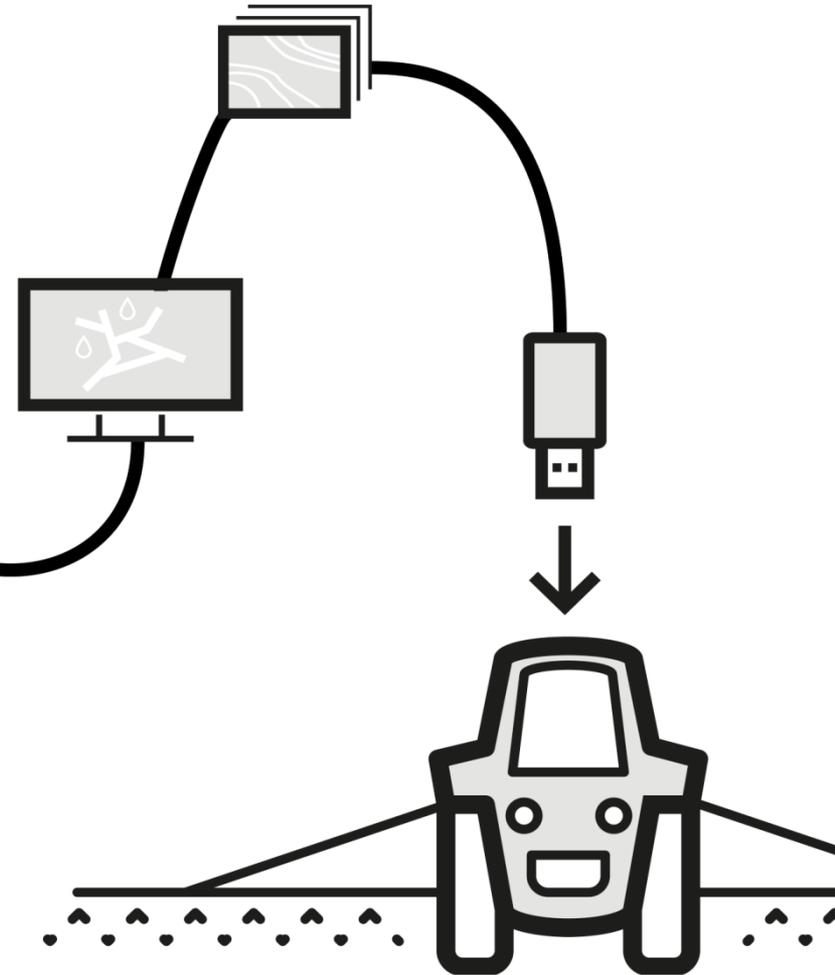




Digital Farming
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**Current use and
development of expert
weather-based
phenological models
for managing OSR
pests in autumn and
spring**

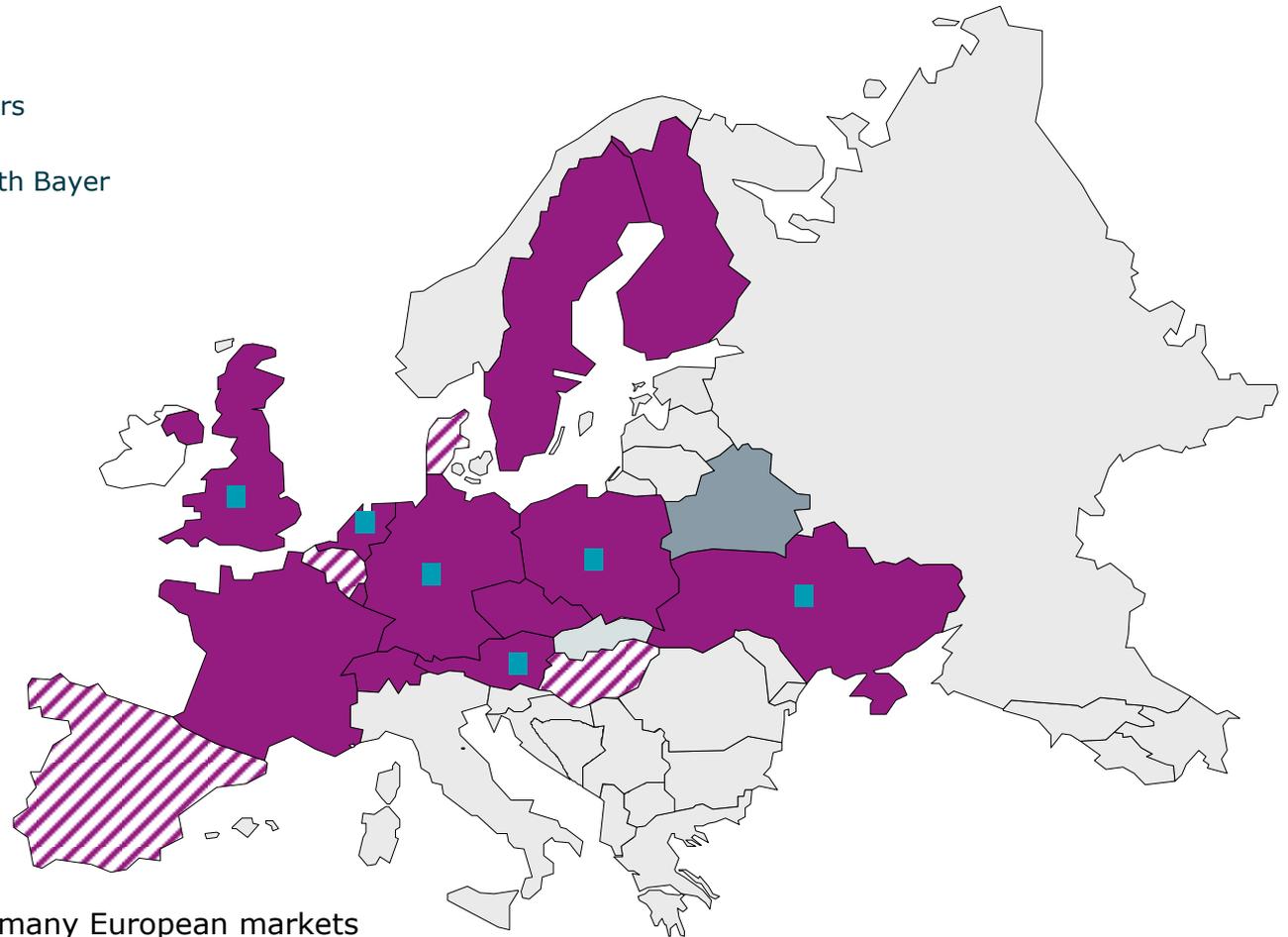


Expert disease & pest prediction models



Digital Farming Solutions

-  expert use by farmers and advisors
-  expert services in cooperation with Bayer
-  New countries 2017

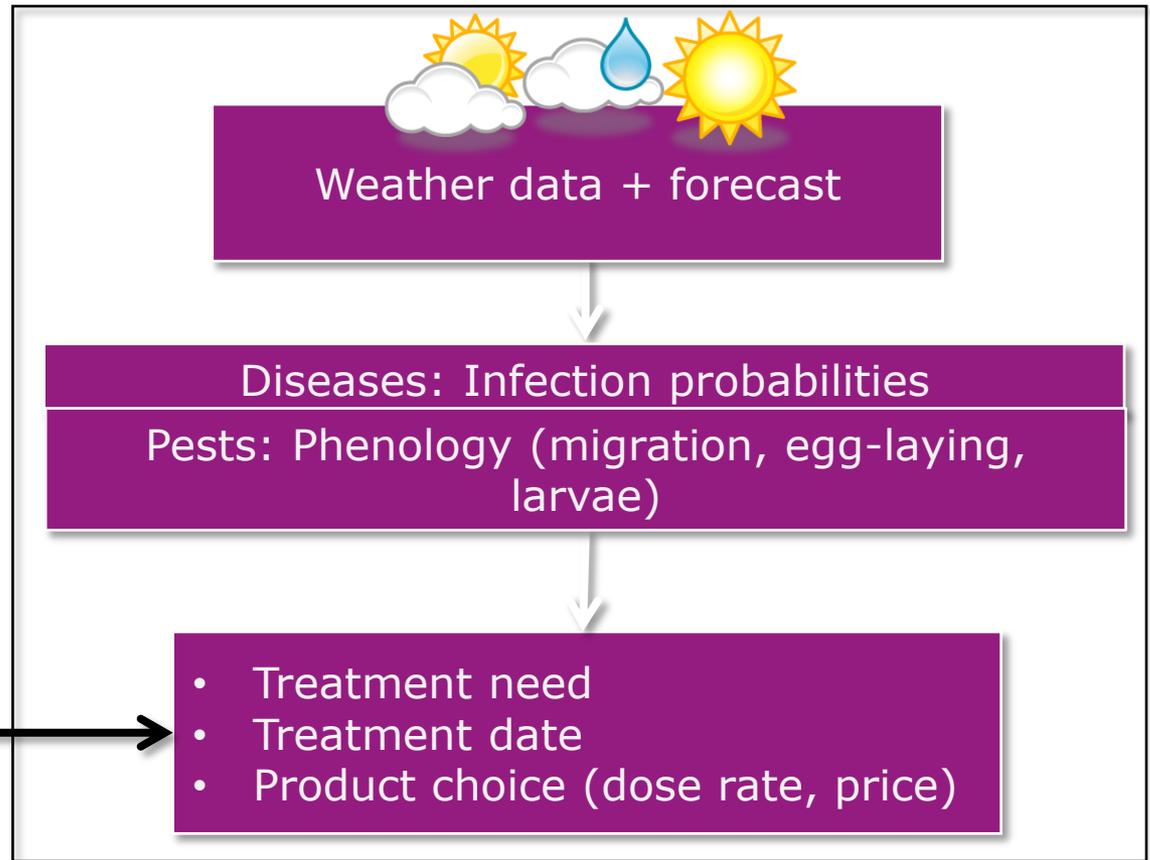
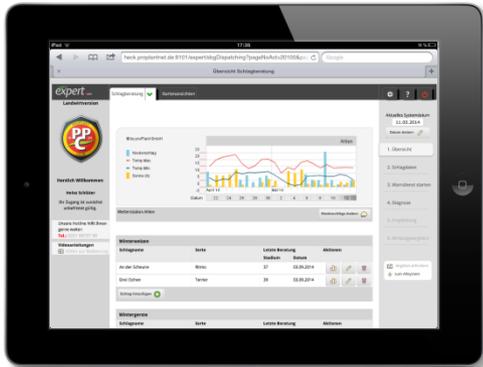


validated by users since >20 yrs in many European markets

Do the consultation with expert



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Variety
Infestation
GS
Previous
spraying,...



Cost savings + efficient disease/pest control

Consultation - examples



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Vue détaillée | Vue cartographique

Cécidomyies Nouveau vol

Colza d'hiver: Cécidomyies Nouveau vol

Regional consultation
Field consultation
View of maps

← All crops
→

Growth stage: 52 (Buds and highest leaves on same level)

Last application: none +

Winter oilseed rape: Schemann

Pollen beetle

Within the next few days stronger migration is likely.

	Beetles per plant	Crop development
●	>3	
●	2-3	bad
●	None of the cases listed applies.	

PLEASE MAKE A CHOICE

Cabbage stem weevil

As yet no or only a few insect pest have finished their egg deposition; in the following days optimal conditions are expected.

	Infestation (yellow trap)	Crop development
●	More than 50 weevils	
●	30 to 50 weevils	
●	None of the cases listed applies.	

PLEASE MAKE A CHOICE

Cabbage seed weevil / Pod midge

Up to now there was no migration. A consultaion is not necessary.

Current systemdate
01.04.2016

1. Overview
2. Field data
3. Warning service
4. Diagnosis
5. Recommendation
6. Comparison of effects

Request a quote

Page 4

Bayer Digital Farming GmbH - Maria Tackenberg

powered by Bayer

Rediscover your fields with SCOUTING

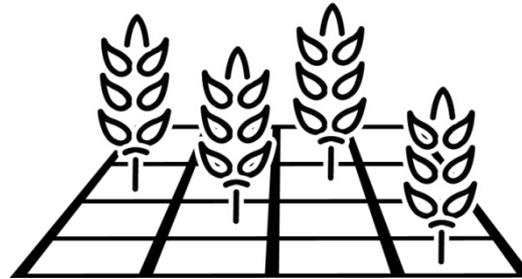


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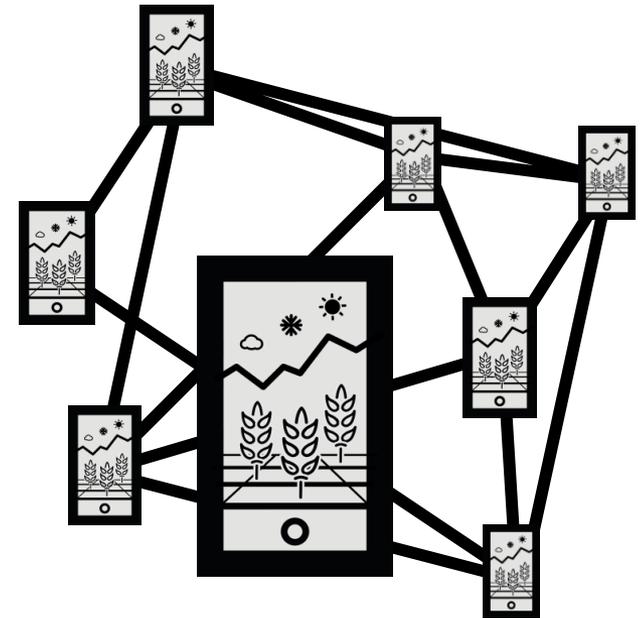
SCOUTING is a mobile application that enables you to...



...do **fast** and **convenient**
scouting and **document**
your results.



...**recognize** and **identify**
in-field **stress** by simply
taking a picture with your
smartphone camera.



...**share** your **insights** within
the **SCOUTING community** to
react faster on spreading
pests and diseases.

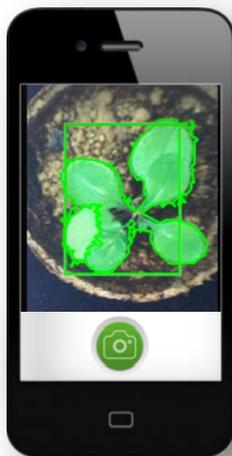
COMPONENTS THAT WILL BE INTEGRATED IN THE FIRST VERSION OF THE Bayer SCOUTING APP in 2017



Digital Farming Solutions

SCOUTING currently consists of **six** key **components**:

Weed scouting



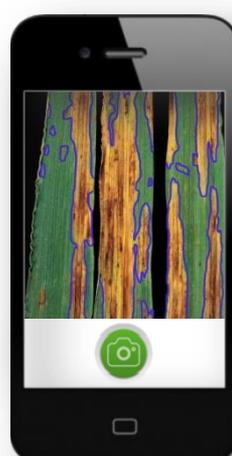
- Determines **weeds** in seconds
- Helps to make the right **weed management** decisions

Insect monitoring



- Detects **present species** and **population density**
- **Better pest management decisions**

Disease recognition



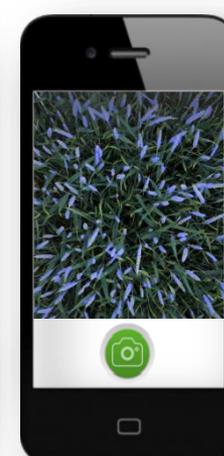
- Helps to **identify a large range of diseases**
- Supports **diagnosis** and **Diseases management**

Nutrient estimation



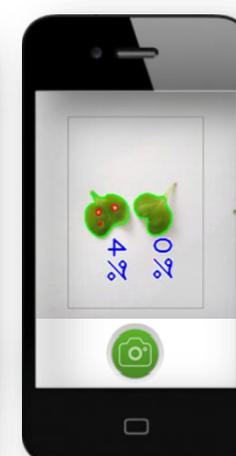
- Allows to **identify nutrient deficiencies** quickly
- Informs **how** the deficiency **affects your crops**
- Recommends on which and **how much nutrients** to apply

Yield estimation



- Counts the the **number of ears /m²**
- **Calculates potential yield** of your fields

Leaf damage detection

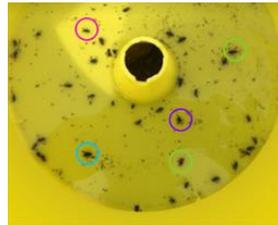


- Identifies **damaged parts** (either by insects or diseases)
- Calculates the **% of affected parts**

Evaluate yellow traps in seconds



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Solutions



23.05.2017
Field 1
Wheat

Results for damaging insects

	Stem weevil <i>Ceutorhynchus napi</i>	2
	Seed weevil <i>Ceutorhynchus obstrictus</i>	2

Results for non damaging insects

	Cabbage stem flea beetle <i>Psylliodes</i>	3
	Pollen beetle <i>Brassicogethes aeneus</i>	2

Total 7

This is a note someone added and saved before.

Trips | Field | Camera | Notifications | Menu

The app counts
and classifies
insects automatically

Insect monitoring – what is it all about?

- > Ease up the **evaluation of yellow traps** for you by **simply taking a photo**.
 - > **Detect present species**
 - > **Population density.**
- > Gain a quick understanding of insect activity in your crops and fields to make **better pest management decisions**.
- > Find your yellow traps easily by setting GPS marking points.
- > Receive alarms when pests are spreading in nearby areas.

Timing Solutions for winter oilseed rape



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Autumn

- > Cabbage stem flea beetle (*Psylliodes chrysocephala*)
- > Phoma leaf spot and growth regulators



Spring

- > Rape stem weevil (*Ceutorhynchus napi*)
- > Cabbage stem weevil (*Ceutorhynchus quadridens*)
- > Pollen beetle (*Meligethes aeneus*)
- > Cabbage seed weevil (*Ceuthorhynchus assimilis /obstrictus*)
- > Pod midge (*Dasineura brassicae*)



Levels of consultation

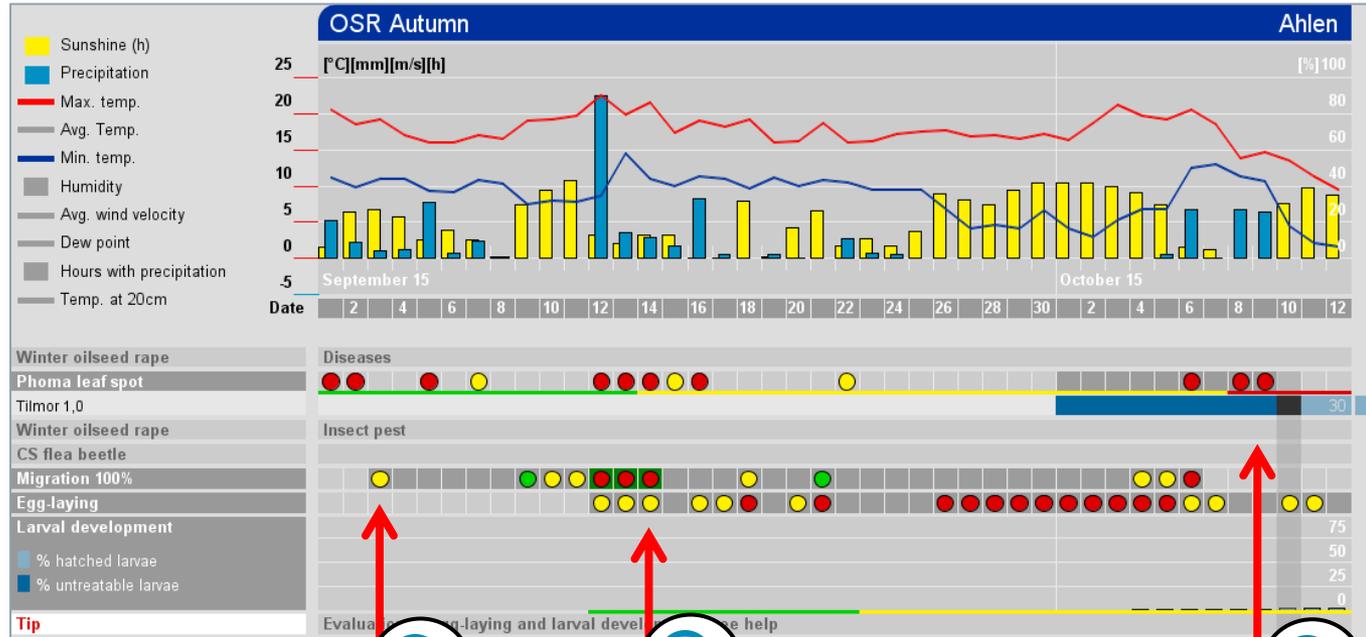
1. Weather analysis for each pest & disease
2. Alerts for each pest & disease
3. Crop recommendation („complete solution“)



Crop: timing autumn 2015



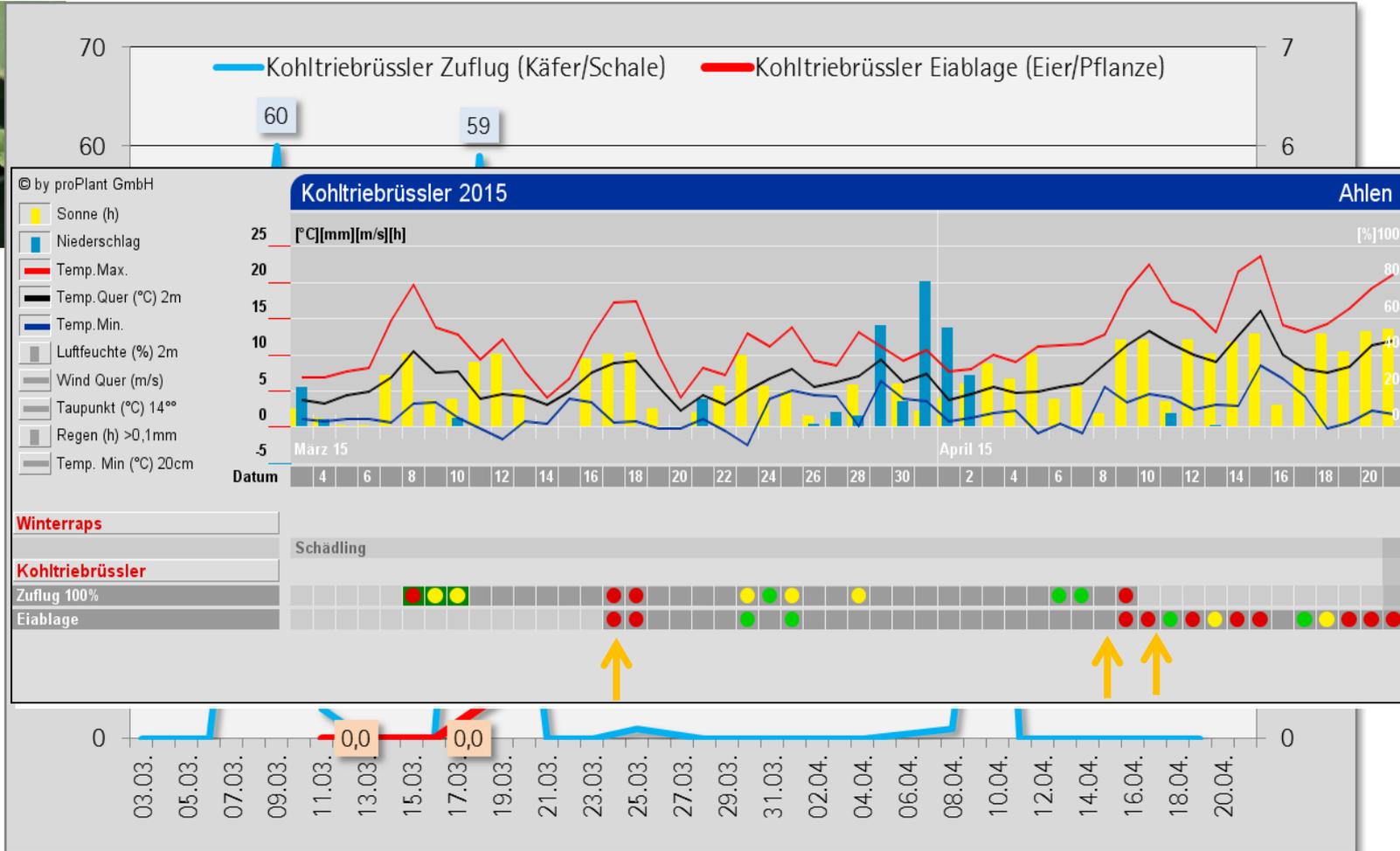
Digital Farming Solutions



Timing: Cabbage stem weevil 2015



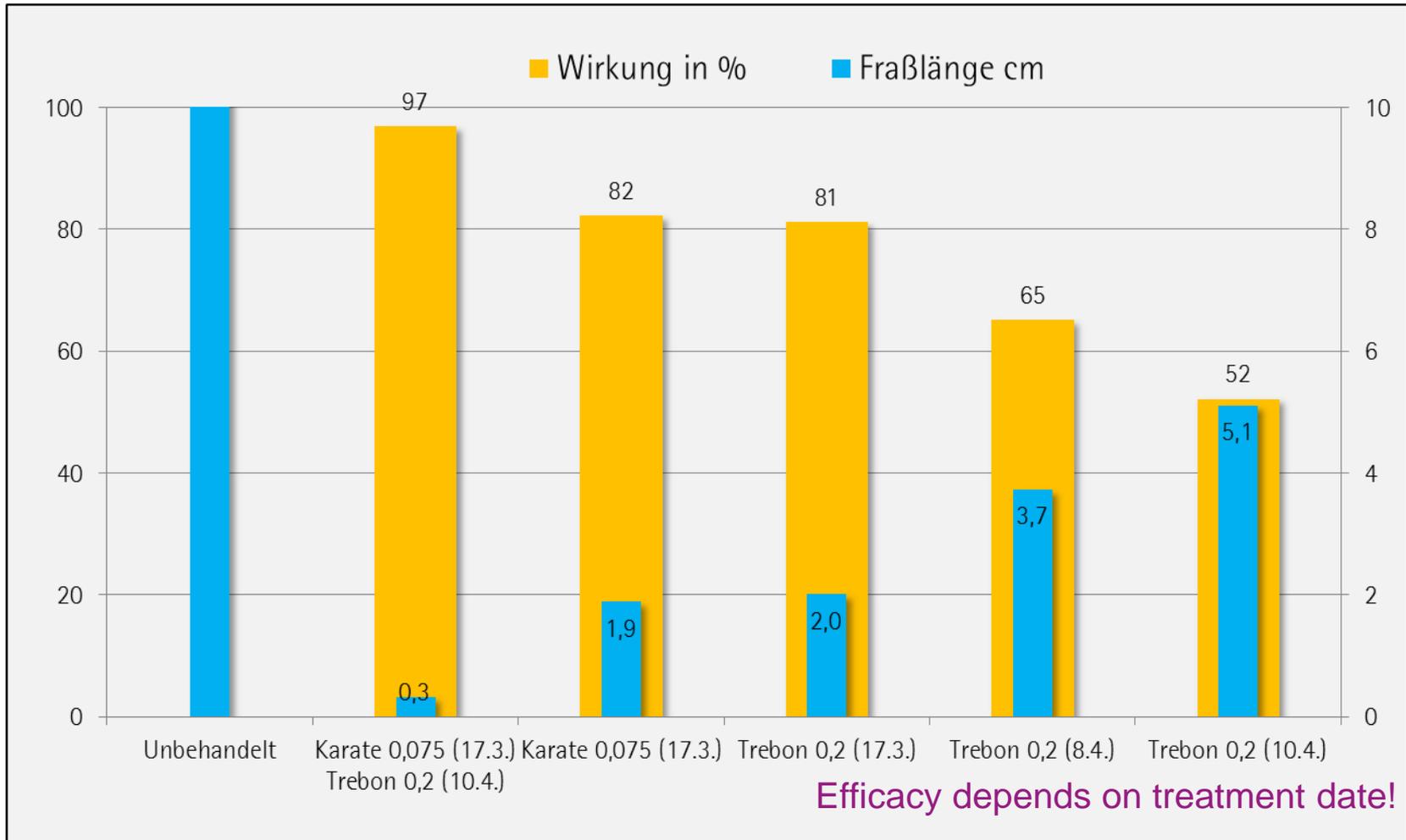
Digital Farming Solutions



Timing: Cabbage stem weevil



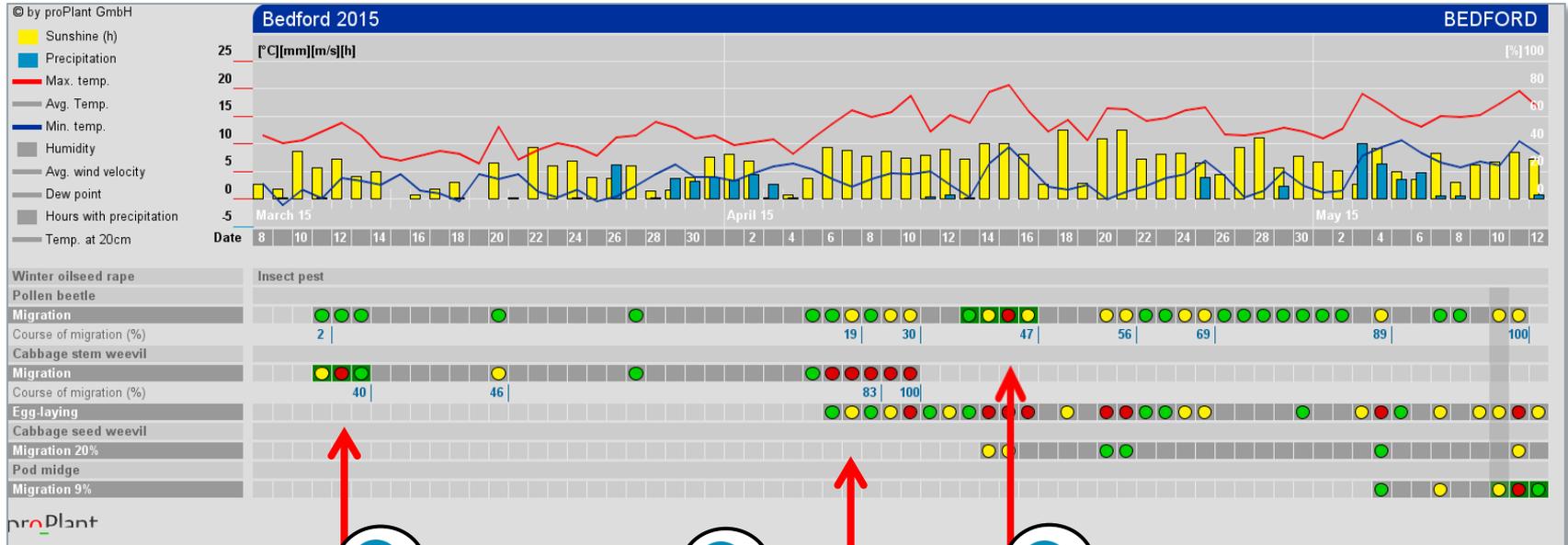
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Crop: timing spring 2015



Digital Farming Solutions





Trusted source for pest & disease diagnostics, application timing and agricultural modeling



Digital Farming Solutions



expert. award in France!

“With 3 years of field trials we proved that expert. models are transferable to all regions in France. For example the models assess correctly the much earlier begin of migration of spring pests.”

www.terresinovia.fr

expert. Partner since 2007

Coordinator Hubert Hebinger



Pollen beetle approved in UK!



“Performed reassuringly well in prompting monitoring that would detect breaches of spray thresholds for pollen beetle in OSR”

“Use of expert DSS could focus monitoring effort to when it is most needed.”



Bayer Pollen Beetle Predictor

Bulletin No. 6





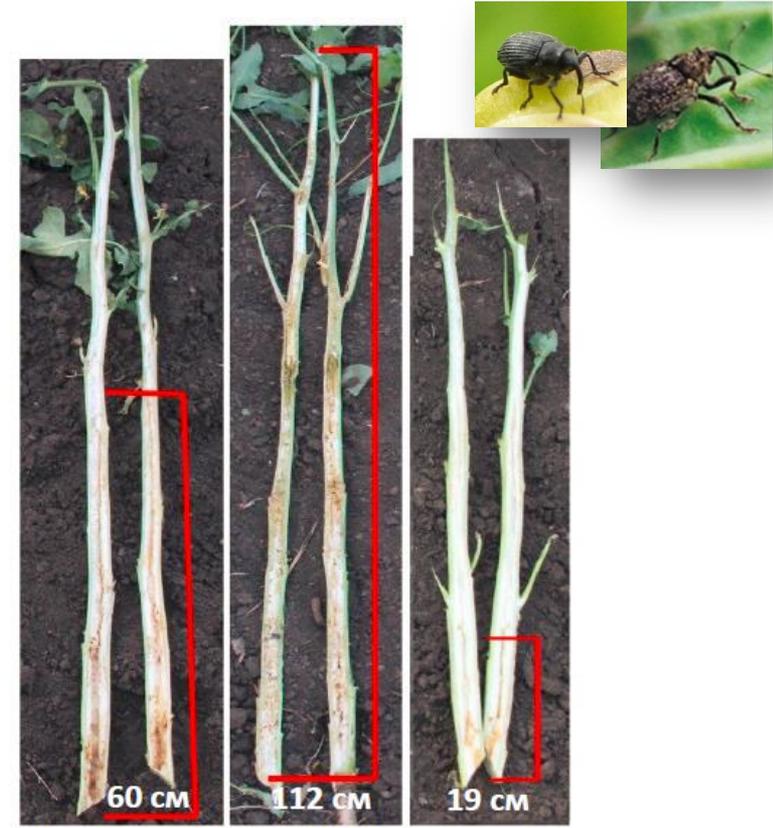
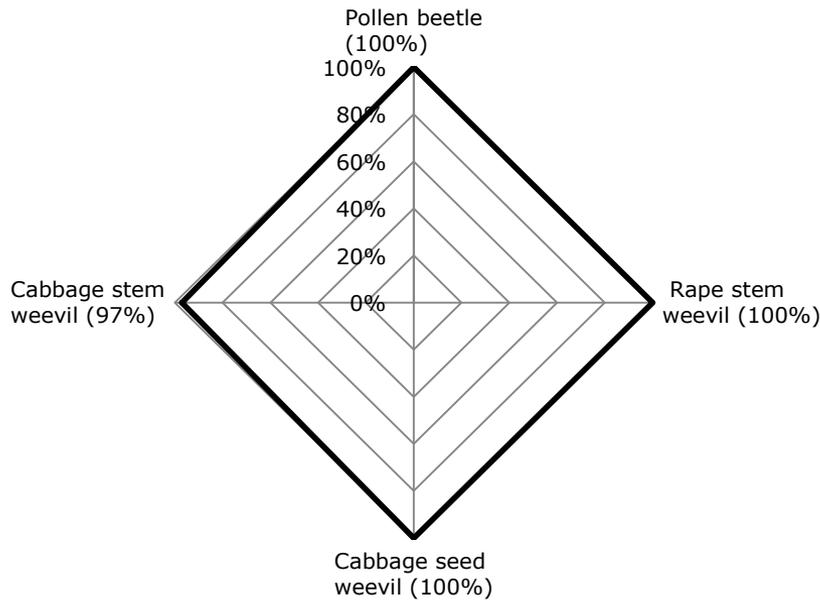
Trusted source for pest & disease diagnostics, application timing and agricultural modeling



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Pest trials in Ukraine 2015 (BCS/IFC)

% of migration was covered by forecast



Стандартна практика Контроль (без обприскувань) Оптимізована, Фітосан

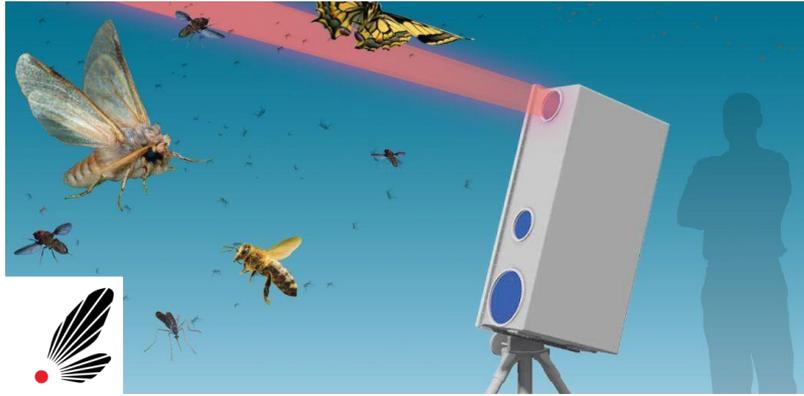
Мал. 1. Розтин стебла ріпаку для обліку рівня ураження (ВВСН 69 Кінець цвітіння)

Common practice Untreated Optimized with expert.

INSECT-Sensor FaunaPhotonics



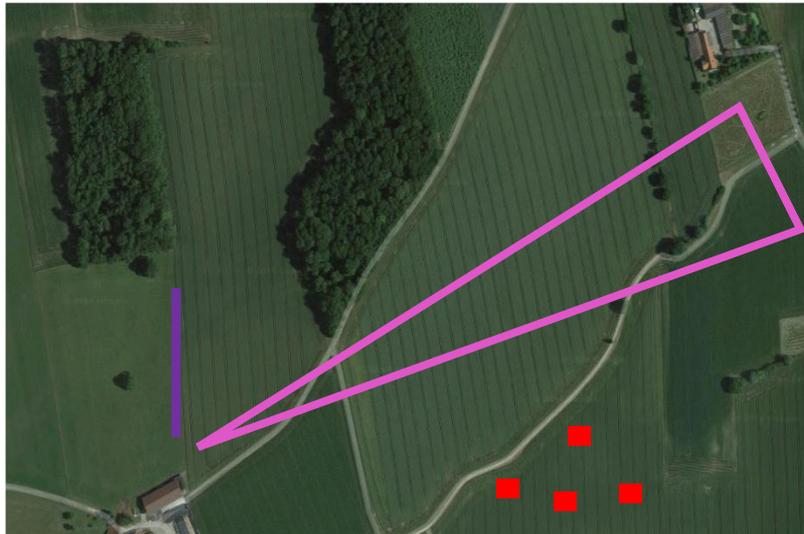
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FaunaPhotonics: a company in Copenhagen, emerged from Lund University in Sweden.

FaunaPhotonics: a laser radar (LIDAR) product that can monitor (detect and identify) aerial fauna in real time. System can parameterize LIDAR signals into insect body size, wing size, wing beat frequency and ... ensuring high species specificity.

Advantages



Challenges/Questions

Are we able to detect/identify key insect pests (e.g. pod midges or aphids or pollen beetles), small insects partly damaging already with low numbers/m²

Can we adapt the system for farm level use cases

Use Case: Oil seed rape flowering



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Target

- Pod midges (small market volume)
- (Cabbage seed weevil)

Agricultural Practice, Monitoring, Modelling

- Flowering spray is extremely critical because of bees and natural enemies
- Pod midges are extremely damaging but only in some years
- Scouting/use of thresholds not practicable for farmers , tank mixtures with fungicides
- expert models available for Pod midges

Advantages / Requirements / Setup Fauna Photonics

- Identification of risk periods, improvement for treatment decisions (more objective measurements of densities), Option for field zone sprays (limited flight distances of pod midges - different damaged zones in larger fields), Combination with bee activity scan is an add on value.
- In field scan (into crop canopy is necessary)
- Field boundary scan - Rotating stationary system

Test Setups

- Sampling of infested pods in June (Larvae), labor storage to capture midge hatch
- visit fields during (midge activity) and after flowering (pod damages)



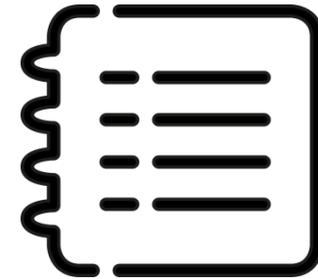
Farmers can...



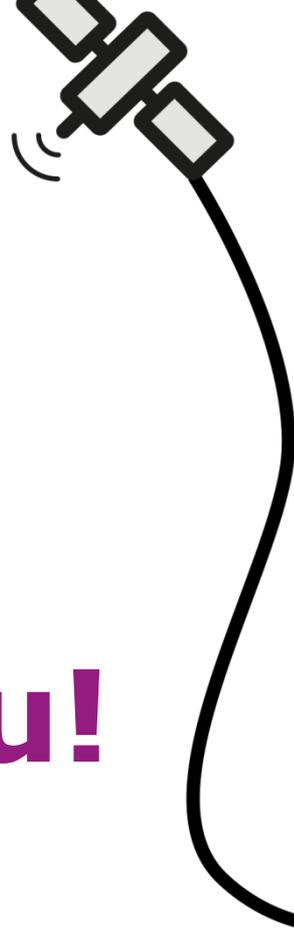
... use crop protection products more accurately and sustainably and thus unleash the potential of their fields.



... identify field-specific stresses by simply taking a picture and remote sensing.



... comply better with official regulatory requirements.



Digital Farming Solutions

Thank you!

