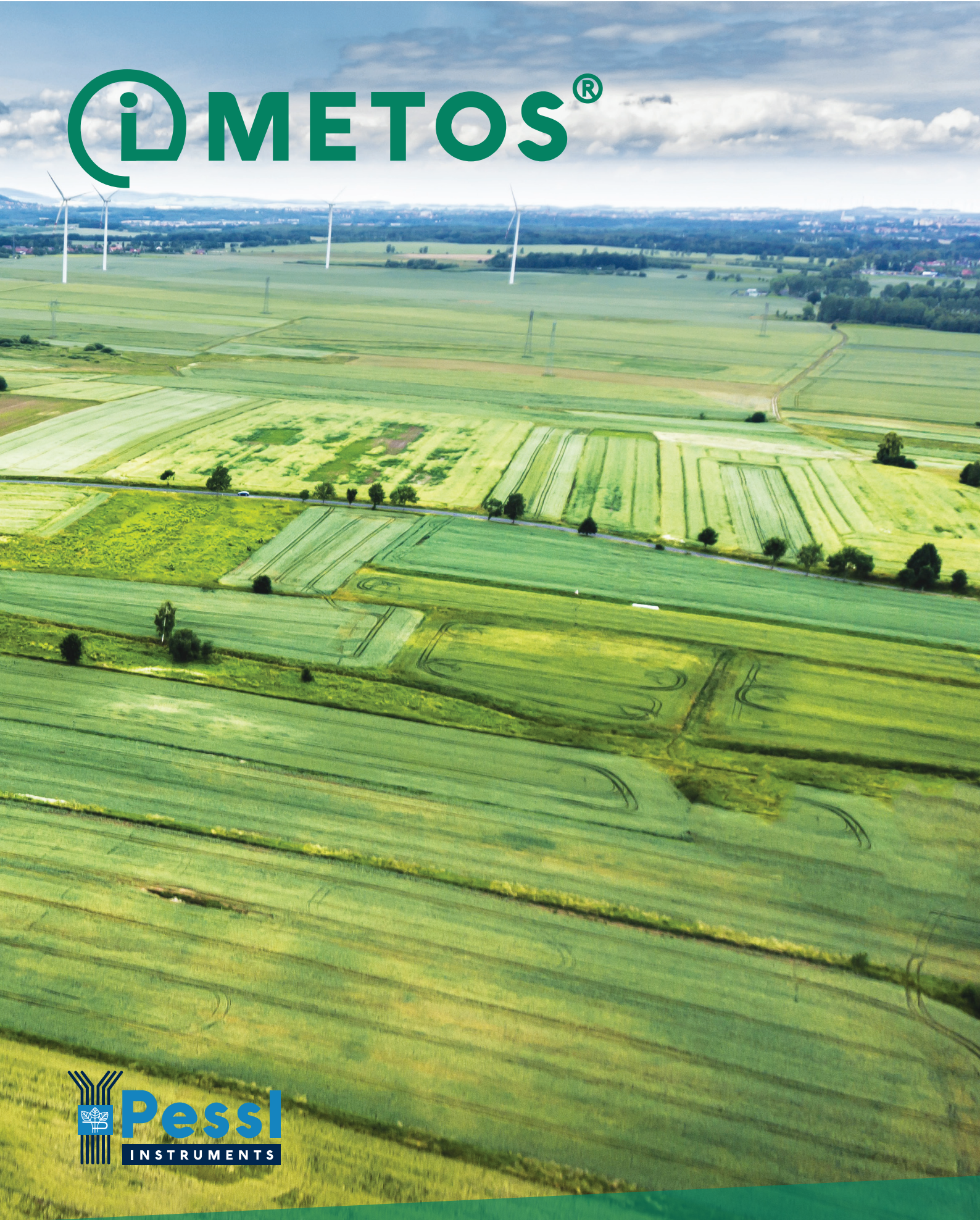
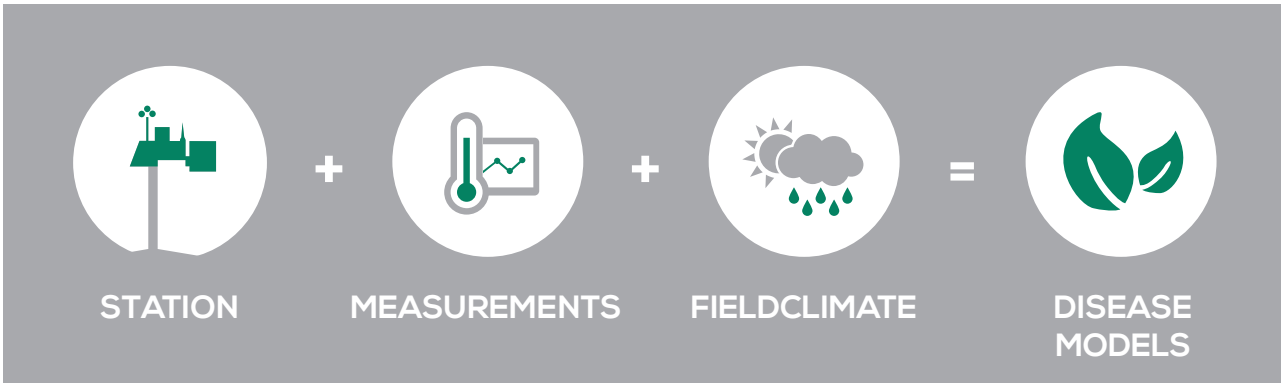
METOS®



Pessl INSTRUMENTS

Weather monitoring • Weather forecast
Plant disease models

PLANT DISEASE PREDICTION MODELS

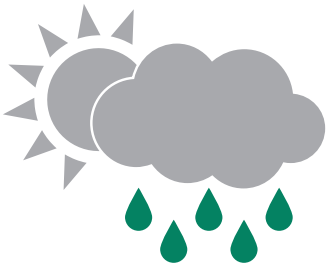


A plant disease model is a mathematical description of interactions among the environment, the host plant and the variables related to the pathogen that can lead to the development of the disease. The more advanced models are those that can predict the impact or severity of the disease and the development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

The Pessl Instruments models have been developed to provide the best information possible and allow you to make a conscious decision and use the best tools to produce more, both in terms of quantity and quality.

The majority of them 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 35 crops, which can be accessed directly through the FieldClimate.com platform.



To offer full support of plant protection management we offer high precision, localized weather forecast, calibrated on the basis of on-site data, in collaboration with the Swiss partner Meteoblue. A forecast of all major meteorological variables and other agronomic information, plant protection window, is available on an hourly basis for 7 days, along with real time data when you access the service on FieldClimate.com.

Through iMETEO Pro service, this information can be combined with disease models, to provide concise prediction for 7 days.

STATIONS

The starting point for the use of plant disease models are accurate measurements of environmental parameters. The Pessl Instruments stations are easy to install and maintain, and provide detailed information on the environment in which they operate.

iMETOS 3.3

Sensors Layout	3 fixed analogue inputs: wind speed, leaf wetness and rain gauge 5 digital inputs: automatic sensor recognition, supporting sensor chains (max. 400 sensors).
Memory	8MB flash memory
Internet Connectivity	GSM - GPRS, EDGE, HDSPA, CDMA, UMTS, Wi-Fi, Satellite
Alert	SMS, user configurable via website
Dimensions without sensors	41 cm L x 13 cm W x 7 cm H
Weight without sensors	2,2 kg
Measuring interval	5 minutes
Logging interval	15 – 120 min (user selectable)
Internet contact	User selectable
Battery	6V, 4.5AH, Operating range: -35°C to 80°C
Solar panel	Dimensions: 13,5 x 13,5 cm, 1,4 Watt solar panel
Part.no. TNS30	iMETOS® 3.3 base unit (no sensors included), Internet based logger, battery 4.5AH, 1,4 Watt solar panel, UMTS based, logger, mounting brackets

The iMETOS® 3.3 station is an ideal tool for environmental monitoring in agriculture. It is simple to install and maintain and allows you to use all plant disease models available on the FieldClimate.com platform.

iMETOS ECO D3

Sensors Layout	1 rain gauge analogue input 1 temperature/relative humidity sensor input 1 leaf wetness sensor input 1 temperature input 1 RS485 digital input - automatic sensor recognition supporting sensor chains 1 RS485 expansion input – supports 2 optional digital inputs
Memory	2MB fl ash memory
Internet Connectivity	GSM - GPRS, EDGE, HDSPA, CDMA, UMTS, Wi-Fi, SATELITTE
Alert	SMS, user configurable via website
Dimensions without sensors	30 cm L x 16 cm W x 19 cm H
Weight without sensors	1,9 kg
Measuring interval	5 minutes
Logging interval	15-120min (user selectable)
Internet contact	User selectable
Battery	6V, 4.5AH, Operating range: -35° C to 80° C
Solar panel	Dimensions: 13,5 x 13,5 cm, 1,4 Watt solar panel
Part.no. iDEC15	iMETOS ®ECO „D3“ base unit (without sensors), solar panel, with main board

iMETOS® ECO D3 is the next generation of the efficient and simple data logger for soil moisture monitoring, ECO D2. It enables the connection of several sensors for weather monitoring and therefore allows the use of plant disease models.

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

Your field in the palm of your hand!

DISEASE MODELS FOR VITICULTURE

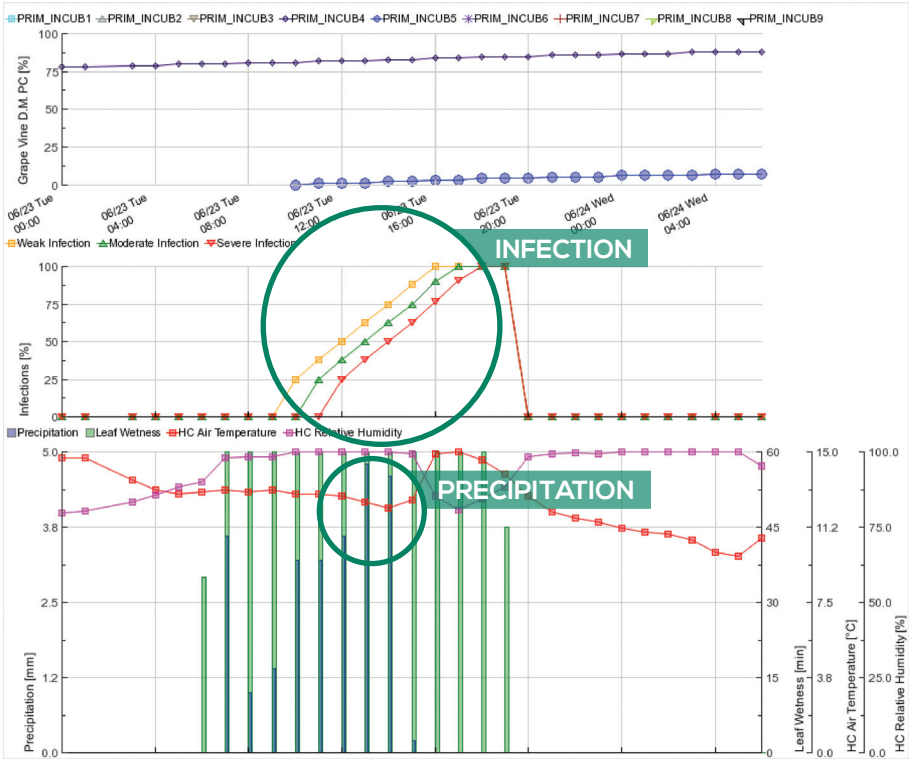
- Downy mildew (*Plasmopara viticola*) (Primary infection according to Cortesi, Hill et al.; secondary infection according to Arens, Blaser and Gehman; incubation time according to Mueller and Sleumer)
- Powdery mildew (Powdery mildew risk according to Gubler and Thomas and powdery mildew risk modified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

Information management in the vineyard is of key importance for the decision-making process, leading to the production of high quality grapes and the starting point for the production of fine wines.
Pessl Instruments GmbH has been helping grape producers and wine experts in the management of their crop on the basis of weather and environmental information for more than 25 years, and was a pioneer in the production of weather stations, able to use disease models for downy mildew of the vine.

The models have been validated through years of use in the wide range of wine-growing areas.

The iMetos® line (iMETOS 3.3 and D3) of products provides 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.

The graph on the right shows how a long period of precipitation and leaf wetness with temperatures between 10 and 15 ° C will be followed by the downy mildew infection.



OTHER DISEASE MODELS

APPLE

- 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

PEAR

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

CHERRY

- Blossom blight (*Monilia laxa*)
- Coryneum Blight (*Wilsonmyces carpophilus*)
- Rainfall accumulation and leaf growth

CITRUS

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

APRICOT, PRUNE AND MIRABELLE

- Pocket or bladder Plum gall (*Taphrina pruni*)
- Rainfall accumulation and leaf growth

PEACH

- Peach leaf curl (*Taphrina deformans*)
- Peach Scab (*Cladosporium carpophilum*)
- Rainfall accumulation and leaf growth

OLIVE

- Olive scab (*Spilocea oleagina*)

NUTS

- Walnut antrachnose (*Gnomonia leptostyla*)
- Walnut blight (*Xanthomonas arboricola pv. Juglandis*)

STRAWBERRY

- Grey mould (*Botrytis cinerea*)
- Powdery mildew (*Podosphaera aphanis*)
- Rainfall accumulation and leaf growth

BLUEBERRY

- Ripe rot (*Colletotrichum acutatum*)
- Rainfall accumulation and leaf growth

MELON AND WATERMELON, CUCUMBER, ZUCCHINI AND PUMPKIN

- Downy Mildew (*Phytophthora infestans*)
- Alternaria
- Powdery Mildew

TOMATO IN OPEN FIELD

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

TOMATO IN PROTECTED FIELD

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

PEPPER AND EGGPLANT

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

ONION

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

LETTUCE

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

CARROT AND BEET

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

ASPARAGUS

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

POTATO

- Potato light blight (*Phytophthora infestans*) (Prediction of risky periods for infection and NoBlight model to define further application intervals)
- *Alternaria solani* (TomCast model)

WHEAT

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

RICE

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

CORN

- Corn leaf blight (*Helminthosporium, Bipolaris*)
- Ear rot (*Fusarium sp.*)
- Western corn rootworm (*Diabrotica virgifera*)

For more information and other disease models visit: http://metos.at/tiki/

www.metos.at

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