

PREDICTING INVASIVE SPECIES ARRIVALS ON GUAM



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Forestry Workshop on Invasive Insects
University of Guam, Feb. 11, 2020

SOURCE 1: REGIONAL BIOSECURITY PLAN

**NAVFAC Pacific**
Naval Facilities Engineering Command

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Regional Biosecurity Plan for Micronesia and Hawaii

Welcome to the Department of the Navy's website on the Regional Biosecurity Plan for Micronesia and Hawaii!

Mission Statement

The concept of the Regional Biosecurity Plan (RBP) is visionary in its scope. The transfer of invasive species or invasive alien species (IAS) to the Pacific region and within the region is real, ongoing, and an increasing problem that must be addressed. The spatial scale for this plan is extremely broad, encompassing most of Micronesia and the archipelago of Hawaii. The plan attempts to cover the broadest possible extent of habitats and taxonomic groups including terrestrial, freshwater, and marine systems. This overall approach is unprecedented due to the broad geographic and taxonomic scope, as well as inclusion of multiple countries and cultures.

This plan was prepared in conjunction with representatives from various countries at various levels including federal/national, state/territory/commonwealth, industry, and non-governmental organizations and was funded by the Commander, Navy Installations Command (CNIC) and Headquarters, Marine Corps.


 [Regional Biosecurity Plan for Micronesia and Hawaii Volume I](#)

 [Regional Biosecurity Plan for Micronesia and Hawaii Volume II](#)

 [Regional Biosecurity Plan for Micronesia and Hawaii Volume III](#)

 [Regional Biosecurity Plan for Micronesia and Hawaii Volume IV](#)

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SOURCE 1: REGIONAL BIOSECURITY PLAN

- Volume 4, Appendix A, Exotic Plant Pests with the Potential to be Introduced to the Micronesian Region is a 70 page table containing a large number of species.
- Many of these species are already established on Guam.
- This data dump is of little predictive value!

SOURCE 2: CABI HORIZON SCANNING TOOL



Horizon Scanning Tool

Prioritizing invasive species threats

The Horizon Scanning Tool is a decision support aid that helps you identify and categorize species that might enter a particular country from another country.

Free

- Refine by habitats, pathways and taxonomic groups
- Access ISC datasheets

[Begin scan](#)

Premium

- Refine by additional filters - plant hosts and plant parts in trade
- Access ISC and CPC datasheets

[Sign in / Sign up](#)

The tool uses CABI data to generate a list of species that are absent from your selected 'area at risk' but present in 'source countries' i.e. countries with similar climates to your 'area at risk', neighbouring or selected trading countries, or countries where there are major transport links.

Using the Horizon Scanning Tool



- Select your 'area at risk' or area of interest which doesn't currently have a pest/invasive species present



- Select potential 'source countries' where species are present and act as points of entry to your 'area at risk'



- Scan for results



- View species results



SOURCE 2: CABI HORIZON SCANNING TOOL

Select areas of interest where pests might enter Guam from:

Select neighbouring countries of Guam:

No result found

Select all countries within a continent:

☐ All

☐ Africa

☒ Asia

☒ Central America and Caribbean

☐ Europe

☒ North America

☒ Oceania

☐ South America

Select other countries:

Select countries from Guam's top 10 trade partners (imports, by value)

No trade data is available for Guam

Select climate zones to add countries with matching climates to Guam:

☐ All

☒ Tropical rainforest [zone map](#)

[Clear All](#) ✕

Matching Continents (295)

Asia (145)

Afghanistan ✕ Armenia ✕

Azerbaijan ✕ Bahrain ✕

Bangladesh ✕ Bhutan ✕

Bismarck Archipelago ✕

British Indian Ocean Territory ✕

Brunei Darussalam ✕ Cambodia ✕

Central America and Caribbean (36)

North America (70)

Oceania (44)

[Show more](#) +

Matching Climates (97)

Tropical rainforest (97)

American Samoa ✕

Australia/Queensland ✕ Belize ✕

Bismarck Archipelago ✕ Bolivia ✕

Brazil/Acre ✕ Brazil/Amapa ✕


Brazil/Amazonas ✕ Brazil/Bahia ✕

Brazil/Para ✕

[Show more](#) +

[Clear All](#) ✕

SOURCE 2: CABI HORIZON SCANNING TOOL

 **CABI**

Horizon Scanning Tool

Prioritizing Invasive species threats

Area at risk: Guam Start Scan

☐ I am only interested in plant pests

Refine by : ?

Source countries

Pathways

Plant hosts

Plant parts in trade

Habitats

Taxonomic group

Results: 8135 species found

Save and share scan

Download as CSV

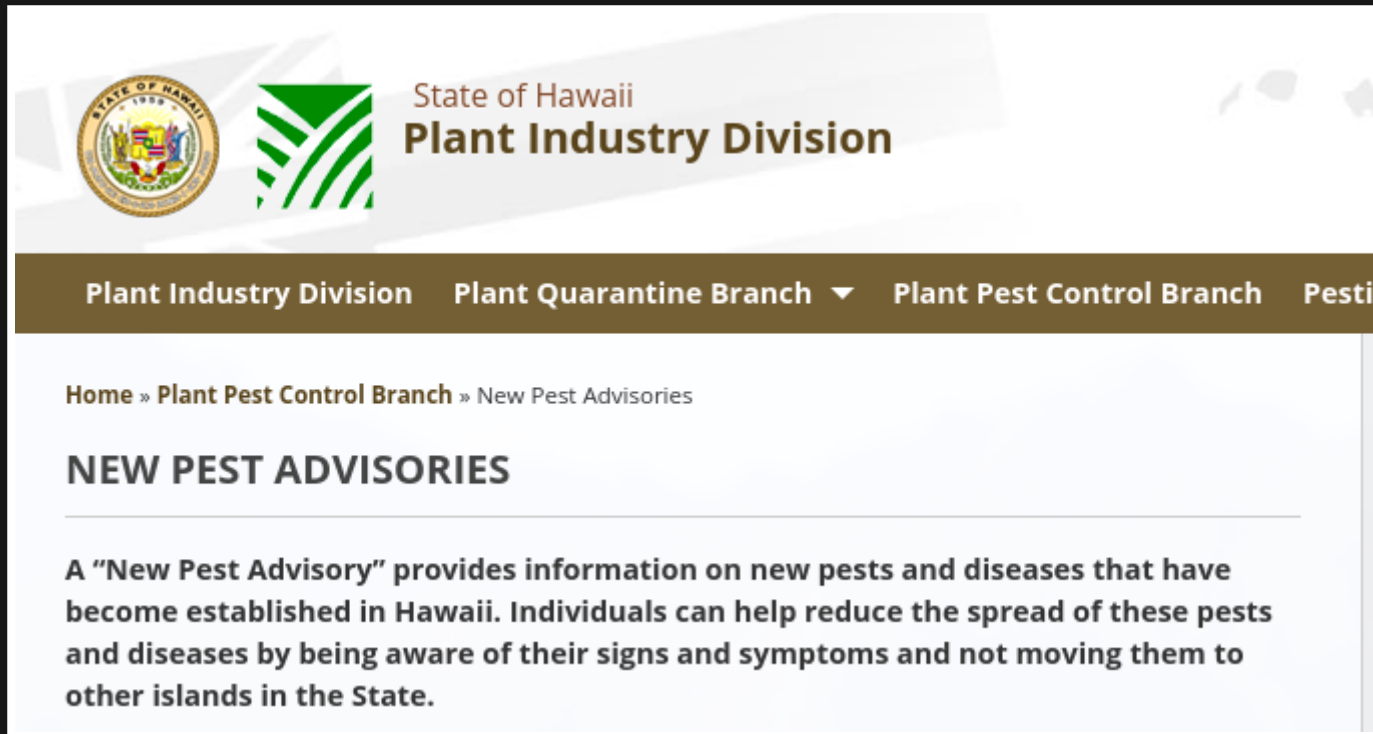
Show: 25 Page: 1 of 326 ◀ ▶

Preferred scientific name	International common name	Taxonomic group	View datasheet
Abacarus hystrix	grain rust mite	Invertebrates	<i>CPC (Basic)?</i>
Abbottina rivularis	Chinese false gudgeon	Vertebrates	<i>ISC (Full)</i>
Abutilon grandifolium	hairy Indian mallow	Plants	<i>ISC (Full)</i>
Abutilon hirtum	Indian mallow	Plants	<i>CPC (Full)</i> <i>ISC (Full)</i>



SOURCE 2: CABI HORIZON SCANNING TOOL

- A query for Guam results yields 8,135 species.
- Many of these species are already established on Guam.
- This data dump is of little predictive value!

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES



The screenshot displays the official website of the State of Hawaii Plant Industry Division. At the top left, there is the State of Hawaii seal and a green logo with white diagonal stripes. To the right of these logos, the text "State of Hawaii" is in a smaller font, and "Plant Industry Division" is in a larger, bold font. Below this header is a brown navigation bar with white text links: "Plant Industry Division", "Plant Quarantine Branch" (with a dropdown arrow), "Plant Pest Control Branch", and "Pest". Below the navigation bar, a breadcrumb trail reads "Home » Plant Pest Control Branch » New Pest Advisories". The main heading "NEW PEST ADVISORIES" is in bold and underlined. A paragraph below explains that a "New Pest Advisory" provides information on new pests and diseases that have become established in Hawaii, and that individuals can help reduce the spread by being aware of signs and symptoms and not moving them to other islands in the State.

  State of Hawaii
Plant Industry Division

Plant Industry Division Plant Quarantine Branch ▼ Plant Pest Control Branch Pesti

Home » Plant Pest Control Branch » New Pest Advisories

NEW PEST ADVISORIES

A "New Pest Advisory" provides information on new pests and diseases that have become established in Hawaii. Individuals can help reduce the spread of these pests and diseases by being aware of their signs and symptoms and not moving them to other islands in the State.

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES

- AVOCADO LACE BUG, *Pseudacysta perseae* (Issued Jan. 2020)
- OLIVE FRUIT FLY, *Bactrocera oleae* (Rossi) (Issued Oct. 2019)
- CROTON SCALE, *Phalacocroccus howertoni* (Issued Sept. 2019)
- PODOCARPUS BLIGHT and TIP DIEBACK (Issued June 2019)
- QUEENSLAND LONGHORN BEETLE, *Acalolepta aesthetica* (Issued August, 2018)

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES

- PAPAYA SCALES, *Philephedra tuberculosa* and *Pseudoparlatoria ostreata* (issued March 2018, updated November 15, 2018)
- COFFEE BERRY BORER, *Hypothenemus hempei* (issued September 2010, updated December 2014)
- MAMAKI RUST (issued May 2016)
- PHYLLANTHUS RUST (issued October 2015)
- HALA SCALE (issued May 2015)

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES

- BAGRADA BUG, *Bagrada hilaris* (issued May 2015, updated March 2016)
- ROUGH SWEETPOTATO WEEVIL, *Blosyrus* (issued February 23, 2009, updated December 9, 2014)
- COCONUT RHINOCEROS BEETLE, *Oryctes rhinoceros* (issued May 1, 2014) Oahu 2013; Guam 2007;
LAG=-4Y
- HETERANTHERA RENIFORMIS (issued September 20, 2013)

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES

- LOBATE LAC SCALE, *Paratrachardina pseudolobata* (issued January 15, 2013, updated March 27, 2013) Oahu 2012; Guam 2018; LAG=6Y
- WEST INDIAN WOODNETTLE (issued August 23, 2012)
- SMALL HIVE BEETLE (issued January 2012)
- FIORINIA PHATASMA (issued November 2, 2011)
- NAIIO THRIPS (issued June 30, 2009)
- VARROA MITE, *Varroa destructor* (issued June 28, 2007, updated December 18, 2009) Oahu 2007; Guam 2014; LAG=7Y

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES

- ASIAN CITRUS PSYLLID, *Diaphorina citri* (issued May 31, 2006, updated February 2, 2009) Big Island 2006
Guam 2006; LAG=0Y
- OHIA RUST (issued July 26, 2005, updated December 14, 2007)
- ERYTHRINA GALL WASP, *Quadrastichus erythrinae* (issued May 27, 2005, updated December 1, 2008)
Oahu 2005 Guam 2006; LAG=1Y
- PICKLEWORM, *Diaphania nitidalis* (issued March 24, 2005, updated April 22, 2005) Maui 2003

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES

- **MACADAMIA FELTED COCCID** (issued March 9, 2005, updated April 11, 2005)
- **PAPAYA MEALYBUG**, *Paracoccus marginata* (issued June 2004, updated March 21, 2007) **Maui 2004**
Guam 2002; LAG=-2Y
- **GLASSYWINGED SHARPSHOOTER** (issued May 2004, updated July 2004)
- **GIANT WHITEFLY** (issued July 2002, updated June 2004)
- **PAPAYA RINGSPOT VIRUS ON MAUI** (issued May 2002)

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES

- DAYLILY RUST (issued March 2002)
- WATERCRESS LEAFHOPPER (issued February 2002, updated September 2003)
- NETTLE CATERPILLAR (issued October 2001, updated September 29, 2008)
- RED GUM LERP PSYLLID (issued March 2001, updated July 2001)
- BLACK SPOT OF PAPAYA DISEASE (issued March 2001, updated May 2001)
- A NEW ANT, *Solenopsis* sp. (issued December 2000, updated July 2001) Oahu 2000

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES

- CITRUS LEAFMINER, *Phyllocnistis citrella* (issued September 2000, updated September 2003) Oahu 2000 Guam 1950s; LAG~-50Y
- CITRUS BLACKFLY, *Aleurocanthus woglumi* (issued October 1999, updated June 2001) Oahu 1996
- LITTLE FIRE ANT, *Wassmania auropunctata* (issued May 1999, updated February 15, 2007) Big Island 1999 Guam 2011; LAG=10Y
- SAGO PALM SCALE, *Aulacaspis yasumatsui* (issued May 1999, updated September 2003) Oahu 1998 Guam 2003; LAG=5Y

SOURCE 3: HAWAII DOA NEW PEST ADVISORIES

- There is a correlation between publication of a New Pest Alert for a species in Hawaii and arrival of that species on Guam within a few years.
- However, arrival of invasive species remains highly unpredictable.