is the only way to manage the disease. Once the tree is infected with the virus, there is no cure. The longer the infected

tree is left standing, the greater the possibility that the virus will spread to adjacent trees. This will certainly result in a greater financial loss to the grower in the long run. The virus caneasily spread not only within your field but also to your neighbor's field.

Recommendation: All infected trees must be cut as soon as they are identified. The trees should be cut as low as possible and the stumps sprayed with a concentrated Roundup solution immediately to prevent regrowth.

Topping Infected Trees to Harvest Additional Fruits

Since the virus is systemic and spreads throughout the plant, leaving any part alive will again maintain a source of the virus. Although the lower fruits may not show symptoms, the tree is still infected. Growers who have topped trees in the past have seen a large number of trees infected at a later date. Please note that the virus takes from 3 weeks to 3 months to show symptoms from the time of infection.

Recommendation: Do not top trees!! Cut them as close to the ground level as possible and immediately spray the stumps with a concentrate solution of Roundup to prevent regrowth.

Cutting Infected Trees and Spraying Herbicide Later

Operationally, it is always easier and more efficient to cut infected trees and spray the stumps later. The reason for the immediate application of the herbicide is that the plant absorbs the Roundup only if it is applied immediately after the plant is cut. Once the plant puts out sap, the herbicide is no longer absorbed.

If the tree is not killed, it will regrow and still be infected with the virus. Similar to the regrowth from the sexing of the papaya trees, spraying a dilute herbicide on the infected regrowth will not kill the trees. Since the regrowth is infected with the virus, it has the potential to continue to spread the virus to surrounding trees.

Recommendation: Spray concentratedRoundup on the cut surface immediately after a tree is cut down. This will insure the absorption of the herbicide and result in the death of the infected tree.

Waiting for the Hawaii Department of Agriculture to Mark Infected Trees

Many growers do not want to take the responsibility of identifying infected trees in their fields. They will cut trees that have been marked but they are reluctant to destroy trees with early symptoms. It is critical for growers to learn to identify the early symptoms of the virus. Since you are in the field daily, you will have the greatest opportunity to identify infected trees early. If you wait for someone else to mark the trees, the virus may spread to additional trees. The best way to manage the virus is quick identification and immediate destruction of infected trees.

The Hawaii Department of Agriculture does an excellent job in identifying infected trees but they have a large area to cover. At the present time they are only able to cover an area on a 7-working day cycle.

Recommendation: Learn the early symptoms of PRV. If the virus is present in your field, it is recommended that you survey your field at least 2 to 3 times per week and destroy all infected trees immediately.

Restricting the Entry of HDOA Motorcycles

Some growers have requested that the HDOA not survey their fields because they feel that the motorcycles may spread

the virus. The primary spread of the virus is by the aphid. This small insect can fly but is usually carried by the wind and spreads the virus. The virus only lives on papaya plants and is spread from infected trees. Unless one can stop the movement of the wind or at least the aphid, the virus will continue to spread. The benefit of identifying an infected tree and destroying it immediately is more important then the small chance that the motorcycle may carry an aphid. More important, it has beenobserved that many of those who do not want HDOA to survey their fields also do not identify and cut down the infected trees.

Recommendation: All growers allow the HDOA to continue to survey their fields. It is critical that the industry understand where and to what extent the virus has spread in production areas.

Transporting Seedlings from an Infected Area to Clean Areas

A few growers continue to ignore the recommendation that grower not transport papaya seedlings from infected areas. Since seedlings can be infected with the virus, it is essential that the practice of transporting seedling be discontinued. If you wish to grow seedings to fill in gaps in your field, start the plants at the planting site. This will insure that the virus is not taken from infected areas to clean areas.

As of this date (3/1/94), the infected areas include Keaau, Pahoa, Hawaiian Beaches, Kahuwai, Nanawale, Chow Ranch, Kapoho, Pohoiki and an isolated area in Opihikao. Areas considered clean include Opihikao (except a small section) and Kalapana.

Recommendation: Do not transport papaya seedlings from infected areas to clean areas.

Leaving a Grass Path Between Plant Rows

Quite a few growers now leave the area between plant rows grassed. Apparently the reason for this action is to give the aphid something to feed on. The aphid will propagate on weeds within a field and move out of these areas when the population gets too large, the weeds start to die, or the aphids are disturbed. Activities that will disturb the insect are spraying of herbicide, mowing and running harvest equipment over the grassed area. Since papaya is not a host of the aphid, keeping a reservoir of insects in the field can only create additional problems.

Recommendation: Keep all fields clean ofweeds.

Planting Vegetable Crops in Papaya Fields

The presence of crops such as pumpkin, eggplant and okra continue to be observed in papaya fields. While we believe these plants do not host the virus, they do host a large population of aphids. This in combination with an infected tree in a field will allow for rapid spread of the virus. If you have weeds that harbor the aphids in your field, spray the weeds with an insecticide before a herbicide application.

Recommendation: Do not plant vegetables or maintain weeds that harbor aphids in and around papaya fields.

Summary

The papaya ringspot virus is now wide spread in the Puna area. It is probably not possible to eradicate the virus from the area so we must all work together to manage the disease. It is not the objective of the Hawaii Department of Agriculture to make it difficult for you to raise papaya. Rather, they are surveying your fields to allow you to quickly identify infected trees. You can only manage the

virus if you identify and destroy infected trees as quickly as possible.

Many of you have heard that we have 3 to 5 years before papaya production will cease to exist in the Puna area. If we all don't do our part, this will most certainly be the case. It may be possible to extend the life of the industry, if we all work together.

If you have any questions or concerns about the papaya ringspot virus, please call. Get involved because it is you industry!!

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HITAHR BRIEF 112–03/94 (2.5M)