PROMOTING WORLD-WIDE PLANT HEALTH AND FOOD SECURITY

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

ISPP NEWSLETTER

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

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INTRODUCTION

Plants are under constant attack from invasive pests. These pests can severely damage crops, forests, and other natural resources that people depend on. Every year, they cause billions of dollars of losses in crops and trade revenue, in addition to expensive eradication efforts. People most often spread them, especially through international travel and trade. Despite declining resources for plant health protection services, international, regional and national plant health organisations continue in their efforts to protect plants.

Plants are the foundation of life on earth. They produce the oxygen we breathe. They provide more than 80 percent of the food we eat. We use them to make clothes, shelter, medicines, and many other things that are essential to our lives. For nearly half of the earth's population, plants are a primary source of income.

Almost every country trades plants and plant products to create wealth and support economic development. A threat to plant health is also a threat to the health and prosperity of people across the globe – especially the most vulnerable.

Any effort to achieve the vision set out by the 2030 Agenda for Sustainable Development must acknowledge the critical importance of plant health. An International Year of Plant Health is essential to raise awareness, drive concrete action and ultimately contribute to a safer, more prosperous and peaceful world[1].

THE 2030 SUSTAINABLE DEVELOPMENT GOALS

The Goals and targets will stimulate action over the next fifteen years in areas of critical importance for humanity and the planet[2]:

- G1 End poverty in all its forms everywhere.
- G2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
- G3 Ensure healthy lives and promote well-being for all at all ages.
- G4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- G5 Achieve gender equality and empower all women and girls.
- G6 Ensure availability and sustainable management of water and sanitation for all.
- G7 Ensure access to affordable, reliable, sustainable and modern energy for all.
- G8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- G9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.
- G10 Reduce inequality within and among countries.

[1] "*Championing an International Year of Plant Health*" (2018). International Plant Protection Convention (IPPC). ©FAO, 2018 CA0324EN/1/07.18.

[2] "*Transforming our world: the 2030 Agenda for Sustainable Development*". Sustainable Development UN. Knowledge Platform.

G11 Make cities and human settlements inclusive, safe, resilient and sustainable.
G12 Ensure sustainable consumption and production patterns.
G13 Take urgent action to combat climate change and its impacts.
G14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
G15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
G16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
G17 Strengthen the means of implementation and revitalise the global partnership for sustainable development.

THE NEW TASK FORCE ON PLANT PATHOLOGY PRIORITIES FOR 2050

Greg Johnson announced the establishment of the new *Task Force on Plant Pathology Priorities for 2050* during the ICPP2018 Opening Ceremony on 28 July 2018.

Following are the plans of the new Task Force:

- A framework of committees focused on key subject areas (linked with ISPP Subject matter Committees and ISPP Associated Societies; IMA, IUFRO);
- Consultations and workshops to review and address the key challenges for plant pathology 2050 and develop pathways for progress against them; and
- A series of ISPP Books "Plant Pathology in the 1st Century" that cover key challenges.

THE TASK FORCE PP2050 ACTIONS

- *September 2017*. Greg Johnson delivered the plenary lecture (Plant health is earth's wealth - partnerships for the next generation) at the Asian Conference on Plant Pathology in Jeju, South Korea http://www.acpp2017.org/. There were more than 400 delegates from the Asian Plant Pathology Societies attending. Greg mentioned the IYPH proposal to the delegates (as did a speaker from Korean Quarantine Agency), and discussed the initiative with the House of Delegates of the Asian Association of Societies for Plant pathology (AASPP), and both the proposed IYPH2020 and the ISPP Task Force PP2050 were warmly endorsed.
- *September 2017*. Greg Johnson attended the Australasian Plant Pathology Society Conference in Brisbane and briefed the outgoing and incoming APPS Presidents and Ian Porter, the co-chair of the UNEP Montreal Protocol Methyl Bromide Technical Options Committee on IYPH2020 and ISPP Task Force PP2050.
- *October 2017*. Ralf Lopian (the IYPH2020 lead) advised that the ICPP2018 programme committee has accepted a proposal for a concurrent session on Plant Health in a Global Economy. This session foresees a focus on the IYPH 2020 and the IPPC, with speakers from the IPPC, the Chair of the Commission on Phytosanitary Measures and Ralf Lopian, if he is still chair of the IYPH Steering Committee of the IPPC.
- *January 2018*. ISPP TF PP2050 Co-Chair, Lodovica Gullino started working in Italy in her region (Piedmont), proposing a programme of plant health events inside cultural events (Salone del Libro 2020; Torino Film Festival, Cinema Ambiente, etc.) and Museums (Egyptian Museum, Fondazione Sandretto). Such a

programme is under evaluation. In addition, as outreach to the 2050 generation, a programme with Schools will be organised with UNESCO.

- *March 2018*. The Italian Phytopathological Society (SIPaV) will join the Task Force and proposed IYPH-related activities: the 2019 National Congress in Milano (Italy); a special issue of the Journal of Plant Pathology; in 2020 the 4th International Symposium on Biological Control of Bacterial Plant Diseases (BIOCONTROL) in Viterbo and in 2020 the 14th International Conference on Plant Pathogenic Bacteria (ICPPB) in Assisi.
- *August 2018*. PP2050 Taskforce Committee met at ICPP2018
- *December 2018*. The Royal Netherlands Society of Plant Pathology (KNPV) joined the Task Force including its President Willem Jan de Kogel and Past-President Piet M. Boonekamp.
- *April 2019*. The International Year of Plant Health (IYPH) partners met to share ideas and build an IYPH network at International Plant Protection Convention (IPPC) - FAO in Rome.

THE FUTURE

- The Task Force on Challenges in Plant Pathology 2050 will work alongside the existing ISPP Task Force on Global Food Security on the issues of 'Food Security in 2050'.
- As looking ahead to 2050 may be difficult, the projections could be in four stages: 2020, due to the challenge posed by the IYPH, 2030, 2040 and then to 2050.
- Development of the Challenges PP2050 can also be framed to align with the United Nations Sustainable Development Goals.
- Participation in planning groups should see a strong participation of young scientists.
- Draft Statement and overview paper: 'Challenges in Plant Pathology 2050' to be published in Food Security during 2019.
- *September 2019*. ISPP meeting on Challenges in Plant Pathology 2050 at APPS Biennial Conference, Melbourne (50th anniversary meeting of Society). Also IYPH2020 events at the Asian Conference on Plant Pathology, Mediterranean Plant Pathology Society and Arab Plant Protection association meetings in 2020.
- PP2050 taskforce will organise a mini-conference in Turin in 2020
- The Task Force PH2050 role and continuation will be reviewed by ICPP2023.

The first International Year of Plant Health (IYPH) 2020 partners meeting took place at FAO headquarters (Rome, Italy) on 6 April 2019.

THE FIRST STEP: IYPH 2020

20 December 2018, Rome – The UN Food and Agriculture Organization and the International Plant Protection Convention Secretariat, based at FAO, welcomed the UN General Assembly's adoption of a resolution proclaiming 2020 as the International Year of Plant Health (IYPH). The year is expected to increase awareness

among the public and policy makers of the importance of healthy plants and the necessity to protect them in order to achieve the Sustainable Development Goals.

Up to 40 percent of global food crops are lost annually due to plant pests. In terms of economic value, plant diseases alone cost the global economy around US$220 billion annually and invasive insects around US$70 billion. "The International Year of Plant Health is a key initiative to highlight the importance of plant health to enhance food security, protect the environment and biodiversity, and boost economic development," IPPC Secretary Jingyuan Xia said.

"Despite the increasing impact of plant pests, resources are scarce to address the problem. We hope this new International Year of Plant Health will trigger greater global collaboration to support plant health policies at all levels, which will contribute significantly to the Sustainable Development Agenda," he added.

Finland first proposed the year to the governing body of the International Plant Protection Convention in 2015. In July 2017, the FAO Conference adopted a resolution in support of the proposal. "Pests and diseases don't carry passports or observe immigration requirements and, therefore, the prevention of the spread of such organisms is very much an international undertaking that requires the collaboration of all countries. This is why Finland proposed to proclaim 2020 the International Year of Plant Health," Jari Leppä, Minister of Agriculture and Forestry of Finland said.

The UN General Assembly invited FAO, with the IPPC Secretariat, to serve as the lead agency to spearhead activities, and called on governments, civil society, and the private sector to engage at global, regional and national levels. An International Plant Health Conference will be among thousands of plant health events to be held globally throughout 2020.

The IPPC is an international treaty that entered into force in 1952 and provides a framework to protect the world's plant resources from the harm caused by pests. It is currently composed of 183 contracting parties[3].

In April 2018, the IPPC Secretariat reported on actions taken since the last IYPH Steering Committee meeting[4], including:

- Launch of a survey on IYPH programme development;
- Promotion of IYPH in some scientific events;
- Follow up with the IPPC - FAO;
- Liaison with partners to raise the awareness on IYPH and mobilise resources to support the initiative;
- Liaison with different partner organisations, including academia and research institutes to promote the IYPH and secure their support and involvement;
- Opening of review through Online Comment System (OCS), comments compilation and follow up with StC members to update the factsheet; and
- Revision and launch of updated IYPH web page.

In April 2019, The IPPC Secretariat organised the first IYPH Partners Coordination Meeting that brought together 50 participants from 30 countries and five international organisations, eight academic and research organisations, five industry groups, seven regional groups, nine national plant protection organisations and six FAO divisions.

[3] "A year to celebrate plants: UN proclaims 2020 the International Year of Plant Health". IPPC website. 21 December 2018.
[4] "*Report of the IPPC IYPH Steering Committee Meeting*" (2018). International Plant Protection Convention (IPPC). 23 - 25 April 2018.

Several facilitated sessions helped trigger **creative ideas to promote the IYPH.** These included:

- Events such as parades, marches, musical shows, etc.
- Speeches by high level authorities
- Monthly campaigns around native plants
- Stands at nurseries, gardens, and gardening events
- Banners on metros, buses, taxis, and at airports and seaports
- Planting trees and caring for them
- Scientific meetings and congresses
- Public service announcements
- Fundraising events, such as telethons, which are good for publicity but also raising funds
- Songs and anthems that can be translated into local languages
- Articles in airline magazines and advice on the risks of bringing in plants and plant products printed on tickets
- Citizen science
- Materials for children and teenagers including videos, cartoons, emojis, games, apps, e-learning courses; and the reaching out to influencers and bloggers to deliver IYPH messages to young people

For more ideas on how to promote IYPH, see: https://www.ippc.int/en/news/my-new-news/

JOIN THE INTERNATIONAL YEAR OF PLANT HEALTH!

Let us know your activities for the International Year of Plant Health! Congresses, Conferences and meetings from all over the world are crucial to raise the critical importance of plant health.

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ISPP OFFERS LIFE MEMBERSHIPS

ISPP is an international association of societies for plant pathology. Individuals who are members of one of the associated societies are automatically associate members of ISPP. However, anyone can join ISPP as an individual member on an annual basis, with two options available including individual membership and individual membership package. The individual package inncludes:

- Individual membership of ISPP,
- Online personal calendar year subscription to Food Security, and
- 20% discount on all English-language books from Springer.

As of 2019, ISPP now also offers life individual memberships! The life membership does not include the journal subscription. (ISPP Fellows are automatically Life Members of ISPP).

Details about individual memberships are on the ISPP website where you can securely purchase memberships.

DURUM WHEAT GENOME IS DECODED

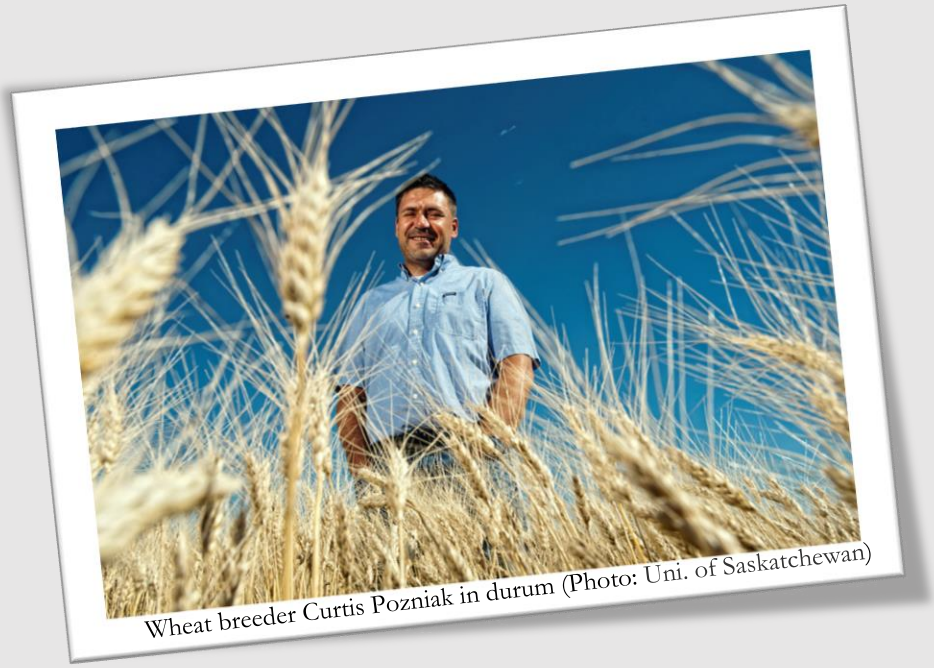
UNIVERSITY OF SASKATCHEWAN, 9 APRIL 2019

The entire genome of durum wheat, the source of semolina for pasta, has sequenced by an international consortium inovoving more than 60 scientists according to an article published in *Nature Genetics*. The team also discovered how to significantly reduce cadmium levels in durum grain, ensuring the safety and nutritional value of the grain through selective breeding.

"This ground-breaking work will lead to new standards for durum breeding and safety of durum-derived products, paving the way for production of durum wheat varieties better adapted to climate challenges, with higher yields, enhanced nutritional quality, and improved sustainability," said Luigi Cattivelli of Italy's Council for Agricultural Research and Economics (CREA).

The durum wheat genome is four times as large as the human genome. The team has for the first time assembled the complete genome of the high-quality Svevo variety.

"We can now examine the genes, their order and structure to assemble a blueprint that provides an opportunity to understand how the genes work and communicate with one another," said wheat breeder Curtis Pozniak of the University of Saskatchewan (USask). "With this blueprint, we can now work quickly to identify genes that are responsible for the traits we select for in our breeding programs such as yield, disease resistance, and nutritional properties."



Wheat breeder Curtis Pozniak in durum (Photo: Uni. of Saskatchewan)

The work was co-ordinated by Cattivelli and included corresponding authors Pozniak of USask and Klaus Mayer of the Helmholtz Zentrum in München (Germany), as well as researchers Aldo Ceriotti and Luciano Milanesi of Italy's national research council CNR and Roberto Tuberosa of the University of Bologna (Italy).

Access to the durum wheat genome is available at: www.interomics.eu/durum-wheat-genome and in the scientific database GrainGenes.

PLANT DISEASES CAUSED BY BACTERIA – NEW BOOK

ARANZAZU MORENO LOZANO, SECRETARY OF SOCIEDAD ESPAÑOLA DE FITOPATOLOGÍA

Edited by M.M. López, J. Murillo, E. Montesinos and A. Palacio-Bielsa. Enfermedades de Plantas Causadas por Bacterias. Sociedad Española de Fitopatología and Bubok, Madrid, Spain, 794 pp.

The importance of many plant diseases caused by bacteria in major crops around the world has increased in the last decades. This book has been edited by the Sociedad Española de Fitopatología (SEF), and provides an extensive coverage of the most relevant bacterial diseases in 48 chapters. It is the only comprehensive resource available in Spanish about phytopathogenic bacteria, providing valuable fundamental knowledge for professionals, scientists, and students in a reader-friendly, well-organized, and updated monograph. The 53 authors, from Spain and other countries, have prepared each chapter after extensive revision of the literature, and in many cases including their own data, to reflect both basic information and recent advances in diagnosis, biology and ecology, taxonomy, interaction with plant hosts, epidemiology and integrated management. Quarantine organisms for the European Union have been especially addressed.

In more detail, this book includes:

- Six general introductory chapters
- Thirteen chapters covering specific genera of plant pathogenic bacteria, including phytoplasmas and spiroplasmas
- Twenty-nine detailed chapters on relevant diseases caused by bacteria on herbaceous and woody plants, and covering free-living, fastidious and obligate pathogens
- Numerous (184) diagrams and color photographs

The book is available both in print (60 € plus taxes) and in electronic format (8 € plus taxes). Visit the SEF publications webpage for a free sample chapter and Bubok to learn more about this book.

FIRST INTERNATIONAL MOLECULAR PLANT PROTECTION CONGRESS

KHALED M. MAKKOUK, VICE PRESIDENT OF ISPP

The First International Molecular Plant Protection Congress was held at Cukurova University, Adana, Turkey during 10-13 April 2019. Around 300 scientists from 30 countries participated in this event. The congress program included 27 concurrent oral sessions which covered molecular aspects of different plant protection disciplines such as fungal, viral and bacterial diseases, insects, nematodes, and weeds. The congress program also included a posters session where 84 posters were exhibited. Eight Arab scientists participated in this event, two from Lebanon, one from Syria, one from Tunisia, three from Algeria and one from Iraq. One positive feature of this congress was the high number of presentations made by graduate students, mostly from Turkey. This was a positive indicator reflecting the interest of the younger generation in solving agricultural problems using research tools.

'DEATH SWITCH' MECHANISM IN PLANTS MAY YIELD STRONGER CROPS

PTI, 5 APRIL 2019

A possible "death switch" mechanism in plant's immune system that triggers infected cells to self-destruct, thus limiting the spread of the disease and keeping other parts of the plant healthy, has been reported by Chinese scientists in the journal Science; 'Ligand-triggered allosteric ADP release primes a plant NLR complex' and 'Reconstitution and structure of a plant NLR resistosome conferring immunity'. The discovery provides clues to cell death control and immunity for plants, and researchers hope it can lead to a new generation of disease-resistant crops that use significantly less pesticide and are more environmentally friendly.

The research was done by scientists from Tsinghua University and the Chinese Academy of Sciences' Institute of Genetics and Development Biology. Zhou and his team investigated a protein called AvrAC, which is produced by a bacterial pathogen that causes black rot on cabbage. The bacterium injects AvrAC into plant cells, where it acts as a "biochemical weapon" weakening the plant's immune system.

They discovered that some plants have evolved to carry a resistance protein called ZAR1 that can detect bacterial proteins like AvrAC. These plants use special proteins as "bait" and trick the bacterial protein into attacking them instead. While the bait is being attacked, ZAR1 is activated to form a multiprotein structure called resistosome," Zhou said. "The resistosome inserts itself into the cell's membrane and triggers it to destroy itself along with the invading pathogens, thus protecting other healthy cells," he said.

Read more.

NEW STANDARDS TO PREVENT THE GLOBAL SPREAD OF PLANT PESTS AND DISEASES

FOOD AND AGRICULTURE ORGANIZATION (FAO) OF THE UNITED NATIONS, 3 APRIL 2019

The Commission on Phytosanitary Measures' (CPM) has adopted new international measures to prevent pests from crossing borders and spreading, including protocols to block highly invasive pests such as *Xylella fastidiosa* and the oriental fruit fly. CPM is the governing body of the International Plant Protection Convention (IPPC) - the only international body charged with setting and implementing phytosanitary standards recognised by governments around the world and the World Trade Organization-SPS agreement to facilitate safe trade and protect plant health.

"With increased trade and travel, the risks of plant pests spreading into new areas across borders is now higher than ever before. Each day, we witness a shocking number of threats to the well-being of our plants and, by extension, to our heath, environment and economy," said Bukar Tijani, FAO Assistant Director-General for Agriculture and Consumer Protection Department. FAO estimates that annually between 20 to 40 percent of global crop production are lost to pests. Each year, plant diseases cost the global economy around $220 billion, and invasive insects around US$70 billion.

New IPPC standards adopted this week include:

- A new standard to provide guidance on improved fumigation methods. This is in response to growing concerns over fumigants that can be harmful to human health and the environment. The standard sets requirements for temperature, duration, fumigants' quantity to make fumigation effective, and puts forward solutions to lessen fumigation's environmental impact - for example, by using recapture technology to reduce gas emissions.
- Diagnostics protocols that describe procedures and methods for the official diagnosis of six pests, including *X. fastidiosa* and the oriental fruit fly (Bactrocera dorsalis). Ensuring a correct diagnosis is essential to catalyse rapid actions to manage the pests.

  X. fastidiosa is a deadly bacterium that attacks economically important crops such as olive, citrus or plum trees and grapevines. Since 2015, it's been rapidly spreading from the Americas to Europe and Asia. Once X. fastidiosa infiltrates a plant, it is there to stay - it starves the plant of water until the plant dies or becomes too weak to grow fruit. *X. fastidiosa* costs $104 million per year in wine losses in California alone. In Italy, the bacteria has led to the decline of 180,000 hectares of olive groves - many centuries-old trees - and constitutes a threat not only to Italy's economy but to all Mediterranean countries' economy.

  The oriental fruit fly (*Bactrocera dorsalis*) has affected trees such as avocado, banana, guava and mango in at least 65 countries. In Africa, import trade bans due to oriental fruit fly infestations cause annual losses of around $2 billion.

NEWS ON CONNECTED VIRUS AND VECTOR DIAGNOSTIC TRAINING

RICHARD WYATT, CONNECTED NETWORK COMMUNICATIONS OFFICER

An innovative partnership between CONNECTED and Biosciences eastern and central Africa – International Livestock Research Institute (BecA – ILRI) Hub enabled 19 delegates from 10 countries (Benin, Burundi, Democratic Republic of Congo, Ghana, Kenya, Nigeria, South Africa, Tanzania, Uganda and Zambia) to take up fully-funded places at 'An introduction to virus and vector diagnostics', a five-day course which took place during March 2019 in Nairobi, Kenya at BecA-ILRI Hub.

"The feedback highlights the huge value of providing this sort of training to share and spread good practice in virus and vector diagnostics to help improve food production and food security in Sub-Saharan African countries", says Prof. Neil Boonham, CONNECTED Network Co-Director.

"Vector-borne plant diseases contribute to food insecurity, hunger, and limited economic development. Tackling these diseases is the CONNECTED network's mission and, if we are to succeed, scientists in Africa need to be able to detect the viruses and identify the insects that carry and spread the viruses that are responsible.

Each and every delegate confirmed their intention to share their newly acquired skills and knowledge with others in their network. They were asked how many people this would involve, and their responses show dissemination will now be taking place to a minimum of 350 colleagues in their networks across the 10 countries represented. Collectively the delegates confirmed they would do this through a combination of lectures, laboratory practicals, seminars & tutorials, research supervision, articles, newsletters, blog posts and funding reports.

Prof. Boonham shared teaching duties during the week with Dr Goncalo Ramalho E Silva, from The Natural Resources Institute, University of Greenwich, UK. Course content included:

- DNA barcoding sample preparation - DNA extractions on insects
- Polymerase chain reaction
- Electrophoresis and purification of DNA for sequencing
- DNA sequence analysis - clustering, database searching
- Isothermal amplification techniques - LAMP and RPA

Early career researchers are invited to ensure they don't miss news of future opportunities, by joining the free CONNECTED network.

RECENT DETECTIONS OF HUANGLONGBING IN CALIFORNIA'S CITRUS

DAVID KARP, LA TIMES, 29 MARCH 2019

The world's most insidious citrus disease, Huanglongbing (HLB), commonly known as citrus greening, invaded Florida in 2005. After just a decade, virtually every citrus tree in the state was dying or infected. In 2012, the disease was discovered in California. It showed up first in a Hacienda Heights backyard, on a pummelo branch derived from budwood that had been smuggled from China, where the disease is epidemic.

The next infected tree wasn't found until 2015, and for two years after that only 81 more turned up. In mid-2017, however, a new sampling method and improved detection technology led to the discovery of far more HLB-positive trees in California: 1,135 as of 11 March.

Now researchers and farmers are racing to fend off the disease. At the 6th International Research Conference on Huanglongbing meeting held recently in California for the first time showed that although the disease is spreading rapidly in the Southland and no breakthrough is imminent, a host of new detection methods and strategies could help California avert the kind of disaster that destroyed almost three quarters of Florida's citrus production.

The infected trees have been found mainly in Orange County, where Garden Grove and Santa Ana accounted for 702 detections, and in the San Gabriel Valley and adjacent regions of Los Angeles County. So far confirmed detections have all been in backyard trees, not commercial groves. Agricultural authorities promptly cut down all the infected trees, but these may be only the tip of the iceberg because the standard HLB test can take many months or years to detect a new infection. During this time trees appear normal but can infect feeding psyllids, which in turn can spread the disease to other trees.

Scientists have labored for a decade to develop devices to detect the disease earlier, but recently a low-tech solution has proved more promising: dogs trained to sniff HLB-infected trees.

Read more.

WHY ARE APPLES TREES DYING IN AMERICA?

BRYAN NELSON, MNN.COM, 29 MARCH 2019

Something is killing apple trees across America and scientists are unsure as to what is causing the mysterious deaths. The puzzling affliction is being called RAD, or 'rapid apple decline', and it typically begins on a single tree limb. As the leaves begin to grow, they curl up and turn yellowish-red while they are still small. This then spreads to other limbs until the entire apple tree dies. Sometimes the disease seems to spread from tree to tree like a contagion, other times it manifests randomly across an orchard.

This isn't the first time something like this has happened to apple trees. A similar unexplained phenomenon occured in the 1980s, but it pales in comparison to the latest epidemic, which began in 2013. Without being able to identify the underlying cause, scientists can't be sure if the two outbreaks are related.

When it comes to plant pathology, there are viruses, fungi, bacteria, parasites and insect infestations. But so far, the problem doesn't seem linked to any of these. Scientists have tried a wide range of chemicals to combat each of these potential suspects, to no avail. It is possible that the trees are dying due to a range of environmental stressors, but it's unclear what those might be.
Read more.

15 Early Stage Researchers (PhD) will be employed in 5 EU countries on EU Marie Curie innovative training network project: Inextvir "Innovative Network for Next Generation Training and Sequencing of Virome", coordinated by the NIB, Slovenia.

The successful candidates will be hosted by a member of a European Consortium of universities, research institutions and companies in Belgium, France, Spain, Slovenia and the UK. Information on the call and application: https://euraxess.ec.europa.eu/jobs/394673 (EURAXESS Job Offer id: 394673)

INEXTVIR - Innovative Network for Next Generation Training and Sequencing of Virome – is a Marie Curie network funded by the European Commission under the Horizon 2020 programme and offers fully funded PhD positions with an attractive salary, complementary training activities and generous travel and laboratory and research budgets. We are looking for 15 Early Stage Researchers (ESR), with a background in either life sciences and related studies (biology, agronomy, biotechnology, bioinformatics) or social sciences (e.g. Psychology, economics, communication sciences, geography, decision-sciences). Successful candidates will be involved in one or more of the following fields: plant virology, bioinformatics, virus ecology and epidemiology, agriculture, socio-economics, societal communication, policy and regulation.

The position is offered for 3 years and all hired researchers must enroll in Doctoral Programmes, undertake mobility in order to implement their individual Research Project, as well as to participate in complementary training activities. Successful candidates will will participate in a transdisciplinary network of research and training aimed at accelerating the start of the applicants' scientific career.

ELIGIBILITY CRITERIA

The Marie Curie funding is available for researchers that move, both within Europe and globally. The following criteria apply:

- Nationals from any country may apply.
- Mobility: at the time of the recruitment, the researcher must not have resided or carried out his/her main activity (work, studies, etc.), in the country of the chosen host institution (recruiting beneficiary) for more than 12 months in the 3 years immediately prior to the date of the recruitment.
- Research category of Early Stage Researcher (ESR): researchers who, at the time of the recruitment, have not yet been awarded a doctorate degree and are in the first 4 years (full-time equivalent) of their research careers, including the research training period that would entitle them to a doctorate.

CURRENT VACANCIES

The Department of Plant Pathology at the **Washington State University** seeks to fill a 12-month, permanent, full time tenure-track position at the rank of Assistant Professor of Plant Pathology. The position has research and extension responsibilities in potato pathology and teaching responsibilities at the undergraduate and graduate levels. Application screening will begin on 30 April 2019 and remain open until filled. Further details about the position and how to apply are available in the PDF.

ACKNOWLEDGEMENTS

Thanks to Grahame Jackson, Greg Johnson, Jan Leach, Aranzazu Moreno Lozano, Khaled M. Makkouk, Andrea Masino, and Richard Wyatt for contributions.

COMING EVENTS

Joint Meeting of the IUFRO working parties "Shoot, foliage and stem diseases" and "Wilt diseases" (7.02.02 and 7.02.03)
6 May - 10 May, 2019
Figline Valdarno, Florence, Italy
Website: www.iufro.org/download/file/29599/2749/florence19-1st-announcement_doc/

2nd International Conference on Holobionts
8 May - 10 May, 2019
Montréal, Québec, Canada
Website: www.fourwav.es/view/1040/info/

14th International Plant Virus Epidemiology Symposium
13 May - 17 May, 2019
Seoul, South Korea
Website: www.ipve2019.com

5th International Symposium on Postharvest Pathology: From Consumer to Laboratory - Sustainable Approaches to Managing Postharvest Pathogens
19 May - 24 May, 2019
Liège, Belgium
Website: www.postharvest2019.be

International Symposium on Cereal Leaf Blights 2019
22 May - 24 May, 2019
University College Dublin, Dublin, Ireland
Website: www.isclb2019.com

2nd International Symposium on Fire Blight of Rosaceous Plants
17 June - 21 June, 2019
Traverse City, Michigan, USA
Website: www.canr.msu.edu/fireblightsymposium/

Functional Metagenomics 2019
16 June - 19 June, 2019
Trondheim, Norway
Website: www.sasm.org.za/component/k2/item/219-functional-metagenomics-2019

20th *Fusarium* Laboratory Workshop
23 June - 28 June, 2019
Kansas State University, Manhattan, Kansas, USA
Website: www.plantpath.k-state.edu/events.fusarium

51st Pest Management Council of the Philippines Anniversary and Annual Scientific Conference
2 July - 5 July, 2019
Coron, Palawan, Philippines
Contact: Mr. Freddiewebb B. Signabon
philphytopath@gmail.com

Rhizosphere 5
7 July - 11 July, 2019
Saskatoon, Saskatchewan, Canada
Website: www.rhizo5.org

11th International Workshop on Grapevine Trunk Diseases
7 July - 12 July, 2019
Penticton, British Columbia, Canada
Website: iwgtd2019.ca/

4th International Symposium on Biological Control of Bacterial Plant Diseases (BIOCONTROL2019)
9 July - 11 July, 2019
Viterbo, Italy
Website: www.biocontrol2019.com

XVIII International Society for Molecular Plant-Microbe Interactions Congress
14 July - 18 July, 2019
Glasgow, Scotland
Website: www.ismpmi.org/Congress/2019

1st International Wheat Congress
21 July - 26 July, 2019
Saskatoon, Saskatchewan, Canada
Website: 2019iwc.ca

American Phytopathological Society Annual Meeting – Plant Health 2019
3 August - 7 August, 2019
Cleveland, Ohio, USA
Website:
www.apsnet.org/meetings/2019/Pages/default.aspx

6th International Conference on Bacterial Blight and Bacterial Leaf Streak of Rice
18 August - 22 August, 2019
Cantho City, Vietnam
Website: icbb6.org/

International Workshop on the Fruit Microbiome: A New Frontier
3 September - 6 September, 2019
National Conservation Training Center, Shepherdstown, West Virginia, USA
Website: www.bard-isus.com/fruitmicrobiome.html

Working Party Meeting of IUFRO WP 7.03.10 Methodology of forest insect and disease survey in Central Europe - "Recent Changes in Forest Insects and Pathogens Significance"
16 September - 20 September, 2019
Suceava, Romania
Website: www.silvic.usv.ro/iufroromania2019/

22nd Biennial Conference of the Australasian Plant Pathology Society
25 November - 28 November, 2019
Melbourne, Australia
Website: www.apps2019.org

International Symposium on Microbe-Assisted Crop Production – Opportunities, Challenges and Needs
2 December - 5 December, 2019
Vienna, Austria
Website: microbe.org/

16th Congress of the Mediterranean Phytopathological Union
23 March - 27 March, 2020
Limassol, Cyprus
Website: cyprusconferences.org/mpu2020

14th International Conference on Plant Pathogenic Bacteria
7 June - 12 June, 2020
Assisi, Italy
Website: www.icppb2020.com

Joint 18th International *Botrytis* Symposium & 17th International *Sclerotinia* Workshop
8 June - 12 June, 2020
Avignon, France
Website: colloque.inra.fr/botrytis-sclerotinia-2020

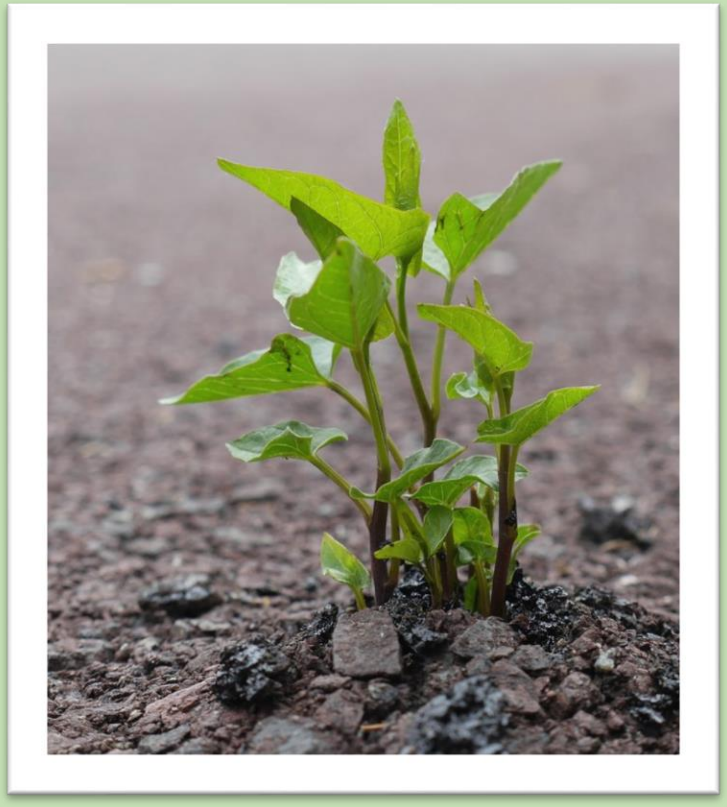
Asian Conference on Plant Pathology: Importance and Impact of Global Plant Health
15 September - 18 September, 2020
Tsukuba International Congress Center, Ibaraki, Japan
Website:
www.ppsj.org/pdf/meeting/2020_ACPP.pdf?0913-2

13th Arab Congress of Plant Protection
1 November - 6 November, 2020
Le Royal Hotel, Hammamat, Tunisia
Contact: Dr. Asma Jajar, Chairperson of Organising Committee info@acpp-aspp.com
Website: acpp-aspp.com

IX International Postharvest Symposium
9 November - 13 November, 2020
Rotorua, New Zealand
Website: scienceevents.co.nz/postharvest2020

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

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP)



WWW.ISPPWEB.ORG

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.

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