Rice blast, caused by *Pyricularia oryzae*, is one of the most important rice diseases worldwide, causing economically important rice yield losses and representing a threat to global food security. Rice blast management relies on fungicides, especially in Europe, as susceptible rice varieties are intensively grown for their quality value. Azoxystrobin (a Quinone outside inhibitor fungicide, QoI) represents often the first – and sometimes the only – choice of chemical control of rice blast. However, it is a fungicide with a high risk of resistance development in pathogen populations. Indeed, *P. oryzae* azoxystrobin-resistant strains from rice have been identified in Japan, which poses concerns about the spread of QoI resistance also in other rice-growing areas. Despite this, no reliable and sensitive detection method of QoI resistance in *P. oryzae* populations exists at the moment. We developed two qPCR-based methods for the detection of QoI-resistant strains of *P. oryzae*. One is based on selective amplification of sensitive (S) or resistant (R) allele using S- and R-specific primers, while the other exploits high resolution melting analysis of the PCR product. Here, we evaluate and compare the sensitivity and specificity of the two methods using DNA mixtures of S and R strains at different ratios. This method is to be used where QoI application is the predominant means of rice blast management, to monitor the emergence of *P. oryzae* QoI-resistant strains.

The International Plant Protection Convention and its common ground with plant pathologists to contribute to plant health and wildlife, in the world

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The International Plant Protection Convention (IPPC) is a 65 years old international treaty among 183 contracting parties, whose mandate is the global adoption of phytosanitary principles and measures, aimed to protect the plant resources of the world, both agricultural and natural. The IPPC it is recognized by the World Trade Organization as one of the three standard setting organizations. The development of international standards of phytosanitary measures (ISPMs) includes, thus far, 94 standards; including 41 ISPMs, 22 Diagnostic Protocols and 31 Phytosanitary Treatments. In order to achieve effectiveness, it balances legal and scientific criteria. So that, regular interaction with scientists, individually and organizations, becomes an invaluable mechanism, that needs to be regular and robust in the long haul. Examples of this interaction include, in the past, *Phytophthora infestans, Erwinia amylovora, Clavibacter michiganensis and Mycosphaerella fijiensis*. Presently, *Xylella fastidiosa*, citrus greening and FOCR4T, in some countries. In the future, it is forseen the need to interact around themes like virus diseases, *Xylella fastidiosa* subsp. multiplex, UG99 rust and *Phytophthora ramorum*. The governing body of the IPPC, the Comission for Phytosanitary Measures has launched, supported by FAO, an initiative for the year 2020 to be recognized by the UN, as the is International Year of Plant Health.

Caliciopsis canker: An emerging disease in pine stands

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Caliciopsis canker, caused by *Caliciopsis pinea*, have been increasingly observed in plantations of *Pinus radiata* in Italy, and occasionally on *P. pinaster*. In Europe the disease has been described since 1896 on *P. mugo*, and has also been reported on *P. radiata* and native species, such as *P. pinea*, *P. pinaster* and *P. halepensis*. In North America the fungus was described since 1920, and recently has been reported as an emerging problem in *P. strobus* plantations in Eastern North America. In 2010 in Spain *C. pinea* was found on the same stem of a P. radiata tree that was also infected by *Fusarium circinatum*, an invasive alien pine pathogen introduced in Europe in the early 2000s. Aim of this work was to increase knowledge on this emerging disease, by analyzing the phylogeny of European (E) and North American (NA) pathogen populations, challenging the pathogenicity on different native and non-native hosts, and assessing whether a possible association with *F. circinatum* exists. European isolates showed no genetic variability and clustered with a single NA provenance. In contrast NA strains are much more variable. *C. pinea* was able to cause significant lesions on seedlings of different pine species. Contrasting results were obtained as regards of association with *F. circinatum*: different *C. pinea* isolates react differently to its presence. The uniformity of the European population suggests an introduction event, probably from North America. It is possible that Caliciopsis canker could become a dangerous pathogen of pine stands in Europe, especially if they suffer for environmental stresses due to climate change. Finally, *F. circinatum* seems to induce the production of ligninases by some *C. pinea* strains, suggesting a fungus-fungus interaction.

Critical aspects of biologically relevant seed health assays

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There is no question on the importance of preventing the spread of plant pathogens across the globe. This is facilitated by the creation and implementation of phytosanitary regulations, and the continuous improvement of seed health testing protocols. Our experience in developing an assay for detection of *Xanthomonas oryzae* pvs. *oryzae* and *oryzicola* rice seed contamination has shown us that this is not an easy task. Critical aspects of seed health assays are not only limited to the technical specifications of the detection method, such as sensitivity, selectivity, ruggedness, and reliability. In diagnostic PCR, the inclusion of test controls (i.e. internal amplification control, process controls, no template controls, positive controls, and non-target controls) are necessary to validate any result. Also, the simplicity of an assay is important for it to be useful. Is the required equipment commonly available or too specialized? Are the extraction steps simple and easy to carry out? In the final stages before protocol dissemination to users, the protocol should be audited by a higher body, such as the International Seed Testing Association (ISTA), and the accreditation of a protocol for universal use would depend on stringent evaluation by ISTA. Developing protocols for seed health testing should be done with the prime intention to create a method for easy adoption by quarantine laboratories across the globe.

Survey and Identification of *Meloidogyne* Species Associated with Potato in North Sumatra, Indonesia

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Root knot nematode (RKN/*Meloidogyne* spp.) is one of the main constraint of potato production in Indonesia, especially in Karo District as potato production centre in North Sumatra. A survey in 9 localities of potato-growing area of Karo District was conducted to identify species of root-knot nematode associated with potato. Morphological characters based perrineal pattern, and DNA sequence analysis were used to identify the nematodes. Soil and root samples were collected from farmer's fields. Single egg mass was identified by morphological studies and then confirmed by PCR amplification of DNA using species-specific SCAR (sequence characterized amplified region) primers, sequencing, and NCBI-BLASTn analysis of the

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