

The International Society for Plant Pathology promotes the worldwide development of plant pathology and the dissemination of knowledge about plant diseases and plant health management

PLANT HEALTH

2020

PROTECTING PLANTS

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PROMOTING WORLD-WIDE PLANT HEALTH AND FOOD SECURITY

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

ISPP NEWSLETTER

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INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP) WWW.ISPPWEB.ORG

How is COVID-19 AFFECTING PLANT PATHOLOGISTS?

In the fourth month of this series, Florence Obani shares her story on: "How is the COVID-19 pandemic impacting your research, teaching, outreach and lives? Share your stories with our ISPP community on how you and your family and colleagues are coping. Send a few lines through the <u>online form</u> to share in the ISPP Newsletters over the next few months!

FLORENCE OBANI, NIGERIA

Covid 19 has seriously affected my research and teaching negatively.

Due to the lockdown and restrictions in movement, field trips couldn't be made and classes were cancelled. Students were dismissed from campus and asked to go home. Salient field data couldn't be taken because I live several kilometers away from my institution. Also laboratory experiments were stopped as the institution was closed down due to the ravaging pandemic. Early crops couldn't be planted as the rains came as early as March which was the onset of the pandemic here in Nigeria and the lockdown by the government of the nation. I hope we can do the late plantings this year. It was not really easy to embark on any practice research.

PLANT PATHOGENS WHICH THREATEN FOOD SECURITY

A review by Khaled M. Makkouk titled "Plant pathogens which threaten food security: Viruses of chickpea and other cool season legumes in West Asia and North Africa" was published in February 2020 by *Food Security* (vol. 12, pp. 495-502). The abstract is as follows:-

West Asia and North Africa (WANA) and the Indian sub-continent are regions of major production of chickpea, faba bean and lentil, where these crops represent a major source of protein in the diet of the population. These crops are attacked by a large number of viruses, the most economically important among them being which cause

stunting and yellowing symptoms together with poor or no pod setting. Our knowledge of the identity of these viruses improved significantly over the past three decades because of the advances in molecular diagnostics. At present, there are 12 viruses in chickpea and 6 in faba bean that are insect transmitted in the persistent manner, cause stunting and yellowing symptoms, and the number is increasing. Virus disease management involving a combination of control measures is the best practical strategy to reduce virus disease levels, and consequently increase productivity of grain legume crops. Research that leads to the design of most appropriate control strategies is needed for each grain legume producing region in WANA countries and within each country.

Read paper.

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PLANT DISEASES RIDING ACROSS GLOBE WITH DUST

KRISHNA RAMANUJAN, CORNELL CHRONICLE, 20 JULY 2020

At the end of June, the largest dust cloud ever observed by satellites crossed the Atlantic from the Sahara in North Africa to the Americas. Undoubtedly, that cloud carried plant pathogens that hitched rides with dust particles. A multidisciplinary, Cornell-led team of scientists has been selected for a \$US750,000 NASA grant to combine their expertise in remote sensing, climate and earth system computer modeling, plant pathology and genomics to better understand how plant pathogens that travel the globe with dust particles might put crops at risk, especially in places where people struggle to eat.

It's well documented that plant pathogens in the soil become airborne; infectious spores have been found in dust samples that travel on intercontinental winds. The team will use Earth-observing satellites to identify areas of potential disease and track plumes of dust that traverse the globe. They will also use earth system modeling to predict how regions will change over time and how that may influence disease dispersal with dust.

NASA's Release of Research Opportunities in Space and Earth Science Interdisciplinary Science grant is for three years, which will allow the team to lay the foundation for a global surveillance system to assess risk and track and potentially prevent the global spread of plant diseases. If the origins and landing spots of specific pathogens can be better predicted, farmers can be advised on how to avoid practices that would increase its spread, such as those that kick up dust from farm fields, and perhaps grow less susceptible crops where such dust falls.

Fusarium oxysporum, an economically important pathogen that causes fusarium wilt in more than 100 plant species, will serve as a model system for the study, to establish proof of concept. Endemic to six continents, *F. oxysporum* can survive in the soil for more than 20 years, causing farmers to abandon infected fields. This study's framework for monitoring the risk of global plant disease could be applied to many other plant pathogens.





CURRENT UNDERSTANDING OF THE HISTORY, GLOBAL SPREAD, ECOLOGY, EVOLUTION, AND MANAGEMENT OF THE CORN BACTERIAL LEAF STREAK PATHOGEN

A review by M. Ortiz-Castro *et al.* titled "Current Understanding of the History, Global Spread, Ecology, Evolution, and Management of the Corn Bacterial Leaf Streak Pathogen, *Xanthomonas vasicola* pv. *vasculorum*" was published in May 2020 by *Phytopathology* (vol. 110, pp. 1124-1131). The abstract is as follows:-

Bacterial leaf streak of corn, caused by *Xanthomonas vasicola* pv. *vasculorum*, has been present in South Africa for over 70 years, but is an emerging disease of corn in North and South America. The only scientific information pertaining to this disease on corn came from work done in South Africa, which primarily investigated host range on other African crops, such as sugarcane and banana. As a result, when the disease was first reported in the United States in 2016, there was very limited information on where this pathogen came from, how it infects its host, what plant tissue(s) it is capable of infecting, where initial inoculum comes from at the beginning of each crop season, how the bacterium spreads from

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plant to plant and long distance, what meteorological variables and agronomic practices favor disease development and spread, how many other plant species X. vasicola pv. vasculorum is capable of infecting or using as alternate hosts, and if the bacterium will be able to persist in all corn growing regions of the United States. There were also no rapid diagnostic assays available which initially hindered prompt identification prior to the development of molecular diagnostic tools. The goal of this synthesis is to review the history of X. vasicola pv. vasculorum and bacterial leaf streak in South Africa and its movement to North and South America, and highlight the recent research that has been done in response to the emergence of this bacterial disease.

Read paper.

APS PRESS MOVING SALE

APS PRESS, 23 JULY 2020

More than 100 titles are on sale, including these peerreviewed and award-winning teaching videos. Save 50% on both classic and popular titles. Members save an additional 10%.

THE NEXT PANDAMIC COULD BE A PLANT DISEASE

LAURA OWINGS, SCI DEV NET, 13 JULY 2020

Global trade and monoculture will lead to crop disease pandemics that jeopardise world food systems, experts warn.

A healthy wheat crop in Uganda, just weeks from harvest, turns into a tangle of black stems and shrivelled grains. As much as 80 per cent of the harvest is lost, a fate that destroys the farmer's investment in the fields and damages the livelihood of the family. Soon wheat fields in Kenya, Ethiopia and Egypt experience the same fate. Iran follows, along with India, Pakistan and Lebanon. Then countries in Asia and Europe show signs.



Large industrial farms across Asia, Europe and Latin America are growing the same crop species, leaving them vulnerable to a global disease outbreak. Copyright: Liang Qu / IAEA, (CC BY-SA 2.0).

The culprit is wheat stem rust. A plant disease

that has been known for decades, a virulent new strain, Ug99, emerged in 1999 to ravage wheat production across the globe — and was spread by the wind.

"Plant disease can be very cryptic and look like water stress or nutrient deficiencies. These tools enable someone to diagnose it effectively where it may have been missed before." Said Stephen Parnell, spatial epidemiologist, University of Salford.

Wheat stem rust is just one example of plant pests and diseases that farmers and agricultural experts across the globe are battling. They are a silent threat to food security, responsible for up to 40 per cent of global food crop losses, according to the Food and Agriculture Organization.

While crop pests and diseases can be spread by environmental factors, such as the wind, they also move into new places via global trade, traffic and transport. As the world prepares to feed its expected population of more than nine billion people by 2050, preventing plant disease outbreaks is becoming more urgent.

Indeed, this has been recognised on a global scale with the United Nation's declaration of 2020 as the International Year of Plant Health. But experts say more research has to be done — and quickly — in order to prevent a global crop disease pandemic..



EXPERTS JOIN FORCES TO PROTECT WORLD FORESTS

HOMED PROJECT NEWS, 20 JULY 2020

Pathologists and entomologists unite knowledge and expertise over the common goal to battle unprecedented biotic threats posed by biological invasions and improve the long-term health of forests. Researchers from the EU project HOMED aim to prevent or reduce the profound impacts on forests of both alien and emerging native pests and pathogens.

The United Nations General Assembly declared the year 2020 as the <u>International Year of Plant Health (IYPH)</u>. HOMED researchers in the field of pathology and entomology take this opportunity to affirm the need to improve the protection of forests, which is essential for climate regulation, wood production, biodiversity reservoir and, ultimately, for human well-being.



Redbay ambrosia beetle (*Xyleborus glabratus*) galleries in redbay tree (Photo by James Johnson, Georgia Forestry Commission, Bugwood.org).

HOMED (HOlistic Management of Emerging forest

<u>pests and Diseases</u>) uses a scientific, technological and risk management approach for the prevention, detection, diagnosis, eradication and control of emerging native and non-native pests and pathogens threatening forest health.

The world's forests have never been more threatened by invasions of exotic pests and pathogens, the causes and impacts of which are reinforced by global change. However, forest entomologists and pathologists have, for too long, worked independently, using different concepts and proposing specific management methods without recognising parallels and synergies between their respective fields. HOMED researchers advocate increased collaboration between pathology and entomology in order to improve the long-term health of forests.

"In a year characterised by a global threat to human health from the COVID-19 coronavirus pandemic, attention to plant health could be considered derisory," project coordinator Hervé Jactel (French National Institute for Agriculture, Food, and Environment - INRAE) comments. "However, plants face similar threats and trees and forests, in particular, play an essential role in providing humans with important services, so tree health is directly connected to human well-being."

HOMED, therefore, recommends to foster the convergence between scientific communities, proposing in particular the development of interdisciplinary research programmes, the development of generic tools or methods for pest and pathogen management and capacity building for the education and training of students, managers, decision-makers and citizens concerned with forest health.



PLANT HEALTH 2020 ONLINE IS HERE!

APS warmly welcomes you to their upcoming virtual annual meeting this August. This is a rare opportunity for members from both of our societies to come together online to share science and learn from one another.

Plant Health 2020 Online features a full week of virtual programming from August 10 to 14, with Plenary, Special, and Technical Sessions in addition to ePoster presentations and networking events. Sample sessions include a Keynote Presentation from Richard Harris, author and Science Correspondent from U.S. National Public Radio (NPR); an Idea Café discussion on the Impact of Soil Health Practices on Plant Pathogens & Disease Management; and a Pathogen Genome and Biology Technical Session.

Register here and view program here.



UBC forestry professor Richard Hamelin preparing samples for analysis (Photo credit: Paul H Joseph/UBC).

PORTABLE DNA DEVICE CAN DETECT TREE PESTS IN UNDER TWO HOURS

UBC NEWS, 20 JULY 2020

Asian gypsy moths feed on a wide range of important plants and trees. White pine blister rust can kill young trees in only a couple of years. But it's not always easy to detect the presence of these destructive species just by looking at spots and bumps on a tree, or on the exterior of a cargo ship.

Now a new rapid DNA detection method developed at the University of British Columbia (UBC) can identify these pests and pathogens in less than two hours, without using complicated processes or chemicals – a substantial time savings compared to the several days it currently takes to send samples to a lab for testing.

"Sometimes, a spot is just a spot," explains forestry professor Richard Hamelin, who designed the system with collaborators from UBC, Natural Resources Canada and the Canadian Food Inspection Agency. "Other times, it's a deadly fungus or an exotic bug that has hitched a ride on a shipping container and has the potential to decimate local parks, forests and farms."

Hamelin's research focuses on using genomics to design better detection and monitoring methods for invasive pests and pathogens that threaten forests. For almost 25 years, he's been looking for a fast, accurate, inexpensive DNA test that can be performed even in places, like forests, without fast Internet or steady power supply.



TIMING KEY IN UNDERSTANDING PLANT MICROBIOMES

OREGON STATE UNIVERSITY NEWS, 16 JULY 2020



Oregon State University researchers in USA have made a key advance in understanding how timing impacts the way microorganisms colonise plants, a step that could provide farmers an important tool to boost agricultural production. The findings, published in the journal <u>Current Biology</u>, will help scientists better

understand the plant microbiome, which consists of hundreds of thousands of microorganisms that live in and on plants and contribute to their health and productivity.

While scientists have studied microbes living in plants for decades, it has only been in the last 10 years or so that advances in DNA sequencing technology have it made it possible to characterise the unseen diversity of plant microbiomes with more precision. The surge in research involving the plant microbiome coincides with a spike in research involving the human microbiome and its role in human health and disease. Understanding how plant microbiomes form is important because some microorganisms are beneficial and others are harmful to plants. Some factors shaping microbiome composition are predictable, like the relative humidity of the environment, or the thickness of the protective, waxy layer of cells on the leaf surface.

However, much of the variation in microbiome composition remains unexplained. The Oregon State research, led by Posy Busby, an assistant professor in the Department of Botany and Plant Pathology, and Devin Leopold, a postdoctoral fellow in her lab, unravels some of those mysteries. In this study, Busby and Leopold explored one process that likely contributes to this unexplained variation: the order in which microorganisms colonise plants.

"Our hope is that our findings will translate into tools for combatting plant disease that aren't limited to planting only disease-resistant cultivars," Busby said. "Because maintaining diversity in our crops is essential to the long-term sustainability of our agricultural systems."

Read more.

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USING LEAF FUNGI TO IMPROVE CROP RESILIENCE

NC STATE UNIVERSITY NEWS, 30 JUNE 2020



Crop of soy and inset photo, Christine Hawkes, a professor in the Department of Plant and Microbial Biology, is leading an interdisciplinary project to identify the beneficial fungi found in five key crops (Photo by NC State University).

An interdisciplinary team of researchers at North Carolina (NC) State University, USA, is setting out on an ambitious three-year project to identify the beneficial fungi found in five key crops: corn, soy, wheat, hemp and switchgrass.

The team is led by Christine Hawkes, a professor in the Department of Plant and Microbial Biology. Once the beneficial fungi are identified, the team will work to determine how the fungal species help plants fend off diseases and tolerate drought stress. The team will also work on tools to detect the types of fungus present in a field and methods to improve the fungal community present – like eating yogurt to improve your gut health.

"Our overarching goal is to improve plant health management and increase crop sustainability through the use of beneficial fungi in plant leaves," said Hawkes, who is also a member of the Microbiomes and Complex Microbial Communities Cluster, a Chancellor's Faculty Excellence Program cluster of excellence. "We hope to mitigate unnecessary crop yield losses to stresses like drought and disease, which will help us safely increase our food supply and better feed the world."

The project is one of four interdisciplinary projects selected by NC State's Office of Research and Innovation to receive seed funding to address the global challenges facing agriculture identified by the North Carolina Plant Sciences Initiative.

No current vacancies.

ACKNOWLEDGEMENTS

Thanks to Grahame Jackson, Greg Johnson, and Jan Leach for contributions.

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COMING EVENTS

International Seed Testing Association Seed Health Workshop: Seed health methods to detect fungi, bacteria and viruses

Postponed – date to be announced Pretoria, South Africa Website: <u>www.seedtest.org/en/event-detail---0--0--</u> <u>111.html</u>

Plant Health 2020 - APS Annual Meeting

10 August - 14 August, 2020 Virtual event Website: <u>www.apsnet.org/meetings/annual/planthealth2020/Pag</u> <u>es/default.aspx</u>

13th Arab Congress of Plant Protection

1 November - 6 November, 2020 Le Royal Hotel, Hammamat, Tunisia Contact: Dr. Asma Jajar, Chairperson of Organising Committee <u>info@acpp-aspp.com</u> Website: <u>acpp-aspp.com</u>

7th International Bacterial Wilt Symposium

3 November - 7 November, 2020 Montevideo, Uruguay Website: <u>7ibws2020.fq.edu.uy</u>

16th Congress of the Mediterranean Phytopathological Union

17 November - 20 November, 2020 Limassol, Cyprus Website: <u>cyprusconferences.org/mpu2020</u>

7th International Conference of Pakistan

Phytopathological Society 29 November - 1 December, 2020 University of Agriculture Faisalabad and Ayub Agricultural Research Institute, Faisalabad, Pakistan Website: <u>pakps.com/web/7icpps</u>

4th International Conference on Global Food Security 6 December - 9 December, 2020 Montpellier, France Website: <u>www.globalfoodsecurityconference.com</u>

10th International IPM Symposium

15 March - 18 March, 2021 Denver, Colorado, USA Website: <u>ipmsymposium.org/2021</u>

7th International Congress of Nematology

25 April - 30 April, 2021 Antibes Juan-les-Pins, France Website: <u>www.alphavisa.com/icn/2020/index.php</u>

International Symposium on Cereal Leaf Blights

19 May - 21 May, 2021 Hammamet, Tunisia Website: <u>www.isclb2021.com</u>

4th **International** *Erwinia* **Workshop** 5 June - 6 June, 2021

Assisi, Italy

Joint 18th International *Botrytis* Symposium & 17th International *Sclerotinia* Workshop 7 June - 11 June, 2021

Avignon, France Website: <u>colloque.inra.fr/botrytis-sclerotinia-2020</u>

14th International Conference on Plant Pathogenic Bacteria 6 June - 11 June, 2021 Assisi, Italy Website: <u>www.icppb2020.com</u>

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International Plant Health Conference "Protecting Plant Health in a changing world" 28 June - 1 July, 2021 Paasitorni Conference Centre, Helsinki, Finland Website: <u>www.fao.org/plant-health-2020/events/eventsdetail/en/c/1250609/</u>

11th Australasian Soilborne Diseases Symposium Mid-late 2022 Cairns, Queensland, Australia Website: <u>asds2020.w.yrd.currinda.com</u>

XX International Plant Protection Congress 10 June - 15 June, 2023 Athens, Greece Website: <u>www.ippcathens2023.gr</u>

12th International Congress of Plant Pathology (ICPP2023) 20 August - 25 August, 2023 Lyon, France Website: <u>www.icpp2023.org</u>

9th ISHS International Postharvest Symposium

11 November – 15 November, 2024 Rotorua, New Zealand Website: <u>scienceevents.co.nz/postharvest2024</u>

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The ISPP List is an e-mail list server which broadcasts messages and announcements to its subscribers. Its goal is to facilitate communication among members of the International Society for Plant Pathology and its Associated Societies. Advertised vacancies in plant pathology and ISPP Newsletter alerts are also sent to members of the ISPP List.

In accordance with the guidelines and recommendations established by the new EU General Data Protection Regulation 679/2016 (GDPR), the International Society for Plant Pathology has created a <u>Privacy Information</u> <u>Notice</u> containing all the information you need to know about how we collect, use and protect your personal data. This policy explains when and why we collect personal information about our users, how we use it, the conditions under which we may disclose it to third parties, how we keep it safe and secure and your rights and choices in relation to your personal information.

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