



DESARROLLO DE SISTEMAS INTEGRADOS DE DECISIÓN Y
GESTIÓN GLOBAL DEL VIÑEDO A TRAVÉS DE NUEVAS TECNOLOGÍAS

Tecnologías para la detección (de riesgo) de plagas y enfermedades

Dra. Ana M. Díez-Navajas



Plagas:

Polilla del racimo

Mosquito verde

Acariosis

Piral

Detección:

Estaciones agrometeorológicas

Sistemas de captura

Viabilidad de propágulos

Observaciones visuales

Enfermedades:

Mildiu

Oidio

Botritis

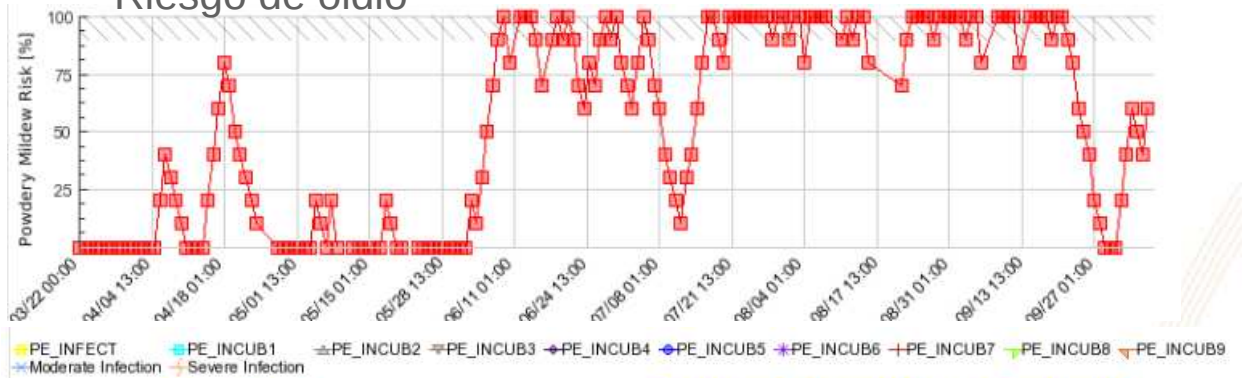


Modelos de predicción-software

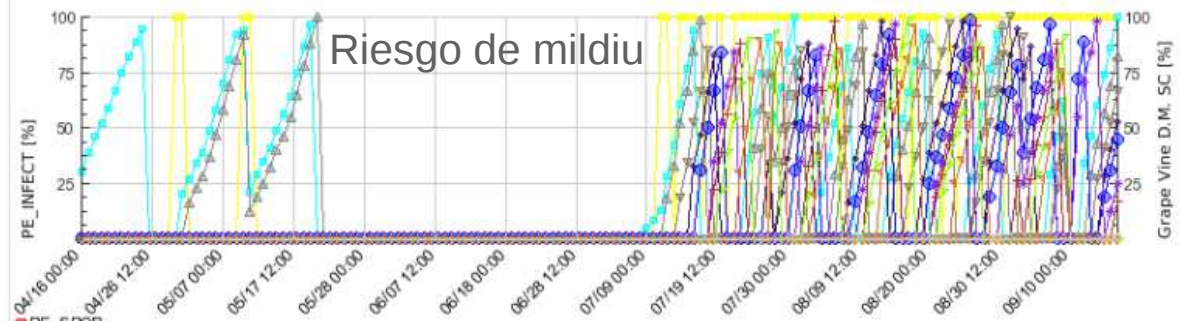
Estación agrometeorológica



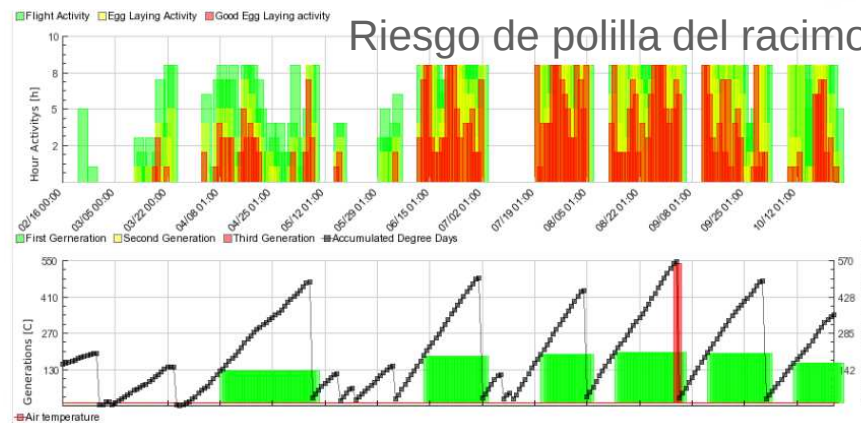
Riesgo de oidio



Riesgo de mildiu



Riesgo de polilla del racimo



Trampas de feromonas



Trampas cromotrópicas



Nuevas tecnologías

Trampa con cámara: feromona específica



Trampas de esporas

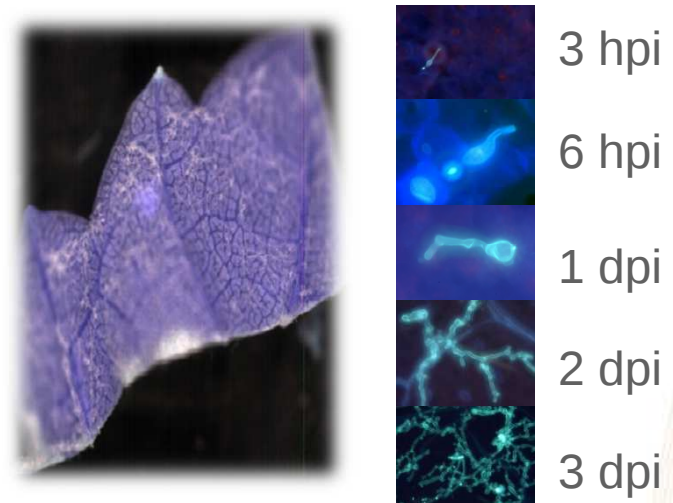


Detección en laboratorio:

- Microscopía
- PCR

Nuevas tecnologías

Imagen hiperspectral



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Detection of downy mildew in the field on grapevine leaves using a new portable fluorescence sensor

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Introduction

Downy mildew is a major disease of grapevine caused by the oomycete *Plasmopara viticola*. It affects all green parts of the plant leading to great losses in yield and to alteration of wine quality. It is at the origin of numerous fungicide treatments.

In order to optimize these treatments and reduce their number, an early detection of the disease in the field is sought after [1], preferably by non-destructive means for a precision agriculture approach.

Stilbenes, the main phytoalexin of grapevine [2], are not present in healthy leaves. Their synthesis and accumulation is induced by *P. viticola* [3-5]. They are fluorescent phenolic compounds [6], displaying violet-blue fluorescence (VBF) under UV-light with excitation and emission maxima around 320 and 390 nm, respectively [7]. In the laboratory, VBF was used to assess stilbenes *in vivo* in grapevine leaves [7-9] or as an indicator of the development of the infection by *P. viticola* [10]. So, this fluorescence signal could potentially be used as a non-invasive proxy for the presence of downy mildew.

A new portable sensor for stilbene VBF, Multiplex 330 (Mx-330) [11] (Fig. 1 and 2), was developed by the company FORCE-A (Orsay, France) based on the field fluorosensor Multiplex® 3 with an excitation and emission

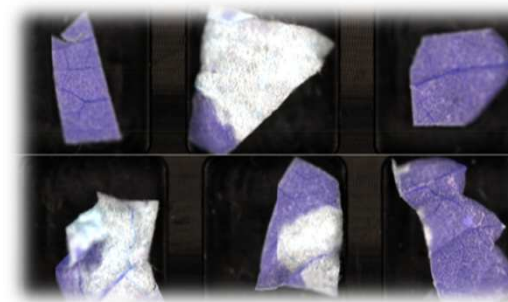
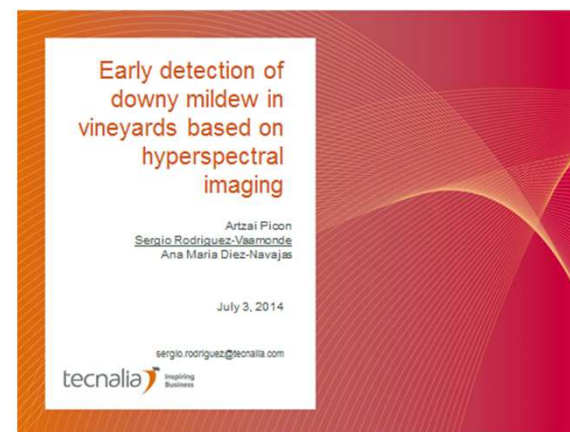


Fig. 1. Multiplex 330 (Mx-330)

optimized for stilbene fluorescence *in vivo* [11]. The Mx-330 was used with success to follow

Abbreviations

AB: abaxial
AD: adaxial
Chl: chlorophyll
DPI: day post inoculation
FRF: far-red fluorescence
GF: green fluorescence
GT: Gewurztraminer
MO: Muscat Ottonel
Mx-330: Multiplex 330
VBF: violet-blue fluorescence
WR: White Riesling



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Sistemas de apoyo para la toma de decisiones

Ajuste de dosis

Optimized Treatment Plan®: a global approach to reduce environmental impacts

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A 3-year evaluation of Optidose® method for pesticide dose adjustment in Mediterranean French vineyards to control powdery (and downy) mildew

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Field validation of Mildium® an expertise-based prototype decision system for managing both downy and powdery grapevine mildews at plot scale

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Gestión de enfermedad

The web module "VitiMeteo Monitoring": A valuable addition to the downy and powdery mildew forecasting models

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Experience with forecasting model Rimpro-Plasmopara in Bulgaria

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