TURNING INFORMATION INTO PROFITS

Crop Health Management

Pessl INSTRUMENTS

METOS®
BY PESSL INSTRUMENTS

Plant Disease Prediction Models

Station » Measurements » FieldClimate » Disease Models

A plant disease model is a mathematical description of interactions among the environment, the host plant and the variables related to the pathogen that can lead to the development of the disease. The more advanced models are those which can predict the impact or severity of the disease and the development of inoculum.

Pessl Instruments models have been developed to provide the best information possible to enable conscious decision making and use the best tools to produce more, both in terms of quantity and quality.

The majority are a result of international scientific cooperation with research institutes and universities over the last 30 years. Having been used by farmers for several years in different climates and environments, they have proven their efficiency over time.

Pessl Instruments has more than 80 disease models for more than 40 crops, which can be accessed directly through the fieldclimate.com platform.

To offer full support for plant protection management we collaborate with the Swiss partner meteoblue. Plant disease models are thus based on highly precise weather forecast which is localized and calibrated on the monitoring site. A forecast of all the main meteorological variables and other agronomic information, such as the window for phytosanitary interventions, is provided on an hourly basis, for 7 days and updated each time the service is accessed on fieldclimate.com.

What you get:

- **Highly precise weather forecast of all major meteorological variables**
- **Disease model calculation and other agronomic information**
- **Hourly forecast for 7 days**
- **Real time data at the time of accessing the service**

The spray window helps identify suitable periods for the application of crop protection measures by showing suitable (green), less suitable (yellow) and unsuitable (red) periods for application. The conditions are calculated from wind, precipitation, air temperature, relative humidity and delta T.

Spray window

Disease Models for Viticulture

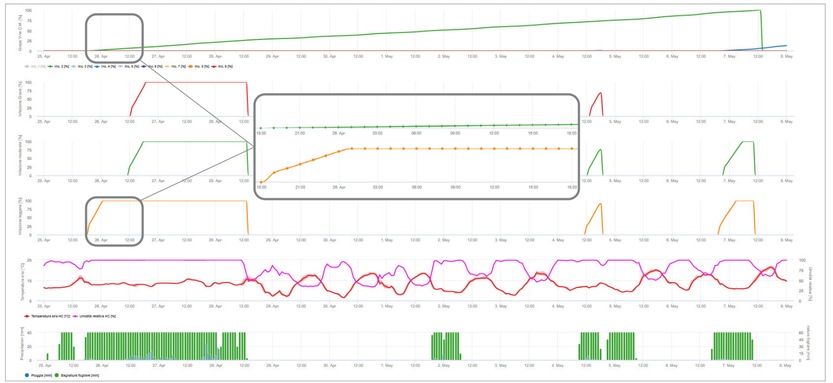
- **Downy mildew** (*Plasmopara viticola*) - Primary infection according to Cortesi, Hill et al.; secondary infection according to Arens, Blaser and Gehman; incubation period time according to Mueller and Sleumer)
- **Powdery mildew** (Powdery mildew risk according to Gubler and Thomas and powdery mildew risk modified to take into account the effects of *A. quisqualis*)
- **Grey mould**
- **Black rot**
- **Anthracnose**
- **Leaf growth** and **rainfall accumulation**
- **Fungicide wash off**
- **Grape berry moth**

Information management in the vineyard is of key importance for the decision-making process. It leads to the production of high quality grapes and is the starting point of the production of fine wines.

We have been helping grape producers and wine experts in the management of their crop for more than 25 years, and were pioneers in producing weather stations capable of calculating disease models for downy mildew of the vine.

THE MODELS HAVE BEEN VALIDATED THROUGH THE YEARS OF USE IN THE WIDE RANGE OF WINE-GROWING AREAS.

The *iMETOS 3.3*, *µMETOS NB-IoT Disease* & *µMETOS CLIMA LoRa Disease* provide the raw data (rainfall, leaf wetness, temperature and humidity) that are used in the mathematical calculation of disease models. They are available through the fieldclimate.com platform - for the main plant diseases and insects.



In the graph you can see how a period with rainfall, long intervals of leaf wetness and high relative humidity combined with air temperature is followed by the development of a primary infection of peronospora. When the infection reaches 100%, the model begins to calculate the incubation period for this infection. When 100% incubation is reached, symptoms are visible on leaves (oil spots).

Other Disease Models

- Apple scab (*Venturia inaequalis*)
- Apple Codling moth (*Cydia pomonella*)
- Apple Aphids (*Aphis pomi, Dysaphis plantaginea*)
- Stroke of fire blight (*Erwinia amylovora*)
- Rainfall accumulation and leaf growth
- Chilling portions

- Pear scab (*Venturia pyrina*)
- Brown spot of pear (*Stemphylium vesicarium*)
- Stroke of fire blight (*Erwinia amylovora*)
- Rainfall accumulation and leaf growth
- Aphid risk
- *Fabraea* leaf spot

- Blossom blight (*Monilia laxa*)
- Coryneum Blight (*Wilsonmyces carpophilus*)
- Rainfall accumulation and leaf growth
- *Cladosporium carpophilum* risk
- Powdery mildew risk
- *Taphrina* leaf curl
- Leaf spot (*Blumeriella jaapii*)
- Western flower thrips (*Frankliniella occidentalis*)
- Bacterial cancer (*Pseudomonas syringae*)
- Chilling portions

- Alternaria rot (*Alternaria alternata*)
- *Colletotrichum acutatum*

- Pocket or bladder Plum gall (*Taphrina pruni*)
- Rainfall accumulation and leaf growth
- Aphid risk
- *Xanthomonas arboricola* infection
- *Monilinia* risk
- Shot hole wilsonomyes carpophilus
- Powdery mildew risk
- *Taphrina* leaf curl
- Scab / *cladosporium carpophilum*
- Brown rot (*Monilia laxa*)
- Rust infection
- Chilling portions

- Peach leaf curl (*Taphrina deformans*)
- Peach Scab (*Cladosporium carpophilum*)
- Rainfall accumulation and leaf growth
- Aphid risk
- *Monilia* risk
- Powdery mildew
- *Sphaerotheca pannosa* risk
- Chilling portions

- Olive scab (*Spilocea oleagina*)
- Anthracnose

- Walnut antrachnose (*Gnomonia leptostyla*)
- Walnut blight (*Xanthomonas arboricola pv. Juglandis*)
- Panicle and shoot blight
- Rust infection

- Grey mould (*Botrytis cinerea*)
- Powdery mildew (*Podosphaera aphanis*)
- Rainfall accumulation and leaf growth
- Leather berry (*Phytophthora cactorum*)
- Chilling portions

- Ripe rot (*Colletotrichum acutatum*)
- Rainfall accumulation and leaf growth
- Anthracnose (*Elsinoë veneta*)
- Chilling portions

- Late Blight (*Phytophthora infestans*)
- *Alternaria alternaria* (TomCast model)
- Root rot (*Phytophthora capsici*)
- Powdery Mildew (*Leveillula taurica*)
- Grey mould (*Botrytis cinerea*)
- Fruit rot
- Powdery mildew risk

- Late Blight (*Phytophthora infestans*) (California model and Pessl Instruments model)
- Grey mould (*Botrytis cinerea*)
- Leaf spot (*Septoria lycopersici*)
- Anthracnose (*Colletotrichum coccodes*)
- Leaf mould (*Cladosporium fulvum*)
- Powdery mildew risk

- Downy Mildew (*Phytophthora infestans*)
- *Alternaria*
- Powdery Mildew
- Grey mould risk

- *Alternaria alternaria* (TomCast model)
- Root rot (*Phytophthora capsici*)
- Powdery Mildew (*Leveillula taurica*)
- Grey mould (*Botrytis cinerea*)
- Fruit rot

- Downy Mildew (Milioncast model for *Peronospora destructor*)
- Botrytis leaf blight (*Botrytis squamosa*)
- Grey mould (*Botrytis cinerea*)
- Leaf blight (*Stemphylium vesicarium*)
- Purple blotch (*Alternaria porri*)

- Downy Mildew (*Bremia lactucae*)
- Grey mould (*Botrytis cinerea*)
- Anthracnose (*Microdochium panattonianum*)

- Carrot leaf blight (*Alternaria dauci*)
- Sugarbeet leaf spot (*Cercospora beticola*)

- Purple spot (TomCast model and infection model for *Stemphylium vesicarium*)
- *Botrytis* (*B. cinerea*)
- Asparagus rust (*Puccinia asparagus*)

- Rice blast (*Magnaporthe grisea*)
- Sheath blight (*Rhizoctonia solani*)

- Corn leaf blight (*Helminthosporium, Bipolaris*)
- Ear rot (*Fusarium sp.*)

- Wheat Rusts (*P. graminis, P. tritici, P. striiformis*)
- *Fusarium* head blight (with mycotoxin alert)
- Septoria diseases
- *Pyricularia grisea*
- Anthracnose
- Aphid risk

- Potato light blight (*Phytophthora infestans*) - Prediction of risky periods for infection and NoBlight model to define further application intervals
- *Alternaria solani* (TomCast model)
- Potato black leg (Pectobacterium aerial infection)
- Potato black leg (Pectobacterium soil infection)
- Colorado beetle
- Aphid risk

For more information visit: metos.at/disease-models

Stations & Sensors

The starting point for the use of plant disease models are accurate measurements of environmental parameters.

Pessl Instruments stations are easy to install and maintain, and provide detailed information on the environment in which they operate.

The iMETOS 3.3 IMT 280-USW comes with the complete sensor set for the calculation of the disease models available on the FieldClimate.com platform.

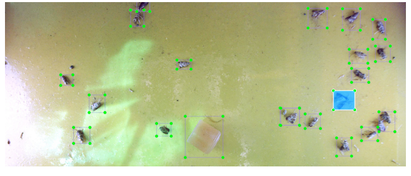
Basic sensor set needed for pest and disease monitoring: air temperature and relative humidity, rain gauge and leaf wetness. In some cases solar radiation, soil temperature and soil moisture sensors are also necessary. You can install these sensors on an iMETOS 3.3 IMT280-USW, µMETOS NB-IoT & µMETOS CLIMA LoRa

Through API, the data from METOS® stations can be used on web platforms to provide plant disease models and DSS for plant protection, such as those of Horta, Rimpro and Vitimeteo.

Insect Monitoring

To optimize field defence strategies, iSCOUT® can be used. It is an electronic trap which enables remote monitoring of insect population development such as the grape berry moth *Lobesia botrana* and *Drosophila suzukii*. The solution uses an automatic learning algorithm (machine learning) for the recognition and the counting of insects. Accessibility from a PC or smartphone enables the technicians to manage the control operations in the territory more efficiently.

iSCOUT®



Electronic trap enables remote monitoring of insect population development.

Lobesia botrana

Contact us

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