WP4

Integrating information and data management

Task leaders and tasks

Jens G. Hansen, AU

Task 4.1
Data management plant (DMP)

Task 4.2
Wheat Rust Toolbox and databases

Hans Pinnschmidt, UKE

Task 4.3
New tools

Task 4.4
Risk management tool

Bill Clark, NIAB

Task 4.5
Early warning integrated with regional information systems

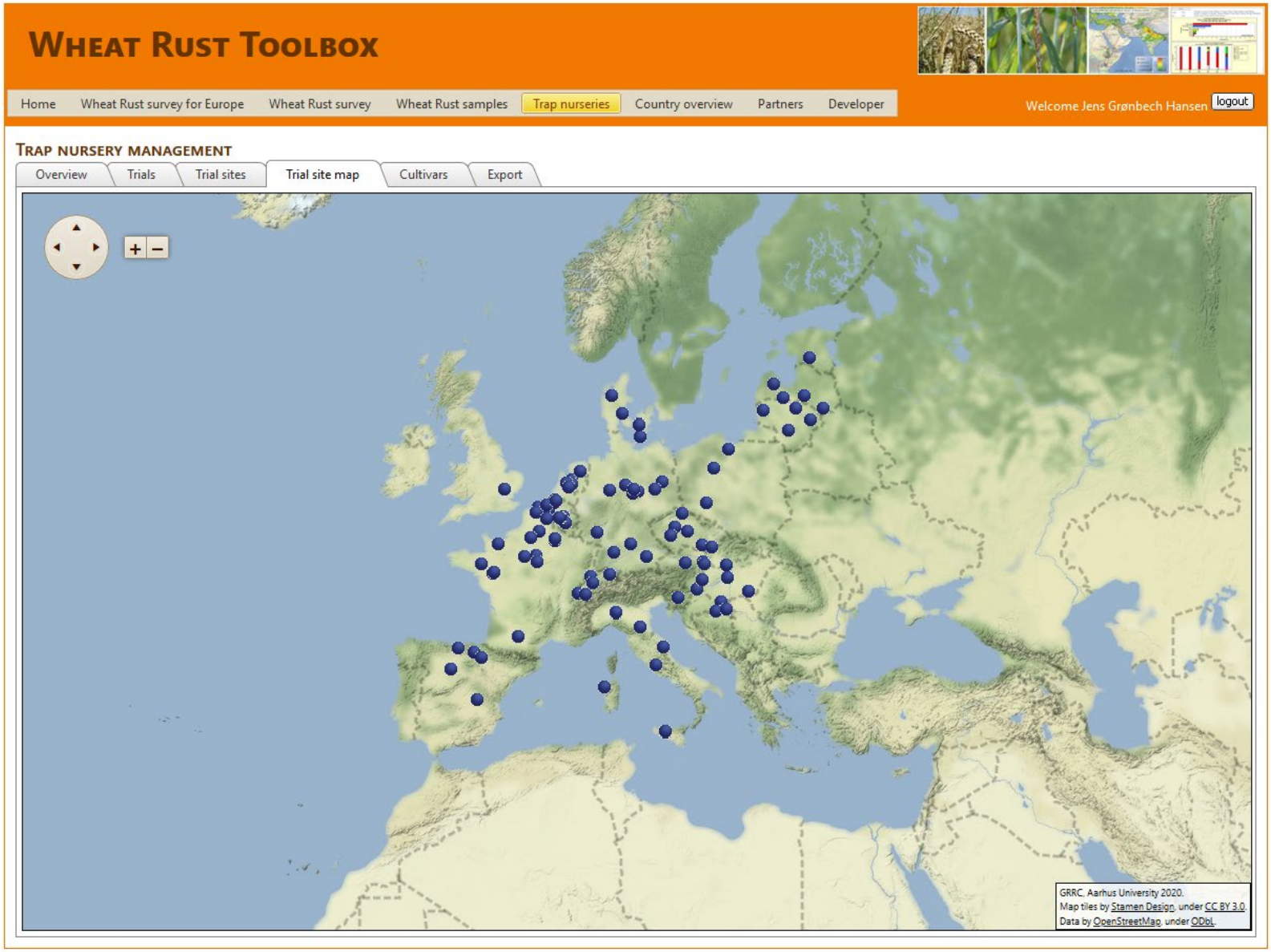
Task 4.6
Communication and engagement plan

RUSTWATCH
WHEAT RUST EARLY WARNING

Outline:

- Trap Nurseries
- Field Nurseries
- Discussion

Trap Nursery data management system



2020:
106 trials in
21 countries

Objective:

Hunting the new via 7 diff cultivars

Indicate disease pressure via diseases scoring in susceptible ref cultivars

Know the races in the trials for better interpretation of results

What races and genotypes was present in the trial?

Wheat Rust Toolbox

Home | Wheat Rust survey for Europe | Wheat Rust survey | Wheat Rust samples | Trials | Tools | Country overview | Partners | Developer

Welcome Jens Grønbech Hansen logout

Trial input

Observations

Year ○ 2020 ◉ 2019 ○ 2018

Trial: 2019_Gembloux, OBEV-CRA-W, BE | Replicates: 1 | Observation date: New date | Delete date

Save | Samples | Comments

Disease severity in differentials

Cultivar	Color	Disease	Sorting	6. May, Rep. 1	Sample	11. May, Rep. 1	Sample	17. May, Rep. 1	Sample	25. May, Rep. 1	Sample
Ambition		Yellow Rust	1	0%	☐	N/A	☐	0%	☐	0.1%	☐
Spalding Prolific		Yellow Rust	2	0%	☐	N/A	☐	0%	☐	1%	☐
Compair		Yellow Rust	3	0%	☐	N/A	☐	0%	☐	0%	☐
Moro		Yellow Rust	4	0%	☐	N/A	☐	0%	☐	10%	☐
Mariboss		Yellow Rust	5	0%	☐	N/A	☐	0%	☐	0%	☐
Rendezvous		Yellow Rust	6	0%	☐	N/A	☐	0.5%	☐	5%	☑
Nemo		Yellow Rust	7	10%	☑	N/A	☐	>75%	☐	>75%	☐

Disease severity in local cultivars

	Local cultivar	Color	Disease	Sorting	6. May, Rep. 1	Sample	11. May, Rep. 1	Sample	17. May, Rep. 1	Sample	25. May, Rep. 1	Sample
YR susceptible cultivar	Cosmos (spe		Yellow Rust	1	10%	☑	N/A	☐	10%	☐	N/A	☐
LR susceptible cultivar	Moro		Leaf Rust	2	0.5%	☑	N/A	☐	N/A	☐	N/A	☐
SR susceptible cultivar			Stem Rust	3	N/A	☐	N/A	☐	N/A	☐	N/A	☐
YR susceptible cultivar	Randam (Trit		Yellow Rust	4	5%	☑	N/A	☐	5%	☐	N/A	☐
YR susceptible cultivar	Garnus		Yellow Rust	5	N/A	☐	50%	☐	N/A	☐	N/A	☐
N/A	Zollernspelz		Yellow Rust	99	N/A	☐	N/A	☐	N/A	☐	5%	☑

New local cultivar | Delete local cultivar

RUSTWATCH
WHEAT RUST EARLY WARNING

Trap Nursery data management system

Wheat Rust Toolbox

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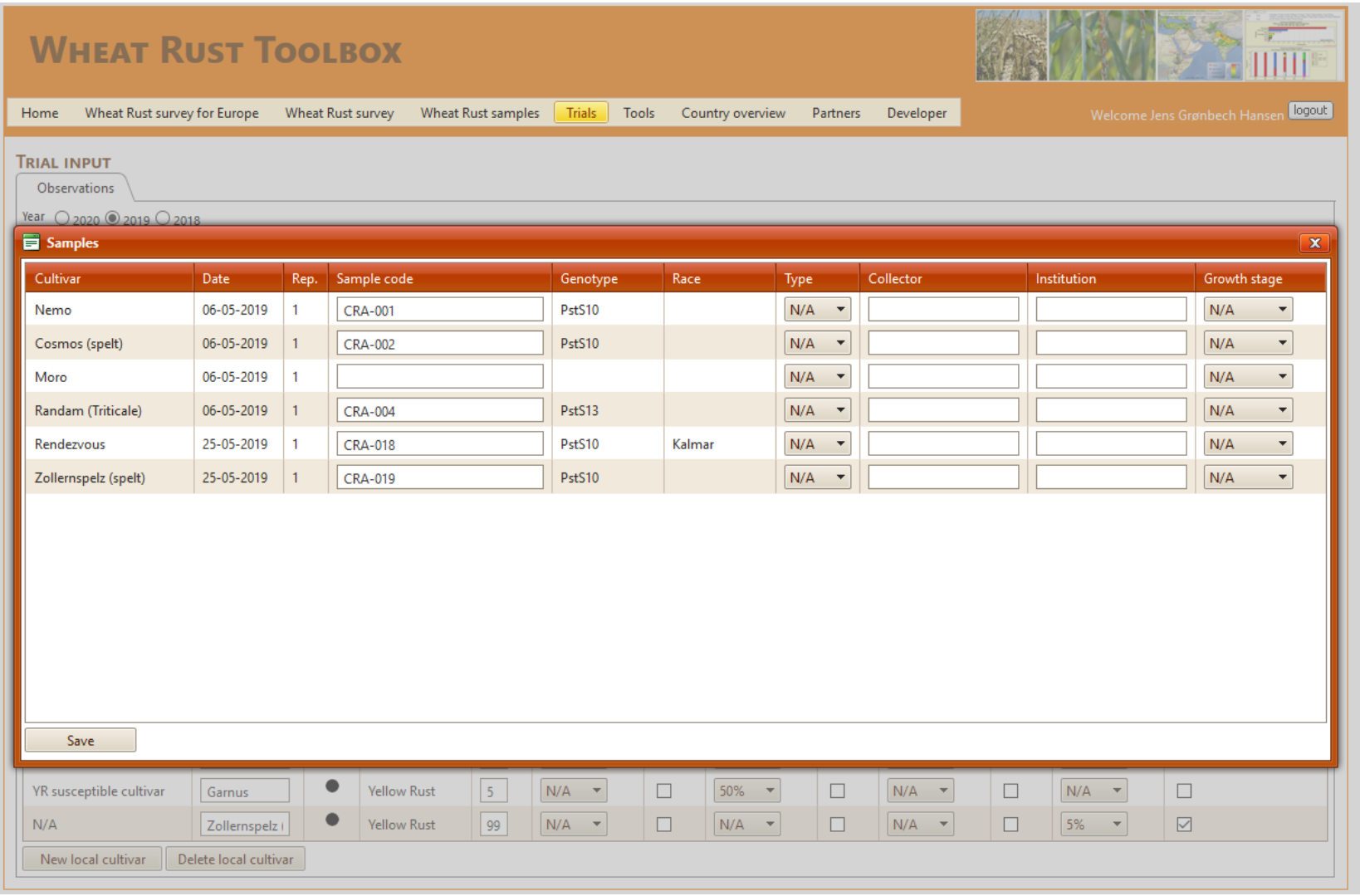
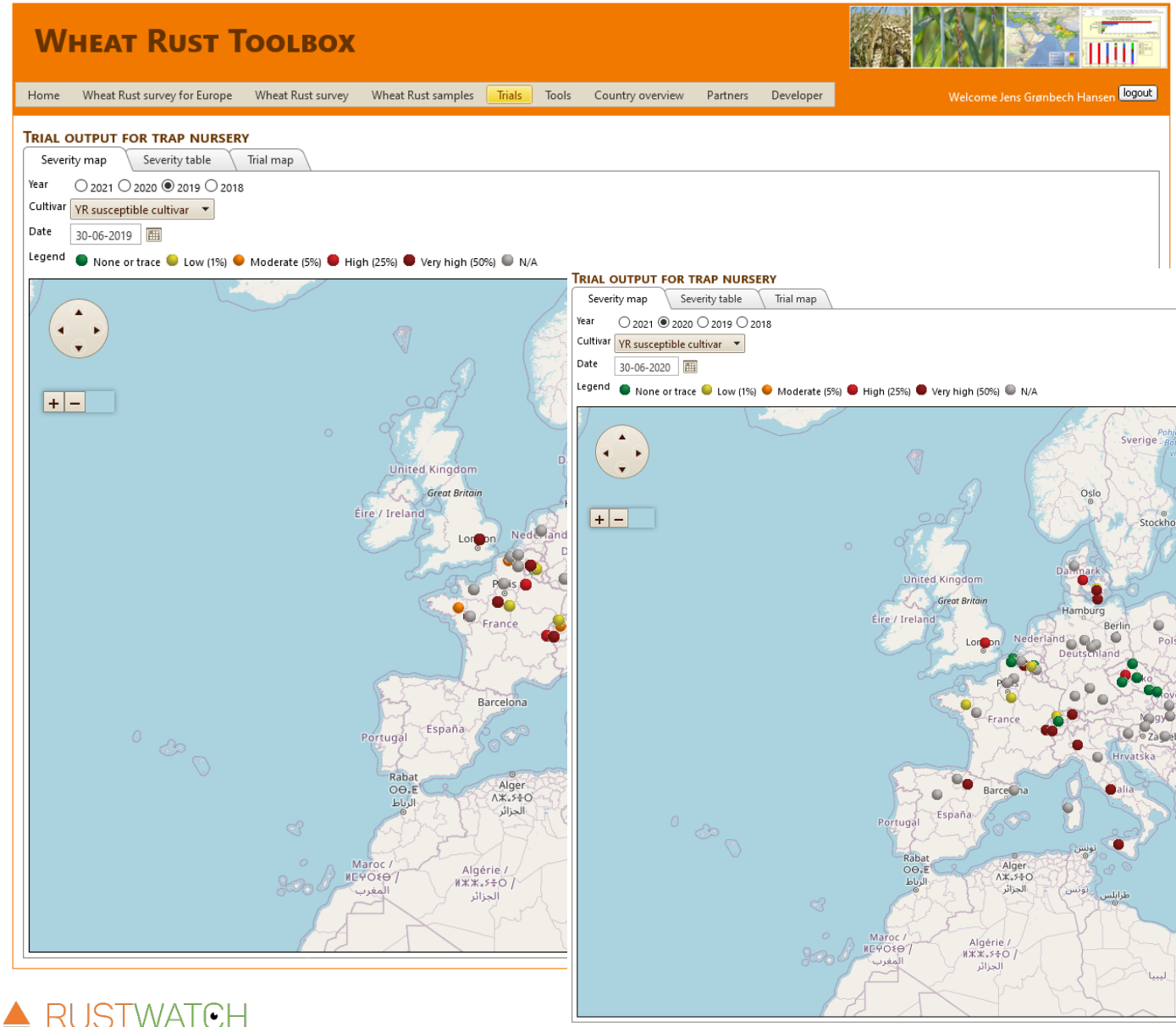
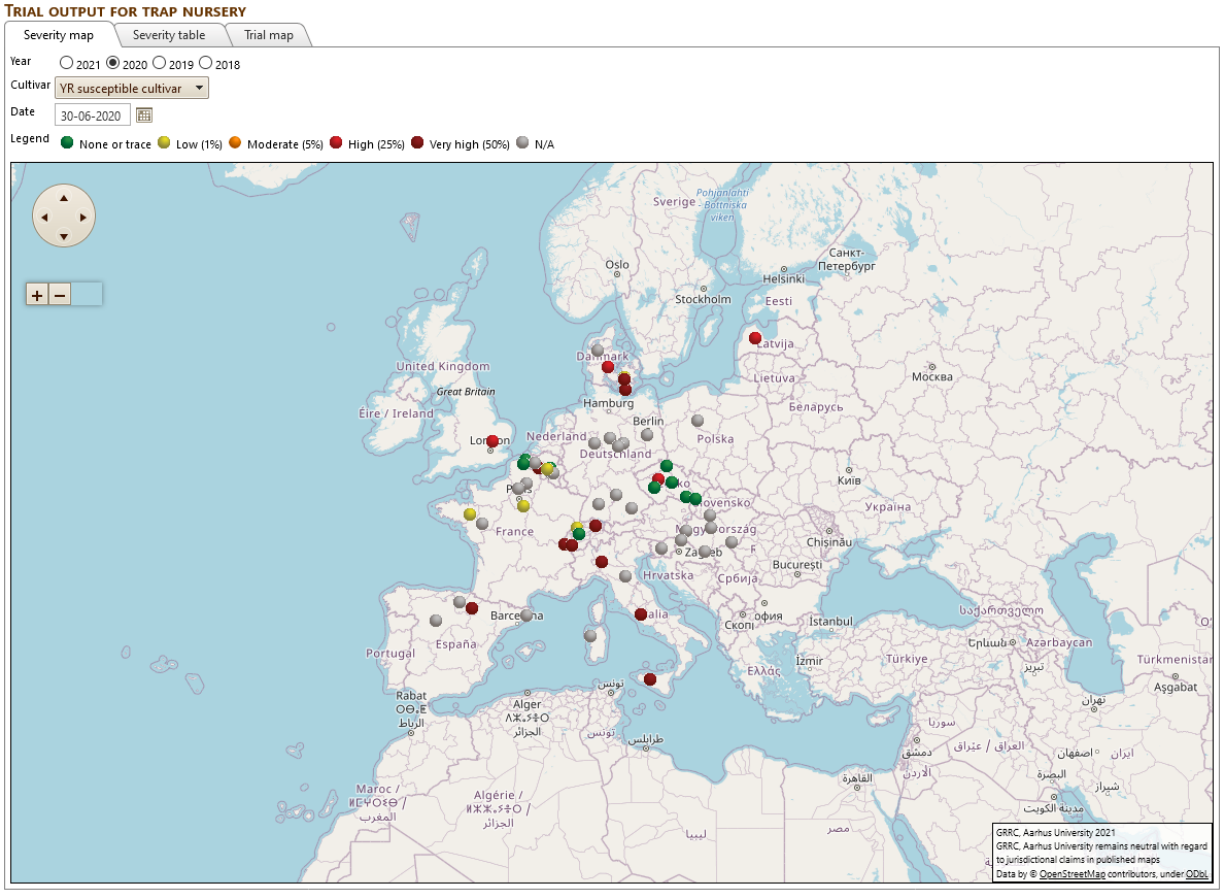
RUSTWATCH
WHEAT RUST EARLY WARNING

Trap Nursery data management system



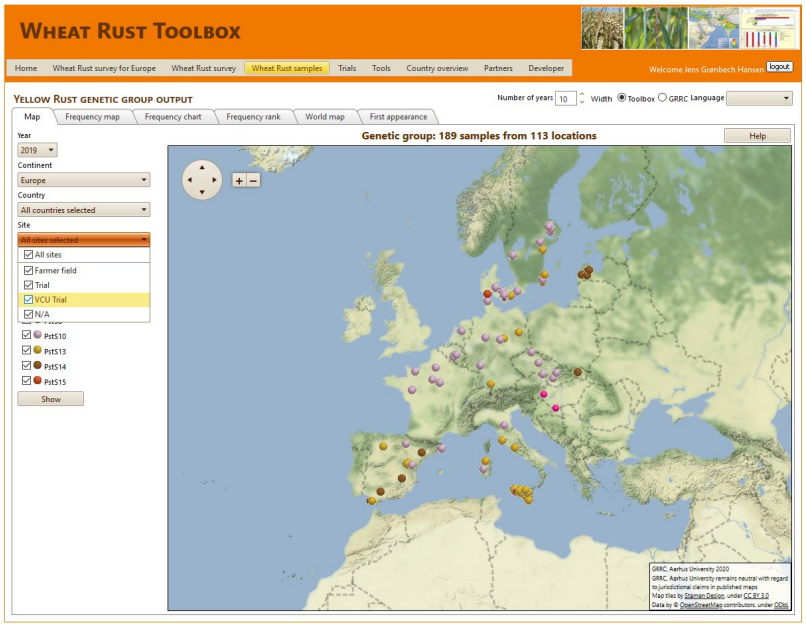
Disease level on susceptible ref cultivars in Trap nurseries





RUSTWATCH
WHEAT RUST EARLY WARNING

Site type = VCU, can be selected on the genotype mapping tool



Show Live

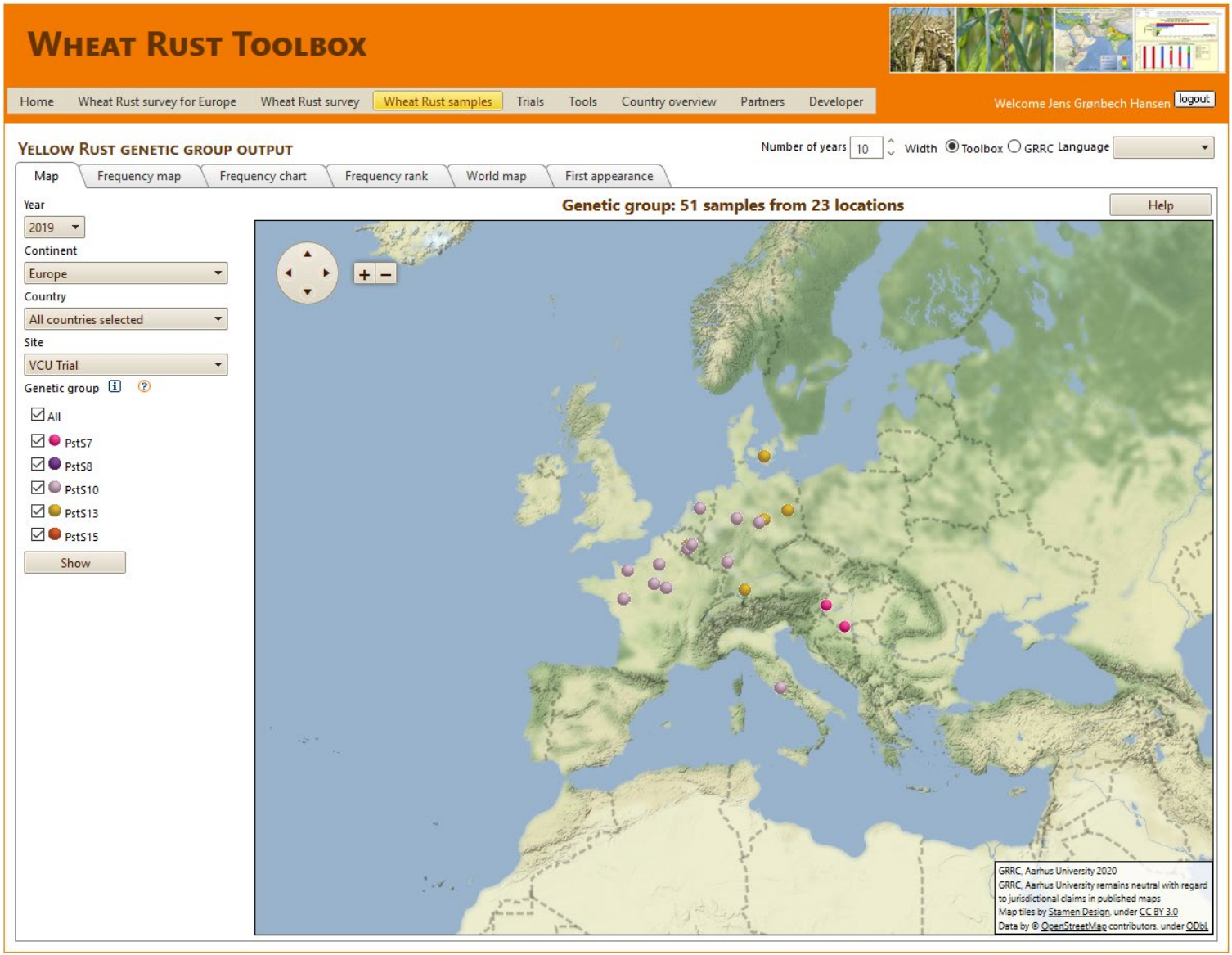
Discussion

Discussion points

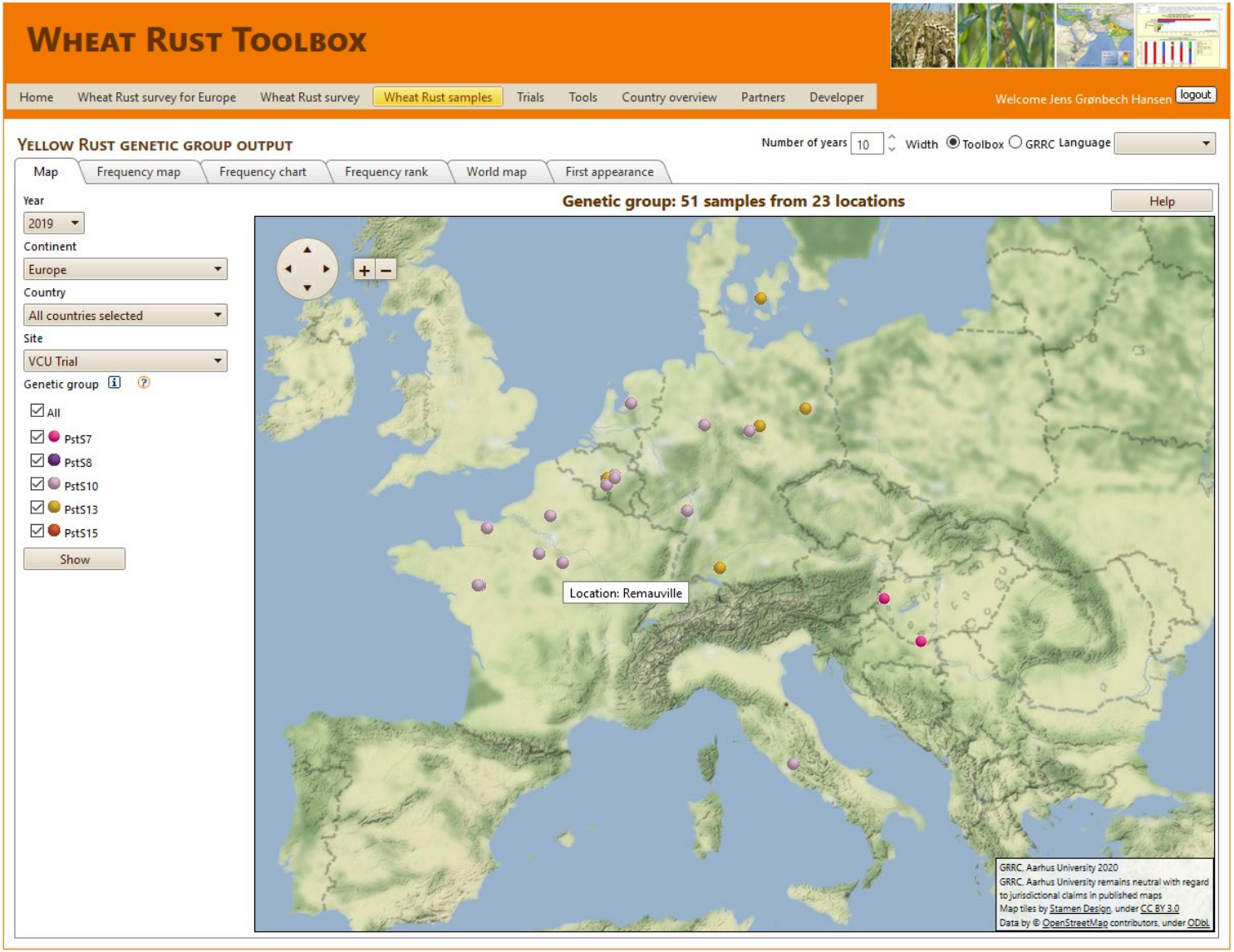
- Sampling strategy in Trap Nurseries
- Is the Trap Nursery data management system relevant for Tystofte / Seges / Regional extension /

- Is the Field Nursery system relevant for Breeding companies / SEGES / Regional extension

Genotype results 2019 only for the VCU trials



Mouse over one dot on the map shows the Trial name



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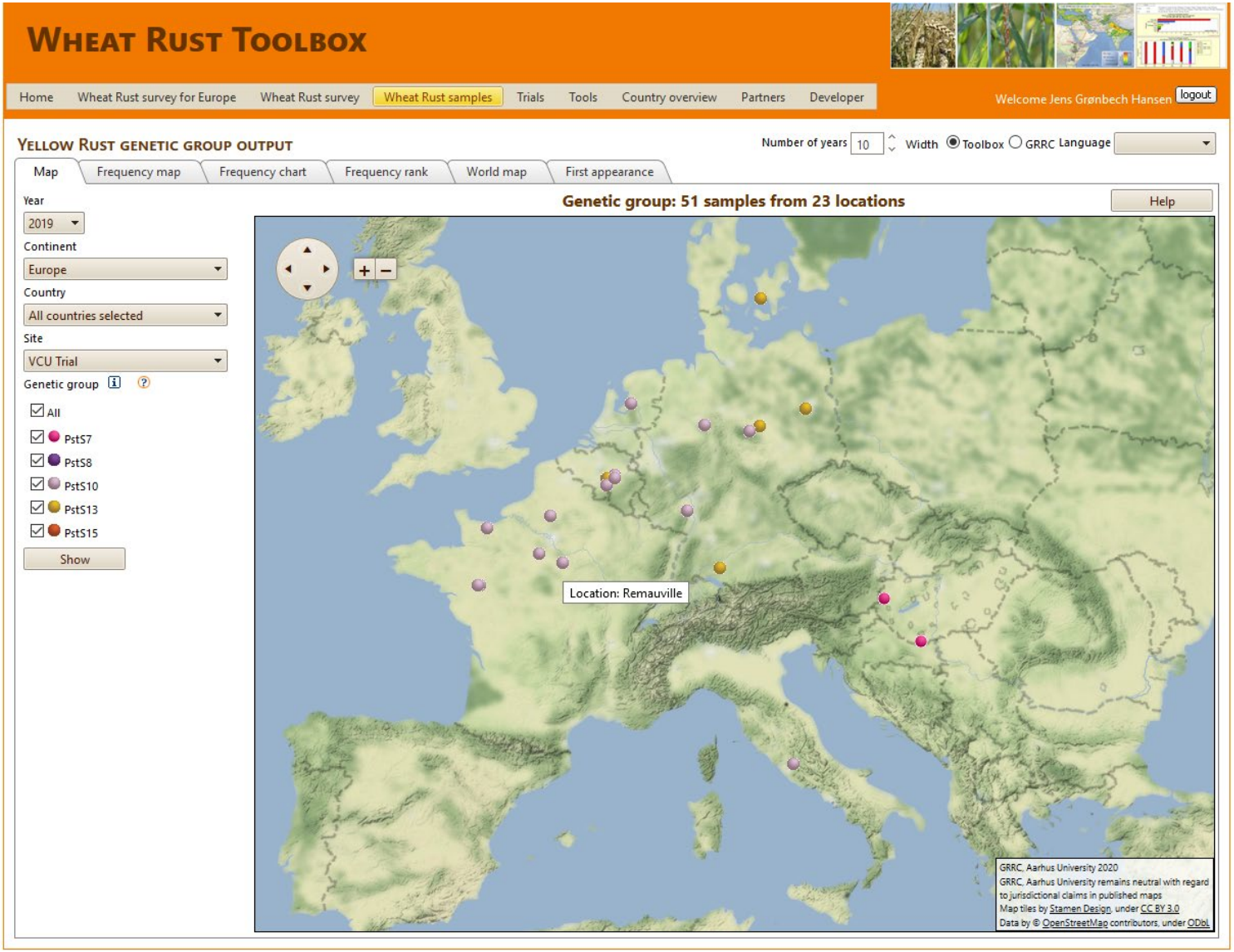


- Home
- About GRRC
- Research Projects
- Submission of isolates
- Yellow Rust Tools - maps and charts
  - Genetic groups on single locations
  - Genetic groups frequency map
  - Genetic groups frequency chart
  - Race Frequency Map
  - Races on single locations
  - Races - Changes across years
  - Disease Survey Mapper
  - Importance of the three wheat Rusts
  - Definitions of races and genetic groups
- Stem Rust Tools - maps and charts
- Leaf Rust Tools - maps and charts
- Rust on Barberry
- Wheat Rust Toolbox
- Publications

Races on single locations

Year: 2020

Continent: Europe

Country: All countries selected

Site: All sites selected

Laboratory: All laboratories selected

Race

- All
- Warrior
- PstS15
- Triticale2015
- Benchmark
- Kalmar
- Amboise
- Other

Show

Race: 55 samples from 38 locations

Help

Data provider : *GRRC, Denmark.*

Rust Survey

Crowdsource App

RUSTWATCH
WHEAT RUST EARLY WARNING

Wheat Rust Early Warning

An early warning campaign will be carried out from late March, 2021 - using the RustWatch Rust survey crowdsource App. Regions beyond the RustWatch case study regions are invited to participate.

Photo by Bill Clark, NIAB, UK

Links: Crowdsource App Dashboard Getting started Read more

Objectives

- **Target:** To establish the status of mainly yellow rust in common wheat, durum wheat and triticale fraom late March in Europe, 2021. It is important also to upload "no disease" as the objective of the campaign is to monitor the status of the wheat rusts and which cultivars are affected and which are not.
- **Where:** RustWatch invite all regions in Europe to participate in the campaign. Campaigns will be carried out also in RustWatch case study regions, Navarra Spain, Sicily Italy, Switzerland, Cambridge region UK, Denmark and Brandenburg in Germany.
- **What we ask for:** Cultivar name, wheat rust observed yes or no, and one or more photos (Growth stage and incidence as optional).
- **Who to contact re local organising:** Contacts in the six case study regions
- **New regions:** please contact fabio.mascher@agroscope.admin.ch
- **Where can you find the results:** Results and photos are publicly available on the Wheat rust dashboard.
- **Samples for genotype and race analysis:** If you find unusual attacks or attacks on a cultivar supposed to be very resistant, then please contact your advisor or consultant. He can decide if a sample should be sent to one of the Rustwatch labs or your national lab for further analysis. You can also get help from your RustWatch Case Study Region contact.

Our goal is to have genotype results ready before the end of May. These results will be a part of an early warning message on the RustWatch website and Twitter. The same alert will be issued via regional Agricultural Knowledge and Innovation Systems web sites in local language.

It is important also to upload "no disease" as the objective of the campaign is to monitor status of the wheat rusts and which cultivars are affected or not. Based on the experiences from this early campaign and feedback from stakeholder groups, we will decide if another campaign will be accomplished later in the season.

You can find the link to the App, where to find results, documentation and a user guide on this web page

Crowdsource App - Rust survey

Open this link on your mobile phone, your computer or tablet:

› https://arcg.is/1zTHTS

Results are available via this link, best viewed on a tablet or a computer:

› https://arcg.is/0H0HGf

To see the photos first click on this button and then select a dot on the map

Getting started user manual

You can read the getting started user manual for the Rust survey Crowdsource App. For 2021 we developed an extended Dashboard

- In English language here
- In Italian language here
- In German Language here NEW
- In French Language here NEW

The Crowdsource App is available for all stakeholders and actors that will participate in wheat rust early warning.

European early warning system for wheat rust diseases – timeline and actions

Unusual rust epidemic event

Action needed:	***How will RustWatch contribute:***
Effective EU coordinated system for disease surveillance and sampling ("hunting the new").	**New SmartPhone App** for uploading disease surveillance obs (T4.3) **Wheat Rust Toolbox** generating maps and charts (T4.2). Samples of rust infected leaves collected and submitted to rust diagnostic labs (T1.1.).
Fast and reliable pathogen diagnostics and characterisations.	**Sample recovery,** purification and molecular genotyping and race phenotyping (T1.1, T1.2). R**espons time** for diagnosis reduced by improved molecular diagnostic tools, and by **increased capacity and expertice** in European rust labs (T1.1).
Effective and coordinated dissemination and communication infrastucture to facilitate alerts.	**Genotypic** and race **phenotypic** data uploaded to WheatRustToolbox and displayed on maps and charts (T4.2), and **analysed in European and global context** (T1.1). Alerts via **Eurowheat.au.dk,** press release, and social media (T4.6, T5.1). M**aps and charts** integrated in **regional** agricultural advisory **information systems** (T3.6, T4.3, T4.5).

Time

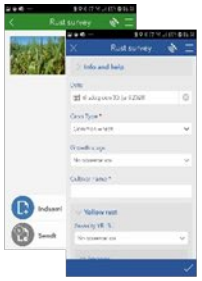
Short term alerts and transboundary warnings (1 day - 6 months). Farmers adapt IPM strategy accordingly

Asessment of epidemic potential of new emerging wheat rust races.	**New tools for coordinated impact evaluation** – epidemic vulnerability (T2.3) and aggressiveness (T1.4). Results feed into Risk models (T4.4).
Accelerating breeding efforts for resistance to new rust races.	**Develop shared facilities,** e.g. access to test wheat varieties and breeding lines in inoculated field nurseries at trial sites in regions, where new/unusual races were detected (T3.4), and off-season trials in green house (T2.3).
Developing IPM based control strategies of rust epidemics in diverse agroecological environments.	Validate **new IPM strategies** taking into account new rust races in field trials in up to 10 regions (T3.1)**,** including collaboration with lead and end-user farmers in five **case study regions** (T3.6)**.**
Impact on Value for Cultivation and Use (VCU) testing.	**VCU trial results** evaluated in the context of new rust races at trial sites where these races are present (T3.2, T4.1, T4.3).
Development of Risk Management tool: Which wheat varieties are at risk? Where may the disease spread next? How to minimise risks of future invasions, spread and how to prevent future yield losses.	Improve **risk management and prevention** (T2.4, T1.5, T4.4). Establish a **wheat rust network for Europe** including all stakeholders to optimise **preparedness, resilience and early warning** (T4.6).

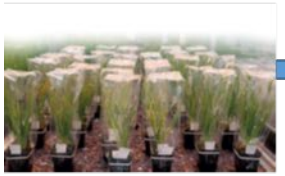
Time

Longer term actions (6-18 months). National lists for variety choice updated. Breeding programs adapted. Early warning maps and charts and the Risk Management tool updated. Results synthesised and communicated via stakeholder networks and academia articles, workshops and conferences.

RustWatch Early warning



Crowdsource App. Disease surveillance 1st campaign February/ March

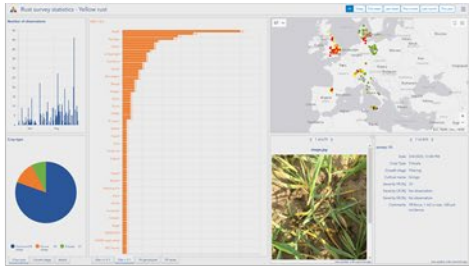


Be prepared! On what varieties, Where and how much + off-season race and genotyping and race typing

Crowdsource App. Disease surveillance 2nd campaign April/May. Prepare isolate sampling strategy.Start scoring in Trap nurseries and Field nurseries. Upload data from Existing AKIS or platforms

Raise awareness among all stakeholders. Adapt IPM strategies accordingly. Sampling of isolates using the Wheat Rust Surveillance App

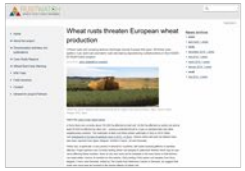
Faster diagnostics and genotyping Interpretation of all data



Rust survey Dashboard

Genotype and race maps updated

Common disease surveillance mapper



Write news stories and contact farmers

Genotype and race maps updated

Discussion

Discussion points

- How to activate “scouts”
- What to look for? What to report?
- Can we integrate the Dashboard with SEGES registreringsnet