

Database contributes to synoptic review of plant disease epidemics and outbreaks

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The [CABI Distribution Database](#)—which holds over a million geographic records of living organisms—contributed to a synoptic review of plant disease epidemics and outbreaks in 2021 as part of new

research published in the journal *Phytopathology*.

CABI data analysts Dr. Hannah Fielder, Tim Beale, and Dr. Anna Szyniszewska, shared their expertise with colleagues from the University of Cambridge, Imperial College London and the University of Warwick, for the study which revealed 15 pathogens reported in new locations.

These included pathogens affecting apple, banana, potato and tomato crops in countries in Asia, Europe, the U.S. and other parts of the Americas.

Of the 15 species, the scientists assessed two of the pathogens—tomato brown rugose fruit virus and cucurbit chlorotic yellow virus—to be actively emerging in or spreading to new locations. The latter of which, for example, has now been found in several US states.

It is hoped the new insights can help lead to more focused monitoring, detection and mitigation of the diseases which can have a severe impact upon [crop production](#), [food security](#) and livelihoods.

The researchers conducted their study by combining data from the CABI Distribution Database—which identified 617 distribution records of 283 [plant pathogens](#) that were new in 2021—and by reviewing [scientific literature](#) on major, plant disease outbreaks published in 2021.

They highlight that the results of both the literature review and interrogation of the CABI Distribution Database revealed distinct sets of plant disease outbreaks and new records with little overlap, reflecting the time lag between first reports of a pathogen being made and major disease outbreaks being observed.

The CABI Distribution Database covers over 55,000 species, across key areas such as crop pests and hosts, crop and animal diseases, [invasive](#)

[species](#) and natural enemies.

Data has been sourced from peer reviewed published literature, CABI project work and other authoritative third-party sources such as EPPO and WOAH.

Throughout 2021, CABI worked hard to use new Distribution Database tools to import more geographic records. This included adding over 12,000 new species to the database and information that filled thousands of gaps in existing species distributions.

Tim Beale, Senior Data Analyst at CABI, said, "CABI regularly updates its distribution data so that when users go to our knowledge products they can be confident that they are getting the latest information about where their species of interest is present or absent."

"In the case of this latest research, the resource has proved invaluable in identifying which pathogens pose the latest threat to food security in a particular geographical location and how this can be tackled to help prevent crop losses."

The researchers argue that their approach has helped build a holistic picture of the range of plant health threats that are impacting, or have the potential to impact, food security, as well as plant and [environmental health](#).

They add that such information can inform appropriate surveillance measures or management strategies to either prevent pathogens from entering a new location or limit the likelihood or impact of recurring outbreaks.

Professor Nik Cunniffe, corresponding author from the University of Cambridge, said, "Problems remain of delays in reporting, publishing,

and communicating plant disease outbreaks and new records for plant health regulation, disease management and farm strategic planning."

"However, the approach taken in this review provides a mechanism for integrating information and a synoptic view on current plant [disease](#) outbreaks and potential future risks and might usefully be adopted regularly in the future."

The CABI Distribution Database serves data to the [CABI Compendium](#) (with six channels covering Animal Health & Production, Aquaculture, Crop Protection, Forestry, Horticulture and Invasive Species), distribution maps for plant pests and plant diseases, the Horizon Scanning Tool, Pest Risk Analysis Tool, Plantwise Knowledge Bank Species Pages (Datasheets) and the Plantwise Knowledge Bank Diagnostic Tool.

CABI Tools and Apps

CABI's range of ICT tools and apps have been designed to support a variety of users from plant health professionals to researchers, farmers, students and more across a number of subjects and disciplines.

CABI's Invasive Species Channel of the CABI Compendium includes a number of open access tools and resources to support pest management, while its Plantwise resources provide a range of information on plant health.

More information: Michael J. Jeger et al, What can be learnt by a synoptic review of plant disease epidemics and outbreaks published in 2021?, *Phytopathology* (2023). [DOI: 10.1094/PHYTO-02-23-0069-IA](https://doi.org/10.1094/PHYTO-02-23-0069-IA)

Provided by CABI

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