

# **ABSTRACT BOOK**

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## **EPPO CONFERENCE ON DIAGNOSTICS OF PLANT PESTS** *RECENT DEVELOPMENTS AND FUTURE TRENDS*

AUSTRIAN AGENCY FOR HEALTH  
AND FOOD SAFETY -AGES

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Po07

**Session: Advances in diagnostic technologies used in the field and in the laboratory**

## **Smart Diagnostics for Plant Health: From Electronic Noses to On-Site Molecular Detection**

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Advances in pest diagnostics are reshaping plant health surveillance by enabling rapid, field-based detection combined with laboratory precision. New isothermal amplification techniques, such as loop-mediated isothermal amplification (LAMP) and recombinase polymerase amplification (RPA), now allow on-site molecular detection of plant-parasitic nematodes and other pathogens. These methods operate at constant temperature, require minimal instrumentation, and deliver highly specific results within minutes, representing a breakthrough in portable molecular diagnostics. In parallel, the European project PurPest is pioneering volatile organic compound (VOC)-based detection through electronic-nose (e-nose) systems that recognize pest-specific VOC profiles emitted by infested plants or substrates. This non-invasive, real-time technology complements molecular tools by providing fast, field-deployable prescreening for pest activity. The combination of e-nose sensing and isothermal molecular tests defines a new generation of integrated diagnostic platforms. Together, they enhance early-warning capacity, support precision pest management, and contribute to the European Green Deal goals of sustainable, low-impact agriculture.

**Keywords:** early detection, field diagnostics; isothermal amplification, nematodes, volatile organic compounds.