

# Plant Diseases of the Western Pacific tropical island of Guam



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## Banana bunchy top



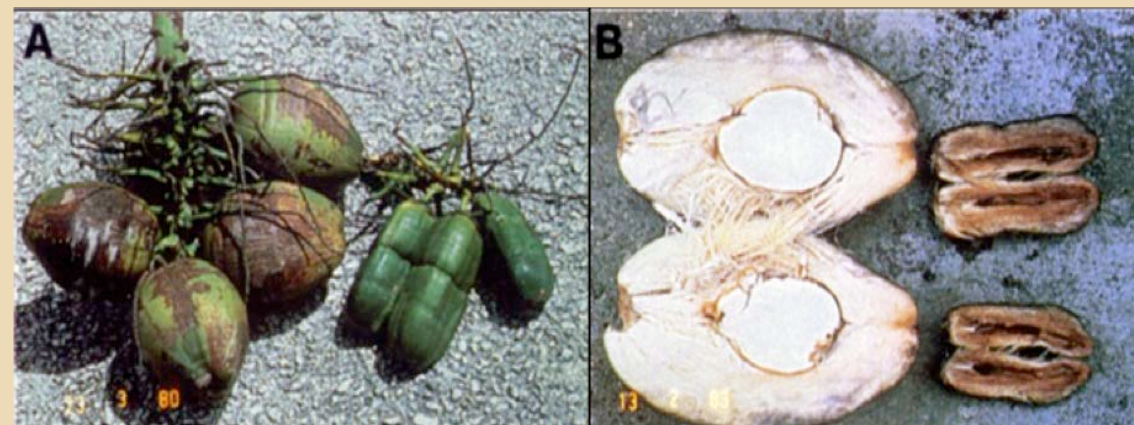
Banana bunchy top disease is caused by the *banana bunchy top virus* (BBTV). The aphid transmitted virus was first reported in Guam in the 1950s. The name bunchy top is evolved from the appearance of plants that are in an advanced stage of infection where they develop a 'rosette' of short, narrow, erect leaves.

Photo provided by Dr. Blas, UOG

## Tinangaja



Tinangaja is a slow progressive lethal disease of coconut palm on the island of Guam and was first described in 1917. The first symptom is a progressive thinning of the crown, caused by a reduction in the number of fronds. The size and number of fruit are also reduced.



Photos provided by Dr. Blas, UOG

## Papaya ring spot

Papaya ringspot (PRS) is caused by an aphid transmitted *Potyvirus*. Type P of the virus (PRSV-P) was confirmed in Saipan, Northern Mariana Islands and Guam in 1994. Symptoms include stunting, leaf distortion with green and yellow mottling, and fruits reduced in size with bumps and rings or C-shaped markings.



Photos retrieved from (left) <https://www.flickr.com/photos/scotnelson/21907406063> courtesy of S. Nelson and (right) <http://www.slideshare.net/penumatsakishore/papaya-ring-spot-virus> courtesy of A. Ranga.

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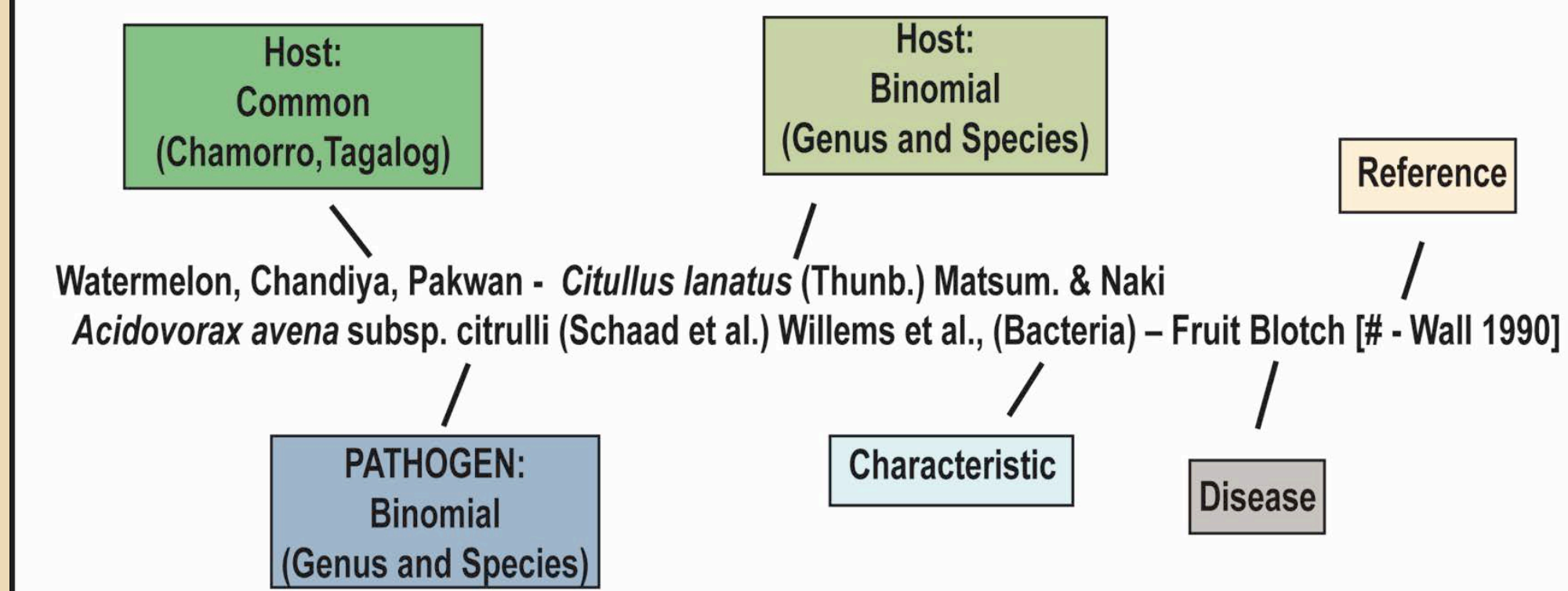
Accumulative reports of infectious plant diseases found in Guam

## INDEX OF PLANT DISEASES IN GUAM



Guam Cooperative Extension  
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## Entry Format



## Introduction

Where available, seven elements of information are provided for each entry: Host Common (English, Chamorro, Tagalog); Host Binomial (Genus and Species); Pathogen (Genus and Species); Characteristic of Pathogen; Disease; and Reference.

Over 300 plant pathogens, mainly of vegetables and fruit crops, have been reported from the tropical island of Guam. Accounts appear among the many annual reports, abstracts, journal articles, and fact sheets that have been produced since 1905. Efforts are being made to consolidate first reports and supporting articles into a reference document, which will become known as the Index of Plant Diseases in Guam. In May of 2016, a four-day diagnostic workshop was held on Guam. Diseases discussed included those that have been known for years to occur on Guam (papaya ring spot, tinangaja, anthracnose, target spot, and banana bunchy top) those that recently emerged (citrus canker and citrus greening) and ones that have yet to be named or identified (tomato with interveinal purpling with chlorosis). Published on February 2017.



Photograph provided by Mr. Joe Afaisen, UOG



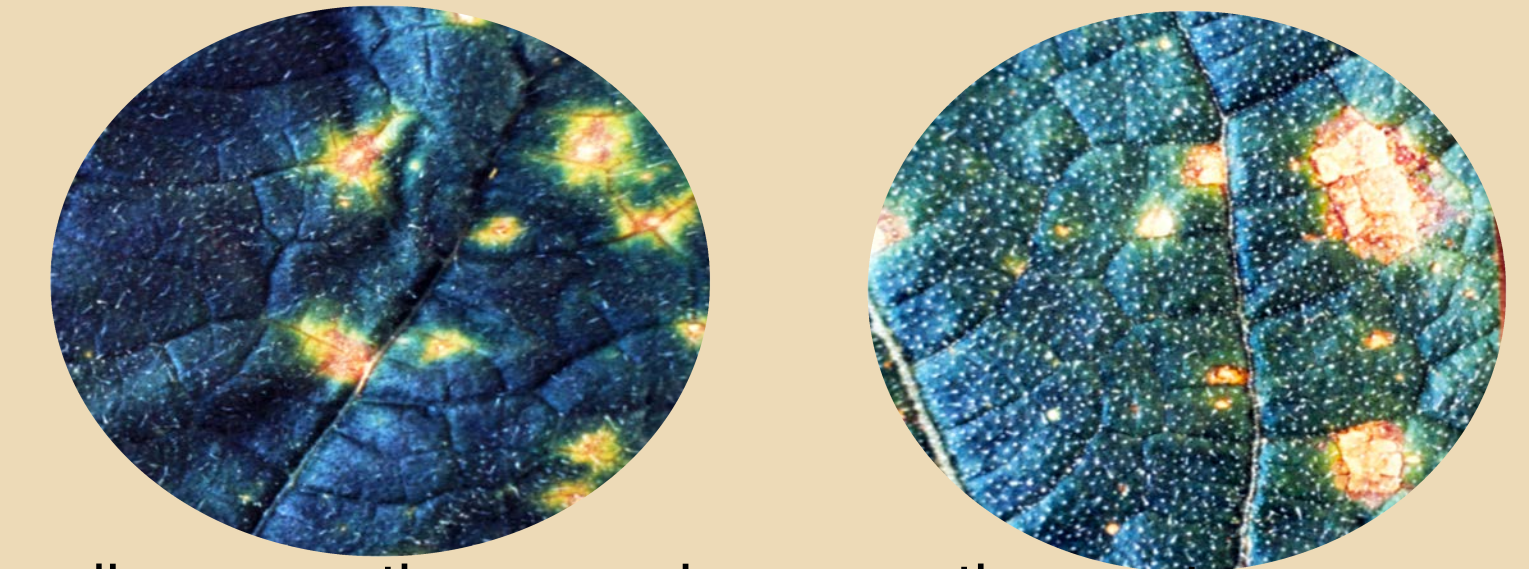
Photograph provided by Mr. Joe Afaisen, UOG

## Unknown: Tomato plants with interveinal purpling and chlorosis



Ten years ago, tomatoes in Guam began showing a mixture of symptoms with varying degrees of stunting, leaf distortion, and foliar discoloration. Production losses ranged from none to total. Subsequent research has contributed the majority of these symptoms to a group of viruses that have been identified in Guam: CMV, ToMV, TBSV, PVX, and AYVV. However, one set of symptoms that remains unresolved is yield suppression accompanied by leaves with interveinal purpling and chlorosis.

## Anthracnose and Target spot



The disease anthracnose is among the most common and earliest plant disease reported on Guam. It is caused by a number of fungi that produce spores in an acervulus such as *Colletotrichum*. Symptoms of infecting include chlorotic spots that enlarge and turn necrotic. Another fungus disease of cucumber, target spot caused by species of *Corynespora*, produces similar leaf spots but lesions are generally smaller and appear later in the crop's life cycle.

## Citrus greening

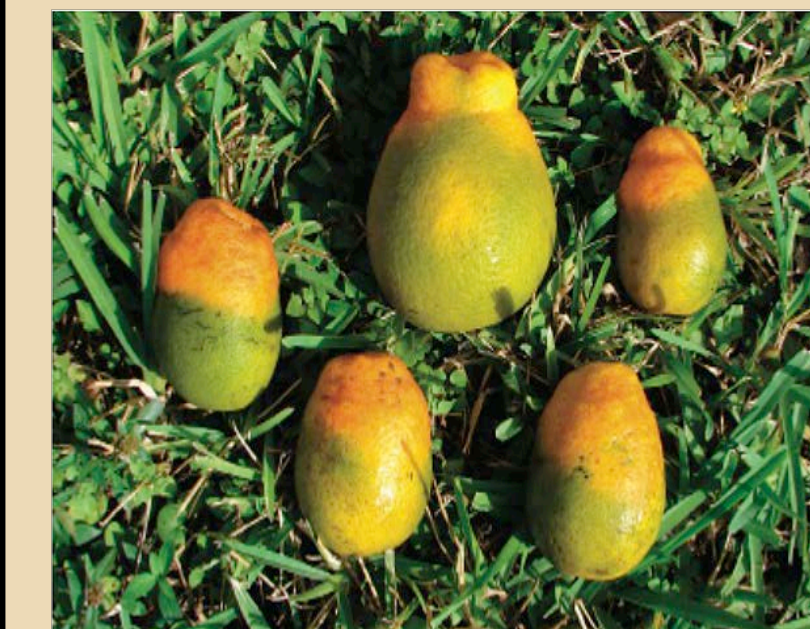


Photo provided by Dr. Blas, UOG



Photo provided by Dr. Singh, LSU

Huanglongbing (HLB; citrus greening) caused by the fastidious bacterium, *Candidatus Liberibacter asiaticus* and vectored by the Asian citrus psyllid was first identified on Guam in 2014. Fruit often are reduced in size or drop early. Leaf symptoms: blotching, mottling, and yellowing of veins.

## Citrus canker

Though first reported in Guam in 1985, the bacterial diseases citrus canker caused by *Xanthomonas axonopodis*, had gone unnoticed until Dr. Singh brought it to the attention of Dr. Schlub and other presenters, and attendees of a four-day diagnostic workshop in May 2016. Symptoms seen at several locations include raised brown spots on leaves and fruits that are surrounded by an oily, water-soaked area and a yellow ring.



## References:

Dixon, L. J. R. L. Schlub, K. L. Pernezny, and L. E. Datnoff. 2009. Host Specialization and Phylogenetic Diversity of *Corynespora cassiicola*. *Phytopathology* 99:1015-1027.  
 Hodgson, R. A. J., Wall, G. C., and Randles, J. W. 1998. Specific identification of coconut tinangaja viroid for differential field diagnosis of viroids in coconut palm. *Phytopathology* 88:774-781.  
 Kiritani, K. and H.J. Su. 1999. Papaya ringspot, banana bunchy top, and citrus greening in the Asia and Pacific region: occurrence and control strategy. *Japan Agricultural Research Quarterly* 33:22-30.