AdvisoryNetPEST

Regional rust monitoring and early warning system

Farmer's name
Arable crops farmers and cooperatives of Navarra region.

Contact
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Name of the farm
Arable crops farmers and cooperatives of Navarra region.

Country
Spain

Description of the farm context

The area of extensive crops in Navarre is around 200,000 hectares. The main crops are wheat and barley, with rapeseed, oats, beans, peas and sunflowers being other common crops in rotation. Climatic conditions vary greatly across the region. In the south, conditions are very arid, with rainfall of around 300 mm per year. Meanwhile, the northern areas receive around 800 mm of rainfall per year.

Partner Organization

INTIA

THE TECHNIQUE

Short Description:

Yellow rust is monitored regionally by farmers and advisors,. Information is recorded to create a map of rust infection used as early warning advise of rust infection.

Crop Sector:

Cereal crops

Targeted pest and diseases:

Yellow rust

Objective of the NA:

Observations of yellow rust infection are done in the region by farmers and advisors. These information are recorded in a digital platform and geolocated compiled to create a map and inform on infection dynamics,. This information is then used by farmers and advisors to better position the fungicide treatments. This early warning is used to optimise treatments

Level of practice adoption across the country:

1 2 3 4

The practices identified in this project are called 'Novel Approaches' and abbreviated as 'NA'

AdvisoryNetPEST

The **AdvisoryNetPEST** project aims to create a **network** and **upgrade advisory services** across the EU to increase the sharing of knowledge and the **adoption of innovative solutions to reduce the use and risks of pesticides** (RURP) in all **EU Member States**, enabling the agricultural sector to achieve the targets proposed by the Farm to Fork Strategy.

AdvisoryNetPEST www.advisorynetpest.eu

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Expectations regarding RURP

*RURP : Reduction of Use and Risks of Pesticides

This early warning system enables to avoid unnecessary fungicide treatments, as well as enabling farmers and advisors to position more efficiently fungicide treatments.

Key success factors

To implement this technique effectively, it is very important to have the involvement and commitment of farmers and advisors in monitoring the disease and sharing data with the digital platform. A previous pest monitoring and alerts system is very helpful for getting started. Another key aspect is communicating the results and the importance of data collection to users.

Methods/strategy of application in the farm

Farmers and advisors regularly monitor wheat crops to detect the initial symptoms of yellow rust and its spread to different growing areas. The symptoms are confirmed by a technician and recorded on the digital platform, either directly in the field using a smartphone or in the office. The points are geolocated and include information on the crop, variety, phenological stage and type of symptoms detected.

Improvements of the NA

This technique mainly improves the efficiency of disease monitoring and enhances the ability to detect infections early. It also provides certainty in choosing the optimal times for fungicide treatments, avoiding unnecessary applications or scheduled application programmes.

Resources and skills needed to adopt the NA

It is important to have a sufficient network of advisors to validate disease detections in the field and/or to have a network of users who are well trained in disease identification. An existing digital platform to support the monitoring network is also recommended.

Figure 1: Rust monitoring

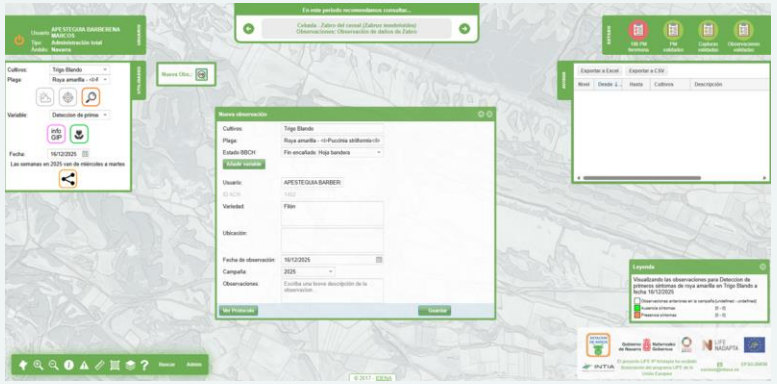


Figure 2: Digital platform

Figure 3: Geolocated visor

Figure 4: Rust symptoms

Advice from the Advisor

The collaborative monitoring system is very interesting as it offers the possibility of learning about the emergence and evolution of the disease in different areas and obtaining better information about what is happening and how the disease is behaving.

Farmers Testimony

This tool allows us to share what we are seeing in the field with other farmers in the area. This way, we can be more alert to risky situations and have greater confidence in the monitoring we do individually.

Policies and Regulatory Support

To promote the use of digital tools, support is needed to improve connectivity in rural areas. It is also important to support agricultural advisory networks that can promote and stimulate the implementation of this type of collaborative tool.

Social and Cultural Acceptance

Both the use of digital tools and collaborative work can be difficult to implement, as they may clash with the usual way of working. Farmers and advisors may therefore be reluctant to get involved in sharing data and/or using a digital platform.

To go further on NA replication:

In order to adopt this technique, it is necessary to assess the existence of a prior pest monitoring system, as well as the existence of a digital platform to support it.

On the other hand, it is necessary to organise the data collection system and encourage its use among farmers and advisors. An established network of collaborating farmers and technical advisors with a presence in the field is very important in this regard.

BENEFITS

Greater efficiency in monitoring and early detection of the disease, enabling better decision-making and positioning of fungicide treatments.

The data collected allows for further in-depth analysis and learning about the behavior of the disease.

It encourages crop monitoring and keeps farmers and advisors actively involved in monitoring their plots, which is a key aspect of integrated pest management.

BOUNDARIES

The growing importance of other diseases in wheat cultivation, as well as the variability in their behaviour and incidence in different seasons, makes it difficult to monitor and make decisions regarding fungicide treatments. This context implies a higher level of training for users and the possible inclusion of new monitoring modules for different diseases in the system.

Systemic Feasibility Analysis: Expert insights from Literature and Field Data

CRITERIUM	INDICATOR	INDICATOR SCORE	EVALUATION
Pesticide use reduction level	Reduction of the applied volume of pesticides	high reduction (>25%) **moderate reduction (10-25%)** low reduction (<10%) no reduction	
Effectiveness of controlling the target pest/diseases/weed	Percentage reduction of the target pest/weed infestation or of the damage caused by the target disease	**high reduction (>60%)** moderate reduction (30-60%) low reduction (<30%) no reduction	
Biodiversity	Impact on aquatic organisms	--/-/0/**+**/++	
	Impact on bees	--/-/0/**+**/++	
Water quality	Impact on pesticide losses to surface water (runoff)	--/-/0/**+**/++	
Air quality	Impact on pesticide emissions	--/-/0/**+**/++	
Energy use	Impact on total energy consumption	--/-/0/**+**/++	
Working conditions	Knowledge requirements	high training level **moderate training level** low training level no training	
	Impact on working-time	**+ 5%**	
	Risk mitigation on operator/employee exposure	high mitigation **moderate mitigation** low mitigation no mitigation	
Costs	Impact on various types of variable costs: fuel, energy, labour, water, consumables...	**+ 5%**	
Outputs	Impact on yields (produced volumes)	--/-/0/**+**/++	
	Impact on crop quality	--/-/0/**+**/++	

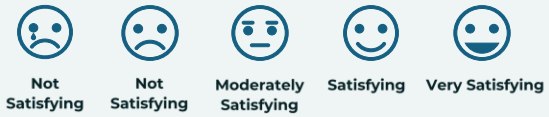
Impact Highlights

The novel regional monitoring and early warning system represents a superior approach to yellow rust management compared to traditional fungicide programmes or individual field scouting. Its data-driven, collaborative, and precision-oriented design enables significant reductions in fungicide use without compromising disease control, yield, and crop quality.

This approach minimises environmental impact, minimizing the impact on bees and aquatic organisms, energy use and pesticide losses. In addition, it reduces variable costs and labour for farmers.

Weaknesses include the need for some training and limited effectiveness in mitigating risks for those applying the system.

Evaluation:



Find out more details:

https://estacionavisos.agrointegra.intiasa.es/ai/accesoVisor.do