

# Transformative Applications of Artificial Intelligence (AI) in Plant Protection: Insights from the 2025 North American Plant Protection Organization (NAPPO) Symposium

National Plant Protection Organizations (NPPOs) and industry stakeholders face complex pressures that challenge their ability to safeguard plant health. Limited resources, competing priorities between trade facilitation and biosecurity, and external forces such as climate change and shifting global trade patterns strain operational capacity. These pressures are compounded by regulatory constraints, fragmented strategic direction, information overload, and concerns about the consequences of pest detections, all of which can hinder timely and effective action. Significant gaps in expertise, particularly in diagnostics, taxonomy, and early pest detection, further weaken preparedness. Retaining specialized knowledge remains a persistent concern, especially as experienced personnel retire or move to other sectors. At the same time, organizations must balance day-to-day

operational demands with the need to adopt innovative tools, including artificial intelligence (AI), while ensuring that legislation and workforce skills evolve accordingly.

AI presents substantial opportunities to enhance plant health management by improving efficiency, strengthening detection capabilities, and supporting decision-making. Although AI cannot resolve the fundamental tension between trade and biosecurity, it can streamline administrative tasks, automate compliance verification, enhance surveillance through AI-enabled tools, support initial pest detection and taxonomic screening, and accelerate processes such as trace-back analysis and climate- or host-based targeting. These applications have the potential to significantly improve operational performance across plant health systems.

## Artificial Intelligence and Plant Health



Information extracted from the 2025 NAPPO Annual Meeting Symposium breakout session and questionnaire. For more information, click on the QR code.

