Lessons learned from recent detections of CRB and a path toward a comprehensive early-warning system for PPQ

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Background

- Dec 2013: Detected for the first time in Hawaii
- Serious pest of coconut and African oil palms. Also feeds on several other crops, incl. bananas, dates, pineapples.
PPQ response

- Surveys
- Host removals
- Grinding/incineration of mulch
- Outreach efforts
Access to current pest information and competent information management form the foundation for everything PPQ does.
PPQ Science and Technology (S&T) contributes heavily to pest information management in PPQ, with the goal of enabling a coordinated and informed response to pest threats.
Overview

• look at S&T actions triggered by the recent detection of CRB …

• to highlight the role of S&T in pest information management and to …

• discuss where PPQ is on the path toward a comprehensive early-warning system
S&T Actions

- GPDD: updated information
- New Pest Advisory Group (NPAG) report
- New Pest Response Guidelines
- CAPS: updated datasheet
- Technical Working Group report
- Identification and Damage Aid
- Protocols for alternative destruction methods
GPDD

- Taxonomy
- Synonyms
- Host Range
- Distribution
- Biology
- APHIS documents related to the pest (e.g. NPAG reports, PRAs, pathway analyses)
- Pdf’s of information sources
NPAG

- Evaluates the significance of new pest introductions
- Provides background information (biology, detection & identification history)
- Recommends actions to the PPQ Management Team
- Recommends quarantine status

**NPAG Report**

*Oryctes rhinoceros* (L.): Coconut rhinoceros beetle

*Coleoptera: Scarabaeidae*

NPAG Chair Approval Date: March 14, 2014

*Initiating Event and Pest Identification:* John Bowers (PPQ-PHP) notified NPAG on January 3, 2014 that the coconut rhinoceros beetle (CRB), *Oryctes rhinoceros*, had been detected in a CRB trap during a CAPS survey on a U.S. Air Force base in Honolulu, Oahu, Hawaii, and is a new state record (Bowers, 2014). It was identified by Natalia J. Vandenberh (USDA-SEL) on January 3, 2014 (APHIS, 2014). In 2007, CRB was detected for the first time in a U.S. territory in Guam, and was not known to occur elsewhere in the United States (NPAG, 2007). NPAG developed a report at that time and recommended that PPQ 1) maintain a reportable/actionable port policy, 2) assess CRB for inclusion on the APHIS Regulated Plant Pest List, and 3) continue cooperative efforts to eradicate CRB populations in Guam (NPAG, 2007). On January 6, 2014, Robert Beleski (PPQ Field Operations Manager) announced that the initial reports at the U.S. Air Force base were a false alarm.
New Pest Response Guidelines

- Pest biology
- Identification
- Survey procedures
- Regulatory procedures
- Pathways
- Hosts
CAPS Datasheets and Survey Manuals

- Pest information
- Survey procedures

Oryctes rhinoceros

Scientific Name
Oryctes rhinoceros (Linnaeus, 1758)

Synonyms:
Oryctes stantor Castelnau, 1840
Scarabaeus rhinoceros Linnaeus

Common Name
Coconut rhinoceros beetle (CRB),
coconut beetle, rhinoceros beetle,
palm rhinoceros beetle, Asiatic rhinoceros beetle

Type of Pest
Beetle

Taxonomic Position
Class: Insecta, Order: Coleoptera,
Family: Scarabaeidae

Reason for Inclusion in Manual
Suggestion from CAPS Community

Pest Description
Descriptions of all life cycles can be found in Gressitt (1953).

Eggs: Eggs are whitish brown and 3 to 4 mm (approx. 1/8 to 3/16 in) (Giblin-Davis, 2001). Eggs are initially soft and oblong but swell into a rubbery circle four to five days after being laid (Hinckley, 1973).
Identification and Damage Aid

• Survey Guide specifically for delimitation surveys in HI
Protocol for alternative destruction methods

- Detailed instructions for steam treatment, both in ground and in trailer
How do we coordinate and keep track?
How do we coordinate and keep track?
An early-warning system supporting PPQ's efforts to protect U.S. agriculture and the environment against exotic plant pests

**Latest PestLens Articles**

- *Colosius confusus* (Gastropoda: Veronicellidae), a new slug species described from South America

- First report of the bacterium *Xanthomonas citri* subsp. *citri* (Gammaproteobacteria: Xanthomonadales), causal agent of citrus canker, in Burkina Faso

- First report of *Potato spindle tuber viroid* (PSTVd) infecting *Argyranthemum frutescens* (marguerite) and *Diascia* sp.

**Additional PestLens News**

Printable version
First report of the coconut rhinoceros beetle, *Oryctes rhinoceros* (Coleoptera: Scarabaeidae), in Hawaii

Reported by PestLens on: Thursday, January 16, 2014  
Source: Hawaii Department of Agriculture  
Event: New Location

On December 23, 2013, the coconut rhinoceros beetle, *Oryctes rhinoceros* (Coleoptera: Scarabaeidae), was detected during routine surveys at Joint Base Pearl Harbor-Hickam in Hawaii. Nine adult beetles have been trapped. Surveys are being conducted to determine the extent of the infestation. This is the first report of *O. rhinoceros* in Hawaii.

*Oryctes rhinoceros* is primarily a pest of *Cocos nucifera* (coconut) and other palms, but it has a wide host range, including *Ananas comosus* (pineapple), *Musa* spp. (banana), and *Saccharum officinarum* (sugarcane). Its distribution includes the coconut-growing regions of Asia, the Middle East, Oceania, Mauritius, Réunion, and Guam. *Oryctes rhinoceros* is listed as reportable in the PEST ID database (queried 1/15/14).

Reference(s):

Other articles about this pest:
- Coconut rhinoceros beetle, *Oryctes rhinoceros* (Coleoptera: Scarabaeidae), may have spread to Saipan
- *Wodyetia bifurcata* (foxtail palm) a host of coconut rhinoceros beetle, *Oryctes rhinoceros* (Coleoptera: Scarabaeidae)
- Acoustic detection of coconut rhinoceros beetle, *Oryctes rhinoceros* (Coleoptera: Scarabaeidae)
- Update on coconut rhinoceros beetle, *Oryctes rhinoceros* (Coleoptera: Scarabaeidae), in Guam
- Coconut rhinoceros beetle, *Oryctes rhinoceros*, found in Yigo, Guam
- Control of coconut rhinoceros beetle, *Oryctes rhinoceros*, using *Oryctes* baculovirus
- Coconut rhinoceros beetle, *Oryctes rhinoceros*, outbreak in American Guam
<table>
<thead>
<tr>
<th>Action Group</th>
<th>Action</th>
<th>Details</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative Agricultural Pest Survey</td>
<td>Updated pest fact sheet for CRB</td>
<td>A sub-section entitled “Status of Infestation in Hawaii” was added to the distribution section.</td>
<td>07/02/2014</td>
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<tr>
<td>Deregulation Evaluation of Established pests</td>
<td>No action</td>
<td></td>
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<tr>
<td>Global Pest and Disease Database</td>
<td>Added new distribution record</td>
<td></td>
<td>02/04/2014</td>
</tr>
<tr>
<td>National Identification Services</td>
<td>No action</td>
<td></td>
<td>---</td>
</tr>
<tr>
<td>New Pest Advisory Group</td>
<td>Wrote NPAG report</td>
<td>NPAG first analyzed CRB after it was detected in Guam in 2007. NPAG updated that report in response to the recent detection in Hawaii, among other things incorporating a pathway analysis component.</td>
<td>02/06/2014</td>
</tr>
<tr>
<td>New Pest Response Guidelines</td>
<td>Write NPRG for CRB</td>
<td>A draft document has been prepared and is currently undergoing PERAL-internal review. Subsequently, the document will be reviewed by government external subject-matter experts.</td>
<td>pending</td>
</tr>
<tr>
<td>S&amp;T – not part of specific action group</td>
<td>Technical Working Group provided report to PPQ MT</td>
<td>Report included biology and treatment options</td>
<td>06/09/2014</td>
</tr>
<tr>
<td>S&amp;T – not part of specific action group</td>
<td>Developed Visual Survey Guide</td>
<td>Specifically for delimiting surveys in HI</td>
<td>03/01/2014</td>
</tr>
<tr>
<td>S&amp;T – not part of specific action group</td>
<td>Developed protocol for steam treatment</td>
<td>Both for in-ground and on trailer treatment</td>
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Lessons learned

• Notification component is working well, but for domestic pest events, information could be reported through PestLens earlier.

• Need to create a more comprehensive list of action groups

• Participation of action groups needs to be increased

• Some refinements to PestLens still need to be made

• Proof of concept for a PPQ early-warning system

• Full integration with certain other information systems (GPDD, IPHIS, ARM, etc.) will take us to the next level
Fully-functioning, effective early warning system

Maximally informed decision-making

Organized and systematic response

Efficient use of resources

Increased collaboration in PPQ

Accountability to stakeholders
To receive PestLens weekly email notification:

pestlens@aphis.usda.gov