

# Strengthening Quarantine Pest Surveillance in Jamaica Through AI-Enabled Smart Trap Technology

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- **Focus Area:** Artificial Intelligence and Smart Plant Health

## Background

Early detection of quarantine pests is critical to protecting agriculture, food security, and trade. Jamaica faces increasing risks from invasive insect pests due to climate change, increased travel, and trade. To strengthen early warning and rapid response capacity, the Ministry of Agriculture, Fisheries and Mining, Plant Quarantine Produce Inspection (PQPI) Branch partnered with Trapview, a global provider of automated pest monitoring and forecasting solutions.



Installation of *Ceratitidis capitata* smart traps. (PQPI 2024)

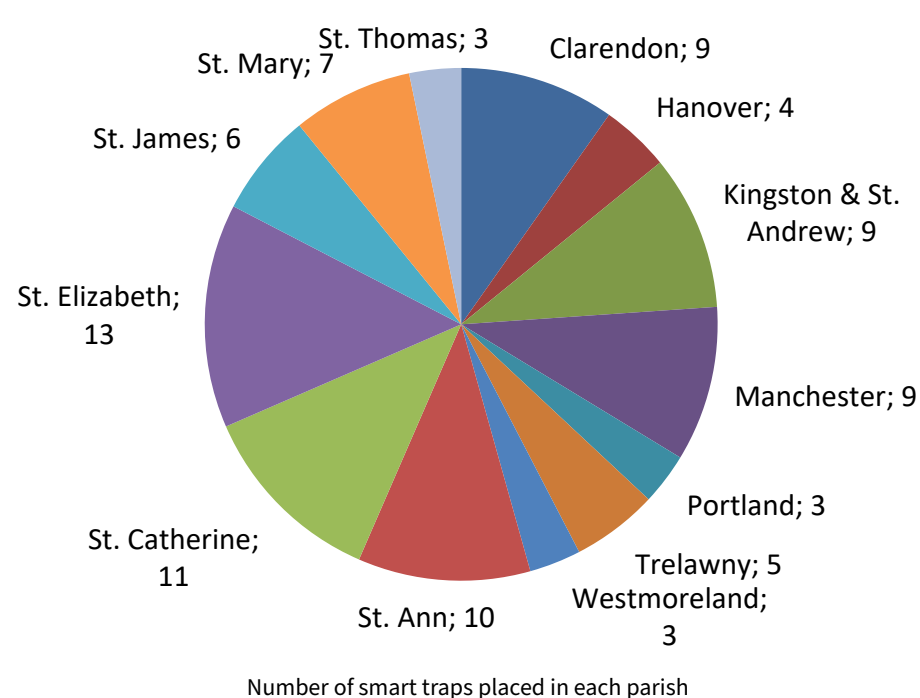
## Innovation overview

Jamaica became the first Caribbean country to implement Trapview's smart trap technology for quarantine pest surveillance. The system enhances national plant health capacity by providing real-time data-driven pest monitoring which supports timely decision-making and emergency preparedness.

## Smart traps:

- Advanced pest surveillance devices.
- It has cameras, sensors, and connectivity.
- Automatically detect insects caught.
- Send data in real time via the Trapview mobile app.

## Implementation in Jamaica



- 125 smart traps installed islandwide
- Integrated into national surveillance and early warning systems
- Data supports inspection, quarantine decision-making, and emergency response planning

## Target quarantine pests

The smart traps were specifically set up to monitor and detect two major pest threats:

- 85 traps for *Ceratitidis capitata* (Mediterranean Fruit fly)
- 40 traps for *Phthorimaea absoluta* (formerly *Tuta absoluta*).

These pests were chosen because of their quarantine importance to Jamaica and their potential to destroy crops and impact export markets if they enter and become established in Jamaica.

## Lures

Medfly – Trimedlure (PQPI 2026)

Tomato leaf miner - (3E, 8Z, 11Z)-3, 8,11-tetradecatrien-1-yl acetate or (3E,8Z)-tetradecadien-1-yl acetate (PQPI 2026)

## Placement

Smart traps are placed strategically across the island to maximize surveillance and early warning capability. They are placed at:

1. Ports of Entry
2. Farming Areas and fields/orchards
3. Markets and Distribution areas
4. Remote or hard-to-reach areas

## How the Smart Trap System Works

Each smart trap has lures specific to target pests, a sensor and camera system, and a built-in SIM that sends images, GPS location and data to a central app. Plant Quarantine officials and Rural Agricultural Development Authority officers monitor traps remotely in real time.

- Automated, self-cleaning smart traps deployed in the field
- Automatic photo capture and insect counting
- Real-time data transmission via a mobile and web-based application
- Artificial intelligence used for population analysis
- Predictive modelling to assess pest pressure and development stages
- Reduced need for physical trap servicing and field visits

## Impact and benefits

Smart trap technology enables activation of emergency response plans, and rapid action upon the detection or introduction of pests.

- Faster detection of quarantine pests
- Improved preparedness and rapid response capability
- Enhanced ability to inform farmers and stakeholders
- Reduced operational costs through fewer field visits
- Strengthened national and regional biosecurity capacity



*Phthorimaea absoluta* smart traps installed in the field. (PQPI 2024)

## Conclusion

To date, surveillance data from the smart trap system indicates no presence of *Ceratitidis capitata* (Mediterranean fruit fly) or *Phthorimaea absoluta*. The adoption of smart trap technology demonstrates how artificial intelligence and digital tools can significantly improve phytosanitary surveillance and quarantine pest management. Jamaica's experience provides a practical model for other Caribbean countries seeking to modernize plant health systems.