Food Security Leadership Council

Global Collaboration to Tackle Agricultural Pests and Diseases

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GLOBAL COLLABORATION TO TACKLE AGRICULTURAL PESTS AND DISEASES

As the United States approaches the halfway point of its 2026 G20 presidency, it should consider spearheading a collective effort that is both intensely practical and long overdue: an international approach to managing transboundary agricultural pest and disease outbreaks.

Agricultural pests and diseases impose enormous losses on global crop production, with cascading effects for food security, rural incomes, consumer prices, and natural resources. An international effort to accelerate detection and response can mitigate this age-old challenge.

The numbers are staggering. Up to forty percent of global crop production is lost to pest and disease, costing the global economy $290 billion each year. Up to 20% of rice, wheat and corn is lost each year from insects alone. Each outbreak can be devastating. For example, a highly virulent strain of wheat rust (Ug99) was calculated to have had the potential to cost U.S. producers up to $11.6 billion over four years. A nationwide outbreak of foot and mouth disease among swine could cost the United States $20 billion in a single year.

These losses represent the immense cost of remediation to producers and higher food costs for consumers. When affected crops or livestock are no longer saleable, they represent wasted input—labor, fuel, fertilizer, and land.

And the losses are on track to deepen. Pests and diseases are increasingly mobile as the climate changes and trade and human travel provide increasing connectivity. For wheat, rice, and corn, yield loss to insects may increase up to 25% per degree Celsius of global warming, with the worst effects in the temperate zones where most grain is produced. Extreme weather increases risk as well; soybean rust arrived in the continental United States in 2004 on the back of a hurricane.

Early detection and response mitigate the worst effects of an emerging pest or disease. Yet, existing international surveillance and response systems are under-resourced, fragmented, and leave major gaps. Responses are mostly national; where they are international, they are generally ad hoc and reactive—conducted through networks established to respond to a single, specific pest.

This is a lost opportunity. To combat threats that spread at exponential rates across farms and borders, national systems cannot act alone or orchestrate a response only after an outbreak is underway.

The international community should act collectively to control major transboundary agricultural pest and disease outbreaks in key commodities by:

- minimizing the time from emergence to detection and
- rapidly developing and deploying control measures.

A public, international, and technology-forward approach would offer substantial gains in efficiency and effectiveness in surveillance and response— with collective benefit for farmers, consumers, private industry, and the environment.

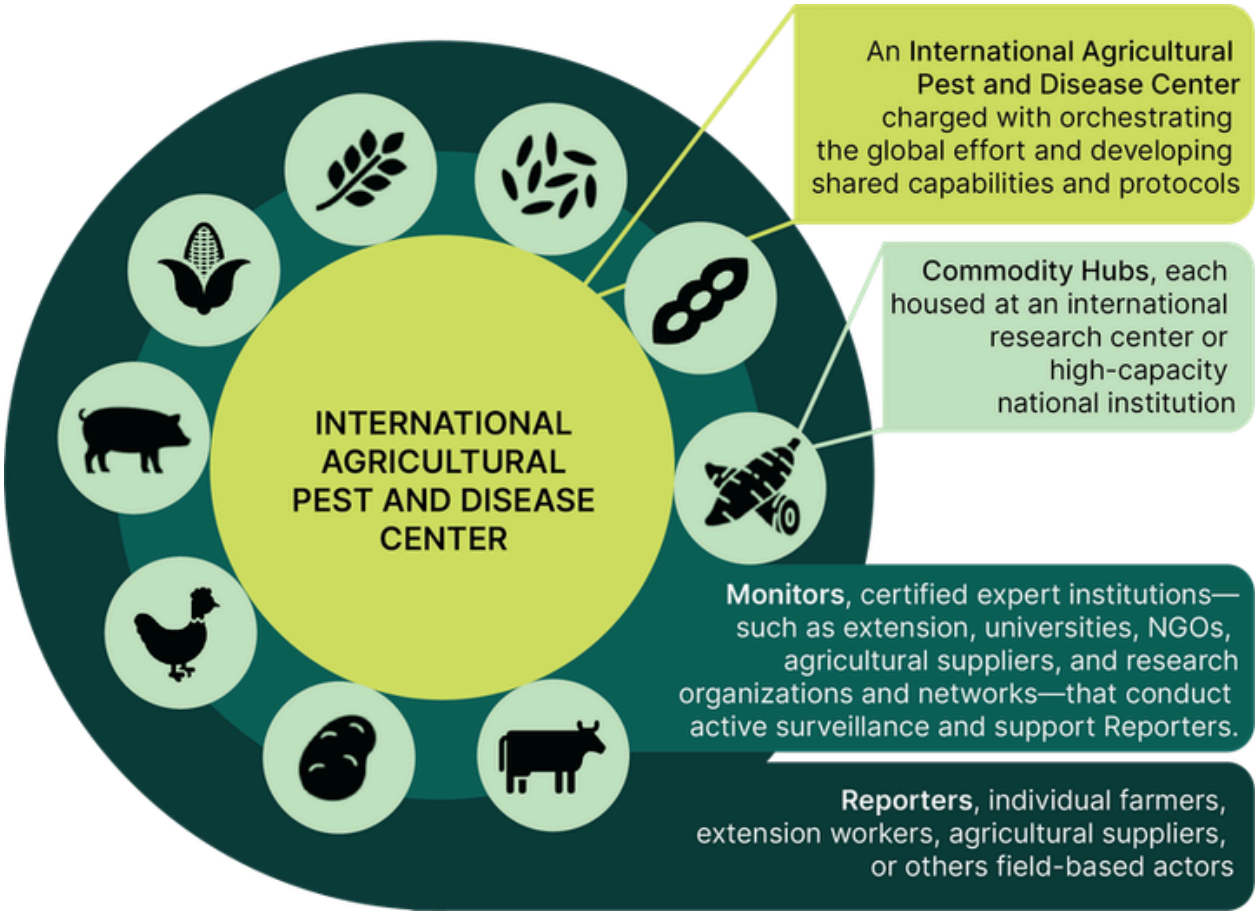
There is no comprehensive international system for monitoring and responding to transboundary agricultural pests and diseases comparable to the coordination mechanisms that exist for global public health. While important efforts exist, they remain fragmented and limited in scope. Examples include:

- The Food and Agriculture Organization (FAO) led a large-scale response to the 2019–2021 Desert Locust outbreak, mobilizing over $200 million for surveillance, aerial control campaigns, and livelihood support. This effort relied heavily on the Desert Locust Information Service (DLIS), which aggregates field and satellite data to generate forecasts and early warnings.
- FAO established the Fall Armyworm Monitoring and Early Warning System (FAMEWS) in 2017, using mobile-based field data collection. In 2020, it launched the Global Action for Fall Armyworm Control, aimed at coordinating international response and research efforts.
- The International Maize and Wheat Improvement Center (CIMMYT), in collaboration with Cornell University, operates the Wheat Disease Early Warning Advisory System, which provides surveillance and risk forecasting for wheat rusts.
- The United States, Mexico, and Panama collaborate through the sterile insect technique to contain the spread of New World screwworm, working to maintain a biological barrier in the Darién Gap.
- The International Plant Protection Convention has begun piloting a Pest Outbreak Alert and Response System, but its role is currently limited to alerting and does not extend to coordinated response.

These efforts demonstrate technical feasibility and offer important lessons learned for a new, comprehensive approach.

A COMPREHENSIVE AND COLLECTIVE APPROACH

An international approach to pest and disease surveillance and response should be structured around a hub-and-spoke mechanism that builds on existing structures and expertise. Together, four sets of actors—a new International Agricultural and Disease Center, commodity-specific Hubs, certified Monitors, and an expansive group of Reporters—should perform the key functions of the system. While the infrastructure for the system overall should be public, each function should forge partnerships with the private sector to leverage its reach and expertise for the collective benefit.



The four key functions of the system are **Data Generation and Sharing, Diagnosis, Analytics,** and **Rapid Response**. Across each of these functions, the new global system should take advantage of lessons learned from the distributed approaches of the World Health Organization's Global Outbreak Alert and Response Network and USDA's Animal and Plant Health Inspection Service (APHIS).

Data Generation and Data Sharing
A key objective of the system must be the promotion of data generation—particularly, the development and deployment of a system and protocols that standardize, facilitate, and incentivize rapid reporting by all types of producers all over the world.

Balanced data sharing agreements will be foundational to the program's success—permitting sufficient detail to enable response and inform risk analysis and sufficient protections on sensitive information to maximize participation. This will include differentiated access across user types and reporting of data at appropriate levels of aggregation.

Diagnosis
Rapid detection of emerging pests and diseases is critical. In the new system, Reporters and Monitors will be the front line of defense for identifying potential new outbreaks, following pre-established reporting mechanisms. Monitors may be the first to verify emergence in each circumstance, with quick hand-offs to the relevant Commodity Hub for final diagnosis.

The Center would enable diagnosis by 1) promoting an accessible, app-based reporting system 2) developing standardized reporting protocols, and 3) deploying or experimenting with automated detection systems.

Analytics
The Commodity Hubs will manage prevention and response analytics, including:

- Risk analysis by pest and disease, commodity, and geography;
- Forecasting of pest and disease emergence and spread across varying time horizons; and
- Tracking pest and disease evolution, including the emergence of new strains and resistance to controls.

Rapid Response
Upon verification of significant pest emergence by a Commodity Hub, the Center will fund the relevant hub to organize a rapid response team to develop control mechanisms, including new resistant varieties, vaccines, or treatments.

The Center and the relevant Hub will lead regional and international communications efforts and leverage a pre-established network of institutions and experts that can deploy as surge capacity.

Calls for Action

There has never been a major concerted effort to establish a multilateral mechanism to track and respond to emerging agricultural pest and diseases, though it has been recommended by experts in recent years.

- A global surveillance system for crop diseases (Science, 2019)
- Building integrated plant health surveillance: a proactive research agenda for anticipating and mitigating disease and pest emergence (CABI, 2024)
- THE MEAN SIXTEEN: Major Biosecurity Threats Facing U.S. Agriculture and How Policy Solutions Can Help (Farm Journal Foundation, 2025)