PPQ 2024 Annual Report

Optimizing Pest Management: Field Crop and Rangeland Ecosystem Pests

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Introduction

The Field Crop and Rangeland Ecosystem Pests (FCREP) program protects U.S. agricultural crops and rangelands from the establishment or spread of invasive or economically significant pests, facilitates safe international trade and domestic commerce, preserves economic opportunities for U.S. farmers, and fosters healthy ecosystems in rangelands and natural lands. To accomplish these goals, the U.S. Department of Agriculture's Plant Protection and Quarantine (PPQ) program provides national coordination, threat assessment, and strategies to prevent pests and diseases such as grasshoppers and Mormon crickets (GMC), imported fire ants (IFA), Karnal bunt, Roseau cane scale, and witchweed from spreading and impacting export markets for U.S. farmers. These programs help protect resources that small, rural communities depend on for income.

Grasshoppers and Mormon Crickets

PPQ cooperates with Federal, State, Tribal, and local agencies, organizations, and institutions to conduct survey and suppression activities in western States to reduce damage that GMC outbreaks cause, protecting rangeland resources that serve as forage for livestock, provide habitat for wildlife and ecosystem services, and provide recreation opportunities. A 2012 University of Wyoming study found that healthy rangeland provides forage value worth $6.7 billion and overall benefits ranging from $10.7 to $21.2 billion. Uncontrolled GMC infestations could cause significant economic losses for U.S. livestock producers by reducing animal food supply in rangeland, therefore forcing producers to buy supplemental feed or sell their livestock at reduced prices.

Besides feeding on grass, GMC can also devastate cultivated crops such as alfalfa, barley, corn, and wheat. Damage from grasshoppers and Mormon crickets also reduces habitat and food sources for wildlife, which can threaten animal and plant biodiversity as well as the rangeland's ability to sequester carbon. Infestations often cover vast acreage, and landowners or land managers may need Federal support to control them. The program helps landowners and land managers by providing population information, helping to predict where grasshopper populations could develop into outbreaks, and providing technical assistance about options for dealing with problem-level populations. By providing information and advice to land managers and by conducting suppression treatments where necessary and possible, this program helps protect 661 million acres of rangeland across the western United States.

In fiscal year (FY) 2024, PPQ conducted surveys in 13 States for GMC, collecting data at 20,270 survey points. The program conducted treatments in five States in FY 2024, using FCREP funding and reimbursements from participating landowners. The Plant Protection Act specifies that the Federal

government covers 100 percent of treatment costs on Federal lands; 50 percent on State lands; and 33.3 percent on private lands.

PPQ conducted treatments on 371,002 acres in Idaho, Montana, Nevada, Oregon, and Utah. These treatments protected rangeland forage and wildlife habitat on more than 812,923 acres. Treatment numbers for FY 2019 through FY 2023 can be found at the following link on the Grasshopper and Mormon cricket program website: APHIS Treatment data 2019-2023 (usda.gov). Before conducting any grasshopper treatments, PPQ confirms the species of the grasshopper as some do not cause damage to rangeland and others can even provide ecological benefits by eating weeds (leaving grasses for grazing livestock). At the State level, PPQ works with landowners and land managers, including the Bureau of Land Management, Tribes, ranchers, and local governments, to coordinate requested treatments and to ensure treatments conform with established environmental standards to minimize impacts on non-target species.

Imported Fire Ants

IFA is a public nuisance and serious agricultural pest, causing approximately $6.7 billion in damage to homeowners, agriculture, and natural ecosystems within the IFA Federal quarantine area, according to the Ant Pests Community funded by the National Institute of Food and Agriculture's Extension Service (https://ant-pests.extension.org). The economic impact if IFA reached all suitable habitats in the United States where IFA could become established is greater than $10.6 billion per year (Economic Evaluation of the Regulatory Program for Imported Fire Ants, APHIS, March 2018). Currently, IFA infests more than 374 million acres in Puerto Rico and 14 States: Alabama, Arkansas, California, Florida, Georgia, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia, which are under a partial or full State quarantine.

In FY 2024, the program expanded the existing imported fire ant quarantine areas in Tennessee and Oklahoma. The IFA program continues to work with university researchers and USDA's Agricultural Research Service (ARS) to develop new pesticide treatments to prevent IFA movement on nursery stock and sod and to evaluate ways to optimize existing biological control agents for IFA control. The program supported 22 cooperative agreements in all infested States and territories for inspecting nurseries and conducting delimiting surveys. The program continued to provide funding to conduct joint surveys with the New Mexico Department of Agriculture staff to collect IFA infestation data for potential deregulation actions. The IFA program continues to provide regulatory guidelines to stakeholders for the treatment of regulated articles, oversight, and enforcement to help prevent the human-assisted spread of the pest. In FY 2024, APHIS completed a review of Federal program functions, and State and industry practices related to IFA, as part of an ongoing evaluation of potential changes to the PPQ program, given that IFA continues to spread naturally.

Karnal Bunt

The FCREP program also addresses Karnal bunt, a fungal disease of wheat that was first detected in the U.S. in 1996. Many U.S. trading partners will not accept U.S. wheat unless it is certified to originate from areas where Karnal bunt is known not to exist. The program prevents the disease from entering the grain market system, spreading beyond the areas of Arizona where it is currently found (portions of 2 counties in the State, accounting for 0.12 percent of wheat acreage in the United States).

In FY 2024, the program implemented a reduced buffer requirement around infested fields based on analysis showing that a significantly smaller buffer (0.2 miles down from 3 miles) will provide protection from spread of the disease's causal agent (a fungal pathogen, *Tilletia indica*). During the year,

the program removed a total of 36,982 field acres (835 fields) in Arizona from Karnal bunt regulation in Maricopa County, Pinal County, Ak-Chin Indian Community tribal land, and Salt River Pima-Maricopa Indian Community tribal lands. Three of the fields met the 5-year cumulative tillage requirement for deregulation, and the rest were removed because of the reduced buffer requirement. The buffer reduction provided relief to multiple growers from having to follow quarantine requirements and allowed the program to discontinue monitoring in buffer fields that never had a positive Karnal bunt detection, without compromising safeguards against the spread of *T. indica*.

In FY 2024, 29 wheat-producing States participated in the Karnal bunt national survey. The program tested 806 samples from 324 unique counties with no positive detections. Based on this national survey, the program certifies wheat exports free of Karnal bunt, assuring trading partners about the safety of U.S. wheat exports, retaining export markets, and facilitating wheat movement into domestic and international markets. In 2023, growers across the country planted approximately 49.6 million acres of wheat and harvested 1.8 billion bushels of wheat with a value of $12.7 billion (National Agricultural Statistics Service, Crop Values 2023 Summary and Crop Production and Quick Stats). The U.S. exported 18 million metric tons of wheat, valued at $6.1 billion; wheat products valued at $189 million; and wheat flour valued at $151 million to 102 countries (USDA Foreign Agricultural Service's Global Agricultural Trade System, 2023). The successful Karnal bunt quarantine and survey program facilitates wheat trade without disruptions.

Witchweed

If witchweed, a parasitic plant that can significantly damage corn, rice, sorghum, and sugarcane, were to spread throughout the Corn Belt, it could decrease crop yields for corn and sorghum by up to 10 percent and could negatively impact trade in commodities from these areas. Since program activities began in 1957, PPQ and cooperators have successfully eradicated witchweed from 99 percent of the infested areas in North Carolina and South Carolina. These activities consist of frequent field inspections, treatment of infested acres (tillage, ethylene injections to stimulate witchweed seeds to sprout, and hand-pulling and herbicide application), post-eradication surveys, and addressing any new infestations.

The program surveyed more than 38,000 acres in FY 2024 (surveys continue through the fall and are still ongoing). At the end of FY 2024, 2,530 acres remain regulated, including acres in 2 risk categories—higher risk acres where witchweed has been more recently detected and lower risk acres approaching the point at which they can be deregulated. Because witchweed seeds can remain viable in the soil for up to 14 years, and a host plant must be present for witchweed germination, year-to-year fluctuations in the number of acres infested are common. The program detected 0 new or reinfested acres during FY 2024. By preventing the spread of this damaging weed, the program indirectly protects U.S. corn production, which covered more than 94.6 million acres in 2023 valued at $73.9 billion (National Agricultural Statistics Service, Crop Production Historical Track Records, April 2024).

Roseau Cane Scale

Roseau cane is an important grass species in wetland areas of the lower Mississippi Delta, Louisiana. The plant's root system provides wildlife habitat, protects the interior from storm surges, and protects riverbanks from erosion, which impacts the Mississippi River navigation channel. However, while

investigating die back, the invasive scale insect, Roseau cane scale, was found infesting affected stands. Researchers from Louisiana State University (LSU) investigated potential stressors causing die back, including high water levels, salinity intrusion, scale insects, plant pathogens, and soil chemistry.

To further investigate the possible causes of the die off and build management and restoration plans, starting in FY 2018 LSU formed a multi-disciplinary and multi-institutional team with support from APHIS and collaboration with ARS. Research objectives include the biology and control of the scale insect that affects Roseau cane; other stressors that may affect the health of Roseau cane, including soil composition, pH levels, and nitrates; marsh grass restoration techniques; host plant resistance to scale insects; impacts of both beneficial and pathogenic microbes on Roseau cane; and restoration ecology.

With FY 2024 funding from APHIS, LSU continued to investigate the causes of Roseau cane decline. Research strongly suggests that dieback of *Roseau cane* was precipitated by saltwater incursion during an extreme drought event. The introduction of the nonnative Roseau cane scale and possibly pathogenic fungi contributed further stress to the plants. In the Gulf of America, sea levels are rising above the global average, leading to prolonged inundation of coastal Roseau wetlands. This extended submersion overwhelms the plants, exposing their roots to excessive salt levels, leading to dieback.

Findings also suggest that the invasion of the non-native taro plant following Roseau cane dieback could severely limit the ability of the common Delta lineage to successfully recover and reestablish in these areas. The work to date by the Roseau cane die-back team improves our understanding of plant stressors on Roseau cane and the biology, distribution, feeding ecology, and impact of the scale insect attacking the cane at the Mississippi River Delta. Project scientists continue to evaluate the impacts of the

presence of *Aprostocetus* sp., a potential biological agent, that arrived independently in the Mississippi River Delta, on Roseau cane scale.

Cogongrass

Cogongrass is an invasive perennial weed that is a prolific seed producer and forms an extensive rhizome network. The primarily wind-dispersed seeds spread easily along rights-of-way and in other disturbed areas, encouraging population expansion. Cogongrass readily invades pine plantations and is believed to create chemical interference that decreases pine production. Moreover, cogongrass is difficult to control because the rhizomes are drought, fire, and herbicide tolerant. PPQ estimates that this species has the potential to spread across 82 percent of the United States.

In 2024, PPQ provided $1.724 million to Alabama and South Carolina to support survey, outreach, and control activities related to cogongrass infestations in these States. In addition, PPQ supported a project aimed at developing new management methods for the weed.