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CARIBBEAN FOOD CROPS SOCIETY

46

**Forty Sixth
Annual Meeting 2010**

**Boca Chica, Dominican Republic
Vol. XLVI – Number 2
T-STAR Invasive Species Symposium**

PROCEEDINGS
OF THE
46th ANNUAL MEETING

Caribbean Food Crops Society
46th Annual Meeting
July 11-17, 2010

Hotel Oasis Hamaca
Boca Chica, Dominican Republic

“Protected agriculture: a technological option for competitiveness of the Caribbean”

“Agricultura bajo ambiente protegido: una opción tecnológica para la competitividad en el Caribe”

“Agriculture sous ambiance protégée: une option technologique pour la compétitivité de las Caraïbe”

**United States Department of Agriculture,
T-STAR Sponsored Invasive Species Symposium**

**Toward a Collective Safeguarding System for the Greater Caribbean Region:
Assessing Accomplishments since the first Symposium in Grenada (2003)
and Coping with Current Threats to the Region**

**Special Symposium Edition
Edited by
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[A Peer Reviewed Paper]

EXOTIC PEST INFORMATION COLLECTION AND ANALYSIS (EPICA): PLANT HEALTH BIOSURVEILLANCE FOR THE UNITED STATES

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ABSTRACT: Early warning about potential pest threats allows the U.S. government to better protect U.S. agriculture and natural resources from the risks associated with the entry, establishment, or spread of exotic pests. Early warning requires up-to-date information on pest developments worldwide. To a large degree, this information is publicly available on the internet (www); however, time and effort are needed to find relevant information. Exotic Pest Information Collection and Analysis (EPICA) continuously monitors internet and other global information sources and collects, analyzes, communicates, and archives relevant news about exotic plant pests, thus providing a systematic, streamlined, and efficient approach to plant health biosurveillance for the U.S. government. This paper describes EPICA's plant health biosurveillance process.

KEY WORDS: Early warning, safeguarding, exotic pest, plant pest, information

INTRODUCTION

Exotic Pest Information Collection and Analysis (EPICA) is a plant health biosurveillance effort conducted cooperatively by North Carolina State University and the Center for Plant Health Science and Technology (CPHST) of the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ).

“Plant health biosurveillance,” as defined by EPICA, is the systematic monitoring, evaluation, and dissemination of plant pest information, with the objective to increase and maintain awareness of potential pest threats. Among the many information sources monitored by EPICA are: scientific journals, web pages, newspapers, and listservs.

The EPICA staff, currently consisting of three full-time analysts and one part-time analyst, has subject matter expertise in entomology, plant pathology, nematology, weed science, and technical communication. This expertise allows the EPICA staff to competently identify relevant information, carry out supplemental research, and develop reports on major types of plant pests.

EPICA focuses on information pertaining to plant pests of quarantine significance to the United States and on pest events relevant to safeguarding, such as changes in known distribution or host ranges, major pest outbreaks, noteworthy port-of-entry interceptions, new methodologies, etc.

BENEFITS OF BIOSURVEILLANCE

Awareness of potential pest threats allows safeguarding personnel to respond quickly and proactively, increasing safeguarding success while minimizing time and cost requirements. Specifically, information provided through biosurveillance may:

- support rapid response and preparedness efforts
- support pest risk analysis
- keep information in pest databases up-to-date
- identify high-risk targets for port-of-entry inspections
- identify potential pathways of pest movement
- support pest prioritization efforts
- increase awareness of new tools or methodologies with safeguarding applications

Systematic and centralized monitoring for pest events:

- a) reduces the likelihood that important information remains undetected
- b) helps to coordinate the dissemination of this information
- c) allows for continuous process improvement
- d) minimizes resource requirements

EPICA'S BIOSURVEILLANCE PROCESS

EPICA applies a five-step process to conduct biosurveillance. It must be noted that these steps do not always occur consecutively, but often simultaneously. The five steps are:

- 1) **Collect information.** EPICA analysts find potentially relevant information using search techniques described below.
- 2) **Analyze information.** Analysts evaluate the information for overall significance and credibility. Analysis takes place not only as a separate step, but also occurs during the information collection and writing processes.
- 3) **Write reports.** Once the information is determined to be both credible and relevant for PPQ, the analysts write a short pest report about each event, supplementing background information as appropriate.
- 4) **Distribute reports.** After careful review, EPICA distributes the pest reports in a weekly email notification (Figure 1) to U.S. government safeguarding personnel.
- 5) **Archive reports.** All EPICA pest reports are archived electronically in the Global Pest and Disease Database (GPDD) (<http://www.gpdd.info>). The choice to use an already existing database to house the EPICA archive, rather than building a new database, created a mutually beneficial relationship between EPICA and the GPDD, minimizing costs and maximizing benefits to the users. The EPICA archive provides an easy-to-use interface for searching and displaying the pest reports (Figure 2). Because the GPDD contains copyrighted materials, access is restricted primarily to U.S. government employees.

Warning: The following information has not been confirmed with the appropriate national plant protection organization(s). It is provided solely for the purposes of early warning and should be used with caution. Please do not distribute this information indiscriminately.



EPICA
Exotic Pest Information Collection and Analysis

Thursday, July 8, 2010 Notification

First report of the fungus *Pseudocercospora angolensis* (Dothideomycetes: Capnodiales) in Sierra Leone

Source: New Disease Reports
Source Publication Date: 7/1/10
Category: New Location

From 2006 to 2008, *Citrus reticulata* (tangerine) plants in Sierra Leone exhibited circular, brown, resinous, corky fruit lesions with cracked centers. Morphological analysis indicated that the causal agent was the fungus *Pseudocercospora angolensis* (Dothideomycetes: Capnodiales). This is the first report of *P. angolensis* in Sierra Leone.

Pseudocercospora angolensis, formerly named *Phaeoramularia angolensis*, infects *Citrus* spp. (citrus) and is present in several parts of Africa. It is not known to occur in the United States. The synonym *Phaeoramularia angolensis* is listed as reportable in the PEST ID database (queried 7/6/10).

References:

1. Harling, R., I. M. O. Shamie, S. S. Sessay, A. B. Kamara, R. Reeder, E. Boa, and P. Kelly. 2010. First report of *Pseudocercospora angolensis* causing leaf and fruit spot of *Citrus* in Sierra Leone. *New Disease Reports* 22:1. Last accessed July 8, 2010, from <http://www.ndrs.org.uk/article.php?id=022001>.

New scale species, *Stictococcus subterreus* (Hemiptera: Stictococcidae), described from Nigeria

Source: Zootaxa
Source Publication Date: 7/5/10
Category: New Description/Identification

A recent publication describes a new scale species, *Stictococcus subterreus* (Hemiptera: Stictococcidae), from Nigeria. *Stictococcus subterreus* feeds on the roots of *Manihot esculenta* (cassava). Little additional information is available regarding the host range and distribution of *S. subterreus*. The paper also describes the adult females of several other *Stictococcus* spp. in greater detail. The genus *Stictococcus* is listed as reportable in the PEST ID database (queried 7/7/10).

References:

1. Williams, D., J. D. Metcalf, Ezzamel, and D. B. Miller. 2010. A study of some species of the genus *Stictococcus* Coquillett

Figure 1. An excerpt from a weekly EPICA notification.

A typical EPICA notification contains between three and seven pest reports. The title of each pest report mentions the scientific name and taxonomy of the pest. Information source, source publication date, and event category are clearly indicated. Main references are listed and are hyperlinked for easy access.

Global Pest & Disease Database

Home Search Reports Cooperators

EPICA Search

Warning: The following information has not been confirmed with the appropriate national plant protection organization(s). It is provided solely for the purposes of early warning and should be used with caution. Please do not distribute this information indiscriminately.

Please enter in search criteria to search the database for EPICA news articles. Keywords will search article titles, content and references. Note: Hold Ctrl when selecting to Add/Remove specific pests and categories.

Keyword(s)

Source Publication Date Range

Category (Descriptions)

- All Categories
- New Description/Identification
- New Host
- New Location
- Eradication

GPDD Preferred Pest Name

- All Pests
- GYDB (Grapevine Yellows Disease Bacterium)
- HPV (High Plains Virus)
- Abgrallaspis perseae (None)
- Acanthopococcus mariannae (None)
- Aceria litchii (Litchi Gall Mite)
- Achaea catocaloides (None)
- Achatina fulica (Giant African Land Snail)
- Acizzia alternata (None)
- Acizzia solanicola (None)

Display article content in results.

Search Reset

Want to view a specific notification?

- July 8, 2010
- July 1, 2010
- June 24, 2010
- June 17, 2010
- June 10, 2010
- June 3, 2010
- May 27, 2010
- May 20, 2010

View Notification

Global Pest and Disease Database - Version 2.1.0
 Developed by the Center for Integrated Pest Management
 Phone: 919-513-8180 / Email: GPDD

Figure 2. The EPICA search page in the Global Pest and Disease Database (Search criteria available in the EPICA archive include pest name, date range, and news category. A search by keyword is also supported. In addition, complete pest notifications can be viewed by selecting the notification date).

COLLECTING INFORMATION

In order to efficiently and effectively search the vast amount of information on the internet (www), EPICA analysts

- develop appropriate search terms
- set up automated queries
- monitor scientific journals
- subscribe to relevant listservs and e-mail alerts
- identify and monitor relevant web sites

In developing appropriate search terms, the analysts generally use the trial-and-error method to determine which terms will or will not yield useful results. For example, a short search term,

such as “plant pathogen,” may result in useful information, but because it is too broad, it will also result in a much greater—and often unmanageable—amount of irrelevant information. Using Boolean logic to create a more explicit search term will often yield better results and minimize irrelevant information. Boolean logic involves the use of the words “and” and “or” as well as parentheses and quotation marks to combine search terms. For example, the query “new AND plant AND (pathogen OR disease)” would only return documents which contain the phrases “new plant pathogen” or “new plant disease”. Other more specific terms could be added to the query to yield even more precise results.

It is important to note that analysts must also consider alternate, as well as less scientific, terms. For example, an invasive weed may also be referred to as a vine, grass, or plant. The terms “bug” and “fly” are commonly used to describe pests in media targeting a general audience with little or no subject matter expertise.

Once useful search terms are identified, EPICA analysts use the search terms to create automated queries using global search web sites such as <http://www.google.com> and subscription-based sites such as <http://www.lexisnexis.com>. Automated queries continuously run searches and send search results to the analysts by email. At any one time, EPICA runs approximately 200 automated queries, which are continually under evaluation for improvement. EPICA queries are primarily in English, because the vast majority of potentially relevant pest information on the internet (www) can be found in English.

To monitor scientific journals, EPICA analysts use a non-automated process, which involves reading the title, and sometimes the abstract, of each new journal article to ensure that potentially relevant publications are not overlooked. EPICA currently monitors more than 100 scientific journals, and this list is continuously expanding.

EPICA also has subscriptions to national and international listservs which report on and discuss plant health issues. A listserv is an electronic mailing list focused on a specific subject area to which persons with an interest in this subject area can subscribe. For example, the Carib-Agri listserv of the Food and Agriculture Organization of the United Nations (FAO) allows its subscribers to share knowledge and concerns about Caribbean agriculture.

In addition, EPICA subscribes to various email alert services. Email alerts are primarily for one-way information sharing (from the source to the subscriber) and do not typically include discussion among subscribers. Some examples of email alerts EPICA monitors include ProMED-mail, which reports on emerging human, animal, and plant diseases worldwide; Horticulture Week Bulletin, which covers horticulture issues in the United Kingdom; and the European and Mediterranean Plant Protection Organization’s (EPPO) Reporting Service, which provides pest reports for Europe and the Mediterranean Region.

EPICA also monitors numerous websites of relevant content, such as the web site of the International Plant Protection Convention (IPPC); National Plant Protection Organization (NPPO) websites; and pest-specific websites, such as <http://www.tutaabsoluta.com>.

SCOPE

In order to determine the significance and usefulness of information to the EPICA audience, analysts look for information which generally fits into one or more event categories of interest.

To facilitate reading and retrieval, each EPICA pest report clearly indicates which category(-ies) it pertains to. The categories are:

New location. A pest report is assigned to the “New location” category if a pest is reported for the first time in a place where it was not previously known to occur. EPICA generally focuses on new country reports; however, if a pest is of particular quarantine importance, spread within a country may be reported.

New host. A pest report is assigned to the “New host” category if a plant is reported to be a host of a pest not previously known to attack the plant. EPICA focuses on hosts or pests of economic importance to the United States.

Outbreak. EPICA reports on pest outbreaks which are out of the ordinary, such as the largest outbreak in many years, or an outbreak at an unusual time of year.

Interception. EPICA reports on pest interceptions (mainly port-of-entry interceptions) on commodities or with passengers from other countries if they are out of the ordinary. For example, a new location for a pest may be implied if an interception is made from a country where the pest is not presently known to occur.

New description/identification. These are newly described or characterized species (usually plant pathogens) which are known to either be plant pests or to have the potential to be plant pests. EPICA focuses on species affecting or potentially affecting plants of economic importance to the United States.

Eradication. This category contains not only reports on successful eradications, but also on eradication efforts currently underway.

New pest. A new pest is either an already described species not previously known to be a plant pest, or an uncharacterized pest causing economic concern.

Research of interest. This category contains reports on new scientific findings or newly developed methodologies that have potential applications in safeguarding. For example, new methods for pest detection, identification, treatment, or biological control are often listed here.

Other. This category contains pest reports which do not fit into any of the previous categories but are nevertheless of interest to the readers.

As a general rule, EPICA does not report on:

- sensitive or classified information
- information that has already been widely distributed to EPICA readers
- obviously unreliable or false information
- pests for which the species name is not provided in the original source and cannot be determined through research by the EPICA team
- routine pest interceptions; or routine pest outbreaks

CONCLUSIONS

As a result of several years of development and implementation of a successful process, the EPICA staff has come to the following conclusions:

- An effective open-source information monitoring system for plant health biosurveillance can be implemented with relatively few resources.
- Solid subject matter expertise and familiarity with the safeguarding environment are the key elements of effective plant health biosurveillance. The specific process applied, while important, is less critical. Technology, while useful, cannot replace skilled analysts.
- Access to the internet and to scientific journals is extremely important in conducting plant health biosurveillance.
- A biosurveillance team must continuously explore new information sources and media.
- Performing internet (www) searches in English yields the best results. The majority of all information on the internet (www) is in English, and most scientific papers are either completely written in English or at least provide an English abstract. Adding searches in other languages may improve results, but the cost-benefit ratio should be considered carefully, depending on specific needs and available resources.
- Ideally, open-source information monitoring would be only one component of a comprehensive plant health biosurveillance system and would be seamlessly integrated into the decision-making process. Any resulting safeguarding action would be documented, and the success of this action would be measured and recorded to inform future decisions.

EPICA's process for conducting plant health biosurveillance may serve as a starting point for organizations and governments in the Caribbean Region wishing to create their own plant health biosurveillance systems. Sharing a regional biosurveillance team may be a cost-effective option for all countries with an interest in safeguarding the Caribbean Region against the entry of exotic plant pests. Although the focus of interest may differ somewhat between countries, the potential benefits of serving shared interests may justify a regional system.

The Caribbean Region, including the United States, may benefit from exploring how such a collaborative effort could be developed, adapted to the needs of the participating countries, and implemented for the protection of plant health in the Caribbean Region.