IPMorama – Press release

Breeding for Integrated Pest Management - Advancing Resilience Through Innovative Varieties

This September, we kicked off IPMorama, a 4-year, €5 Million worth Horizon Europe project that brings together **17 partners** from **10 European countries** with a common goal to improve the state of the art in variety-centric Integrated Pest Management (IPM) for important diseases in the **wheat** (rust pathogens), **potatoes** (blight) and the **grain legumes** soybean (the *Diaporthe*/*Phomopsis* complex DPC fungi), pea (broomrape) and white lupin (anthracnose).

Why IPMorama is important?

The IPMorama project is crucial for advancing integrated pest management (IPM) in key crops like wheat, potatoes, and legumes by generating tools to fast-track the breeding of disease and pest resilient varieties, whilst simultaneously developing IPM practice methodologies that maximise their utility by integrating knowledge of host resistance with pathogen virulence. The effect of this innovative approach will be to reduce pesticide reliance, thereby securing agricultural productivity whilst addressing the ambitious sustainability goals demanded by EU citizens. IPMorama aims to create a „community of practice that involves the entire crop production value chain from breeders, through farmers to consumers and wider society. To achieve this, the project will not only develop advanced technologies for breeding and IPM but also pursue social engagement to ensure effective policy-making and stakeholder collaboration, ultimately contributing to healthier soil, water quality and sustainable agriculture.

A word from the coordinator!

“The core idea of the IPMorama project is to develop what we call a whole “practice-ecosystem” for IPM using resistant varieties. The goal is to provide a framework of real-world benefits for stakeholders all along the crop value chain. Breeders will benefit by being able to better target their varieties based on an understanding of potential emerging disease threats, growers will benefit from more secure

production, consumers will benefit from more sustainable food, and policymakers will have an evidence-based framework for future policy on sustainable agriculture."

Coordinator - **Dr Dan Milbourne** of Teagasc's Crop Science Department

Kick-off Meeting

With the Kick-off meeting held last week in Dublin, Ireland the IPMorama project started its mission. The meeting was hosted by the coordinating entity **Teagasc | Agriculture and Food Development Authority** at Teagasc Ashtown Food Research Centre **on 3-4 October.** Here the consortium introduced their plan for activities over the lifetime of the project and refined internal procedures for the IPMorama project implementation, focusing on effective dissemination, exploitation, and communication strategies to engage stakeholders and maximise impact. Additionally, we developed a plan for efficient data management and established a solid roadmap for the upcoming year.

What can you expect in the future?

The IPMorama project will develop and refine tools that integrate knowledge of host resistance with the distribution of pests and pathogens. By understanding the genetic resistance in crops and mapping the virulence of pathogens, IMPorama will support breeders in developing resistant varieties. Additionally, the project aims to scale these innovations by engaging stakeholders across the agricultural value chain, offering a comprehensive framework to improve pest management and agricultural sustainability

The IPMorama paradigm for the next generation of IPM practices is based on the following 5 specific components:

1. **Development of IPM-centric varieties:** Enhanced crop varieties with integrated pest and pathogen resistance, specifically for wheat (rust pathogens), potatoes (blight), and legumes like soybeans, peas, and white lupin (broomrape and anthracnose).
2. **Genetic insights for breeders:** Advanced understanding of the genetic composition of pest and pathogen resistance in key crops, which will assist breeders in targeting and assembling effective resistance traits.
3. **Landscape-level pathogen mapping:** Detailed maps of pathogen virulence, enabling precise and location-specific IPM strategies that exploit the resistance traits of different crop varieties.
4. **Innovative IPM tools:** Creation of practical tools such as crowdsourcing apps and vulnerability maps that farmers and stakeholders can use to monitor and manage pest risks across different regions and timeframes.
5. **Stakeholder engagement:** A robust knowledge infrastructure for actors across the agricultural value chain, promoting the competent use and scale-up of variety-centric IPM solutions.

IPMorama seeks to make significant contributions to Europe's' visions and goals as set by the EU Green Deal and Farm to Fork Strategy (F2F). The project aims to achieve a larger societal impact by integrating into the project actors including; research institutions, scientists, breeders, seed companies, plant variety testers, agrichemical producers networks such as EPI-AGRI, National Rural Network (NRN), European Network for Rural Development (ENRD), farmers and many more, ultimately leading to greater acceptance and uptake of the solutions developed.

GEVES role in the project:

GEVES will be mainly involved in 4 tasks on wheat and potatoes:

- **Monitoring resistance deployment in European varieties of wheat, potatoes**
  This task, coordinated by INRAE, mainly aims at monitoring the deployment of critical **wheat** and **potato** diseases in Europe (rusts, late blight). GEVES will help to collect available information about disease resistance levels scored in field trials for registration, by contacting the relevant European institutions (VCU network) for wheat and potatoe.
- **Isolate sampling in VCU and breeders' networks for wheat and potatoes**
  This task, coordinated by GEVES, aims at managing the constitution and organization of sentinels sets across EU VCU & breeders trials for yellow rust, leaf rust and stem rust and potato late blight. This task contributes to reinforce epidemiological surveillance, and to detect new virulences by ensuring the visual scorings and the sending of samples to labs to confirm these virulences by pathotyping races and/or genotyping by SSR markers

- **P*G*E analysis of the level, type and stability of resistance in time and space**

GEVES will participate with the other institutes to combine databases dealing with pathogens and resistance cultivars to analyse the level of resistance and the type of resistance across environments.

- **Variety centric IPM validation trials**

GEVES will contribute to evaluate wheat variety mixtures only for wheat, in small scale field. Evaluations will include reduction of epidemic development, longevity of key resistance sources for yellow rust. This will result in recommendations on how to conduct specific variety mixture trials. This will create a direct link between the **IPMorama** testing activities and local VCU authorities, which are/expected to be engaged in testing, promotion and adoption of **wheat** mixtures in EU agriculture.

The IPMorama project is Funded by the European Union's Horizon Europe research and innovation programme. Associated country partners are Funded by SERI & UKRI. All information is available on the project's website, as well as on Facebook, LinkedIn, Twitter, Instagram, and YouTube.