

Nation, from having its stone-fruit exports quarantined. CAPS-generated information saved the stone-fruit industry millions of dollars in potentially lost exports.



Hand-held global positioning devices and bar-coding technologies are used to track the exact coordinates of every field that is sampled for exotic pests, diseases, or weeds. The data are then used to create survey maps detailing the distribution of each. (APHIS photo by Ann Czapiewski.)

Expanding Plant-Pest Preparedness and Response Capability

With the enormous range of foreign and domestic pests that could wreak havoc on native plant species and agricultural industries, protecting U.S. agriculture and plant resources is an almost overwhelming job. Sharing that burden across government and private-sector organizations makes the job doable. CAPS continually strives to broaden its network of partners and improve its information sharing with cooperators. By partnering and by engaging nontraditional survey partners, CAPS can expand its mission to address unintentional and intentional plant-pest introductions.

APHIS' Plant Protection and Quarantine (PPQ) officials partner with Federal and State agencies, industries, and professional organizations to develop and maintain effective emergency response systems to detect, respond to, and eliminate outbreaks of invasive pests and diseases. PPQ and State CAPS cooperators, who

meticulously gather plant pest data, are important links in safeguarding U.S. agriculture and natural resources from accidental or intentional introductions of exotic plant pests. CAPS survey and monitoring programs are essential for understanding the scope of exotic pests in the United States today. As this country continues to expand its export markets around the world and increases the variety of agricultural commodities it imports, PPQ and the CAPS program will be at the forefront of shaping the rules and regulations for safeguarding U.S. agriculture in the 21st century.



Protecting U.S. agriculture through the early detection of foreign pests requires the cooperation and coordination of USDA, State governments, and industry. Helping to ensure effective and efficient coordination between these entities, CAPS provides the infrastructure and funding to collect, manage, and share pest survey data. (ARS photo by Scott Bauer.)

For More Information

For more information about PPQ pest detection, please visit:

<http://www.aphis.usda.gov/ppq/ep/pestdetection> on the Web.

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Cover photo: Early detection of foreign plant pests and weeds minimizes agricultural production costs and results in an abundant and affordable supply of food and plant products for domestic and export markets. (The apple orchard image was taken by USDA Agricultural Research Service [ARS] photographer Scott Bauer. The picture of the false codling moth, which came from <<http://www.forestryimages.org>>, was taken by the Tertia Grové Institute for Tropical and Subtropical Crops.)

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The Cooperative Agricultural Pest Survey

Detecting Plant Pests and Weeds Nationwide



In today's era of globalization, the risk of foreign plant pest introductions is increasing.

Some of these plant pests leave almost immediate evidence of their presence—signs of disease or weed growth—and spread rapidly. Other pests, however, can go undetected for months or even years in the absence of vigilant surveillance.

Without early detection, plant pests can become established in the United States and permanently damage agricultural resources and the environment.

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) estimates that introduced plant pests result in an annual \$41 billion loss to American agriculture and cost taxpayers millions more dollars in control expenditures. Early detection of pests minimizes agricultural production costs, enhances product quality and marketability, and results in an abundant and affordable supply of food, fiber, plants, and plant products for domestic and export markets.

Recognizing that early pest detection can lessen such expenditures, the Federal Government established a nationwide system of experts to track plant pests of concern. The Cooperative Agricultural Pest Survey (CAPS), as its name suggests, is a pest-surveillance program managed cooperatively by USDA-APHIS and State departments of agriculture. Universities, industry groups, and natural resource protection organizations are also partners in the program.

Early Detection of Foreign Plant Pests

The primary function of CAPS is to survey, identify, and monitor pests of concern to U.S. agriculture and plant resources. Located in all 50 States and 3 territories, CAPS program personnel track more than 400 pests nationwide.



Scientists speculate that the ALB arrived in the United States via infested wooden pallets from Asia. The insect has the potential to destroy millions of acres of America's treasured forests and park and backyard trees if it becomes established here. Experts believe that the ALB was introduced into the country more than 10 years before the first infestation was found in New York in 1996. (APHIS photo by R. Anson Eaglin.)

Between 1985 and 2002, APHIS intercepted more than 7,400 different species of plant pests at U.S. ports-of-entry. Many of these pests could have become established if they had been allowed to enter the country.

As the rate of interceptions continues to climb, so do the high costs of eradicating foreign pests, such as the Asian longhorned beetle (ALB), the emerald ash borer, and citrus canker. The ALB outbreak in Illinois, New Jersey, and New York dramatically illustrates the need for early detection of foreign pests. Between 1996 and 2004, \$194 million was spent on controlling the ALB by removing infested or potentially infested trees.

But the ALB is just one pest of concern. CAPS cooperators survey for many others. To prioritize survey and response efforts, CAPS maintains a comprehensive list of target species that are potential threats to the Nation's agricultural and environmental resources. Originally a short and simple list of pest names, it has now grown to about 400 species, ranked according to their potential environmental and economic impacts.

This list includes both pests of limited distribution in the United States and pests not yet found in the country. By including foreign pests, the list

has become a proactive management tool used to prepare for plant health emergencies and strengthen offshore pest-exclusion programs.

Asian soybean rust (*Phakopsora pachyrhizi*), a fungal disease naturally introduced into the Southeastern United States in the fall of 2004, offers a good example of how the target list can be used proactively. When the disease was first detected in northern Brazil in 2002, APHIS immediately began work on emergency-preparedness and response guidelines for its inevitable spread to U.S. soybean production areas by windborne spores. Therefore, when the disease arrived in the country, U.S. farmers and agricultural authorities were prepared to deal with it.

Management of a National Plant Pest Database and Survey Tools

The National Agricultural Pest Information System (NAPIS), which has a Web-based interface, collects data to help plant health officials make policy and management decisions in the event of pest incursions, evaluate market-access bids for U.S. exports, and justify quarantine measures to exclude potentially harmful foreign organisms.

Utilizing data-collection devices, such as personal digital assistants and global positioning system units, CAPS pest surveyors collect climatology, environmental, and pest-specific information in a State database. Software such as the Integrated Survey Information System then integrates the survey information into the national database, which currently maintains records on more than 4,800 different pests and 1.4 million individual records on insects, fungi, weeds, mollusks, and biological control organisms.

In addition to managing national pest-distribution data, CAPS is at the forefront of developing state-of-the-art survey and predictive modeling tools. The North Carolina State University/APHIS Plant Pest Forecast System (NAPPFAS), an Internet-based modeling tool, utilizes weather,

soil, and climate information to predict when and where a particular pest might establish itself in the United States. CAPS sponsored the development of NAPPFAS in 2002 and has since used it extensively to guide survey efforts for plant diseases such as soybean rust.



Since the discovery of plum pox—a nonnative viral disease of stone fruit—in 1999, CAPS surveyors have sampled more than a million trees and pieces of fruit looking for the virus. Intensive surveys were conducted in Maryland, Michigan, New Jersey, New York, South Carolina, California, and Pennsylvania, but the disease has been found in only four Pennsylvania counties. (APHIS photo by R. Anson Eaglin.)

Supporting Exports of U.S. Agricultural Commodities

Aimed at increasing the free flow of trade and eliminating the potential for countries to use pests as artificial barriers to trade, CAPS survey data support the development and expansion of export markets by identifying pest-free regions. The establishment of pest-free regions allows the continued export of commodities from a particular area within a country if it can demonstrate that the area has been historically free of a particular pest, even if the pest is established in surrounding areas.

Such an event occurred when Pennsylvania officials discovered an outbreak of plum pox virus—a destructive disease of stone fruits—in October 1999. CAPS program data proved that the disease was isolated to four Pennsylvania counties and kept the entire State, and perhaps the entire