



Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Plant Protection and Quarantine: Helping U.S. Agriculture Thrive— Across the Country and Around the World



Fiscal Year
2020

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Helping U.S. Agriculture Thrive—
Across the Country and Around the World**

2020

At-a-Glance

In fiscal year (FY) 2020, PPQ kept potentially damaging plant pests out of the country.

Inspected and pre-cleared **5 billion** pounds of fresh fruits and vegetables and more than **1 billion** plants and bulbs from **23** countries before they shipped to the United States

Certified 25 overseas treatment and production facilities in **12** countries that ship high-demand, large-volume commodities to the United States. Twenty-one of these facilities shipped over **1 billion** plant cuttings to the United States, providing high-quality, pest-free inputs for American nurseries and garden centers

Launched the Offshore Greenhouse Certification Program, giving U.S. producers a faster, more reliable supply chain of healthy plants while protecting our country from harmful pests

Cleared 179,522 shipments containing over **1.8 billion** plant units and nearly **797 tons** of seeds, intercepting **6,786** quarantine pests at plant inspection stations

Intercepted 56,653 pests found during U.S. Customs and Border Protection inspections of **25,315** ships and more than **1.4 million** cargo, mail, and express carrier shipments; took quick action to prevent those of concern from entering the United States

Issued 58,788 emergency action notifications and monitored more than **42,000** treatments to reduce pest risks on incoming cargo

Oversaw the processing and identification of more than **128,000** intercepted pests, with approximately **60,000** being quarantine significant

Continued to implement risk-based sampling at U.S. ports of entry to focus inspections on higher risk shipments, reducing inspection times on the southern border for **8** commodities by **67** percent and expediting low-risk imports by **77** percent

Inspected nearly **5.7 million** passengers' bags in Hawaii and Puerto Rico before they left for the U.S. mainland, intercepting approximately **134,000** prohibited agricultural products and **900** quarantine pests

Conducted 40,824 inspections of agricultural commodities before they left Hawaii and Puerto Rico for the U.S. mainland; conducted **6,450** treatments to mitigate pest risks

Issued more than **30,000** import permits and regulatory guidance letters for plants and plant products and responded to over **9,800** inquiries about imports and plant health permits

Cleared through post-entry quarantine **1,176** normally prohibited high-risk cultivars and germplasm from **14** different plant genera, making safe new plant varieties available to U.S. importers and producers

Seized 255,610 pounds of prohibited agricultural items valued at over **\$1.7 million** through product recalls, from retail stores and internet sales, and during express courier package inspections, helping to protect U.S. crops and livestock from potentially devastating and costly plant pests and foreign animal diseases

We fought back against the spread of invasive plant pests that threatened our Nation's crops and forests.

Eradicated *Ralstonia solanacearum* race 3 biovar 2—a disease that can significantly harm U.S. agriculture—from more than **650** U.S. commercial greenhouses in **44** States, just **2** months after it was detected

Eradicated 8 of 9 exotic fruit fly outbreaks in the United States that started in FY 2019 and 2020

Worked with State, industry, and Mexican government partners to reduce boll weevil populations by **12.4** percent in the Lower Rio Grande Valley, despite weather and other challenges that impacted the program

Conducted 253 plant pest surveys with cooperators in **50** States and **3** territories

Funded 7 new projects that aim to develop effective strategies for keeping citrus groves productive in areas affected by citrus greening (Huanglongbing) disease

Responded to outbreaks of grasshoppers and Mormon crickets in **5** Western States to protect more than **930,000** acres of rangeland forage and wildlife habitat

Coordinated with our State partners to address **54** domestic pest detections in the United States

Allocated \$63 million to support **357** projects in **49** States and **3** territories to prevent the introduction or spread of invasive plant pests and diseases, including rapid response funding for plant pest and disease emergencies

Provided \$7.5 million to support **29** clean plant centers in **16** States and territories that diagnose, clean, and distribute disease-free stock of fruit trees, grapes, hops, berries, citrus, sweet potatoes, and roses to growers

Reared and released more than **585,000** stingless wasps to help control emerald ash borer beetle populations and protect U.S. ash trees in **30** States and the District of Columbia

Responded to the detection of Asian longhorned beetle in South Carolina and began tree removals in pursuit of eradication with the support of the local community

Reared, transported, and released about **108 million** sterile navel orangeworm moths in calendar year 2020 to help suppress wild populations of this serious tree nut pest and protect California almond, pistachio, and walnut production

We helped U.S. agriculture thrive in the global marketplace.

Finalized the plant health requirements and protocols for the U.S.–China Phase One Economic and Trade Agreement, helping to secure market access worth almost **\$1 billion** annually for U.S. commodities

Provided critical support—such as inspecting and certifying shipments, conducting technical negotiations, and providing online trade tools—for the export of U.S. plants and plant products valued at nearly **\$112.5 billion** in calendar year 2020

Issued 658,079 Federal phytosanitary (plant health) certificates directly or through authorized State and county cooperators to aid the export of U.S. plants and plant products to **206** international destinations

Completed 270 risk analyses associated with imports, exports, invasive pest threats, and program requirements to support safe trade and protect American agriculture

Positioned more than **50** U.S. experts on international working groups to advance key standard-setting initiatives on seeds, plants for planting, accreditation, and forestry, among other important issues

Achieved electronic exchange of export phytosanitary certifications (ePhytos) with **46** countries—a **400**-percent increase from FY 2019—helping to facilitate fast, safe, and fraud-resistant trade

Processed 900,000 Lacey Act declarations, helping to combat illegal trade of protected plant species



Message From the Deputy Administrator



As I think back to the start of fiscal year 2020, I remember how we were excitedly preparing to participate in the first-ever International Year of Plant Health. This global initiative, led by the United Nations, would inspire people across all sectors of society to take concrete action and protect the world's plant resources against invasive pests.

Although we have worked diligently to advance the International Year of Plant Health nationally, for most, 2020 will live in infamy for bringing us the COVID-19 pandemic and all its consequences. That's certainly true for us in PPQ. The pandemic changed our daily routines and challenged us to evolve our thinking about how we can and should accomplish our plant health protection work. But it also revealed how deeply our commitment to public service runs—a commitment that spawned innovation to overcome every obstacle.

Despite the unprecedented pandemic, PPQ continued to safeguard agriculture and facilitate safe trade without interruption. We deployed more than 1,000 employees to the field daily to combat exotic fruit flies, spotted lanternflies, grasshoppers and Mormon crickets, and other pests that threaten our Nation's crops and forests. We eradicated *Ralstonia solanacearum* race 3 biovar 2—a dangerous plant pathogen that we hadn't seen in this country in almost two decades. And we investigated mysterious seed packages delivered to tens of thousands of households across the United States.

Our work continued overseas. More than 200 PPQ inspectors in 23 countries performed the essential task of inspecting fresh fruits, vegetables, and plant material destined for the U.S. market, ensuring that these commodities were free from pests and delivered to American consumers without delay. In some instances, COVID-19 prevented our ability to travel to other countries. By working with our colleagues in

our agency's International Services (IS) program, we kept key markets open even during the worst of the pandemic. For example, IS' staff in Vietnam provided interim program coverage for 5 months, allowing a \$20 million market for fresh tropical fruit to remain open. On top of this, PPQ worked tirelessly to implement the U.S.-China Phase One Economic and Trade Agreement and finalize the plant health requirements for opening China's markets to U.S. plant products worth nearly \$1 billion annually.

You can read about these and many other achievements in the pages of this report.

The lessons we've learned and the insights we've gained this year will shape our operations and inform our policies for years to come. As we look to the future, I want us all to move forward knowing that no matter what comes our way, we will rise to the occasion and help U.S. agriculture thrive—across the country and around the world.

Sincerely,

A handwritten signature in blue ink, appearing to read "Osama El-Lissy".

Dr. Osama El-Lissy
Deputy Administrator
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture

We safeguard U.S. agriculture and natural resources against the entry, establishment, and spread of economically and environmentally significant pests and facilitate the safe trade of agricultural products.

Table of Contents

3 Strengthening
Pest Exclusion



23 Making
Agricultural
Trade Safe
and Supporting
U.S. Exports



9 Optimizing Pest
Management and
Eradication



29 Recognizing
PPQ's Employees





Strengthening Pest Exclusion

To protect American farms and forests from harmful plant pests and foreign animal diseases, PPQ has created a system of safeguards that begins overseas in other countries, continues through U.S. ports of entry, and extends across the Nation. It's called the Safeguarding Continuum. All along the continuum, PPQ experts assess risks associated with pests that hitchhike on and in the agricultural products we import and take action to protect U.S. agriculture and natural resources while keeping international trade and travel moving.

Taking the Fight Offshore

One of the most effective ways to ensure the safe movement of commodities and other products into the United States is to address pest threats where they originate. When we take action to prevent or deal with pests in imported goods before they reach our shores, we significantly increase our ability to protect the health and marketability of our Nation's agricultural and natural resources.

Preclearing Commodity and Military Shipments

In FY 2020, our commodity preclearance program spanned 23 countries and covered 68 different types of commodities. Through this program, we inspected and pre-cleared 5 billion pounds of fresh fruits and vegetables and more than 1 billion plants and bulbs, providing billions of dollars' worth of food to American tables during the COVID-19 pandemic. This work not only ensures the safety of imported commodities but also benefits importers whose inspected, precleared, and certified products may pass through U.S. ports of entry without delay.

To help the U.S. military prevent the spread of foreign animal diseases and plant pests, we worked with the U.S. Department of Defense to inspect military equipment, cargo, vehicles, and household goods returning stateside. This included inspecting 39,216 shipments of personal goods (including household goods, unaccompanied baggage, and vehicles), and more than 1.2 million pieces of cargo in FY 2020 before they returned from 18 countries in Europe and Africa. We facilitated military readiness by speeding the safe entry of these items into the United States.

Facilitating Safe Trade and Travel Between Hawaii, Puerto Rico, and the U.S. Mainland

Hawaii and Puerto Rico, while part of the United States, have plant pests that are not established on the U.S. mainland. These pests, including certain fruit flies, scale insects, beetles, and mealybugs, are a threat to mainland agriculture. To prevent their spread, PPQ inspected more than 5.7 million passengers' bags before they left Hawaii and Puerto Rico in FY 2020, intercepting approximately 134,000 prohibited agricultural products and 900 quarantine pests. We also conducted 40,824 inspections and 6,450 treatments of agricultural commodities that shipped from Hawaii and Puerto Rico to the mainland. This work safeguarded mainland agriculture while facilitating interstate trade and travel.

Expanding Offshore Certification

This year, PPQ certified 25 overseas treatment and production facilities in 12 countries that ship high-demand, large-volume commodities to the United States, such as orchids, geraniums, *Dracaena*, and niger seed, a common ingredient in bird seed.



PPQ worked with the U.S. Department of Defense to inspect military equipment, cargo, vehicles, and household goods returning stateside, including 39,216 shipments of personal goods and more than 1.2 million pieces of cargo.

These certifications verified that the facilities and their operations met our standards and regulatory requirements, helping to protect U.S. plant health from harmful invasive pests and serious plant diseases.

We also launched the Offshore Greenhouse Certification Program in FY 2020. Nearly half of all plants sold in U.S. retail stores start from cuttings produced offshore, and every year the United States imports more than 1 billion of them. By channeling a significant portion of these cuttings through our new certification program, we will drive down pest and disease risks, making the cuttings safer overall, while expediting clearance of this highly perishable commodity at U.S. ports of entry. Ten offshore facilities in six countries are participating in the program during the 2020-2021 season.

Zeroing In on Higher Risk Shipments at U.S. Ports of Entry

PPQ continually evaluates, tests, and applies cutting-edge technologies that allow us and our U.S. Customs and Border Protection (CBP) partners to more effectively detect and address plant pests and diseases arriving in foreign shipments and passenger bags. We are also refining our ability to use the pest interception data we collect during port-of-entry inspections to better predict and reduce pest threats approaching our shores. Together, these advances are strengthening our ability to exclude pests, focus resources on the highest risks, and safeguard our Nation's agricultural security, all at the speed of commerce.

Risk-Based Sampling

In September 2018, PPQ and CBP began developing and implementing risk-based sampling (RBS), a data-driven way to sample imported commodities for inspection at U.S. ports of entry. Commodities with demonstrably lower pest interceptions are eligible for reduced inspection rates, which means they can move more efficiently through ports and into consumer markets. This in turn provides an incentive for traders to avoid shipping infested or non-compliant commodities. In FY 2020, the use of RBS was expanded to include 14 new maritime ports of entry and 2 new commodities. RBS is currently being used for select commodities at major land border ports in Texas, Arizona, and California, and at maritime ports on the Atlantic, Gulf, and Pacific. As a result of RBS, CBP reduced the total time necessary to clear agricultural cargo in RBS pathways by an average of 67 percent, expediting the clearance of millions of pounds of commodities for U.S. consumers.

Pest Identification

When inspectors detect pests in cargo, PPQ's identification programs must put a name to them to determine how to regulate the shipment. Our identifiers determine (1) whether the pests are "quarantine significant" under our regulations, which means they could pose a threat to U.S. plant health; (2) whether the cargo can be allowed to enter the United States; and (3) which, if any, mitigation measures are required. In FY 2020, our National Identification Services oversaw the processing and identification of more than 128,000 pests; about 60,000 were quarantine significant. During the second half of FY 2020, PPQ increased its use of digital imaging technology to identify pests, in part to protect staff health by reducing the number of people present in our pest identification laboratories during the COVID-19 pandemic. We will continue to expand our use of this technology to identify pests faster when cargo is on hold pending an urgent identification.

PPQ and CBP also continued the Cargo Release Authority program to reduce the pests that CBP must submit to PPQ for identification, speeding the inspection process for shipments with no quarantine pests. Through the program, PPQ provides training and job aids that allow CBP agriculture specialists to recognize frequently intercepted, easily identifiable, low-risk organisms and release the cargo if the organism is not a quarantine significant pest.



In FY 2020, PPQ's National Identification Services oversaw the processing and identification of more than 128,000 pests. About 60,000 were quarantine significant.



PPQ has found no evidence that anyone intentionally tried to harm U.S. agriculture with tens of thousands of deliveries of unsolicited seed packages in 2020.

Safeguarding Beyond the Border

PPQ officers scour markets and retail stores across the country and monitor internet sales to detect prohibited products that have evaded safeguarding measures or entered the United States illegally. Our goal: Intercept items that could harbor invasive plant pests or foreign animal diseases before they can harm our Nation's crops, livestock, or forests.

In FY 2020, PPQ seized 182,569 pounds of prohibited plants, plant products, meats, and meat products valued at over \$1.2 million from retail stores, internet sales, and express courier packages. We also conducted 14 national recalls of illegally imported agricultural products, including wood handicrafts with bark that could introduce wood-boring beetles and holiday ornaments made of Federal noxious weed seeds.

Unsolicited Seeds

This year, PPQ investigated unsolicited seed packages delivered to tens of thousands of households across the United States. The incident captured media attention and underscored our growing concerns about pests coming into the country through new, unknown, or non-traditional pathways. For years, PPQ's Smuggling Interdiction and Trade Compliance unit has worked with e-commerce companies to find and remove listings of prohibited agricultural products, including seeds, from their sites. But as illegal seed mailings flooded the country in the summer of 2020, it was clear we needed a more aggressive and holistic solution. We engaged e-commerce companies to discuss what they could do to improve sellers' compliance with U.S. import regulations. Following weeks of talks, one of the largest U.S.-based e-commerce companies issued a new policy indicating it would no longer allow sellers outside the country to sell seeds and plants on its

site. We expect that this kind of policy change, and the changes other companies are making, could help to significantly reduce the volume of illegal seeds and plants entering the United States and close a critical pathway for invasive pests that threaten our Nation's food security, economy, and natural environment.

PPQ has found no evidence that anyone was intentionally trying to harm U.S. agriculture with these shipments. In fact, there was no correlation between where the seeds were sent and critical U.S. agriculture infrastructure. APHIS officials believe the unsolicited packages were part of an internet "brushing scam." Sellers carrying out brushing scams will often ship inexpensive items to increase transactions. The more transactions sellers complete, the higher their rating and the more likely that their items will appear at the top of search results on an e-commerce site.

Case Study:

Facilitating the Safe Trade of Plant Cuttings

When importing propagative materials such as live plants and cuttings, every minute counts. Any delay at the port of entry could significantly impact their quality and cause significant economic loss to the nursery industry.

For the last 3 years, PPQ has worked with the U.S. nursery industry to design, test, and now implement the Offshore Greenhouse Certification Program, which is designed to minimize pest risks in live plant cuttings and expedite their clearance at U.S. ports of entry. The program will help speed U.S. producers' access to the diverse varieties of healthy plants they need to be competitive in the global marketplace, while protecting our country against the entry of harmful plant pests.

From Inspection to Certification

Like most countries, the United States has for decades relied on inspections and treatments at ports of entry to keep harmful plant pests and diseases out of this country. But these are not necessarily the most efficient or effective tools for the job—it's simply not possible to inspect every shipment and find every pest or disease.

Over time, PPQ has been shifting away from port-of-entry inspections and treatments as a primary means of preventing pest entry to a more proactive approach. We apply integrated measures—or systems approaches—in the country of origin before the product is exported to the United States. Systems approaches use two or more specific measures, at least two of which operate independently, at critical points in the production process to reduce pest risks. These measures can include pest surveys, treatments,



Cuttings produced and exported under the Offshore Greenhouse Certification Program may receive fewer or less frequent inspections at U.S. plant inspection stations, allowing our inspectors to focus on higher risk shipments.

packaging or handling requirements, or certain sanitation steps, among others. They cumulatively achieve the appropriate level of protection against regulated pests.

Making Cuttings Safer

A systems approach is at the heart of the Offshore Greenhouse Certification Program. The approach includes minimum requirements for greenhouse construction, security, production and sanitation, pest management, training, and recordkeeping. Facilities that are accepted into the program must agree to produce generally admissible unrooted plant cuttings

under the systems approach. In doing so, they will effectively mitigate most pest and disease risks before the product ever leaves the exporting country. "Our goal is to channel a significant portion of generally admissible plant cuttings into this certification program," said Karelyn Cruz, an offshore certification specialist with PPQ's Precognance and Offshore Programs. "In doing so, we will drive down pest and disease risks associated with unrooted cuttings, making them safer overall."



The United States imports more than 1 billion plant cuttings annually. Nearly half of all plants sold in U.S. retail stores start from cuttings produced offshore.

Speeding Up Port-of-Entry Clearance

The Offshore Greenhouse Certification Program will also help address peak season challenges at U.S. ports of entry. As cuttings arrive in the United States, they are transferred to one of PPQ's 16 plant inspection stations, where experts examine them to ensure they meet U.S. import requirements and are free of pests and diseases. With the volume of plant cutting imports exceeding 1 billion per year, workload and staffing limitations can cause inspection delays.



Facilities participating in the Offshore Greenhouse Certification Program will produce generally admissible plant cuttings under a systems approach to reduce pest risks.

However, shipments produced and exported under the Offshore Greenhouse Certification Program will qualify for fewer or less frequent inspections at U.S. plant inspection stations, helping to expedite clearance and entry. This is especially important when the volume of arriving shipments peaks in late winter and early spring.

"The program creates a powerful incentive for offshore growers to produce a clean, pest-free product," said Cruz. "It's a triple win. U.S. industries are protected against damaging pests and diseases, importers can avoid costly delays at ports of entry, and PPQ inspectors can spend less time looking at low-risk shipments and more time focusing on those that present a greater threat. We are excited to bring this program online. It is a great example of how PPQ and industry can develop solutions that provide mutual benefit."



Optimizing Pest Management and Eradication

When foreign pests capable of harming our Nation's forests, damaging U.S. crops, or disrupting trade become established in the United States, PPQ works closely with Federal, State, Tribal, and industry partners to control and, when possible, eliminate them from our country. Together, we leverage our collective resources and make wise use of one another's unique capacities to protect America's agricultural and natural resources—and the livelihoods of everyone who depends on those resources.

On the Cutting Edge of Plant Health Protection

PPQ uses the best available science and technologies to develop more effective tools for detecting, identifying, managing, and, eradicating invasive pests. These

advances keep PPQ and its partners on the cutting edge in the fight against harmful plant pests and diseases.

Expanding the Use of Canines and Unmanned Aircraft

For years, PPQ has trained detector dogs and their handlers to inspect international cargo, passenger bags, and mail parcels. These teams help find prohibited agricultural products that could carry foreign plant pests or animal diseases, such as African swine fever, into our country. With their keen sense of smell, PPQ-trained canines have an accuracy rate higher than 85 percent. In FY 2020, we placed nine new canine teams at U.S. ports of entry. We also supported 12 canine teams in California and 4 in Florida to detect prohibited agricultural products in express courier and mail packages.

Additionally, we have been training canine teams to detect in the environment a wide range of plant pests and diseases, such as coconut rhinoceros beetles, Asian citrus psyllids (ACP), giant African snails (GAS), hornail snails, and Mexican fruit flies (Mexfly). Following successful trials, we deployed the Mexfly-detecting canine team in the field this year. We also successfully cross-trained two canine teams in Florida to detect GAS and hornail snails. We continued to evaluate whether canines can detect spotted lanternfly (SLF) egg masses.

In addition to training canines, we have been exploring how we could use unmanned aircraft systems to support a range of operational needs. In FY 2020, we advanced the use of unmanned aircraft for applying liquid insecticides and baits for fruit flies, grasshoppers, and imported fire ants, as well

as releasing sterile insects to support pest eradication programs and imported fire ant management. We also continued investigating the use of unmanned aircraft equipped with digital cameras as an additional survey tool. If successful, we could use these systems to examine trees too risky to climb or in areas difficult to access, improving safety for program personnel and lowering survey costs.

Turning Innovation Into Action

The Agricultural Act of 2014 authorized permanent annual funding for two critical safeguarding programs: The National Clean Plant Network and the Plant Pest and Disease Management and Disaster Prevention Program. PPQ is charged with allocating this funding to strengthen the Nation's infrastructure for pest detection and surveillance, identification, and threat mitigation, while working to safeguard the nursery production system. In FY 2020, PPQ allocated \$63 million to support 357 projects in 49 States and 3 territories to prevent the introduction or spread of invasive plant pests and diseases. We distributed \$7.5 million to support 29 clean plant centers in 16 States and territories that diagnose, clean, and distribute disease-free stocks of fruit trees, grapes, hops, berries, citrus, sweet potatoes, and roses to growers.

Projects funded in FY 2020 supported:

- Evaluation of tangible landscape technology that allows users to forecast pest and pathogen spread
- Distribution of over 851,000 plant pest traps and lures to 50 States and 4 territories
- Surveys in all 50 States and 1 territory targeting 338 different pests—including those affecting apples,



PPQ trains canine teams to detect a wide range of plant pests and diseases, such as coconut rhinoceros beetles, Asian citrus psyllids, giant African snails, hornail snails, and Mexican fruit flies.

grapes, stone fruits, palms, solanaceous, small fruits and berries, and other orchard crops—as well as Asian defoliators, exotic woodborers, bark beetles and other forest pests, cyst nematodes, and mollusks

- Various certification programs, including the National Ornamentals Research Site at Dominican University of California, the development of a Tribal nursery certification program, and an update of New York’s apple tree nursery stock certification program to harmonize requirements with surrounding States’ certification programs
- Agriculture detector dog teams in California, Florida, and Guam to enhance package inspections

- Agriculture detector dog teams in Texas to detect Mexfly, in Hawaii to detect CRB, in Pennsylvania to detect SLF, in Florida to detect mollusks, and in California to detect ACP
- Development of new methods or treatments for economically significant pests, including SLF, khapra beetles, wood-boring and bark beetles, and CRB, among others
- Eradication of two Mexfly outbreaks in Texas, as well as efforts to eradicate two Asian gypsy moth outbreaks in Washington State and one in Oregon
- Grasshopper treatments in Montana, Wyoming, and Arizona
- Eradication of *Ralstonia solanacearum* race 3 biovar 2 from commercial greenhouses
- Initiatives to protect honey bees, bumblebees, and other important pollinators from harmful pests

Maximizing PPQ and Partner Actions To Deliver Results

Strategic partnerships are a critical part of PPQ’s pest management and eradication success. We work with numerous groups to fight back against invasive plant pests. These groups include grower and industry associations, State and local officials, academia, other Federal agencies, Tribal nations, and foreign governments.

Our most important domestic partner is the National Plant Board (NPB), an organization of plant regulatory officials from State departments of agriculture. Not only do we work together to effectively address plant pests and diseases that may threaten U.S. production and disrupt U.S. access to valuable export markets, but we also collaborate to determine when, where, and how we take action to yield the greatest results. In FY

2020, we consulted with NPB members on the change in quarantine status of 18 domestic pests. Their input allowed us to make better regulatory decisions.

Eradicating Cotton Pests

For decades, PPQ has worked with growers, the cotton industry, affected States, and Mexico to eradicate two of the most destructive cotton pests—pink bollworm and boll weevil—from all U.S. commercial cotton-producing areas. In 2018, thanks to rigorous control and regulatory activities carried out by PPQ and sister USDA agencies, State departments of agriculture, the U.S. cotton industry, and growers, pink bollworm was eliminated from all cotton-producing areas in the continental United States. As a result of our coordinated efforts, PPQ and its cooperators have eliminated boll weevil from 99 percent of the United States’ 12.2 million cotton acres. The Lower Rio Grande Valley is the last zone within the United States where boll weevil persists. We continue to work with the Mexican and U.S. cotton industries to eradicate boll weevil from Tamaulipas, Mexico, a source of constant pest pressure along the U.S.-Mexico border. This effort includes providing funding and technical assistance through the North American Plant Protection Organization to support boll weevil treatments in northern Mexico.

In FY 2020, the boll weevil program faced several challenges. In July, Hurricane Hanna made landfall in the Lower Rio Grande Valley, obstructing access to traps, dispersing cotton seed and insects, and delaying aerial treatments. In addition, early-season equipment failures in Tamaulipas limited ground treatment. As a result, boll weevil numbers in the valley spiked in late summer. Fortunately, the program overcame these issues and ended the season with a 12.4-percent decrease in boll weevil



In FY 2020, PPQ allocated \$63 million to support 357 projects in 49 States and 3 territories to prevent the introduction or spread of invasive plant pests and diseases.



PPQ's cooperative boll weevil program ended the season with a 12.4-percent decrease in boll weevil captures compared to FY 2019.

captures compared to FY 2019. Although captures in Tamaulipas were four times higher than during the previous year, cooperators were able to treat nearly 450,000 acres compared to approximately 372,000 acres in FY 2019.

Protecting Field Crops and Rangeland

PPQ cooperates with Federal, State, Tribal, and local agencies to protect U.S. field crops and rangelands from harmful pests, including grasshoppers and Mormon crickets, imported fire ant, Karnal bunt, and witchweed. This work helps protect important natural and agricultural resources that rural communities depend on for income.

Grasshoppers and Mormon Crickets: Each year, PPQ tracks and monitors grasshopper and Mormon cricket populations on rangeland in 17 Western States. If left uncontrolled, detrimental grasshopper species and Mormon crickets could devastate

crops such as alfalfa, wheat, barley, and corn. They could also significantly reduce rangeland forage, an important animal food supply, causing significant economic losses for U.S. livestock producers. By providing information and advice to land managers and conducting control treatments where needed, the program safeguards 661 million acres of rangeland and resources valued at nearly \$8.7 billion annually.

In FY 2020, grasshopper and Mormon cricket populations reached outbreak levels in some areas due to favorable weather conditions for hatching and survival. As a result, treatment needs were about four times higher in FY 2020 than in recent years. In total, the program treated 486,161 acres of rangeland in five States (Arizona, Idaho, Montana, Nevada, and Wyoming), which directly protected rangeland forage and wildlife habitat on approximately 932,000 acres. In addition, our scientists evaluated the efficacy of two leading types of aircraft spray nozzles and worked on improving treatment methods.

Imported Fire Ants: Imported fire ants infest more than 366 million acres in 14 States and Puerto Rico. These invasive pests eat crops, inflict painful stings, and build large nests that can damage farm equipment. According to the Extension Service of USDA's National Institute of Food and Agriculture, they cause approximately \$6.7 billion in damage to agriculture and the environment in the Federal quarantine area. PPQ and its cooperators work to prevent the human-assisted spread of imported fire ants to other areas by regulating the interstate movement of high-risk commodities such as baled hay, nursery stock, and other products that could harbor the pest.

In FY 2020, PPQ continued its work with university researchers and USDA's Agricultural Research



PPQ's Rangeland Grasshopper and Mormon Cricket Suppression Program treated 486,161 acres of rangeland in five States, which directly protected rangeland forage and wildlife habitat on approximately 932,000 acres.

Service (ARS) to develop new pesticide treatments to prevent this pest's movement on nursery stock. We provided support to California to expand the scope of the State's annual imported fire ant surveys and provided New Mexico with information on procedures for deregulating quarantined areas. In addition, PPQ worked with Arkansas, North Carolina, Oklahoma, and Virginia to expand the Federal quarantine area in those States.

Karnal Bunt: Karnal bunt is a fungal disease of wheat that was first detected in the United States in 1996. PPQ protects 1.8 billion bushels and 44.3 million acres of wheat production across the United States by preventing the disease from entering the U.S. grain market system, spreading beyond the areas of Arizona where it is currently found, and affecting other wheat-producing States. The successful regulatory and mitigation program in 2020 reduced

the regulated area by 38,547 field acres. In FY 2020, 28 wheat-producing States participated in the Karnal bunt national survey, with no detections of the disease. Based on these results, PPQ and its partners were able to certify that U.S. wheat exports were free of Karnal bunt, assuring trading partners about the safety of U.S. wheat exports, retaining export markets, and facilitating almost 26.7 million metric tons of wheat exports valued at nearly \$6.3 billion in FY 2020.

Witchweed: Witchweed is a parasitic plant that can significantly damage corn, sorghum, and sugarcane. If witchweed were to spread throughout the U.S. Corn Belt, it could decrease crop yields for corn and sorghum by 10 percent and negatively impact trade in commodities from these areas. Since 1957, PPQ and its cooperators have successfully eradicated witchweed

from 99 percent of infested areas in North and South Carolina. In FY 2020, the program surveyed nearly 26,000 acres for witchweed and treated 515 acres. By preventing the spread of this damaging weed, the program indirectly protects nearly 91 million acres of corn valued at \$61 billion in 2020.

Roseau Cane Scale: Roseau cane is an important grass species that grows in the wetlands of Louisiana’s lower Mississippi Delta region. The plant’s root system protects riverbanks from erosion, provides wildlife habitat, and protects the interior from storm surges. Louisiana State University, with support from PPQ and ARS, has been investigating the factors that have caused the cane’s die-off since 2018. In FY 2020, PPQ provided funding to expand research into host plant resistance, microbial interactions, and restoration ecology. PPQ and ARS also used Plant Protection Act 7721 funding to evaluate Roseau cane scale and its associated natural enemies, with the aim of developing biological control methods to protect this beneficial grass.

Cogongrass: Cogongrass is an invasive perennial weed that spreads easily and is difficult to control because its rhizomes can tolerate drought, fire, and herbicides. Cogongrass readily invades pine plantations and can decrease pine production. We estimate that this species could eventually spread across more than 80 percent of the United States. In FY 2020, PPQ completed an environmental assessment that evaluates various control options and provided funds to Alabama and South Carolina to support survey, outreach, and control activities in those States.

Supporting Specialty Crops

PPQ works with State and Tribal partners, universities, and industry to develop and carry out

programs to protect U.S. fruits and vegetables, tree nuts, and nursery crops from damage and trade disruptions due to invasive pests. Our efforts directly protect U.S. specialty crop production valued at \$9.5 billion in 2017. Indirectly, PPQ protects specialty crop production nationwide worth more than \$21 billion and export markets valued at \$8.9 billion in 2017.

Citrus Pests: PPQ stands shoulder to shoulder with citrus growers to combat citrus canker, Huanglongbing (HLB or citrus greening), ACP, sweet orange scab, and citrus black spot. Through our Citrus Health Response Program, we use areawide pest management strategies, biocontrol, and flexible regulatory protocols to support the U.S. citrus industry’s ability to produce, harvest, process, and ship citrus fruits and nursery stock despite the presence of these diseases. For example, PPQ produced and released approximately 5 million parasitoid wasps in FY 2020 to suppress ACP populations in Arizona, California, Louisiana, and Texas. We also helped more than 12,000 businesses move regulated host materials, such as citrus fruits and nursery stock, under compliance agreements. These activities directly protected citrus production on 681,300 acres in the United States—worth approximately \$3.4 billion for the 2019-2020 growing season—and facilitated U.S. citrus exports valued at approximately \$898 million.

Since 2013, PPQ has led the HLB Multi-Agency Coordination (MAC) Group, which has invested nearly \$47 million to speed the development of tools that could help the U.S. citrus industry fight back against HLB. Projects have focused on four critical areas: ACP control, infected tree therapies, technologies to protect new plantings against HLB infection, and early detection technologies. In FY 2020, the



PPQ’s cooperative witchweed program surveyed nearly 26,000 acres for the parasitic weed and treated 515 acres, indirectly protecting nearly 91 million acres of corn valued at \$61 billion.

USDA APHIS PPQ - Oxford, North Carolina, USDA APHIS PPQ, Bugwood.org



Through our Citrus Health Response Program, PPQ uses areawide pest management strategies, biocontrol, and flexible regulatory protocols to support the U.S. citrus industry's ability to produce, harvest, process, and ship citrus fruits and nursery stock despite the presence of these diseases.

HLB MAC funded seven new projects. The largest of these is the Citrus Research and Field Trials (CRaFT) project in Florida, which is designed to improve management of citrus in HLB-affected groves. In FY 2020, the CRaFT Foundation continued planting test sites and testing combinations of management and therapeutic strategies to determine the best techniques for growing citrus in HLB-infested areas. Additionally, the HLB MAC supported three projects in California focused on improving scouting and data analysis to support early detection of HLB in

that State, standardizing the use of microbial agents targeting HLB, and developing new ACP treatments that will not adversely impact honey bees and other pollinators. In Texas, the HLB MAC supported a project focused on enhancing productivity in HLB-affected groves through soil health management strategies.

Exotic Fruit Flies: PPQ takes the threat of exotic fruit fly outbreaks very seriously. These insects are among the most destructive, feared, and well-publicized pests of fruits and vegetables around the world. Working with State partners, we aim to detect an outbreak early and respond rapidly. Our swift and effective action protects crops and the industries that depend on them, as well as valuable foreign export markets.

PPQ and its cooperators maintain a sensitive fruit fly detection network of more than 160,000 traps across four States and one territory: California, Florida, New York, Texas, and Puerto Rico. When outbreaks occur, we take immediate action to eradicate them. In FY 2020, we eradicated eight of the nine outbreaks that started in FYs 2019 and 2020. We continue to address one outbreak in the Lower Rio Grande Valley of Texas. This year, PPQ released an average of 165 million sterile Mexflies per week in southern Texas and northern Mexico to support eradication and control programs in that region.

Since 2015, PPQ has worked with countries in the Greater Caribbean Region to improve surveillance for Mediterranean and other exotic fruit flies. In FY 2020, 19 Caribbean countries participated in trapping and surveillance programs. Going forward, PPQ will continue to provide trapping supplies and help build regional surveillance capacity to maintain an early warning network for these damaging pests.

PPQ has continued efforts to control the European cherry fruit fly (ECFF), which was first detected in

the United States in 2017. ECFF is a serious pest of cherries that damages ripening fruit, causing it to rot and fall off the tree. In heavily infested areas, the fly can destroy up to 100 percent of ripening cherries. In FY 2020, PPQ shifted from an eradication program to a management program, given that this pest's primary host is wild honeysuckle, which is widespread in New York, surrounding States, and Canada. Under the management program, growers produce cherries using a PPQ-developed systems approach that helps them mitigate pest damage and safely move fresh cherries from within a quarantine zone to processing plants outside the area.

Grape Pests: PPQ works with several cooperators to protect U.S. grape production from damaging pests, including the European grapevine moth (EGVM), glassy-winged sharpshooter, and SLF. In 2016, we eradicated EGVM from the United States. Since then, we have continued to monitor for the pest in all grape-growing areas of California, with zero detections again in FY 2020. PPQ is currently working with cooperators to determine the level of survey that we will continue for this pest moving forward.

PPQ and its cooperators also continued efforts to suppress glassy-winged sharpshooter populations and prevent the pest's spread in California. This year, PPQ conducted surveys in 49 counties and carried out areawide control activities in 4 counties. The program treated more than 21,000 acres, including growers' voluntary treatments, and inspected more than 40,000 nursery stock shipments from infested areas. Together, the glassy-winged sharpshooter and EGVM programs directly protect 860,000 acres of grape production worth \$5.4 billion in 2020.

Spotted Lanternfly: SLF is an invasive pest that feeds on more than 70 types of plants including



Together, PPQ's cooperative glassy-winged sharpshooter and European grapevine moth programs directly protect 860,000 acres of grape production worth \$5.4 billion in 2020.

apples, hops, walnuts, and other hardwood trees. Since its introduction in this country, the pest has caused the most damage to vineyards in impacted areas. From its original detection in 2014 until the end of the 2020 field season, SLF populations expanded from Pennsylvania to several nearby States, including Connecticut, Delaware, Maryland, New Jersey, New York, Ohio, Virginia, and West Virginia. Recent detections in Maine, Massachusetts, and New Hampshire underscore the ability of the pest to hitchhike to other parts of the country.

PPQ's goal is to contain and suppress SLF, eradicate satellite populations, and reduce human-assisted spread. In addition to carrying out areawide surveillance, control, and outreach activities, PPQ is treating locations along the leading edge of infestations to suppress populations. In FY 2020, PPQ and its cooperators treated more than 1,220 properties covering 39,557 acres and treated 143,369 trees. We are continuing to evaluate treatment and survey strategies and implement new approaches, such as treating areas along rail lines using ground-based broadcast applications. We are also increasing outreach to industries related to high-risk commodities such as nursery stock and high-risk pathways such as trucking, airports, maritime ports, and railroads.

Naval Orangeworm: Since 2015, PPQ has cooperated with California's tree nut industries to combat the navel orangeworm, which threatens California's \$8 billion pistachio and almond crops. Working with industry, PPQ scientists adapted the sterile insect technique (SIT) we used to help successfully eliminate pink bollworm from the United States to target this pest.

In FY 2020, PPQ and its cooperators put in place an areawide integrated pest management (IPM) program covering nearly 4,000 acres in California. The program includes grower-managed pheromone mating disruption treatments, coordinated pesticide applications, and field sanitation practices that remove host material. We also incorporated the release of sterile moths on approximately 2,000 of those acres to determine the impact of SIT along with the other IPM measures. In total, we reared, transported, and released about 108 million sterile navel orangeworm moths. In FY 2021, cooperators

and stakeholders hope to expand the area for sterile moth releases and collect more data to determine the impact of these moths on navel orangeworm.

Phytophthora ramorum: PPQ protects natural resources and nursery stock production and trade by stopping the spread of *P. ramorum* from quarantine areas and affected nurseries. *P. ramorum*, which causes sudden oak death, can be moved through nursery stock and affect a variety of forest trees. The disease is present in coastal northern California and a small area in Curry County, OR. In September 2020, PPQ confirmed a new detection in Del Norte County, CA. This county connects quarantined areas in California and Oregon, bringing the number of California counties affected to 16. Nurseries within the quarantine areas that ship interstate must meet annual certification survey and sampling requirements to prevent the movement of potentially infested material. PPQ and its cooperators also regulate nurseries outside the quarantine areas that test positive for the disease within the preceding 3 years and ship host nursery stock interstate. Any interstate-shipping nurseries that test positive must participate in a compliance program, use disinfestation protocols to eliminate the pathogen, and implement measures to reduce the risk of reintroduction. In FY 2020, 25 nurseries participated in the program. We added three new nurseries to the program and released two. PPQ also supports annual surveys, with 23 States participating.

Asian Giant Hornet in Washington: The Asian giant hornet (AGH) is present in the far northwest corner of Washington State, where it was first detected in December 2019. The hornets are a concern for beekeepers because they can attack honey bee hives in the late summer and early fall. After killing all



PPQ has been providing funding, technical expertise, methods, technology, and survey assistance to our partners in the Washington State Department of Agriculture (WSDA) to combat the Asian giant hornet.

Photo courtesy of WSDA

the adult bees, the hornets take the bee larvae and pupae back to their nest to feed their own brood. In response to the detection, PPQ has provided funding, technical expertise, methods, technology, and survey assistance to our partners in the Washington State Department of Agriculture (WSDA). Recently, WSDA entomologists were able to capture live hornets and track one of them to its nest, using a radio transmitter that PPQ's Otis Laboratory provided. The WSDA team, joined by a PPQ representative, eradicated the nest a few days later. This was a significant achievement in the fight against this pest because it validated a crucial eradication method: trap, tag, and track. PPQ has also been working with ARS and academia to conduct genetic research on the AGHs captured in

Washington, along with specimens collected from various locations in Asia. This will help us determine if there were multiple introductions of the hornet into North America, and possibly their origin.

Plum Pox Virus: In 2019, PPQ declared plum pox virus (PPV), the world's most devastating viral disease of stone fruits, to be eradicated from the United States. PPQ continues to protect the country's \$6.3 billion stone fruit industry—involving more than 1.3 million commercial acres of stone fruits nationwide, with an annual trade value in excess of \$5.4 billion—from PPV incursions. In FY 2020, PPQ conducted a second year of post-eradication surveys in the Hudson Valley, Adirondack, and Niagara regions of New York, with no positive samples. We will conduct one more year of post-eradication monitoring in FY 2021. We will also continue to fund surveillance along the U.S.-Canada border and other fruit-producing areas of New York and detection surveys in other States to ensure that we quickly detect and respond to any reintroduction of the disease.

Potato Pests: Working with State departments of agriculture and the potato industry, PPQ is fighting back against two major potato pests: pale cyst nematode in Idaho and golden nematode in New York. Together, the Idaho and New York programs indirectly protect more than 1 million acres of potato production nationwide valued at \$4.2 billion in 2019.

In Idaho, PPQ and its partners have reduced pale cyst nematode populations by 99 percent since the pest was first detected in 2006. In FY 2020, there were 31 infested fields, totaling 3,446 acres, in a 7,150-acre regulated area. PPQ treated 5 of those fields, totaling 450 acres. PPQ also collected samples from four fields that returned to potato production in 2019—the first crop of potatoes since PCN was detected there. The

fields must produce three crops of potatoes with no PCN detections before eradication can be considered successful. Three of these fields tested negative and may continue producing potatoes next year. We also released four associated (exposed) fields in FY 2020 that successfully completed a soil-testing protocol with no PCN detections.

PPQ and the New York State Department of Agriculture and Markets (NYS AGM) maintain an active control and mitigation program in New York to prevent the spread of golden nematode. As a result, this pest has never been found outside regulated areas. In recent years, we adopted strategies already used in the pale cyst program in Idaho and began focusing regulatory activities on infested and associated fields rather than along geographic boundaries. As a result, we have been able to reduce the regulated area by more than 1.1 million acres—some 85 percent—allowing farmers to grow and trade crops without restrictions.

In FY 2020, PPQ regulated 140,972 acres, including 5,945 acres infested with golden nematode, in eight New York counties. We conducted more than 2,000 treatments of used farm equipment and certified approximately 600 shipments of potatoes and other regulated articles for movement. We also processed nearly 5,000 national survey samples, with no new detections of golden nematode.

PPQ cooperates with ARS, NYS AGM, and Cornell University to develop golden nematode-resistant potato varieties. To date, we have developed a total of 45 resistant varieties. Because the pest can overcome resistant potato varieties over time, work to develop new resistant varieties continues.

Tomato Brown Rugose Fruit Virus: In 2019, PPQ confirmed the detection of tomato brown rugose fruit



PPQ launched a vigorous safeguarding effort after tomato brown rugose fruit virus was detected in 2019 on imported tomatoes and in a plant in a university garden.

virus on imported tomato fruit and in a plant in a university garden. Since then, we have taken steps to protect U.S. tomato and pepper production, including restricting imports of tomato and pepper seeds and transplants from all countries, as well as and tomato and pepper fruit from countries where the disease was known to exist. Domestically, we worked with State departments of agriculture to survey commercial greenhouses that produced tomatoes, peppers, and eggplants in FY 2020. In total, our State cooperators surveyed approximately 4.5 million plants from 130 facilities in 22 States. The results, and our response, support the conclusion that tomato brown rugose fruit virus is not established in commercial greenhouses in the United States. This finding provided a strong assurance to our trading partners. We will continue to monitor for this pest in FY 2021.

Combating Tree Pests

PPQ safeguards U.S. forests and natural resources from non-native pests such as Asian longhorned beetles, emerald ash borers, and gypsy moths. These pests threaten urban and suburban shade trees, parks, and forests. They could also harm industries such as maple syrup production, hardwood lumber processing, nurseries, and tourism. According to the USDA Forest Service, our work protects forest products valued at over \$200 billion.

Asian Longhorned Beetle: This pest was first detected in Brooklyn, NY, in 1996. Since then, Asian longhorned beetles (ALB) have been found in New York, Illinois, New Jersey, Massachusetts, and Ohio. Working with State agencies, PPQ has eradicated ALB from Illinois (2008), New Jersey (2013), southwestern Ohio (2018), and New York City (2019). Eradication work continues in Long Island, NY; Worcester County, MA; and Tate Township, OH.



After confirming an Asian longhorned beetle infestation in South Carolina, PPQ established a 58-square-mile Federal quarantine area and began removing infested trees in November 2020.

In June 2020, APHIS confirmed the detection of an ALB population in Hollywood, South Carolina. Upon confirmation, we began delimiting surveys in coordination with Clemson University's Department of Plant Industry in June. We established a 58-square-mile Federal quarantine area and began removing infested trees in November 2020.

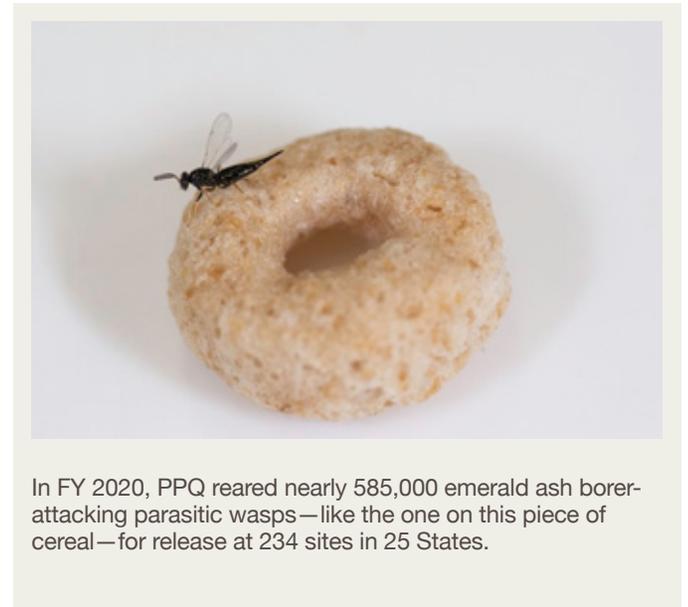
Gypsy Moth: The European gypsy moth (EGM) was first detected in Massachusetts in 1869 and is currently found throughout the northeast quadrant of the United States. Since 2000, PPQ and the USDA Forest Service have worked together to slow this pest's rate of spread by nearly 50 percent. Each year, we place approximately 80,000 traps along the leading edge of the infestation and in other at-risk locations around the country to detect and rapidly respond to EGM introductions into new areas. In addition, we place thousands of traps as part of the port environs survey and Asian defoliator surveys conducted through the Cooperative Agricultural Pest Survey program. In FY 2020, PPQ and State cooperators eradicated an EGM population detected at a single location in Minnesota and conducted delimiting surveys at multiple locations in the State to make sure the eradication was successful. PPQ also developed and launched an interactive gypsy moth quarantine map webpage that shows an updated and accurate national quarantine map.

The Asian gypsy moth (AGM) is not known to occur in the United States. If it were to become established here, it could cause widespread damage to the U.S. landscape and natural resources. To prevent incursions of this pest, the United States and Canada work with China, Japan, South Korea, and Russia to inspect and certify that ships headed for the United States are free of AGM before they leave Asia. At U.S. ports, CBP inspects ships and

cargo to ensure they contain no AGM. PPQ also surveys areas around ports of entry to detect any possible introductions. In FY 2020, PPQ and State partners conducted two eradication treatments for this pest in Washington State. We also had two new detections in traps along the Columbia River in Washington and Oregon State, as well as another in Northern California. In response, in FY 2021 California and Oregon will conduct a delimiting survey, and Washington will conduct an eradication treatment. In May 2020, PPQ developed and launched an analytical tool to identify businesses that may be at a higher risk of importing AGM. It produces a map of possible locations for AGM trapping and surveying work beyond the port of entry.

Emerald Ash Borer: This wood-boring beetle was first detected in the United States in southeast Michigan in 2002, but we estimate that it probably

entered the country in the 1990s. Since then, emerald ash borer (EAB) has spread to 35 States and the District of Columbia. After several years of careful consideration and in consultation with stakeholders, PPQ issued a final rule to remove the EAB domestic quarantine as of January 14, 2021. Moving forward, PPQ will focus on biocontrol and IPM to maintain native ash trees as part of the North American landscape. In FY 2020, we reared nearly 585,000 parasitic wasps for release at 234 sites in 25 States. To date, PPQ and its partners have released approximately 8 million parasitoid wasps in 30 States and Washington, DC, to control EAB populations. We have successfully recovered wasp offspring in 22 States, demonstrating that the wasps are reproducing, becoming established in the areas where they were released, and most important, attacking and killing the beetles.

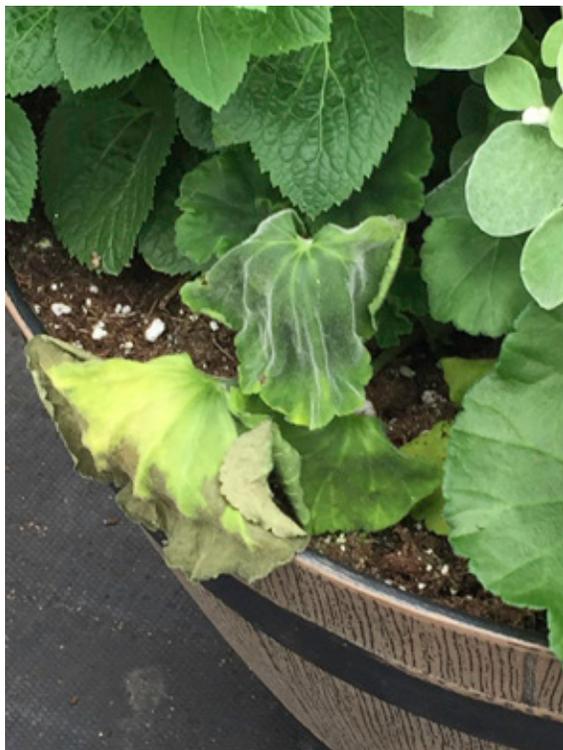


In FY 2020, PPQ reared nearly 585,000 emerald ash borer-attacking parasitic wasps—like the one on this piece of cereal—for release at 234 sites in 25 States.

Case Study:

Eradicating *Ralstonia Solanacearum* Race 3 Biovar 2 From U.S. Greenhouses

PPQ's confirmed detection of *Ralstonia solanacearum* race 3 biovar 2 in a U.S. greenhouse in April 2020 triggered a race against time to find, contain, and eradicate the pathogen, which could have threatened high-value nursery and specialty crop production. The circumstances were unique: PPQ had to respond to this plant health emergency while navigating the unprecedented COVID-19 pandemic. Thanks to the experience and resilience of our employees and



A geranium infected with *R. solanacearum* race 3 biovar 2 has yellow, wilting leaves.

partners around the country, we declared eradication of this pathogen just 2 months after it was detected.

A Wilting Start to the Spring Flower Season

In the first week of April, a Michigan greenhouse manager noticed unusual and excessive wilting on about 200 geraniums in his inventory. With the peak sales period just around the corner, he was eager to diagnose and fix the problem. He took a leaf sample to Michigan State University's Plant and Pest Diagnostics Laboratory—a member of USDA's National Plant Diagnostic Network. There, the plant pathologist made a preliminary identification of *R. solanacearum*—a bacterial pathogen that can infect certain ornamental and vegetable crops such as geraniums, potatoes, and tomatoes.

R. solanacearum has many strains, called races. USDA was particularly concerned about *R. solanacearum* race 3 biovar 2 because of its potential to cause serious harm to U.S. agriculture. Since only PPQ's advanced molecular testing could determine the specific race and biovar, the plant pathologist safely transferred the sample to PPQ's Beltsville Laboratory for additional analysis.

The day the sample arrived, the Beltsville Laboratory had only three employees on site due to COVID-19 restrictions. Fortunately, one was molecular biologist John Rascoe, who specializes in diagnostics for the *R. solanacearum* pathogen.

"When I opened the package from Michigan State University, I had no idea that this would be the first *R. solanacearum* race 3 biovar 2-positive sample that had been seen in the United States since 2004," said Rascoe. "With so much at risk, I spent many intense

hours testing and sequencing the sample to determine and verify the race and biovar."

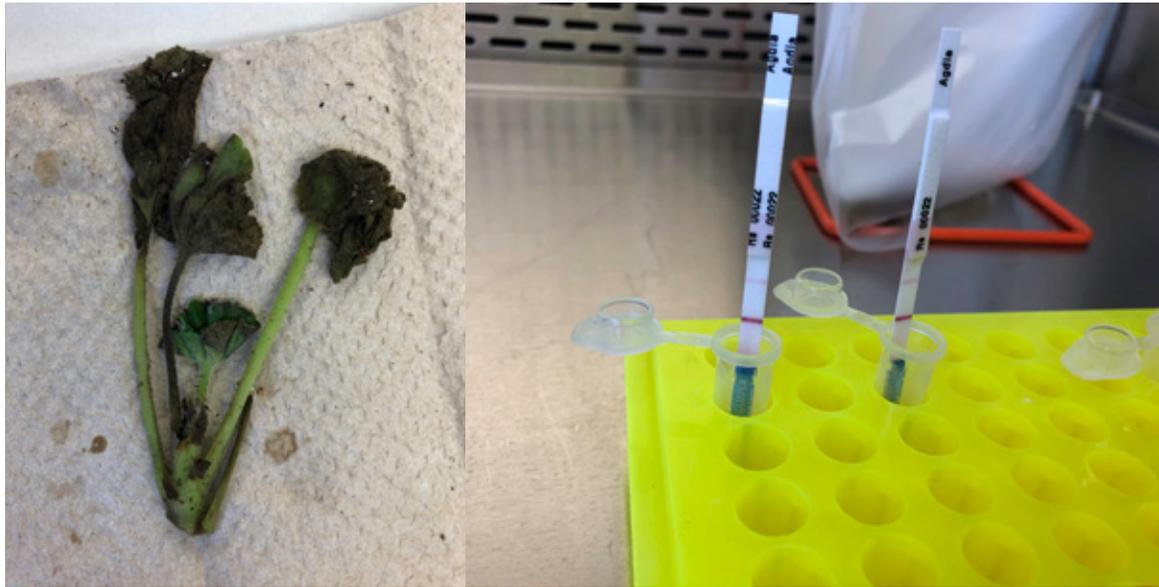
Twenty-four hours later, it was official. Rascoe confirmed the sample was positive for *R. solanacearum* race 3 biovar 2.

The Race Begins

Given the stakes, PPQ began preparing for the worst even as the sample from Michigan State University was on its way to the Beltsville Laboratory. PPQ alerted the Federal Select Agent Program and pulled together a team to coordinate an emergency response if needed. The team immediately started holding daily briefings with experts across PPQ and began mapping out a response plan.

"Although this was my first time coordinating an emergency response, PPQ has dealt with this pathogen before, so we knew what to do," said Erin Otto, National Policy Manager and Emergency Response Coordinator. "And since we were looking at a potentially serious threat to U.S. specialty crops, we couldn't wait to get started; we had to start right then and there."

The team began laying the groundwork for an effective response. They started updating the *Ralstonia* response guidelines last used in 2004 when *R. solanacearum* race 3 biovar 2 was detected in geraniums in U.S. greenhouses. They also started talking about how they would carry out the response despite travel restrictions, social distancing requirements, and other challenges the ongoing pandemic created.



(Left) The sample arrives from Michigan State University’s Plant and Pest Diagnostics Laboratory on April 8, 2020. (Right) The Beltsville Lab’s initial ImmunoStrip diagnostic test confirms the sample is positive for *R. solanacearum*.

When they received word on April 9 that the pathogen was *R. solanacearum* race 3 biovar 2, the team hit the ground running. Craig Kellogg, Michigan State Plant Health Director, issued an emergency action notification, placing a hold on the Michigan facility’s inventory. Carlos Martinez, then Executive Director for PPQ’s Field Operations, deployed one of the agency’s incident management teams. And the response team started exploring how this pathogen made its way into the Michigan greenhouse.

The Problem Grows

Based on records obtained from the Michigan grower, the most likely source of the infection was a producer

in Guatemala that exports geranium cuttings to the United States. Working with the importer, a U.S.-based horticultural company, PPQ identified 288 greenhouses in 39 States that received cuttings from the Guatemalan facility.

Over the next few weeks, State department of agriculture officials visited each location in coordination with PPQ field staff. They found, isolated, contained, and destroyed infected and exposed plants. They oversaw the cleaning and sanitation of each facility. And they reviewed records from each facility, helping to identify other facilities that had received potentially infected cuttings or plants.

“We hit this response with every resource we had, including using inspection staff from all sections of our division. We had to move quickly to address the threat and get the affected greenhouses back in business as soon as possible,” said Robin Rosenbaum, State Plant Regulatory Official with the Michigan Department of Agriculture and Rural Development. “COVID-19 restrictions made it difficult for our teams to get into the greenhouses at first. Despite these challenges, we were able to wrap up the initial response in Michigan in just 3 weeks’ time.”

Initially, the response focused on only one geranium variety, Fantasia Pink Flare. But as the investigation progressed, inspectors soon found infection in Fantasia Salmon geraniums as well. Eventually, PPQ expanded the response to include a subset of all U.S. greenhouses that received geranium plants of any variety from the Guatemalan nursery during the 2019–2020 shipping season.

“We went from 288 greenhouses to more than 650 potentially impacted facilities,” said Otto. “In total, PPQ field staff and State officials destroyed more than 621,000 infected and exposed plants to stop this pathogen in its tracks.”

A Team Effort

As the scope of the response grew, so did the team to support it. Soon, the eradication effort involved every part of PPQ. It also involved the National Plant Board, 44 State departments of agriculture, and the U.S. horticulture industry’s national trade organization, AmericanHort.

Protecting Plant Health During a Human Health Crisis

According to everyone involved, one of the most challenging parts of this response was carrying out operations that adhered to all Federal, State, and local pandemic guidelines and restrictions.

“This was a fast-paced, intense response,” said Otto. “We faced a triple threat: a plant pathogen capable of causing serious harm to U.S. agriculture, a global health crisis that changed just everything

about how we normally do our work, and a rapidly dwindling window for finding and destroying all of the potentially infected plants. Fortunately, we have dedicated employees and partners who never said, ‘We can’t.’ Instead, everyone came to the table with the attitude that we will find a way.”

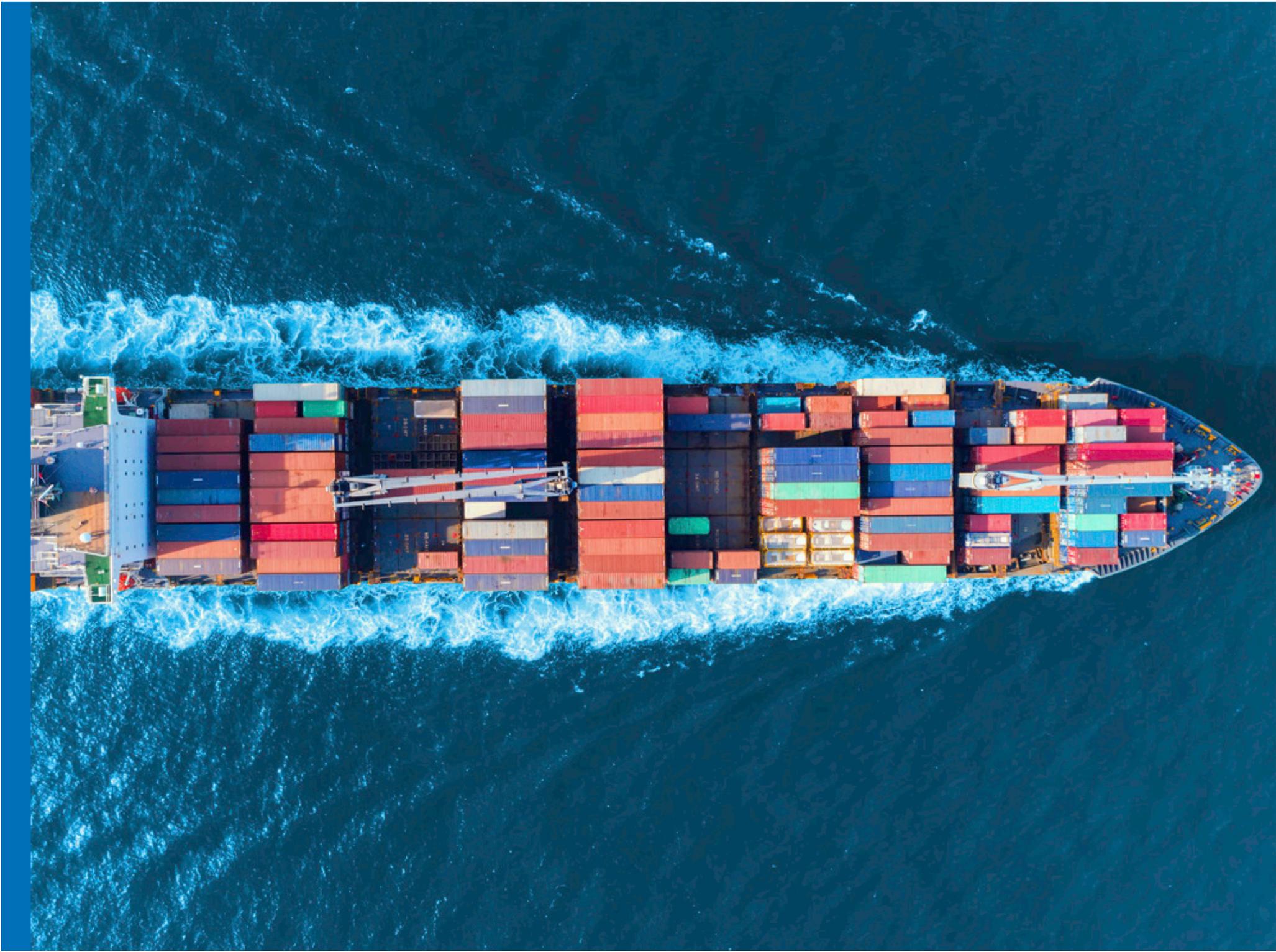
USDA considers *R. solanacearum* race 3 biovar 2 a pathogen of concern because of its potential to cause serious harm to U.S. agriculture. It causes plant diseases such as brown rot of potatoes, bacterial wilt of tomatoes and eggplants, and

southern wilt of geraniums. It can be transmitted through contaminated water, contaminated soil and equipment, or by people’s inadvertent actions. Fortunately, it is not harmful to people or animals.

PPQ has a history of successfully eradicating this pathogen from U.S. greenhouses. The last time it was detected in the United States, in 2004, the response involved 453 nurseries in 41 States. PPQ and its partners destroyed approximately 1 million geranium plants to control and eradicate the disease.



R. solanacearum race 3 biovar 2 causes brown rot of potatoes (left, photo courtesy of P. Champoiseau, University of Florida); bacterial wilt of tomatoes (center, photo courtesy of C. Allen, University of Wisconsin); and southern wilt of geraniums (right, photo courtesy of the Wisconsin Department of Agriculture, Trade and Consumer Protection).



Making Agricultural Trade Safe and Supporting U.S. Exports

While global trade brings tremendous benefits, it also brings risk. Potentially harmful plant and animal pests and diseases can hitchhike on or in the plants, fruits, vegetables, and other products we trade. To help the world move billions of dollars in commodities without spreading invasive pests and diseases, PPQ works with countries around the globe to promote a safe, fair, and predictable trade system. This system, built on internationally and regionally harmonized, science-based plant health measures, not only reduces pest risks, but also helps to create a level playing field for U.S. products abroad.

Creating a Safe, Smooth-Functioning Trade System

PPQ sits at the negotiating tables of two of the world's renowned plant health standard-setting organizations: The International Plant Protection Convention (IPPC) and the North American Plant Protection Organization (NAPPO). Through these forums, PPQ maintains and builds important international and regional relationships that help the United States advance plant health protection standards and harmonized regulatory approaches for safely expanding global agricultural trade.

Promoting Safe Trade Through Effective International Collaboration

Strategic international relationships are critical to achieving a safe, fair, and predictable trade system. These relationships create a stronger basis for addressing trade-related pest and disease threats, resolving plant-health trade problems, establishing science-based trade standards, and advancing

mutually beneficial trade goals. Despite the pandemic, PPQ successfully worked with the IPPC's other 183 member countries to continue progress on the organization's current work program to protect the world's plant resources against invasive pests and promote safe trade. We collaborated closely with our partners to ensure IPPC action and forward momentum on various subjects, including draft standards. PPQ also actively advanced and influenced the IPPC work program through its ongoing membership in the IPPC Bureau and leadership on important strategic committees. International discussions moved forward a new, 10-year IPPC draft strategic framework and the development of long-term funding mechanisms. PPQ also positioned key U.S. experts on various technical committees, particularly those related to standards setting.

At the regional level, PPQ worked effectively with Canada and Mexico through NAPPO to advance key regional standard-setting and implementation initiatives. Our goal is to strengthen the North American perimeter against foreign pests and facilitate safe agricultural trade. PPQ, in collaboration with our partners, successfully advanced NAPPO's 2020 work program, which focused on seeds and diagnostics, in-transit consignments, forestry, plants for planting, biological controls, electronic phytosanitary certificates, the regional pest alert system, and lab accreditation. PPQ also actively influenced the NAPPO work program through its robust participation in strategic NAPPO governance committees and expert groups, using new approaches for effectively conducting business virtually. In addition, PPQ successfully positioned U.S. experts in key NAPPO expert groups. During



PPQ has long contributed expertise and leadership at the International Plant Protection Convention (IPPC), a global plant health standard-setting organization that helps ensure safe agricultural trade.

2020, more than 50 agency and U.S. Government, State, academic, and industry experts served in over 17 active NAPPO initiatives, ensuring strong U.S. stakeholder involvement in standard-setting activities.

In March 2020, as a matter of priority, NAPPO launched an expert group including representatives from the NAPPO member nations, academia, and industry to develop a pilot project that would harmonize diagnostic protocols for the tomato brown rugose fruit virus, which can cause major fruit loss in tomatoes and peppers. The expert group continued to make progress through virtual meetings necessitated by the pandemic. The pilot project could serve as a model for future regional harmonization on seed diagnostics.

PPQ also continued to actively support NAPPO's Expert Group on International Year of Plant Health (IYPH) outreach and education efforts at the North American regional level by regularly publishing articles on NAPPO's safeguarding and trade facilitation work. Lastly, through NAPPO, PPQ strengthened strategic and technical dialogue, as well as collaboration with key international counterparts and regional plant protection organizations—particularly the European and Mediterranean Plant Protection Organization and the Inter-American Coordinating Group for Plant Protection.

Outside the IPPC and NAPPO, PPQ continued building influential relationships with important foreign colleagues to advance shared goals. Since 2009, PPQ has met regularly with the chief plant protection officers of Australia, Canada, and New Zealand. This strategic coalition, known as the Plant Health Quadrilaterals (or Quads), promotes safe trade concepts and influences the global plant health policy agenda. This year, the four Quad members agreed to coordinate strategies for advancing key issues. Some examples include: ensuring future work on commodity-focused standards that will create new opportunities for exporting specific plant products, influencing the global approach for managing pest risks associated with e-commerce and sea containers, introducing new concepts for monitoring emerging pest threats at the global level, promoting updated risk management approaches that will ensure phytosanitary measures are based on and proportional to actual pest risks, and recognizing and harmonizing the use of third-party accreditation.

Advancing the Global Use of Modern Technologies

Internationally, PPQ has been instrumental in building the world's first global electronic phytosanitary (ePhyto) system, which began operating in 2018 and

is steadily being embraced worldwide. Phytosanitary certificates are important documents attesting that a country's plant or plant product exports meet the importing country's plant health requirements. The ePhyto system makes their exchange fast, efficient, and fraud-resistant.

In FY 2020, we maximized the use of electronic documents during the COVID-19 pandemic. We arranged with trading partners to send or accept scanned copies of phytosanitary certificates to facilitate the clearance of imported and exported products. Whenever possible, we also used the global ePhyto system to exchange electronic phytosanitary certificates. This helped us to avoid travel and courier delays that could slow the arrival of paper certificates and cause issues at ports of entry.

This year, the adoption of ePhyto accelerated as more countries realized how the safe, fraud-resistant exchange of electronic certificates can facilitate the clearance of shipments at ports of entry, especially during the pandemic. In FY 2020, PPQ sent electronic export certificates to 46 countries—a 400-percent increase over FY 2019—and received ePhytos from 18 countries. We also achieved full electronic exchange with Argentina and Chile and no longer require paper phytosanitary certificates in addition to the electronic documents. In October, we finalized the mechanism for transferring incoming ePhytos to U.S. Customs and Border Protection (CBP), which will enable true paperless exchanges with our trading partners.

Helping the World Address High-Risk Pest Pathways

PPQ helps the global community cope with high-risk pest pathways such as sea containers and international seed trade. In FY 2020, we advanced our work with the Canadian Food Inspection Agency,

U.S. and Canadian border protection agencies, North American shippers, and global shipping companies to promote the use of practical, voluntary guidance for cleaning and inspecting sea containers. We also welcomed Mexico's national plant protection organization (SENASICA) to the North American Sea Container Initiative, ensuring we will be able to take a truly regional approach to this issue. Despite challenges created by the COVID-19 pandemic, which forced us to cancel in-person meetings, we hosted the first in a series of webinars with key sea container stakeholders. Through these events, we are gathering information from groups across the container supply chain about how they can help clean up this critical pathway—including potential adjustments to business practices that could help reduce pest contamination. Additionally, we held monthly virtual meetings with the Quads Sea Container group, which includes representatives from Australia, Canada, New Zealand, and the United States. Currently, the group is putting together a work plan to identify common risk areas among the four countries.

For several years, PPQ has been working to create a holistic systems approach to reduce pest risks associated with seed trade. By putting safeguards in place throughout the seed production system, we can keep seed clean and healthy from start to finish. This will not only prevent the spread of seedborne pathogens, but also facilitate seed trade by reducing potential phytosanitary obstacles. In FY 2020, we redoubled our efforts to implement the regulatory framework for seed health, also known as ReFreSH. The ReFreSH framework is based on a systems approach that will leverage industry best practices and testing to verify seed health, offering a more efficient and effective alternative to the current consignment-by-consignment certification process. This year, we



Through the North American Sea Container Initiative, PPQ works with the Canadian and Mexican governments and global shipping companies to promote voluntary guidelines for cleaning and inspecting sea containers.

continued to work with the American Seed Trade Association (ASTA), other seed industry stakeholders, and trading partners to advance this important initiative. We prepared foundational documents outlining the standards and guidelines for participating in ReFreSH. We also began working with Chile's national plant protection organization, its national seed association, ASTA, and several seed companies on a pilot project to develop a systems approach for trade of small lots of seeds used for research and plant breeding programs. PPQ is also working to develop a similar pilot with Australia, Canada, and New Zealand.

Securing Economic Opportunities Abroad for U.S. Products

U.S. agricultural exports bring significant value to our economy. In FY 2020, international sales of U.S. agricultural products totaled \$135.9 billion. These exports created a trade surplus of more than \$2.7 billion, helping to energize our economy and support more than 1 million American jobs. PPQ's work to negotiate science-based phytosanitary requirements with foreign trading partners and remove plant health-related trade barriers is essential to helping America's

farmers reach new customers and ensuring that U.S. products are treated fairly in the global marketplace.

Sustaining and Expanding Key Export Markets

Each year, PPQ conducts technical negotiations with countries around the world to open, expand, or maintain export markets for U.S. commodities. In addition, we provide technical expertise to the Office of the U.S. Trade Representative (USTR) and USDA's Foreign Agricultural Service (FAS) as they pursue other diplomatic channels, such as the World Trade Organization, to help resolve trade barriers for U.S. exporters.

In our technical negotiations, we use science, data, and international guidelines to remove plant health-related barriers to American products. In FY 2020, our scientists completed 44 pest risk analyses to open, expand, or maintain export markets for U.S. producers, and 44 new and 69 updated risk assessments and technical reports for import requests from foreign countries.



In FY 2020, PPQ completed 36 bilateral and 15 technical meetings to establish practical, science-based requirements for the safe trade of live plants and fresh fruits and vegetables.

In FY 2020, we completed 36 bilateral and 15 technical meetings to establish practical, science-based phytosanitary requirements for the safe trade of live plants and fresh fruits and vegetables. PPQ transitioned from in-person to virtual meetings due to the pandemic, completing 6 in-person and 30 virtual meetings, an 80-percent overall increase compared to FY 2019. Through these meetings, we helped the United States realize significant trade opportunities. As just one example, we finalized the plant health requirements and protocols for the U.S.-China Phase One Economic and Trade Agreement, helping to secure market access worth nearly \$1 billion annually for U.S. commodities. We also provided critical support—such as inspecting and certifying shipments, conducting technical negotiations, and providing online trade tools—for the export of U.S. plants and plant products valued at nearly \$112.5 billion in calendar year 2020.

Certifying the Health of U.S. Exports

U.S. exporters rely on PPQ and its State and county partners to inspect and certify plants and plant products being shipped to markets overseas. These export certificates attest that the United States is presenting products that meet the importing countries' requirements. Thanks to PPQ's electronic certification system, the once time-intensive, manual process of issuing phytosanitary certificates is now fast, efficient, and fraud-resistant. PPQ also maintains a database of foreign countries' plant and plant product import requirements. With these tools, PPQ export certification specialists and authorized State and county cooperators issued more than 658,000 certificates to facilitate the export of U.S. plants and plant products to over 200 international destinations in FY 2020.

Case Study:

PPQ Plays a Pivotal Role in U.S.-China Trade Deal

For almost 2 years, we heard about the U.S.-China “trade war” or “tariff war” in the news. But in January 2020, the two nations took the first step toward a new trade relationship by signing the landmark U.S.-China Phase One Economic and Trade Agreement. Agricultural products make up a large portion of the accord. And that’s where PPQ comes in.

“Countries—including the United States—are extremely careful about what plants and plant products they allow across their borders,” said Andrea Simao, Assistant Deputy Administrator of PPQ’s Phytosanitary Issues Management (PIM) unit. “We all know some of these products could harbor destructive invasive plant pests and diseases, so trading partners require the exporting country to minimize those risks. That’s PPQ’s expertise. We manage plant health issues for U.S. exports and imports.”

PPQ Seals the Deal

As the United States’ national plant protection organization (NPPQ), PPQ leads plant health negotiations during technical bilateral trade meetings held around the world. Our experts negotiate directly with other countries’ NPPOs, using science and international standards to resolve trade issues. The result: plant health (phytosanitary) protocols that both countries agree will sufficiently minimize the pest risk of an imported or exported plant or plant product. Commodities cannot move in commerce until the trading partners finalize the protocols.

Both countries have now signed technical protocols that allow a wide range of U.S. commodities—estimated to be worth nearly \$1 billion annually upon maturity—to be exported to China.



The PPQ team, some of the members pictured here, overcame numerous pandemic-related challenges to advance phytosanitary negotiations and help finalize the U.S.-China Phase One Economic and Trade Agreement.

These commodities include:

- U.S. barley for processing
- U.S. blueberries
- California Hass avocados
- U.S. almond meal pellets and cubes
- U.S. timothy hay
- U.S. alfalfa hay pellets and cubes
- Idaho, Oregon, and Washington chipping potatoes
- California nectarines

Some of these successes were longstanding efforts. “The chipping potato agreement was 20 years in the making,” said Mike Guidiciopietro, PIM’s Associate

Director. (Mr. Guidiciopietro regrettably passed away just 2 months after the agreement was signed.) “In fact, I was there when we first made the request. Throughout these two decades, we’ve worked closely with the U.S. potato industry. We needed their collaboration to develop the protocols so we could be certain the U.S. producers and exporters could comply with them.”

On the import side, PPQ worked on the requirements for China’s requested commodities, including jujube (Chinese date), fragrant pears, and citrus.

In addition to Phase One, PPQ is negotiating the phytosanitary requirements for other items on the U.S. export commodity list, which includes pomegranates,



PPQ and China's national plant protection organizations signed phytosanitary protocols for U.S. exports of chipping potatoes from Idaho, Oregon, and Washington as well as California nectarines, officially opening two markets worth an estimated \$22 million annually. These were the first commodities approved under the Phase One Trade Deal.

sweet potatoes, and peaches. We are also working with China to discuss new treatment options for U.S. logs, and to revise the export requirements for California strawberries.

A Glimpse Into the Negotiation Process

"During negotiations, our delegation represents all of PPQ and brings the full force of PPQ's work to the table," Simao said. "That includes solid program policy and processes proven to safely import commodities into the United States or export them to other countries; the best science, methods, and analyses to determine and mitigate pest risks for a given commodity or pathway; and survey data and regulatory compliance information, helping to demonstrate the absence or effective control of pests of concern to our trading partners."



PPQ Deputy Administrator Osama El-Lissy (right) and China's Director General Li Jianwei (left) sign a bilateral meeting summary as part of ongoing U.S.-China phytosanitary negotiations.

PPQ also coordinates closely with other units in APHIS, FAS, USTR, and the U.S. State Department.

Getting the Job Done—Despite a Public Health Emergency

To deliver on Phase One commitments, PPQ and China's NPPO had planned to meet in person in February to work out the needed phytosanitary requirements and protocols. Then a new coronavirus—COVID-19—led to a global pandemic.

"Instead of face-to-face meetings, we turned to conference calls," said Simao. "With China on the other side of the world and a 12-hour time difference from the U.S. East Coast, we needed to compromise on the start time. That meant getting up at 3 a.m. to make the 5 a.m. calls, day after day. We were still able to get the job done."



Recognizing PPQ's Employees

Every day, PPQ employees give their all to deliver extraordinary results for our stakeholders. This section highlights some of the exemplary work recognized in FY 2020.

American Phytopathological Society Honors PPQ Employees for Scientific Contributions



At its Plant Health 2020 virtual annual meeting, the American Phytopathological Society presented PPQ's Gloria and Jorge Abad with its Excellence in Regulatory Affairs and Crop Security Award. The award recognized this husband-wife team for their outstanding contributions to regulatory plant pathology crop security and trade enhancement efforts.

"We are truly humbled by this award," said Jorge Abad, Preclearance and Offshore Programs (POP) Area Director for Central America and the Caribbean.

"We are partners in life and in science, and share this recognition with each other, our family, and our PPQ colleagues."

Gloria Abad is a senior plant pathologist at PPQ's Science and Technology laboratory in Beltsville, MD. She is an international leader in the systematics and identification of fungus-like microorganisms called oomycetes. She has also developed an innovative toolkit that rapidly and accurately detects and identifies *Phytophthora*, an oomycete that contains many pathogens of concern. Gloria is a pioneer in evaluating and using new diagnostic and sequencing technologies, including state-of-the-art third generation high-throughput sequencing. In 2018, she received the prestigious Science Fellow award from the International Society of Plant Pathology for her contributions in the area of oomycetes.

For his part, Jorge Abad oversees POP's efforts to intercept pathogens and pests in Central America and the Caribbean before they can reach the United States. Thanks to POP's diligence, these regions have been able to export a substantial number of agricultural products to the United States with no interceptions of regulatory pathogens and pests. An internationally renowned virologist, Jorge previously managed PPQ's Potato, Sweet Potato, and Cassava Quarantine Program, where he developed several innovative techniques to improve virus detection and protect U.S. potatoes. He also participated in the description of several new viruses and the first U.S. detection of zebra chip disease in 2008.

As a scientific team, the Abads are motivated, dedicated, and tireless scientists who have applied their talents to addressing the challenges and opportunities in safeguarding U.S. agriculture and the environment.

APHIS Administrator's Awards

Each year, APHIS Administrator Kevin Shea honors exceptional agency employees whose efforts have transformed our work and fortified our safeguarding mission. This year, several PPQ employees were among those honored for their accomplishments and contributions to the agency.



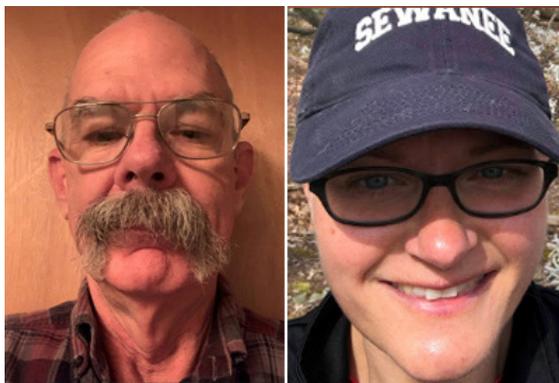
U.S.-China Phase One Trade Team

Team Leaders: PPQ Deputy Administrator Osama El-Lissy, Veterinary Services Deputy Administrator Burke Healey, and International Services Regional Manager for North Asia Karen Sliter

In January 2020, the United States and China signed the U.S.-China Phase One Economic and Trade Agreement, which included plant and animal health commitments and market access completion deadlines for select U.S. agricultural products. APHIS teams at

Maryland/DC headquarters, domestic field offices, and foreign posts worked tirelessly to meet the goals.

Among the many pandemic challenges they faced with ingenuity and resourcefulness, APHIS' teams had to move from in-person to virtual negotiations, work weekends and after/before business hours to accommodate time differences, and tackle complex coordination and logistical planning issues that resulted from the evacuation of APHIS Foreign Service Officers in China. Despite these hurdles, the teams fulfilled all of the agreement's sanitary and phytosanitary commitments on or before deadline, and opened Chinese markets to U.S. agricultural goods worth over \$1 billion.



Ralstonia Response Team

Team Leaders: PPQ Colorado State Plant Health Director Pat McPherrren and PPQ Agriculturist Erin Otto

Ralstonia solanacearum race 3 biovar 2 is a pathogen that causes a wilt disease in several important agricultural crops such as potatoes, tomatoes, peppers, and eggplants. It is a select agent that is not known to occur in the United States. So, when *R. solanacearum* was confirmed on a geranium sample from a Michigan greenhouse, it triggered an emergency response.

PPQ responded swiftly to safeguard U.S. agriculture by mobilizing and coordinating with dozens of State partners to find, isolate, and destroy the infected and suspect geranium plants. The program also immediately stopped all plant shipments from the Guatemalan facility that was the suspected source of the infection. Two months after the pathogen was detected, PPQ and its State partners had eliminated *R. solanacearum* from 650 facilities in 44 States—successfully maintaining all foreign markets and protecting valuable American industries.

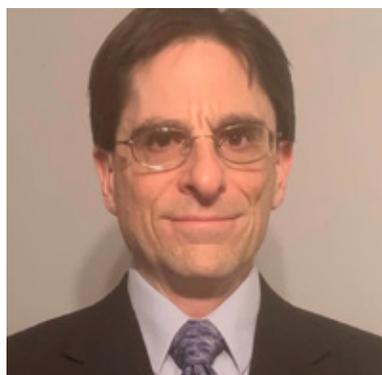


APHIS Scientist of the Year Team Award: Citrus Tristeza Virus (CTV) Team

Team Leader: Assistant Deputy Administrator for Biotechnology and Regulatory Services Alan Pearson

APHIS' Biotechnology Regulatory Services (BRS) has worked tirelessly to issue a statewide permit for citrus tristeza virus (CTV), which is genetically engineered to control citrus greening in Florida. Citrus greening is the world's most devastating citrus disease. It has caused an exponential loss of citrus production in Florida over the past 15 years and is solely responsible for a 74-percent decrease in fruit production.

The team—which included PPQ experts **Angela McMellen Brannigan**, **Rubella Goswami** (with BRS during the project), **Peter Grace**, and **Paul Hornby**—collaborated to provide safeguarding data, documentation, and scientific justification that supported confined CTV field trials and helped guide permit decision making. Despite the many unknowns at the outset of the project, the team pressed forward and found practical solutions.



USDA Secure Rule Team

Team Leaders: Deputy Administrator for Biotechnology Regulatory Services (BRS) Bernadette Juarez, BRS’ Supervisory Policy Analyst/Chief of Policy for Program and International Collaboration Chessa Huff-Woodward, and BRS’ Assistant Deputy Administrator Alan Pearson

The SECURE rule—which stands for Sustainable, Ecological, Consistent, Uniform, Responsible, and Efficient—regulates the importation, interstate movement, and environmental release of certain organisms developed using genetic engineering that may pose a pest risk to plants. The APHIS Biotechnology Regulatory Services (BRS) SECURE Rule team, which included several experts from PPQ, reformed U.S. agriculture biotechnology policy

to reduce regulatory burdens and establish a clear, consistent, and risk-based regulatory framework for products developed using genetic engineering.

The team’s efforts were both innovative and unprecedented. They included assembling a multi-disciplinary working group across USDA mission areas, conducting nationwide listening sessions with diverse stakeholders, using novel communication tools to effectively explain hundreds of pages of technical regulatory text, and dedicating countless hours to successfully roll out and implement the new rule.

PPQ team members included **Andrea Huberty**, **Colin Stewart**, and **Amanda Kenny**, as well as **Rubella Goswami** and **Gwendolyn Burnett**, who were with BRS during the project.

Safety & Health Individual Achievement Award

PPQ lead tree climber Anthony Ryan Haeseley willingly shares his knowledge and experience to keep PPQ colleagues and fellow tree climbers safe while on the job. This year Anthony revised and updated the tree climbing standard operating procedures and rescue techniques for the Asian Longhorned Beetle Program and led occupational training. Anthony also wrote the stationary rope system chapter for USDA’s Forest Service Tree Climbing Guide and worked with the Occupational Safety and Health Administration to standardize the national climbing policy. Anthony’s dedication has helped to transform tree climbing in the agency.

Deputy Administrator's Awards

Each year, PPQ Deputy Administrator Osama El-Lissy recognizes the exemplary people—employees, partners, and cooperators—who made significant contributions toward achieving PPQ's mission of safeguarding American agriculture. He honors one supervisor whose work in the current year has shown exceptional leadership and helped to transform our organization. Deputy Administrator El-Lissy also presents the Outstanding Employee Award and the Safeguarding Award to recognize extraordinary efforts and results during the previous year.



2020 Supervisor of the Year Award

This year, PPQ's Supervisor of the Year Award went to Kris Luurs, a management and program analyst with PPQ's Resource Management Services.

Kris has spent her entire career at USDA—the first year at another agency, but the rest with APHIS, in PPQ and Human Resources. According to her, she has “seen everything there is to see.” After 32 years of

service, her focus now is to mentor people and “pay it forward.” Her goal is a noble one: to leave PPQ a better place.

According to her employees, Kris is always open to candid discussions and receptive to their concerns. Her communication style—which instills trust and maintains a high level of morale—has been particularly helpful during the COVID-19 response. Kris also regularly encourages innovation, which has resulted in notable improvements that reach across PPQ.



2019 Deputy Administrator's Outstanding Employee of the Year Award

Sarah Ortiz, an AQI (agriculture quarantine inspection) veterinary medical officer (VMO), received the 2019 Deputy Administrator's Outstanding Employee of the Year Award. This award recognizes an individual employee for actions, contributions, or initiative that exceeded expectations, performance standards, and duties.

According to her colleagues, Sarah is a reliable, positive, and hardworking professional who demonstrates an unwavering resolve. She has the

vision and initiative to accomplish vital tasks for her program and far beyond—and works closely and effectively with other AQI VMOs, Federal partners, and stakeholders on a wide array of issues to achieve PPQ's mission.

The year 2019 was especially successful for Sarah. Without hesitation, she gladly shouldered several responsibilities, including:

- Serving as acting AQI VMO director when the director was on a temporary duty assignment and leave. In this capacity, she supervised the other 11 AQI VMOs; managed the AQI VMO program; and represented the AQI VMO group in meetings and calls with PPQ, APHIS' Veterinary Services program, and U.S. Customs and Border Protection leadership
- Applying her extensive experience to resolving regulatory issues at the Dallas-Fort Worth airport, and assisting PPQ-regulated garbage leads in reviewing all new applications throughout the United States
- Playing influential roles in work groups and committees such as the Texas Veterinary Medical Association's Disaster Preparedness/Emergency Response Committee
- Conducting outreach at many events, from the CBP-sponsored El Paso Trade Days to a local 4-H Veterinary Science Club meeting
- Serving on the planning committee for the Arizona AgDiscovery summer program



2019 Deputy Administrator’s Safeguarding Award

Team Leaders: Joe Beckwith, PPQ State Plant Health Director for North Carolina; Joy Goforth, State Plant Regulatory Official for North Carolina Department of Agriculture and Consumer Services; Jim Kelley, Supervisory Agricultural Specialist with U.S. Customs and Border Protection; and Michael Fuller, forester and response team liaison with the U.S. Department of Defense

Deputy Administrator El-Lissy presented the 2019 Safeguarding Award to the Multiagency Infested Sea Container Response Team. This award recognizes exceptional work in safeguarding America’s agricultural and natural resources.

The incident that earned the team its award began on October 1, 2019, at the Military Ocean Terminal Sunny Point in North Carolina. This massive facility serves as a transfer point for rail, trucks, and ships for the U.S. military. When U.S. Customs and Border Protection (CBP) inspected military sea containers that had just arrived from Korea, they discovered suspect sawflies and Asian gypsy moth (AGM) egg masses. PPQ quickly identified the pests and recommended full inspection of all 1,000 containers to mitigate the risk.

CBP officials immediately realized they needed help to perform a task of this magnitude, and PPQ managers acted quickly to pull in additional resources. Within a few hours, they had scheduled a team of

volunteers from PPQ units in three States, as well as the North Carolina Department of Agriculture and Consumer Services. The volunteers quickly shifted work and personal plans to assist with limited notice. Everyone understood that timely inspections were crucial to safeguarding American agriculture, and their rapid response reflected their strong commitment to the mission.

The multi-agency group developed an effective inspection process by staging containers efficiently, saving time and cost. They also created a collection device to remove egg masses from the underside of containers without needing to stand under a container, which was prohibited. As a result, the group successfully inspected all 1,000 containers within 9 days. In total, they intercepted 225 pests, including 115 AGM egg masses, and fumigated 196 containers, working after hours and on weekends.

By quickly coordinating a multi-agency response, the group mitigated the risk of these harmful pests becoming established in the United States, where they could damage agriculture and natural resources and incur significant eradication costs. In addition, the team ensured that the U.S. military could safely move the now-cleared containers, which held important cargo, to their destinations as quickly as possible, minimizing disruptions to the U.S. Department of Defense (DoD). This operation strengthened the relationships among PPQ, CBP, DoD, and the State, enhancing the safeguarding efforts of all the organizations now and in the future.

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