12th INTERNATIONAL CONGRESS OF PLANT PATHOLOGY

ICPP 2023

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LYON

20-25 August, France

BOOK OF ABSTRACTS

ISPP INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

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SFP Société Française de Phytopathologie

The International Society for Plant Pathology & the French Phytopathological Society

Based on VITO's long-standing research in the use of RS technology for disease detection and monitoring, an overview of these technologies will be presented, together with their merits and pitfalls.

SPREAD OF NEOPESTALOTIOPSIS SP. CONIDIA FROM STRAWBERRY UNDER CONTROLLED CONDITIONS

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Text

The Florida strawberry industry has been recently affected by a new species of Neopestalotiopsis that is more aggressive and has caused significant losses. Since the fungus had been considered of secondary importance, little is known about its life cycle. Thus, experiments were set up in a wind tunnel to evaluate the dispersal of the pathogen from symptomatic strawberry leaves, fruit, as well as dried senescent leaves, and inoculated sandy soil. Plates with selective media for Neopestalotiopsis spp. were placed at 0.6, 1, 3, 5, and 7 m away from the inoculum sources, and the following treatments were tested: 5 m/s, 5 m/s + water, 7 m/s, and 7 m/s + water. To describe the dispersal gradients, an exponential model was fitted to the number of colony-forming units of Neopestalotiopsis sp. found on the plates and to the distance from the inoculum source. The exponential model described the dispersal gradient for treatments with water, although a few colonies were found in the treatments without water. The highest number of CFU were found in plates where strawberry fruit and strawberry dried leaves were the inoculum sources. Most inoculum moved less than 1 m, regardless of the inoculum source. The 7 m/s wind + water moved the inoculum further than 5 m/s + water. Our data suggest that Neopestalotiopsis dispersal occurs within short distances, but higher wind speeds, which commonly occur during storms in Florida, may move conidia longer distances.

VOLATILE ORGANIC COMPOUNDS -CHEMICAL SIGNALS TO COMMUNICATE PLANT HEALTH

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Text

Plants and their respective pests, including pathogens, communicate their physio-chemical status to their surroundings by emitting volatile organic compounds (VOCs). The specificity and uniqueness of these VOCs could be utilized as "infochemicals" to detect, identify and monitor diseases. Pre-symptomatic detection would allow more targeted and less resource intensive pest control strategies to be employed. In addition, the release of pathogen-related VOCs might elicit defense responses in neighboring plants that delay the spread of the disease within the crop stand. As such, the study of VOCs holds an untapped potential in plant pathogen epidemiology and management. We have collected VOCs emitted from wheat grown both in the greenhouse and in the field exposed to different fungal pathogens and identified those compounds emitted from infected plants by GC-MS. Concentrations of VOCs were very low, but the target diseases could be identified based on the VOC profiles of

the infected host plants. The project 'PurPest- Plant Pest Prevention through technology-guided monitoring and site-specific control', currently funded by EU's Horizon Europe program, is exploring the most recent sensor technology to detect and identify pathogens and insect pests based on their VOC signature in host plants to limit their spread, target control measures and better understand the drivers of pest invasion.

A MODELLING APPROACH TO MAP THE RISK OF HLB IN THE IBERIAN PENINSULA

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Text

Huanglongbing (HLB), or citrus greening, is a devastating citrus disease, currently found in Asia, Africa and North and South America. At present, no cases of HLB have been found in Europe, but in the past decade one of the disease vectors, the African citrus Psyllid (AfCP), has been found in several locations in North-Western Spain and Portugal. The presence of an established vector population means there is a high risk of transmission between citrus if HLB is subsequently introduced.

We present the findings of a 1 km^2 computational model of vector and pathogen spread in the Iberian Peninsula. The density of citrus in residential areas and commercial orchards, as well as climate suitability, influence the pattern of spread. The majority of vectors disperse locally and are dependent on the availability of citrus plants, but we also account for long-distance dispersal via mechanisms such as wind or human transportation. Using the current estimated distribution of AfCP as an initial condition, results often show a pattern of slow growth of the psyllid in the North-West. However, once long distance dispersal or new introduction of psyllid into the densely populated commercial citrus regions in the South or East of Spain occurs, the population quickly increases. There is subsequently a high risk of rapid spread of HLB upon the introduction of an infected plant in this region.

AN EPIDEMIOLOGICAL MODEL TO ASSESS THE EFFICACY OF MONITORING TECHNOLOGIES FOR EARLY DETECTION OF TREE PESTS AND PATHOGENS AT LOCAL AND TREESCAPE LEVELS

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Text

Trees are an essential natural resource that stores carbon, provides habitats and food for wildlife and is an important ecosystem service. Nevertheless, they are under increasing threat from pests and pathogens. Efficient monitoring of tree conditions is needed to respond