Stepping Up IPM

Promoting improved IPM Decisions and demonstrating that IPM Works

How can IPM tools be easily applied in different regions?

IPM DECISIONS

2019 - 2024

IPM works

2020 - 2024

Horizon 2020

IPM Decisions – Project 817617
IPMWorks – Project 101000339

www.IPMDecisions.net
www.IPMWorks.net

What IPM Tools are available?

- Monitoring tools
- Decision support tools
- Variety selection tools
- Application tools
- Behavioural and socioeconomic tools

Catalogue of IPM Decisions Support Systems

Details nearly 100 pest forecasts, thresholds etc. from across Europe.

IPM Resource Toolbox

Making tools from across Europe accessible

IPM Decisions Platform

Quick access to IPM Decision Support	• Simple 'click and go' platform to find and run DSS
Adopt systems from other countries	• Testing/comparing decision support systems
Validate systems in new regions	• Ensure systems developed elsewhere continue to work in different areas
Create new decision support systems	• Creating new systems and combining existing systems for holistic IPM

Login Register

IPM DECISIONS A "one-stop shop" for decision support in integrated pest management

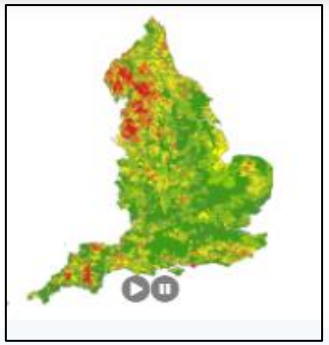
Risk Maps Information

The maps will show the risk for a range of key pests, weeds and diseases across Europe.
Risk is represented as follows:

- Dark Green = very low risk
- Light green = low risk
- Yellow = medium risk
- Orange = high risk
- Red = very high risk

The maps will have been produced by running the DSS for a fixed number of weather stations across each country and then interpolating the results returned by the DSS for each location.

The current maps are example maps only and **do not** represent any specific pest risk.



IPM DECISIONS News

1st March 2020

The layouts and specifications for dashboards aimed at farmers, advisors and interest groups are defined in their first iteration.

Farmers&Advisors

Researchers

Developers

Contacts

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Social

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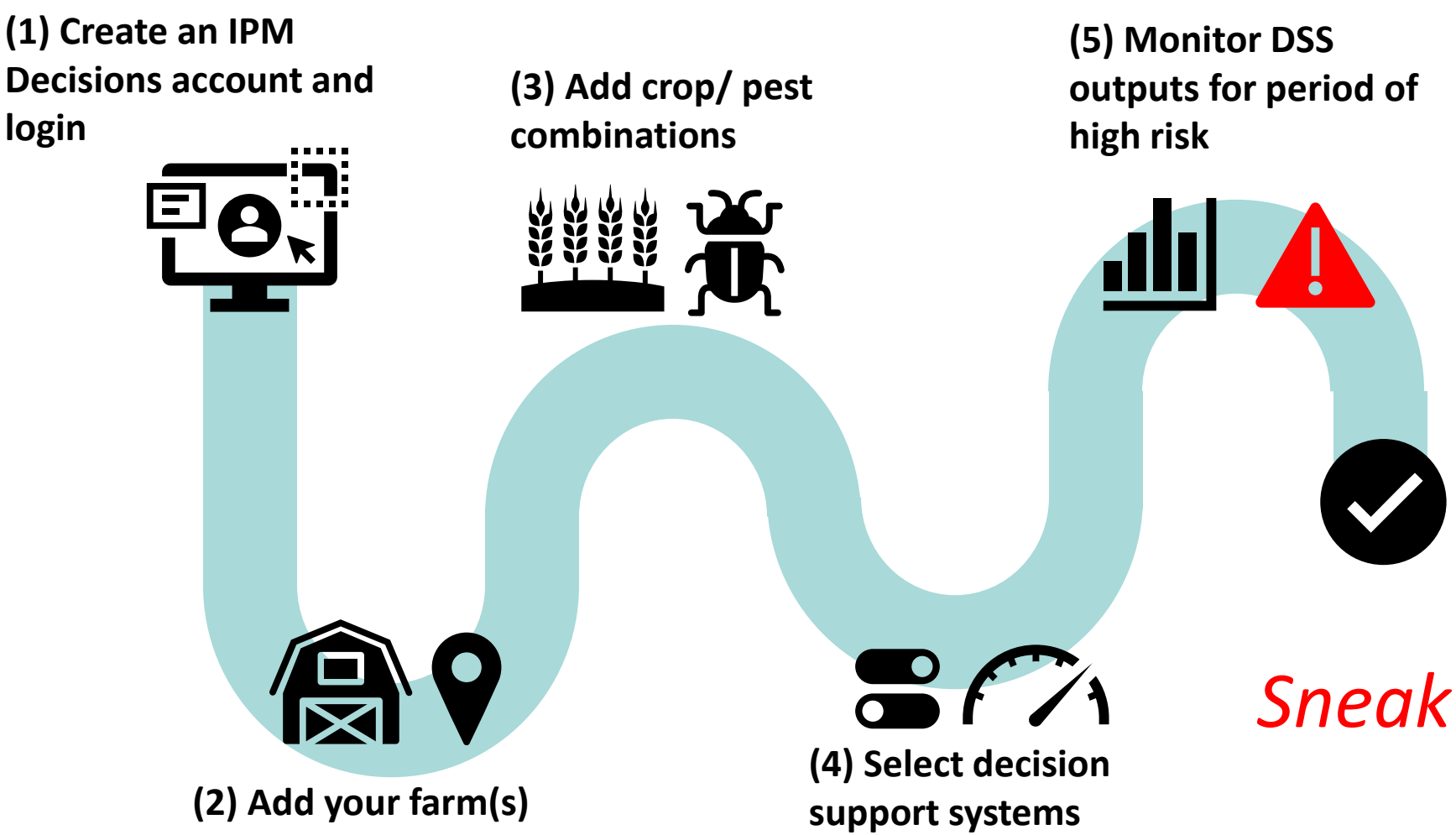
Co-funded by the Horizon 2020 Framework Programme of the European Union
Under grant agreement No 817617

IPM DECISIONS

The IPM Decisions Platform



Sneak Preview…

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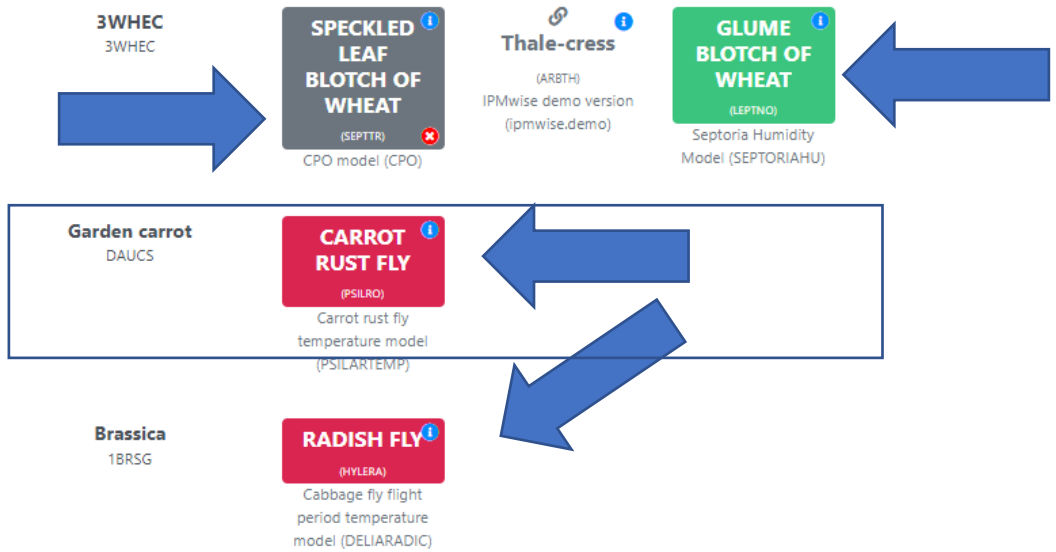
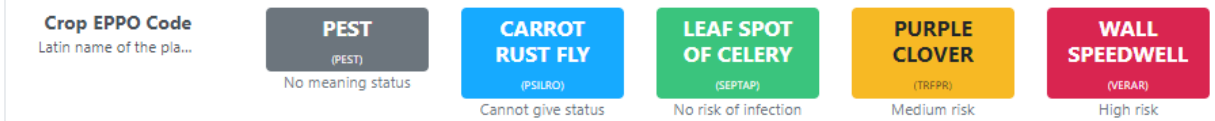
Settings
FARM MENU
Farm Management
DSS USE Dashboard

DSS USE Dashboard

ADAS Boxworth



Legend / Example



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Farm Management
DSS USE Dashboard

DSS USE Dashboard

ADAS Boxworth

3WHEC
3WHEC

SPECKLED LEAF BLOTCH OF WHEAT (SEPTTR)
High risk of infection

Thale-cress (ARBTH)
IPMwise demo version (ipmwise.demo)

GLUME BLOTCH OF WHEAT (LEPTNO)
Septoria Humidity Model (SEPTORIAHU)

Garden carrot
DAUCS

CARROT RUST FLY (PSILRO)
Carrot rust fly temperature model (PSILARTEMP)

Brassica
1BRSG

RADISH FLY (HYLERA)
Cabbage fly flight period temperature model (DELIARADIC)

Legend / Example

Crop EPPO Code
Latin name of the pla...

PEST (PEST)
No meaning status

CARROT RUST FLY (PSILRO)
Cannot give status

LEAF SPOT OF CELERY (SEPTAP)
No risk of infection

PURPLE CLOVER (TRFPR)
Medium risk

WALL SPEEDWELL (VERAR)
High risk

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DSS USE Dashboard

ADAS Boxworth

3WHEC
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SPECKLED LEAF BLOTCH OF WHEAT (SEPTTR)
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Garden carrot
DAUCS

CARROT
High risk of infection

Other: The warning system model «Carrot rust fly temperature» is based on a Finnish temperature-based model (Markkula et al, 1998; Tiilikkala & Ojanen, 1999; Markkula et al, 2000). The model determines the start of the flight period for the 1st and 2nd generation of carrot rust fly based on accumuleted degree-days (day-degrees) over a base temperature of 5,0 °C. VIPS uses the model for the 1st generation only. Standard air temperature (temperature measured 2 m above ground) is used in the model. Degree-days are defined for this model as the sum of the difference between a base temperature of 5,0 °C and the mean temperature for all days with a temperature >5,0 °C, in other words (daily mean temperature – 5,0 °C) from 1 March (beginning when the ground has thawed). .

Brassica
1BRSG

Legend / Exampl

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DSS Details

PSILARTEMP

Day degrees

Reccomended actions

600
400
200

05/22/2021
05/23/2021
05/24/2021
05/25/2021
05/26/2021
05/27/2021
05/28/2021

SHOW DATA LEGEND

Delete

Back

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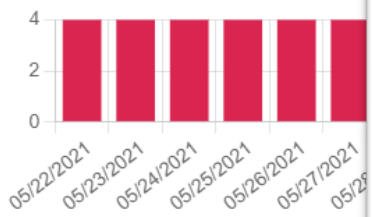
DSS Details

Garden carrot

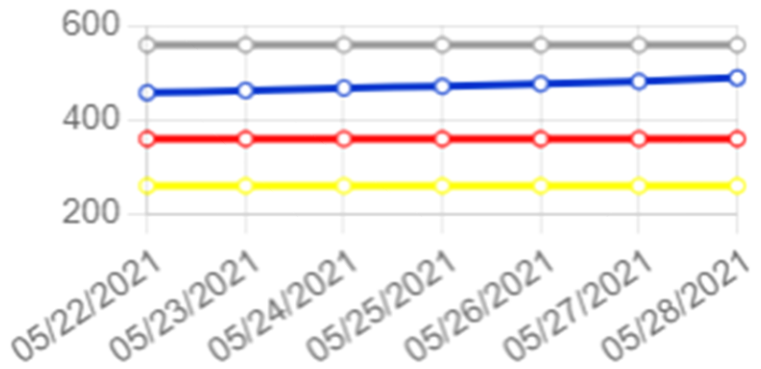
Carrot rust fly

Risk score



Edit Parameters

Day degrees



SHOW DATA LEGEND

- Accumulated day degrees
- Threshold for start of flight period
- Threshold for peak flight period
- Threshold for end of 1st generation flight period

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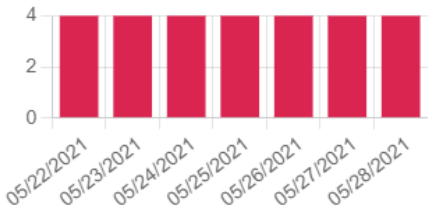
DSS Details

Garden carrot

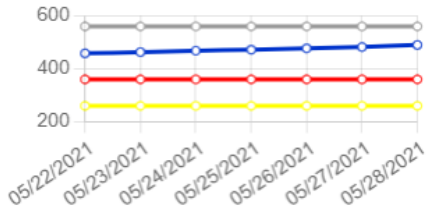
Carrot rust fly

PSILARTEMP

Risk score



Day degrees



SHOW DATA LEGEND

Reccomended actions

Edit Parameters

Delete

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Dss Informations

Crop / Pest Combination	**DAUCS** - Garden carrot | **PSILRO** - Carrot rust fly
Type of the output	Risk indication
Description	Other: The warning system model «Carrot rust fly temperature» is based on a Finnish temperature-based model (Markkula et al, 1998; Tiilikkala & Ojanen, 1999; Markkula et al, 2000). The model determines the start of the flight period for the 1st and 2nd generation of carrot rust fly based on accumuleted degree-days (day-degrees) over a base temperature of 5,0 °C. VIPS uses the model for the 1st generation only. Standard air temperature (temperature measured 2 m above ground) is used in the model. Degree-days are defined for this model as the sum of the difference between a base temperature of 5,0 °C and the mean temperature for all days with a temperature >5,0 °C, in other words (daily mean temperature – 5,0 °C) from 1 March (beginning when the ground has thawed). .
Creation Date	Dec 10, 2021
DSS ID	no.nibio.vips
DSS Model ID	PSILARTEMP
Warning Status Representation	High risk of infection
Warning Message	Green warning indicates that the flight period has not yet begun. Yellow warning indicates that the flight period is beginning and that flies can be coming into the field. Red warning indicates peak flight period. Grey warning indicates that the flight period of the 1st generation is over. Be aware that in areas with field covers (plastic, single or double non-woven covers, etc.) with early crops the preceding season (either on the current field or neighboring fields), the flight period can start earlier due to higher soil temperature under the covers.

Close

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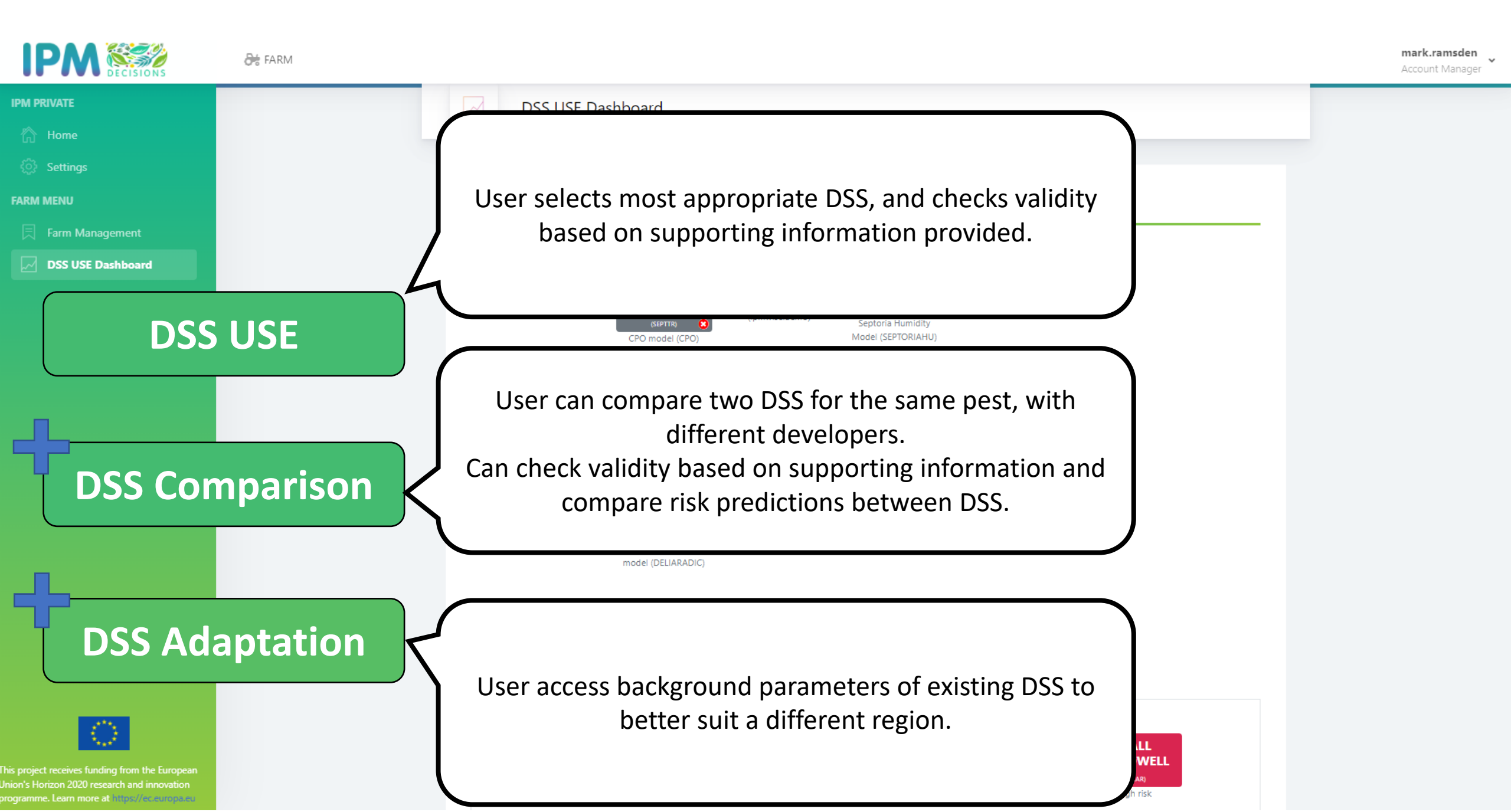
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model (DELIARADIC)
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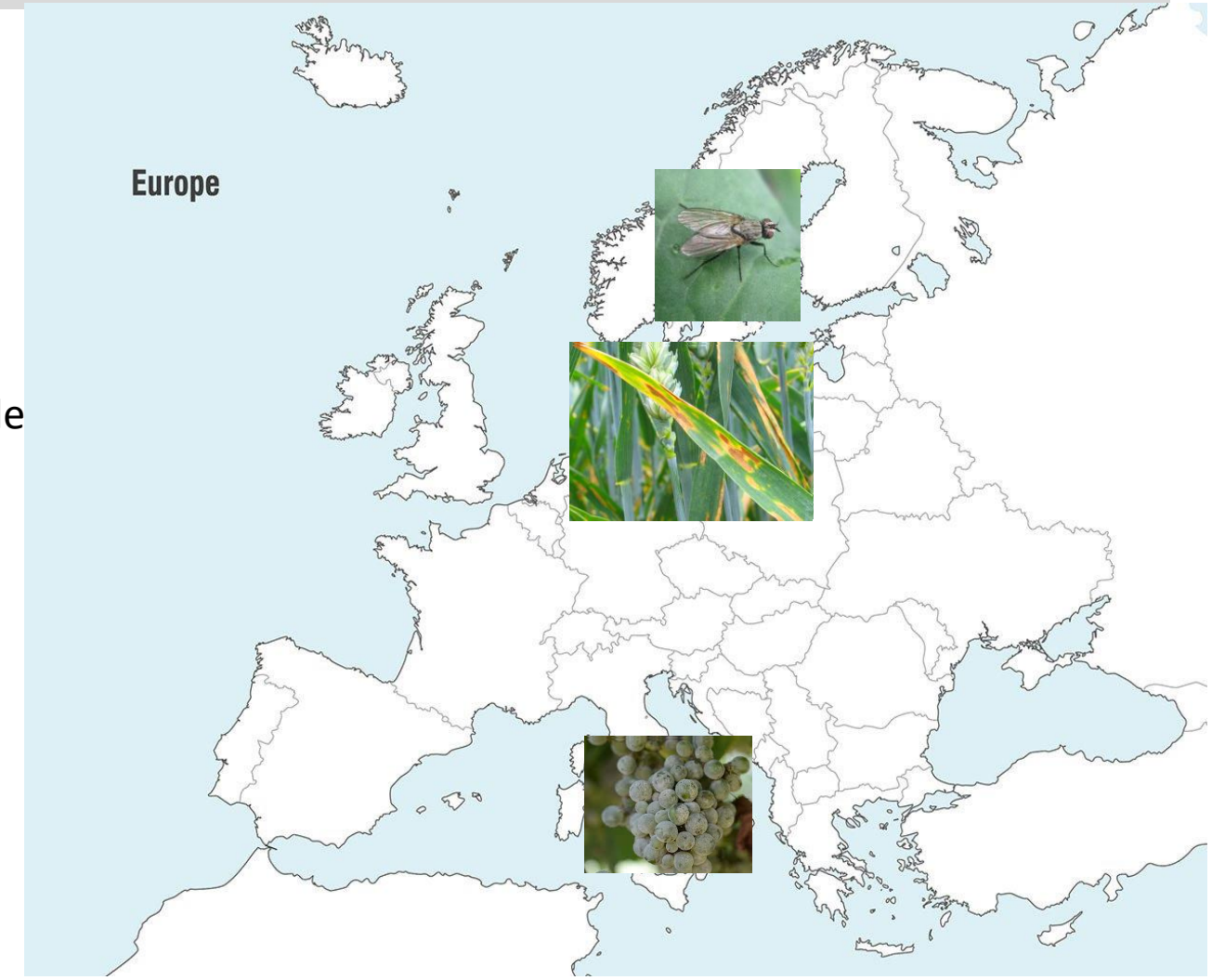
DSS USE
User selects most appropriate DSS, and checks validity based on supporting information provided.
DSS Comparison
User can compare two DSS for the same pest, with different developers.
Can check validity based on supporting information and compare risk predictions between DSS.
DSS Adaptation
User access background parameters of existing DSS to better suit a different region.

Varying ecology of pests

- Collating DSS across Europe creates a matrix of DSS/pest/crop/region.
- Duplication of Crop/Pests DSS from different regions.
- Gaps in some regions for pests with DSS available elsewhere.

- Opportunities to adapt DSS developed for pest/crop in one region to another.



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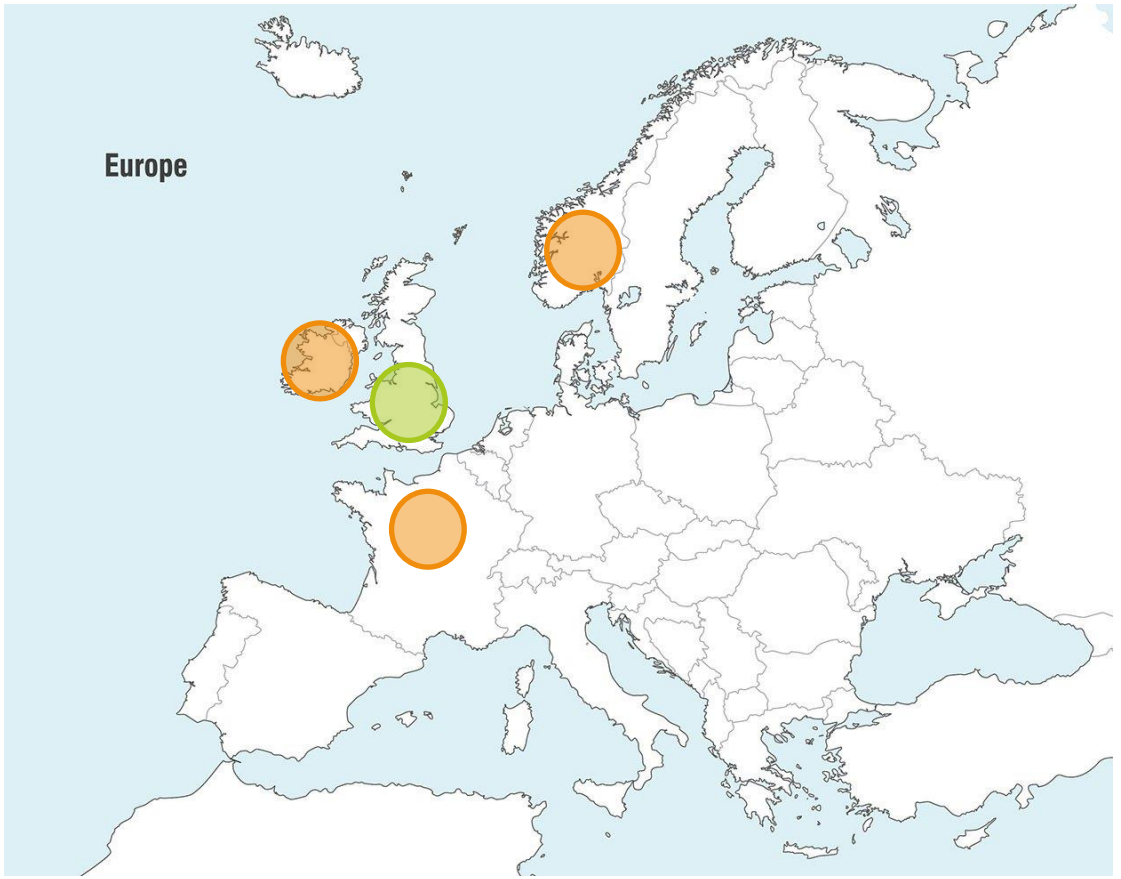
Varying ecology of pests

Cabbage Root Fly

Delia radicum



- Causes damage to various brassicas
- Forecast models based on climate predicts activity
- BUT need to know emergence of local population, which can vary between regions

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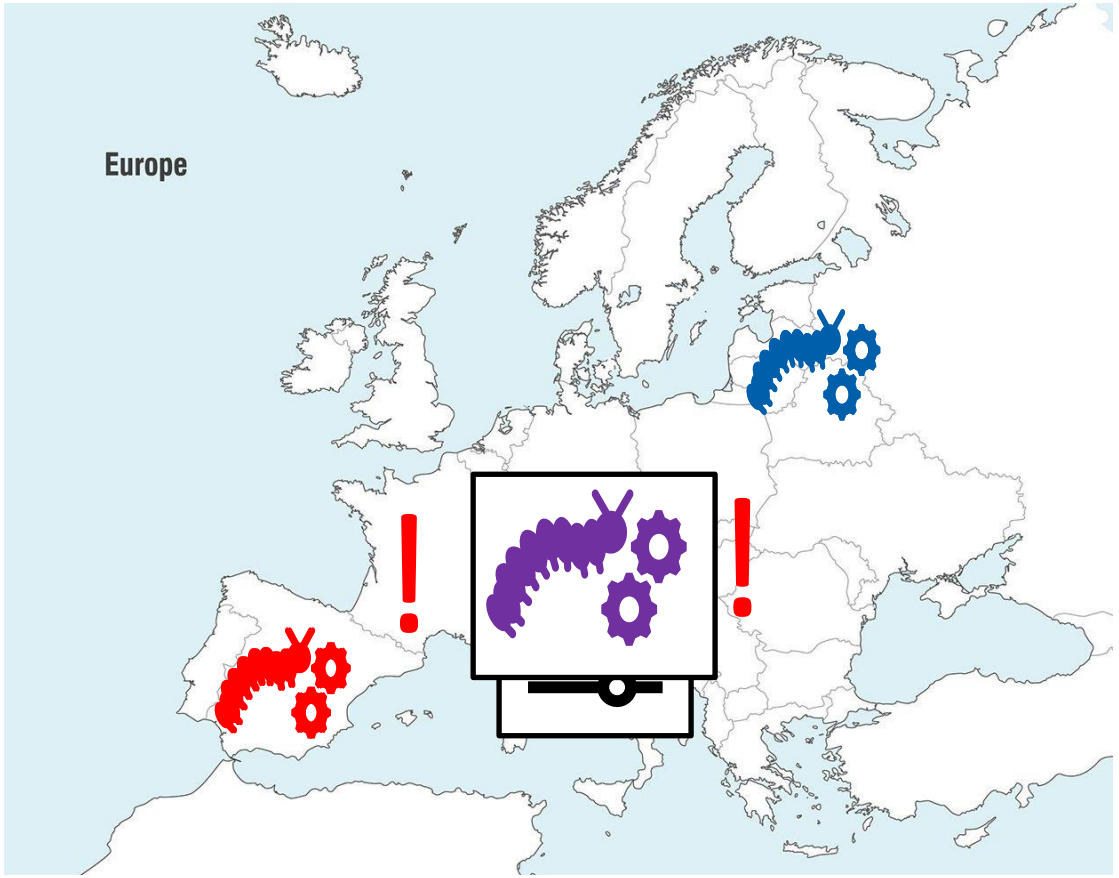
Varying ecology of pests

- In USE Dashboard, user would see model was developed in XXX and that it hasn't been validated in YYY, with warnings
- In COMPARISON, User could see contrasting models (if available)
- In ADAPTATION, User could adjust the model to suit local conditions



Validating DSS for application in new regions

DSS name/description	Crop	Target pest	known to be validated	description of model published	developed since
Crop Protection Online	wheat	Aphids in wheat	1	1	1990
Crop Protection Online	barley	Aphids in barley	1	1	1990
Crop Protection Online	oat	Aphids in oats	1	1	1990
CropMonitor Pro	Winter wheat	All wheat pests inc. slugs			
CropMonitor Pro	Winter oilseed rape	All OSR pests inc. slugs			
GAIA	Almondso	almond fruit wasp			
GAIA	Grapes	european grapevine moth			
GAIA	Peaches	peach twig borer, summer fruit tortix, peach moth			

- *Are the predictions accurate?*
- *Are the predictions useful?*
- *Is it sufficiently risk averse?*
- *Where/when have they been verified?*
- *Costs/benefits to the farmer?*
- *Costs/benefits to the environment?*

Applying IPM tools in different regions

Technical considerations

- Ecology of pest and occurrence of pesticide resistant variants

Socioeconomic considerations

- Farmer/advisor/researcher/industry relationships
- Access to tools
- Farm type (size/sector)

Increase user access to, and uptake of, IPM DSS

Understanding current incentives and barriers to IPM Decision Support Systems

2020 workshops

- 16 workshops across 12 EU countries
- 395 participants
- Farmers, agronomists, researchers and developers took part

2021 workshops

- 12 workshops across 10 EU countries
- 475 participants
- Farmers, agronomists, researchers and developers took part

Access to IPM tools, and willingness to use them

Farmers

- Almost all farmers have smartphones and home computers
- Over 50% of farmers are already using DSS
- Farmers are very willing to try new products and services

Agronomists

- Very confident that decision support systems compliment their work
- Mostly believe DSS are generally accurate (*healthy skepticism in UK*)
- Majority recommend that farmers use DSS, but suggest it takes time to get them to use them

But…

- Agronomists are not providing support in selecting or using online decision support systems

Trust in IPM DSS

Who trusts DSS?

- Farmers with **larger farms** trust DSS **more**
- **Integrated** and **biodynamic** farmers tend to trust **DSS more**
- Regular exposition to **DSS manufacturers' demonstrations increases** trust
- Interestingly, being exposed to DSS **marketing negatively** affects a farmer's trust

Who is more likely to use DSS?

- Farmers with **higher education**
- Those with **larger farms**
- **Vegetables** producers
- Those having **speed internet** in both the office and the fields
- Obviously, those who are **willing to pay** for DSS are more likely to use it.
- **Flowers** producers are **less likely** to use DSS

Paper in prep...

Key considerations for applying IPM tools regionally

Technical

- Compare known ecology of target pest at location of tool development and target new region for application.
- Review the parameters set within the DSS, and consider relevant adjustments to fit new region
- Validate with field trials, ideally within a network of engaged farmers willing to demonstrate result

Socioeconomic

- Compare current tool uptake and management options available to growers at the location of development and new region for application
- Review any additional drivers of IPM uptake that may differ between locations that may influence uptake.

Making it real…

On farm demonstration

- Engaging demonstration events associated with a consistent support network is the best route to increasing uptake of new tools

Making it real…

WHERE

Country: UK

Crop: Wheat

Site: Cambridgeshire

Coordinates: 44°51’24.60’’N - 9°51’16.33’’E

Varieties: Skyfall

WHAT

DSS tested: for managing wheat pests and diseases

HOW

On farm application:

- One tramline (or a portion > 0,5 ha) managed according the DSS;
- One tramline (or the rest of the farm) managed traditionally;
- Data will be collected to demonstrate the impact of using DSS on crop performance

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