Pacific Pest Detector News

A Quarterly Newsletter for First Detectors

NPDN
National Plant Diagnostic Network
WPDN
Western Plant Diagnostic Network

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Pacific Pest Detector News
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All issues of PPDNews available at
https://www.wpdn.org/newsletters

Pests in Brief

• **From PestNet:** An applicable app (page 2)?

• **Pandanus scale** (page 3) causes serious damage to species of *Pandanus*, an important cultural, economic, and environmental plant in the Pacific. The scale insect is small and difficult to detect, but the photos and descriptions from Hawaii Department of Agriculture should be helpful.

Courtesy Hawai'i Department of Agriculture

• **Frosty pod rot** (page 4) is one of the most severe diseases of cacao (cocoa). From its probable origin in Colombia in the early 1800s, it spread through the north of South America, Central America, and Mexico. The disease is still on the move and was detected in Bolivia in 2013. By June 2015, growers in that country's main cocoa-producing region had lost over 50% of their crops.

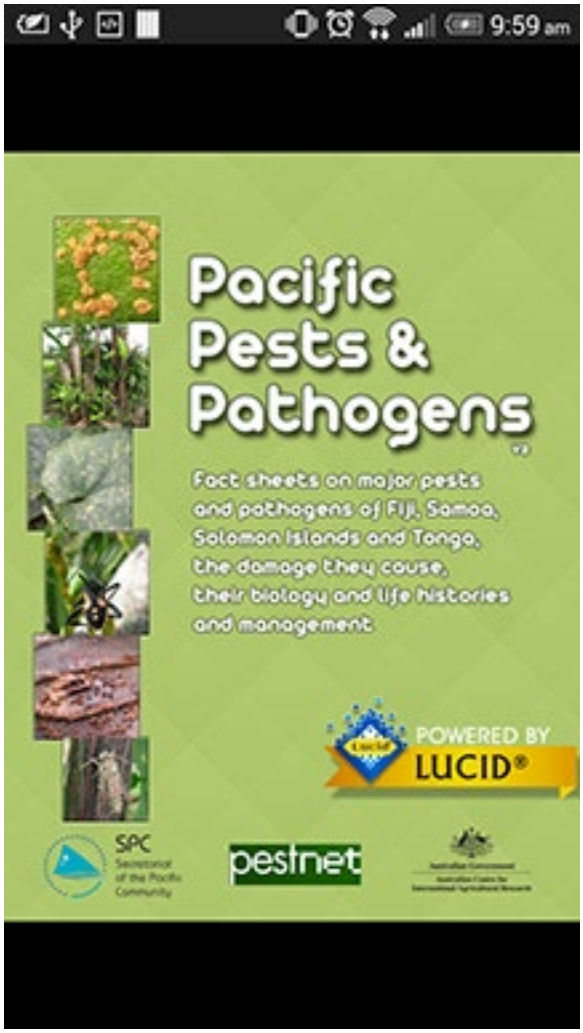
Cacao is grown on many islands in the Pacific, but only on a small scale. One reason is a disease called black pod, which has similar symptoms. Our "Not Wanted" poster also compares frosty pod rot and black pod rot. Be alert! Though frosty pod rot is half an ocean away it can travel long distances on infected fruits.

Courtesy W. Phillips-Mora, Tropical Agricultural Research and Higher Education Center (CATIE), Costa Rica

WANTED

The New *Pacific Pests & Pathogens* App

Pacific First Detectors and others might be interested in the *Pacific Pests and Pathogens* app recently released by Grahame Jackson and his colleagues at PestNet. The app is free and can be downloaded from the Google Playstore for Android devices and from iTunes for Apple devices. The fact sheets are also available online. v

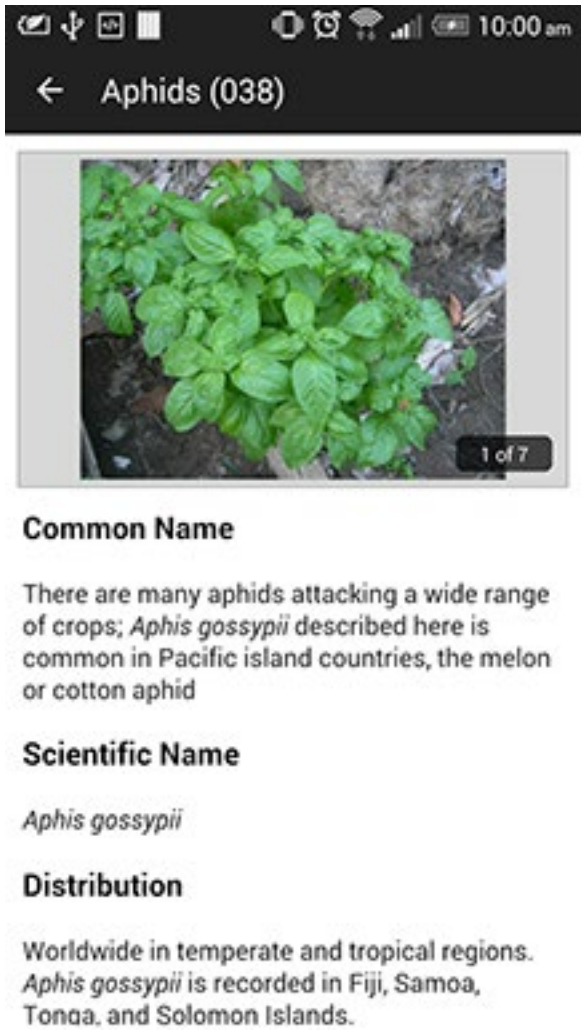


When a pest attacks, growers need immediate help. Often they cannot wait. If they don't act quickly, their crop could be destroyed.

This app gives extension staff and growers the information they need to manage the pest. If the crop cannot be saved, suggested steps can help prevent or reduce the problem in the future.

After choosing the crop of interest, a series of simple questions are asked that narrow the choices until a match is made and compared with thumbnail images. Each fact sheet has sections on damage, biology and life cycle, and management.

There are now 236 fact sheets, but this number will increase. There also will be shorter, less technical fact sheets for those less familiar with English.

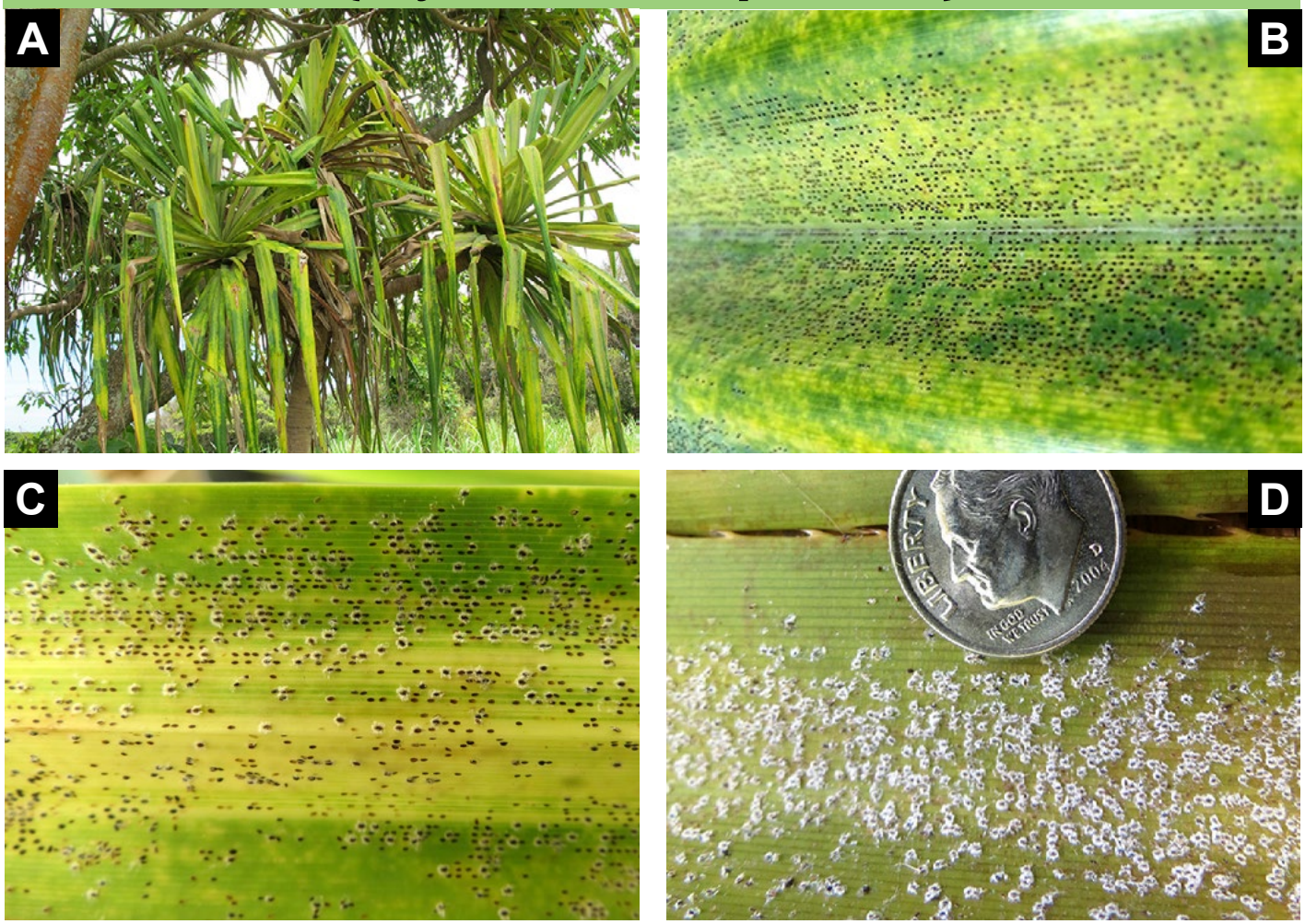


Information provided by Aubrey Moore, an entomologist at the University of Guam.

NOT WANTED

Pandanus Scale

(*Thysanococcus pandani*)



Images and information courtesy of Hawai'i Deptartment of Agriculture

(A–B) Feeding by pandanus scale causes light green and yellow areas on leaves that turn brown, dry out, and then die. Heavily infested leaves are discolored, brittle, twisted, and stunted. (B) Early infestations of this scale are difficult to detect without magnification due to the small size of the first instar or crawler stage, about 0.3 mm. (C–D) Adult females attach themselves to the undersides of leaves but will settle on upper surfaces as their populations increase. They are 0.6 mm long and form a white waxy ring around their oval, black bodies.

Origin, Distribution. First reported from Indonesia (Java) and Singapore. Detected in Hana, Maui in 1995. Small populations were found on Oahu in 2013 and Molokai in 2014.

Likely Locations. Wherever *Pandanus* species are present. Because of their small size, the first instar or crawler stage can be moved by wind, other insects, or animals. People can unknowingly move pandanus scale from infested areas on their clothing, or on leaves or fruits of infested plants.

Hosts. Possibly all *Pandanus* species, including *P. penangensis*, *P. utilis*, and especially *P. tectorius* in Hawaii.

Impact. Pandanus scale reduces fruit production and weakens and kills trees and seedlings. Heavy scale infestations can cause the loss of an important tree species from costal ecosystems as *Pandanus* inhibits invasive species and helps prevent coastal erosion. *Pandanus* is important in many island cultures, especially for weaving. Severe scale infestations make the dried leaves useless for making mats, baskets, and other articles.

For more information: http://hdoa.hawaii.gov/pi/ppc/new-pest-advisories/ (see HALA SCALE)

NOT WANTED

Frosty Pod Rot

(*Moniliophthora roreri*)

Courtesy of W. Phillips-Mora, CATIE, Costa Rica

(A) Young fruits (pods) of cacao (*Theobroma cacao*) infected by *Moniliophthora roreri* are chlorotic, swollen and misshapen. Infected pods are heavier than healthy pods and seeds already may be damaged. (B) Advancing necrosis of frosty pod rot has uneven borders (white arrow) and when mycelium of the fungus first appears it is felty and white.

Origin & Distribution. Central and South America. Possible origin in Columbia (1817), and then Ecuador in the early 1900s, Venezuela (1941), Peru (1950), Panama (1956), Costa Rica, Nicaragua, Honduras, Guatemala, and Belize, and then Mexico in 2005. Reports of the disease in Bolivia in 2013 were confirmed in 2015.

Hosts. Fruits of *Theobroma cacao* (cocoa) and other species of *Theobroma. Herrania* species can act as reservoirs of the disease.

Courtesy of W. Phillips-Mora, CATIE, Costa Rica

(A) Late in the disease cycle, at about 50 to 60 days, the mycelium turns from white to cream colored. (B) In the final stages of the disease the mycelium is tan to light brown. Pods begin to shrivel and become hard. These "mummies" do not fall from the tree, but remain attached to their branches and produce spores.

Impact. Frosty pod rot (*Moniliophthora roreri*) can have a major economic impact on fruit production and is reported to cause twice the damage of black pod rot (*Phytophthora* spp.). Yield losses average 30%, but can be up to 90% depending on crop and disease management and the environment. For example, over 50% of Peru's 16,500-ha cacao cultivation has been abandoned and frosty pod rot is the major factor affecting yield in Central America and Mexico with losses of 80% and more.

Likely Locations. Natural spread of the disease is mainly by wind-blown spores of the fungus; the mycelium on one mature pod can produce 7 billion spores. Long-distance spread, however, is usually on infected fruits during international trade. This may be accidental due to the long period, one month or more, between infection and appearance of the first symptoms.

For more information:
Cocoa diseases: www.dropdata.org/cocoa/cocoa_prob.htm
Black pod (select from list of diseases): www.ctahr.hawaii.edu/site/publist.aspx?key-plantdisease

Frosty Pod Rot

Black Pod Rot

Courtesy of W. Phillips-Mora, CATIE, Costa Rica

Frosty pod rot (left) has not been reported in the Pacific Islands, but black pod rot (right) has.

HERE ARE SOME WAYS TO TELL THESE TWO DISEASES APART.

- **Frosty Pod Rot Life Cycle (about 85 days)**
  - 30 days: fruit distortion
  - 40-70 days: brown necrotic areas on fruit
  - 50-90 days: mycelium and spores on fruit

- The frosty pod pathogen, *Moniliophthora roreri*, only attacks pods of *Theobroma* species. (Note: Internal, diagnostic mycelium appears at high humidity.)
- Early infection and seed damage can occur before external symptoms; fruits are heavier.
- Swelling, bumps or distortion of fruits occur about 30 days after infection.
- Spores on mummified fruits spread the disease by wind, rain splash, or on humans.

- **Black Pod Rot Life Cycle (about 10 days)**
  - 5 days: brown spots on fruit
  - 8 days: spots merge and cover the fruit
  - 10 days: mycelium and spores cover fruit

- Black pod, caused by *Phytophthora* spp., attacks *Theobroma* pods and other plant species. It also damages branches and roots.
- Internal damage usually begins with external symptoms; seeds rapidly rot or shrivel.
- Brown spots usually appear at the ends of the fruits first, about 5 days after infection.
- Spores on fruits spread the disease by rain splash, windblown rain, or fruit-to-fruit contact.

Who to contact: Diagnostic Clinics and Diagnosticians — Page 8

Pests of Concern

ARTHROPODS

Africanized honey bee (*Apis mellifera scutellata*) http://www.invasivespeciesinfo.gov/animals/afrhonbee.shtml

Asian citrus psyllid (*Diaphorina citri*) http://cisr.ucr.edu/asian_citrus_psyllid.html

coconut rhinoceros beetle (*Oryctes rhinoceros*) http://www.ctahr.hawaii.edu/adap/ASCC_LandGrant/Dr_Brooks/BrochureNo8.pdf **Oahu biweekly updates:** https://gallery.mailchimp.com/9a2eda30317f9dbc89fb881b9/files/CRB_2_13_2015.pdf

little fire ant (*Wasmannia auropunctata*) http://flrec.ifas.ufl.edu/entomo/ants/pest%20ants%20of%20fl/little_fire_ant.htm **Oahu biweekly updates:** https://gallery.mailchimp.com/9a2eda30317f9dbc89fb881b9/files/LFA_2_9_15_EM.pdf

naio thrips (*Klambothrips myopori*) http://cisr.ucr.edu/pdf/myoporum_thrips_hawaii.pdf

red imported fire ant (*Solenopsis invicta*) http://entnemdept.ufl.edu/creatures/urban/ants/red_imported_fire_ant.htm

red palm weevil (*Rhynchophorus ferrugineus*) http://www.aphis.usda.gov/import_export/plants/manuals/emergency/downloads/nprg-redpalmweevil.pdf

silverleaf whitefly (*Bemisia argentifolii*) http://www.entnemdept.ufl.edu/creatures/veg/leaf/silverleaf_whitefly.htm

varroa mite (*Varroa destructor*) http://entnemdept.ufl.edu/creatures/misc/bees/varroa_mite.htm

DISEASES

banana Xanthomonas wilt (*X. c.* pv. *musacearum*) http://apsjournals.apsnet.org/doi/pdf/10.1094/PDIS-93-5-0440

citrus canker (*Xanthomonas axonopodis*) http://www.apsnet.org/publications/imageresources/Pages/IW00011a.aspx

citrus greening (*Candidatus* Liberibacter asiaticus) http://www.crec.ifas.ufl.edu/extension/greening/index.shtml

coffee rust (*Hemileia vastatrix*) http://www.apsnet.org/edcenter/intropp/lessons/fungi/Basidiomycetes/Pages/CoffeeRust.aspx

downy mildews of corn http://maizedoctor.cimmyt.org/index.php?id=233&option=com_content&task=view

guava rust (*Puccinia psidii*) http://www.ctahr.hawaii.edu/oc/freepubs/pdf/PD-38.pdf

iris yellow spot http://aces.nmsu.edu/pubs/_h/H-255.pdf

lethal yellowing of palm (*Candidatus* Phytoplasma palmae) http://edis.ifas.ufl.edu/pp146

moko disease of banana (*Ralstonia solanacearum*) http://www.promusa.org/tiki-custom_home.php

Panama disease of banana TR 4 (*Fusarium oxysporum* f.sp. *cubense*, tropical race 4) http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/ph/dis/fn/fs01200.pdf

papaya ringspot http://www.apsnet.org/publications/apsnetfeatures/Documents/2004/ControllingPapayaRingspotVirus.pdf

sudden oak death (*Phytophthora ramorum*) http://www.suddenoakdeath.org/

tomato yellow leaf curl http://www.ctahr.hawaii.edu/oc/freepubs/pdf/PD-70.pdf

PLANTS

cogongrass (*Imperata cylindrica*) http://www.issg.org/database/species/ecology.asp?si=16&fr=1&sts=sss&lang=EN

fireweed (*Senecio madagascariensis*) http://www.hawaiiinvasivespecies.org/pests/fireweed.html

fountain grass (*Pennisetum setaceum*) http://www.nps.gov/plants/alien/fact/pdf/pese1.pdf

miconia (*Miconia calvescens*) http://www.hawaiiinvasivespecies.org/pests/miconia.html

Siam weed (*Chromolaena odorata*) http://plants.usda.gov/java/profile?symbol=CHOD

Pests listed in **'BOLD'** are not, to our knowledge, present in the American Affiliated Pacific Islands.

Websites

PEST INFORMATION

American Samoa: http://www2.ctahr.hawaii.edu/adap2/ascc_landgrant/technical_papers.asp#brochures

Bugwood (images): http://bugwood.org/

Crop Knowledge Master: http://www.extento.hawaii.edu/kbase/Crop/crop.htm

Hawaii Invasive Species Council: http://dlnr.hawaii.gov/hisc/

Plant Pono: http://www.plantpono.org/

Hawaii Department of Agriculture (new pest advisories): http://hawaii.gov/hdoa/pi/ppc/new-pest-advisories

Hawaiian Ecosystems at Risk (Pacific invasive species): http://www.hear.org/

Master Gardeners (national pest list): http://wiki.bugwood.org/npdn-mg-training

Western Micronesia Regional Invasive Species Council: http://guaminsects.net/gisac/index.php?title-Main_Page

DIAGNOSTIC CLINICS AND DIAGNOSTICIANS

American Samoa Community College, Land Grant: Mark Schmaedick (insects) m.schmaedick@amsamoa.edu (684) 699-1575; Ndeme Atibalentja (plant diseases) n.atibalentja@amsamoa.edu

University of Guam: Robert Schlub (plant diseases) rlschlub@uguam.uog.edu (671) 735-2089; Aubrey Moore (insects) amoore@uguam.uog.edu (671) 735-2141

Hawaii Department of Agriculture: Janis Matsunaga (insects) Janis.N.Matsunaga@hawaii.gov (808) 973-9534; Mann Ko (plant diseases) Mann.P.Ko@hawaii.gov (808) 973-9546

University of Hawaii at Manoa (diagnostic clinic): Honolulu adsc@ctahr.hawaii.edu, (808) 956-6706 ; Komohana Research Extension Center, Hilo komohana@ctahr.hawaii.edu, (808) 981-5199

ORGANIZATIONS

Guam Department of Agriculture: http://www.nasda.org/cms/7195/8617/8761.aspx

National Plant Diagnostic Network http://www.npdn.org/

Western Plant Diagnostic Network https://www.wpdn.org/index.php

Western Pacific Tropical Research Center (Guam) http://www.wptrc.org/

EDUCATION AND TRAINING

Extension Disaster Education Network http://eden.lsu.edu/Pages/default.aspx

NPDN First Detector Training Sites: http://www.npdn.org/first_detector

NPDN First Detector Newsletter: http://www.npdn.org/newsletter

Protect U.S. invasive species network http://www.protectingusnow.com/

WPDN Homepage: https://www.wpdn.org/index.php

WPDN and Pacific First Detector Newsletters: https://www.wpdn.org/newsletters

IF A LINK IS INOPERABLE, TRY COPYING AND PASTING IT DIRECTLY INTO YOUR BROWSER