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The Journal of Plant Pathology Editors' Choice May 2024

This is the author's manuscript

Original Citation:

Availability:

This version is available http://hdl.handle.net/2318/2066470 since 2025-04-14T11:06:10Z

Published version:

DOI:10.1007/s42161-024-01642-y

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02 May 2026

Journal of Plant Pathology (2024) 106:409–410
https://doi.org/10.1007/s42161-024-01642-y

The Journal of Plant Pathology Editors' Choice May 2024

The May 2024 issue of the Journal of Pant Pathology is proud to feature an unprecedent number of reviews. Two such reviews were selected for the Editors' Choice (EC) section of the Journal. Each one of them deals with crops of major importance in subtropical and temperate regions of the world, and it does so in an innovative, wholistic and forward-thinking fashion. Both reviews have a focus on green safe alternatives to manage disease and discuss the implications of treatments for either human or ecosystem health. The emergence of pathogen resistance to products currently used, and the need to increase the market availability of safe green alternatives are two topics touched by the reviews. These topics underline a period of transition in how we "do" agriculture. On one hand, global change, globalization, and exposure to chemicals are accelerating the evolution of pathogens, while diminishing the effectiveness of certain compounds; on the other, we are voluntarily abandoning the use of certain compounds due to their negative impact on ecosystems and human populations. In some cases, the remaining options available are few, and thus we absolutely need new research. A further -welcomecomplexity is offered by the rise of smart technologies and integrated approaches to disease management: these are very promising, but often are not ready yet to be fully implemented until more data are accumulated and published. For this reason, we welcome these two reviews, because they both push the envelope about a next generation approach to crop productions. We also chose two research papers that follow the same leitmotifs, while providing experimental data on (a) the potential adaptation of fungal pathogens driven by global climate change, and (b) integrated disease control options. We note that neither research paper provides definitive results, yet we selected them to prove the point that research papers do not need to "solve the problem" or to "find a solution" to be worthy of our attention. Many research papers may be incremental rather than transformative, but those incremental contributions can become transformative when combined. Join us in a journey that starts from the past in the quest to explore possible future agricultural scenarios: a journey created by the minds of scientists from Italy, Spain, USA, South Africa, Australia, Pakistan and France. Below are the EC papers, in more detail.

"Green solutions and new technologies for sustainable management of fungus and oomycete diseases in the citrus fruit supply chain" by Rovetto, La Spada et al. (Italy, Spain, USA) is unique because it covers the entire citrus supply chain, including diseases of trees in orchards, diseases of fruits in the field and post-harvest diseases. The review introduces the main fungal and oomycete plant pathogens and the disease they cause and then summarizes the knowledge about specific management options, with particular emphasis on novel ecofriendly tools and sustainable disease management strategies, including the management of contamination of food products by mycotoxins.

New, rapid, accurate and cost-effective molecular techniques for the early detection of fungal and oomycete citrus pathogens are also discussed, although briefly because the authors deem them as a necessary component of any sustainable and integrated citrus disease management strategy. It summarizes the great contribution that smart technologies are providing towards new solutions for the prevention and sustainable management of such diseases, including the use of biopesticides, resistance inducers and biostimulants. This review is extremely timely, given the economic importance of citrus in many world regions.

"Soil amendments for management of Phytophthora root rot in avocado and their impact on the soil microbiome" by Qurrat Ul Ain Farooq et al. (Australia and Pakistan) focuses on Phytophthora root rot threatening avocado crops worldwide. This review is very timely in that not only summarizes the current state of the art on control options alternative to chemical treatments, which have triggered the development of resistance in *P. cinnamomi* populations, but also considers the effects on soil microbiome of these control options as well as future directions of the research. The paper is best described by quoting the authors. "Although some new fungicides are becoming available, an integrated approach for managing *P. cinnamomi* in avocado orchards is the best option and has been widely adopted. It promotes root health by planting *P. cinnamomi*-resistant rootstocks, careful soil selection and site preparation, organic and inorganic amendments, irrigation management, and chemical control However, even with integrated management, the control of *P. cinnamomi* in avocado orchards still relies heavily on applying phosphite." There is an increasing awareness that, as climate warms and water availability become more unpredictable, much of the future of agriculture relies in the chemical and biological quality of soils, a quality that will increase plant health, suppress diseases, and increase the amount of green water available to crops. For this reason, this review which focuses on soil suppressiveness, and microbial diversity is extremely timely. Yet, the use of chemical compounds, such as phosphites cannot be discontinued without compromising the productivity of infested orchards, hence, once again, an integrated approach is needed and "what and how much to integrate" is the answer that needs to be urgently answered.

In their study titled "Chemical control of the polyphagous shot hole borer beetle (PSHB, *Euwallacea fornicatus*) and *Fusarium euwallaceae* in American sweetgum (*Liquidambar styraciflua*)", Roberts et al. (South Africa) focused on the chemical control of the shot hole borer beetle *Euwallacea fornicatus* and its fungal associate *Fusarium euwallaceae* in *Liquidambar styraciflua*. Although none of the chemical treatments tested was completely effective against the disease, the paper is relevant in more of one way, because: (i) it targets relevant polyphagous pests and pathogens, which are often regulated worldwide, (ii) it used a newly described inoculation technique, and, more importantly, (iii) it suggests that the successful management of this disease will likely depend on a combination of control strategies instead of a single strategy.

In "Is thermal aptitude a pivotal driver in the establishment of recent *Puccinia striiformis* f. sp. *tritici* lineages in

Europe?" Meyer et al. (France) tested the hypothesis of an adaptation to temperature of several recent European races of the causal agent of yellow rust on wheat *Puccinia striiformis* f. sp. *tritici*. By setting an elegant inoculation experiment, the authors compared the infection efficiency and latency period of isolates representative of European races collected over the last decade (2010–2020) with those of "old" reference isolates collected before the 1990s, under different thermal regimes. Authors concluded that the pathogen species has the potential to adapt to temperature changes, but that such adaptation probably did not drive the establishment of neither the previously dominant races nor the most recent races. The paper is a valuable contribution to the effects of climate change on plant pathosystems.

We hope that you will join us in congratulating the authors of these Editors' Choice papers selected for the May 2024 issue of the Journal of Plant Pathology because of their original contributions to the field.

Matteo Garbelotto, Editor in Chief
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