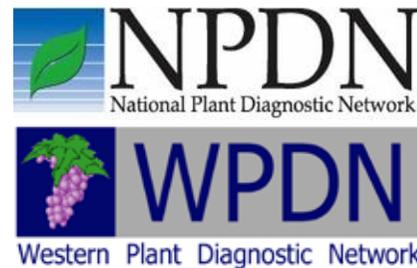


Pacific Pest Detector News



A Quarterly Newsletter for First Detectors March–May 2012—No. 9

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Pacific Pest Detector News

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Pests in Brief

PLANT TRADE PESTS OF CONCERN

This newsletter usually reports on pests of plants and plants that are themselves pests (weeds). However, we think it is important to call your attention to some other pests that travel in or on plants and soil.

- Coqui and greenhouse frogs and their eggs are moved in plant pots and hidden on plants.
- Slugs and snails, insects, and other pests avoid detection inside tightly bundled Christmas trees, or in packaged fruits, vegetables, and flowers.



- Little fire ants can be in pots or on plants from garden and landscape nurseries.
- Red imported fire ants are moving across the Southern U.S. in turf (sod), root balls of nursery plants, and on other agricultural products.

These pests and others will always be a threat. Quarantine services cannot adequately inspect all imported plants and plant products. Some organisms are too small to be seen, even on close inspection, and others may be inside the plant. You, the First Detectors, are often the first line of defense.



Top: Coqui (l) and greenhouse (r) frogs. Courtesy of Lori Oberhofer, US Department of Agriculture

Middle: Giant African Snails. Photo by David Robinson, USDA APHIS PPQ, Bugwood.org

Lower: Red Imported Fire Ant, Museum Victoria, Australia, Bugwood.org

A Resurging Pest in the Hawaiian Islands

Phantasma scale — *Fiorinia phantasma*

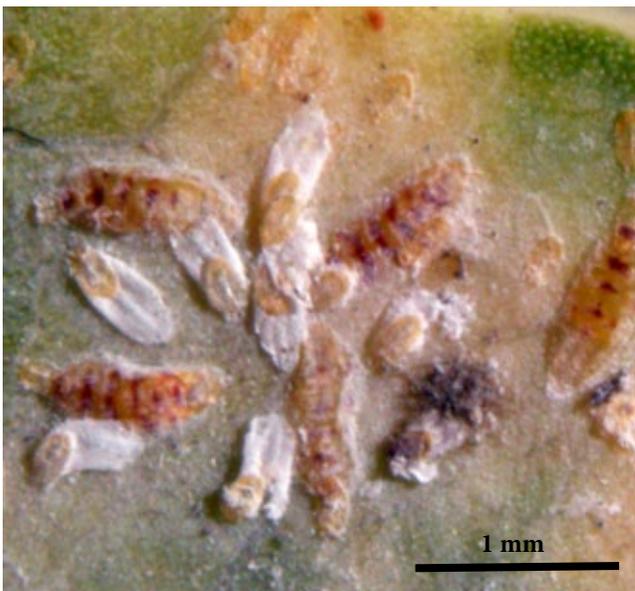
This armored scale was first reported in the Philippines (1914), then on Oahu (2004 and 2008), Maui (2011), and American Samoa (2008). It is an important pest of palms and other nursery and landscape plants. Because of its limited distribution, exporters may also face problems with plant quarantine.

The pest: females may form clear, red-striped, or all red waxy coverings. They live and feed under these protective coverings, hence the name “armored” scale. They look similar to *F. fioriniae*, a long-time pest in Hawaii that feeds on protea, as well as palms. Look for them on the undersides of leaves.



Symptoms of scale infestation on the upper surface of an areca palm leaf

Photo courtesy Hawaii Dept. of Agriculture



Scales on the lower leaf surface of an areca palm; banded females and white, immature males.

Symptoms: these insects suck fluids from the cells of plants, causing yellow blotches on upper leaf surfaces, early leaf drop, and loss of plant vigor. Armored scales do not secrete honeydew, so sooty mold fungi will not be associated with it.



Scale infestation on the lower leaf surface

Photo courtesy Hawaii Dept. of Agriculture

Partial host list: most common on palms (coconut, manila, areca, and bottle); also reported on shower tree (*Cassia* sp.), lobster claw (*Heliconia caribaea*), weeping fig (*Ficus benjamina*), naio (*Myoporum sandwichense*), mock orange (*Murraya paniculata*), pittosporum (*Pittosporum tobira*), wax leaf privet (*Ligustrum japonicum*), and breadfruit (*Artocarpus altilis*).

Pest Alert <http://hawaii.gov/hdoaladmin-rules/pi/ppc/npa-1/Fiorinia%20phantasma%20NPA.pdf>

New record http://scholarspace.manoa.hawaii.edu/bitstream/handle/10125/21682/43_59-61.pdf?sequence=1

Contact Your Local Diagnostic Clinic, Department of Agriculture, or University—Page 8

NOT WANTED

Maize Chlorotic Mottle Virus (MCMV)

A PEST OF MAIZE (CORN) IN BOTH TEMPERATE AND TROPICAL CLIMATES



Courtesy of Scot Nelson



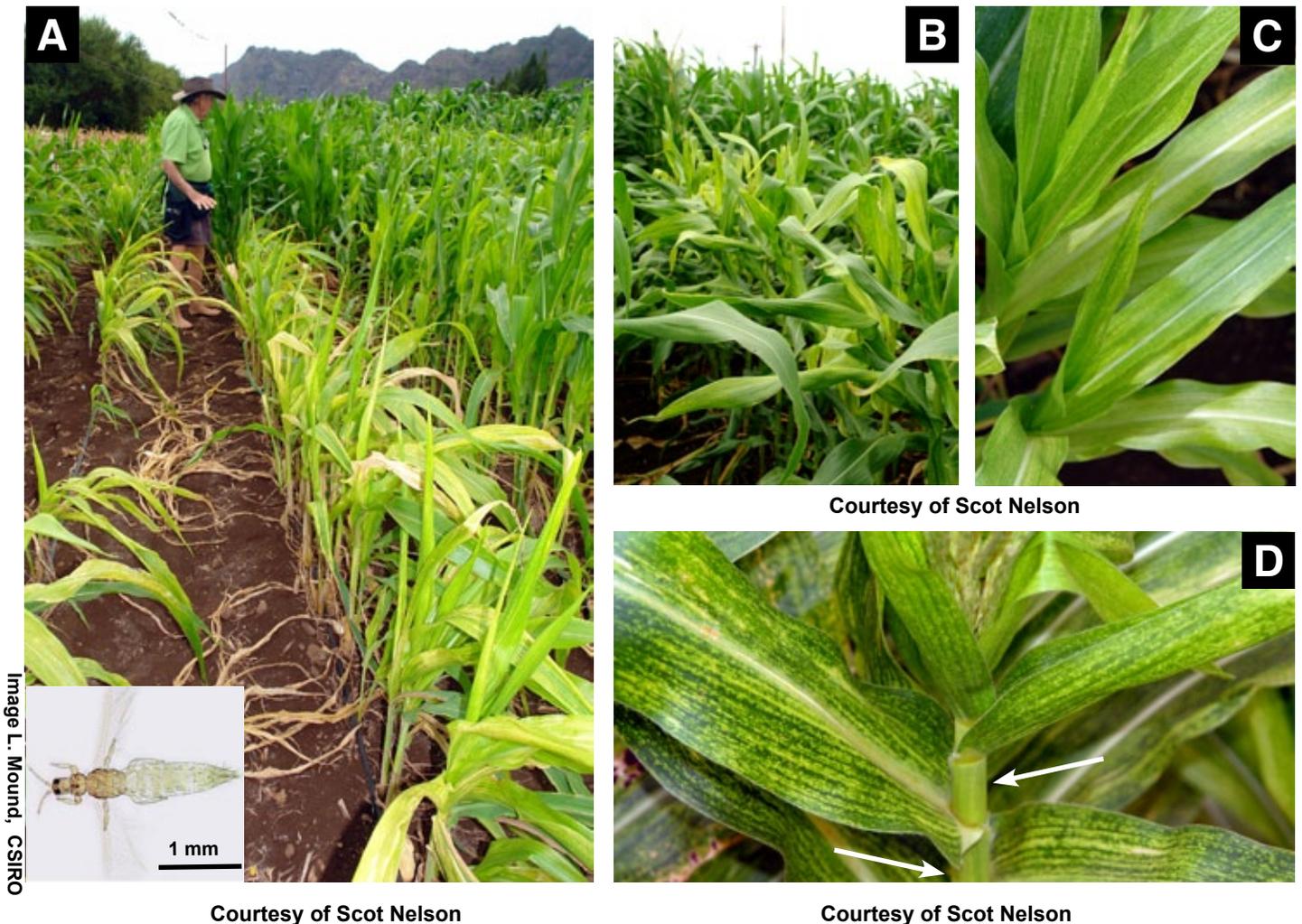
Courtesy of Kelcie Rico

Courtesy of Scot Nelson

(A) Yellow (chlorotic) streaks and blotches (mottle) on corn caused by Maize chlorotic mottle virus (MCMV); (B) healthy corn leaf; (C) close-up of chlorotic streaks and mottling; (D) the yellow color on virus-infected plants indicates a lack of chlorophyll, which can lead to slow growth and reduced yields. Severe infections can cause leaf necrosis, fewer or malformed ears, and plant death.

Origin and Distribution: Maize chlorotic mottle disease was first reported in Peru in 1974 and shortly thereafter in Kansas and Nebraska. It is also present in Argentina and Brazil and was found in Mexico in 1989. The disease reached the island of Kauai in 1989-1990 and was recently found on Oahu and Maui.

Impact: The virus is seedborne at very low levels. It is a concern, however, for companies producing susceptible temperate-zone seed corn for export and sale. If MCMV is part of a mixed infection with a potyvirus, such as Sugarcane mosaic virus (SCMV) or Maize dwarf mosaic virus (MDMV), it can result in corn lethal necrosis (CLN) and yield losses of more than 50%.



(A) Traditional breeding of corn varieties for disease resistance in Hawaii, with more resistant lines in the background and a highly susceptible line in the foreground (inset: corn thrips vector); (B) a corn line with moderate resistance to MCMV compared to the highly susceptible breeding line in Photo A; (C) this systemic virus disease causes chlorosis in whorls of new leaves; (D) stunting in virus-infected plants is mainly due to shortened internodes (arrows), the distance between leaves.

Insect Vector: The most common carrier of MCMV in Hawaii is reportedly the corn thrips, *Frankliniella williamsi* (Photo A inset). Adults are ~2 mm long, found on tassels, ears, in leaf whorls, and on the undersides of leaves.

Likely Locations: The disease is most likely to be found where temperate-zone corn varieties are grown. Many tropical varieties of sweet corn have partial or complete resistance to MCMV.

Host Range: *Zea mays* (corn) is the only natural host known. Experimentally infected plants in the grass family (Poaceae) found in Hawaii include: sorghum (*Sorghum* spp.), brome grass (*Bromus molis*), guinea grass (*Panicum maximum*), and broomcorn millet (*P. miliaceum*).

For More Information

- 1) MCMV pest alert <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/PD-79.pdf>
- 2) University of Nebraska–Lincoln <http://pdc.unl.edu/agriculturecrops/corn/maizechloroticmottlevirus>
- 3) MCMV description <http://www.dpvweb.net/dpv/showdpv.php?dpvno=284>

NOT WANTED

Miconia, Velvet Tree (*Miconia calvescens*)

MICONIA, ESTABLISHED IN TAHITI AND HAWAII, IS A SERIOUS THREAT TO PACIFIC RAINFORESTS



Courtesy of Forest and Kim Starr



Courtesy of Nature Conservancy Archives, Bugwood.org



Courtesy of Forest and Kim Starr

(A) The leaves of miconia (*Miconia calvescens*) found in French Polynesia and Hawaii are purple when they emerge, turning to green on the upper surface; (B) the three lengthwise leaf veins typical of miconia are light-colored above and form prominent ridges below; (C) the white to pink flowers bloom three times per year, forming dark purple berries with up to 250 seeds per berry.

Origin and Distribution: Native to Mexico, Central America (green- and purple-leaf form) and South America (green leaves only). Established in French Polynesia (Tahiti 1937), Marquesas Islands; Hawaii Island (1959), Oahu (1960s), Maui (1970s), Kauai (1985); Australia (1963); New Caledonia. Seeds spread in bird droppings and on animals; on hikers' clothes and shoes; on vehicles, machinery and equipment; in water, soil, and by wind. Introduced into French Polynesia through botanic gardens and to Hawaii by the nursery trade.

Description: Woody, shrubby tree to 15 m (45 ft) with slender stems. Leaves opposite, elliptic, 60 cm to 1 m (25 to 39 in) long. Three prominent longitudinal veins. Two-colored form has dark-green, smooth leaves above with fuzzy, iridescent purple undersides. Inflorescence is a large panicle with 1000 to 3000 white to pink flowers; berries 6 to 7 mm (0.25 in) diameter, purple to black when ripe.



Courtesy of HEAR.org



Courtesy of HEAR.org



Courtesy of HEAR.org



Courtesy of Forest and Kim Starr

(A) The narrow trunks of miconia support a dense canopy that shades out understory growth; **(B)** bare soil and miconia’s shallow roots promote soil erosion and landslides, like this one on the island of Tahiti; **(C)** miconia seedlings; **(D)** green and purple leaves that grow 2 to 3 feet long and have three distinctive leaf veins sound the alarm for this damaging invasive plant.

Impact: Forms dense stands that outcompete other plants; eliminates native understorey vegetation; increases runoff and soil erosion; reduces groundwater recharge in watersheds; shallow roots increase the danger of landslides on steep slopes. Potential loss of agricultural land. Miconia’s fast growth, early maturity, and massive seed production (one tree can produce 3 to 5 million seeds per year) and seed dispersal, are a particular threat to biodiversity. In Tahiti, 70 to 100 native plant species (35 to 45 species endemic to French Polynesia) are threatened with extinction.

Likely Locations: Thrives in tropical montane climates. Can establish in areas that receive at least 1800 to 2000 mm (70 to 80 in) of rain per year. Look for it in lowland to montane tropical rainforests between 300 and 1800 m (975 to 6000 ft). A very showy ornamental that could appear in nurseries or in the yard of an uninformed homeowner.

For More Information

- 1) Pacific Island Ecosystems at Risk <http://www.hear.org/miconiainhawaii/>
- 2) Global Invasive Species Database <http://www.issg.org/database/species/ecology.asp?si=2&fr=1&sts=&lang=EN>
- 3) Miconia in the Pacific http://www.li-an.fr/jyves/Meyer_1996_Pacific_Science_Status_Miconia.pdf

Pests of Concern

ARTHROPODS

Africanized honey bee (*Apis mellifera scutellata*) <http://www.invasivespeciesinfo.gov/animals/afrhonbee.shtml>
Asian citrus psyllid (*Diaphorina citri*) <http://hawaii.gov/hdoa/pi/ppc/npa-1/npa06-01-ACP.pdf>
coconut rhinoceros beetle (*Oryctes rhinoceros*) http://www.ctahr.hawaii.edu/adap/ASCC_LandGrant/Dr_Brooks/BrochureNo8.pdf
little fire ant (*Wasmannia auropunctata*) <http://hawaii.gov/hdoa/pi/ppc/npa-1/npa99-02-lfireant.pdf>
naio thrips (*Klambothrips myopori*) http://hawaii.gov/hdoa/pi/ppc/projects/Naio_Thrips
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://hawaii.gov/hdoa/pi/ppc/npa-1/npa07-01-Varroa.pdf>

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 virus <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://bananas.bioversityinternational.org/files/files/pdf/publications/disease6_en.pdf
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 virus <http://www.apsnet.org/publications/apsnetfeatures/Documents/2004/ControllingPapayaRingspotVirus.pdf>
sudden oak death (*Phytophthora ramorum*) http://hawaii.gov/hdoa/pi/pq/QPA04-02_Sudden_Oak_Death.pdf
tomato yellow leaf curl virus <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/PD-70.pdf>

PLANTS

cogon grass (*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.

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

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://www.hawaiiinvasivespecies.org/pests/>

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

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 Comm. College, Land Grant: Mark Schmaedick m.schmaedick@amsamoa.edu (684) 699-1575

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: Bernarr Kumashiro (insects) Bernarr.R.Kumashiro@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>

Pacific Islands Distance Diagnostics and Recommendation System (PIDDRS): <http://dddi.org/pacific/>

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

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

National Plant Diagnostic Network <http://www.npdn.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.protectingsnow.com/>

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

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

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