

Why do research and innovation on plant health matter?

Keeping healthy crops is becoming more challenging due to mounting factors like globalisation, international travel, and trade that can unintentionally spread pests and diseases rapidly worldwide. Moreover, climate change is altering pests' behaviour and geographical distribution, which may further increase the risk of introducing pests to new areas and the severity of the impact. These factors can cause significant damage to crops, native plants and the environment.

Risks to plant health are on the rise, threatening agricultural sustainability, biodiversity and food security. The introduction and spread of plant pests are serious threats with far-reaching economic, social and environmental consequences. Tackling numerous and highly dynamic biotic and abiotic changes requires integrated approaches and the development of a wide range of solutions for the prevention, early detection, monitoring, control and management of pests and diseases, along with risk management strategies. Reducing pesticides in the management of plant pests protects the environment, pollinators, natural pest enemies, beneficial organisms, animals and people. Sustaining **plant health** must be achieved without putting further strain on the environment. The EU **farm to fork** and **biodiversity strategies** set **two key targets for pesticides** by 2030: a 50% reduction in the use and risk of chemical pesticides and a 50% reduction in the use of the more hazardous pesticides.

Research and innovation on plant health are key to keeping crops healthy in a challenging environment while aiming for a sustainable, climate-neutral and biodiversity-friendly farming system

Plant health under Horizon 2020 and Horizon Europe



CORDIS search keywords

plant health, integrated pest management, plant pests and diseases, pesticides reduction



Nb of projects

37 Horizon 2020
27 Horizon Europe



EU contribution

€ 189 million
€ 144 million

Figures comprise Horizon 2020 Societal Challenges 2 and Horizon Europe Cluster 6 projects, including Work Programme 2023-2024 expected projects
Selection of a few projects logos



Success stories dedicated to plant health

On emerging and future risks to plant health

Emerging plant pests and diseases threaten food security, agricultural sustainability and biodiversity. EU-funded projects such as **XF-ACTORS**, **PRE-HLB**, **FF-IPM**, **IPM-Popillia**, **VIRTIGATION**, and **TROPICSAFE** focus on important plant pests providing tools for their early detection, prevention, monitoring, control and management, reducing their impact on key crops in Europe. The three new projects **REACT**, **PurPest**, and **BeXyl** will seek solutions for critical plant pests. The project **HOMED** has developed a full set of science-based, innovative, practical methods and tools for assessing and controlling emerging and invasive pests threatening EU forests.

Spotlight on outbreaks of plant pests: the case of *Xylella fastidiosa*

Since the first detection of *X. fastidiosa* in 2013 in Puglia (Italy), EU-funded R&I has been helping to raise awareness, train actors (researchers, farmers, advisers, plant health officers, among others), and improve the detection, surveillance, prevention and control of the pathogen through projects such as **POnte**, **XF-Actors**, and **Cure-XF**. Building on the results of these projects, **BeXyl** works on integrated management strategies for mitigating the impact of *X. fastidiosa* in Europe. Biopesticides targeting *X. fastidiosa* and the insects spreading the disease are being developed by **Biovexo**, an innovation action co-funded under the Bio-based Industries Joint Undertaking.

Controlling plant pests with reduced use of chemical pesticides

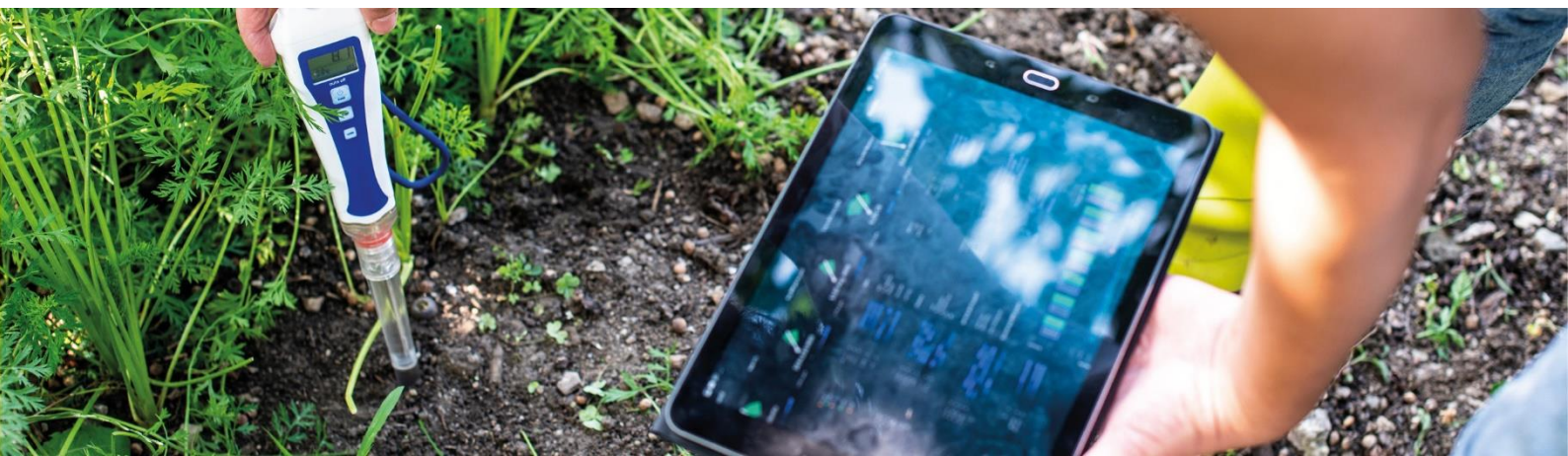
Integrated pest management (IPM) is a low-pesticide-input pest management and environmentally friendly approach to controlling pests, which prioritises all other methods of pest control before using chemical pesticides as a last resort, minimising risks to human health and the environment. EU-funded research develops and tests solutions for farmers as part of the IPM toolbox. The project **IPM Decisions** has created an online platform integrating decision support systems, which can be adjusted for regional conditions. The platform allows farmers and advisers to monitor insects, weeds and diseases across Europe. A 'toolbox' of validated and optimised integrated weed management (IWM) methods was developed by the project **IWMPraise**. The results are available to end users to enable sustainable weed management.

EU-funded projects demonstrate and disseminate IPM practices. **IPMWorks** has established an EU-wide network of farmers to promote IPM strategies and to demonstrate how a low reliance on pesticides can be achieved with better pest control, reduced costs, and enhanced profitability. Innovative solutions and practical knowledge are also made available to advisers and farmers through thematic networks like **Innoseta**, **SmartProtect**, **Winetwork**, and **Oper8**.

Research projects such as **Diversify**, **Diverfarming**, **Diverimpacts**, and **Remix** have designed and tested cropping systems based on agroecological approaches to control and reduce pest damage, among other benefits, decreasing the need for pesticides. Innovative approaches to control plant pests are being developed by several projects such as **SuperPests**, **Novaterra**, **WeLaser**, **Bioschamp**, **NoviGrain**, **Viroplant**, **nEUROSTRESSPEP**, and **PestNu**.

Plant health: Keeping plants healthy while protecting the environment

More success stories from EU-funded projects are showcased in the CORDIS Results Pack [Plant Health: keeping plants healthy while protecting the environment](#).



Horizon 2020 and Horizon Europe collaborative projects on plant health

Follow the [CORDIS link](#) for more information on the start-end date, EU contribution, coordinator and results. Non-exhaustive list sorted by ascending project acronym.

Acronym	Project	CORDIS
Adopt-IPM	EU-China joint action to increase development and adoption of IPM tools	101060430
AGROSUS	Agroecological strategies for sustainable weed management in key European crops	101084084
BeXyl	Beyond Xylella, Integrated Management Strategies for Mitigating Xylella fastidiosa impact in Europe	101060593
Bioschamp	Biostimulant alternative casing for a sustainable and profitable mushroom industry	101000651
Conserwa	Evidence-based support for transition to agroecological weed management in diverse farming systems and European regions	101081802
Excalibur	Exploiting the multifunctional potential of belowground biodiversity in horticultural farming	817946
FF-IPM	In-silico boosted, pest prevention and off-season focused IPM against new and emerging fruit flies ('OFF-Season' FF-IPM)	818184
GOOD	AGrOecOlogy for weedDs	101083589
Homed	HOlistic Management of Emerging forest pests and Diseases	771271
Innoseta	Accelerating Innovative practices for Spraying Equipment, Training and Advising in European agriculture through the mobilization of Agricultural Knowledge and Innovation Systems	773864
IPM Decisions	Stepping-up IPM decision support for crop protection	817617
IPM Works	An EU-wide farm network demonstrating and promoting cost-effective IPM strategies	101000339
IPM-Popillia	Integrated Pest Management of the invasive Japanese Beetle, Popillia japonica	861852
IWMPrise	Integrated Weed Management: PRACTical Implementation and Solutions for Europe	727321
Novaterra	Integrated novel strategies for reducing the use and impact of pesticides, towards sustainable mediterranean vineyards and olive groves	101000554
NovlGrain	Sustainable storage of grains by implementing a novel protectant and a versatile application technology	101000663
Oper8	European Thematic Network for unlocking the full potential of Operational Groups on alternative weed control	101060591
PestNu	Field -testing and demonstration of digital and space based technologies with agro-ecological and organic practices in systemic innovation	101037128
Pre-HLB	Preventing HLB epidemics for ensuring citrus survival in Europe	817526
PurPest	Plant pest prevention through technology-guided monitoring and site-specific control	101060634
Ration	Risk Assessment InnOvatioN for low-risk pesticides	101084163
React	Rapid elimination of invasive insect agricultural pest outbreaks by tackling them with Sterile Insect Technique programs	101059523
RustWatch	A European early-warning system for wheat rust diseases	773311
Smartprotect	SMART agriculture for innovative vegetable crop PROTECTioN: harnessing advanced methodologies and technologies	862563
SoilDiveragro	Soil biodiversity enhancement in European agroecosystems to promote their stability and resilience by external inputs reduction and crop performance increase	817819
SuperPests	Innovative tools for rational control of the most difficult-to-manage pests (super pests) and the diseases they transmit	773902
Support	Supporting UPTake Integrated Pest Management and IOw-Risk pesTicide Use	101084527
Valitest	Validation of diagnostic tests to support plant health	773139
Virtigation	Emerging viral diseases in tomatoes and cucurbits: implementation of mitigation strategies for durable disease management	101000570
WeLaser	Sustainable weed management in agriculture with laser-based autonomous tools	101000256
XF-Actors	Xylella Fastidiosa Active Containment Through a multidisciplinary-Oriented Research Strategy	727987

Some projects under “Agroecology and organic farming” and “Genetic resources and breeding” also contribute to plant health

Relevant sources of information supporting plant health

Instruments like the “European Innovation Partnership for Agricultural productivity and sustainability” (EIP-AGRI), partnerships, the Circular Bio-based Europe Joint Undertaking and EU missions, in particular the Mission ‘A Soil Deal for Europe’, also support plant health and a reduction of use of chemical pesticides.

EIP-AGRI activities

Different activities were organised by EIP-AGRI related to [sustainable use of pesticides](#) and [plant health](#) so far.

Focus groups, workshops and seminars

- Sustainable ways to reduce the use of pesticides in pome and stone fruit production
- Integrated Pest Management for Brassica species
- Integrated Pest Management for soil-borne diseases
- Cropping for the future: networking for crop rotation and crop diversification
- Innovative arable crop protection - using pesticides sustainably
- Pests and diseases of the olive tree
- Pests and diseases in viticulture
- Non-chemical weed management in arable cropping systems

In the pipeline

- Emerging and future risks to plant health (2 projects)
- Biodiversity friendly practices in agriculture – breeding for Integrated Pest Management (IPM) (2 projects)
- Towards research and innovation beyond farm to fork strategy targets for pesticides after 2030 (1 project)
- Innovations in plant protection: alternatives to reduce the use of pesticides focusing on candidates for substitution (2 projects)
- Digital technologies supporting plant health early detection, territory surveillance and phytosanitary measures (2 projects)
- Developing EU advisory networks to reduce the use of pesticides (1 project)
- European partnership on accelerating farming systems transition – agroecology living labs and research infrastructures. The [R&I partnership on agroecology](#) will enhance the knowledge base and deliver solutions and tools that will underpin the agroecology transition in Europe. The partnership will tap into the potential of agroecology to reduce and phase out the use of pesticides and mineral fertilisers and close nutrient cycles, while preserving natural resources.

Future funding opportunities

- [HORIZON-MISS-2023-SOIL-01-03](#): Onsite digital technologies to monitor nutrients and chemical or biological stressors in soil and plants with relevance for food safety and nutrition
- [HORIZON-EIC-2023-ACCELERATORCHALLENGES-06](#): EIC Accelerator Challenge: Novel technologies for resilient agriculture
- [HORIZON-CL6-2024-FARM2FORK-02-3-two-stage](#): Tools to increase the effectiveness of EU import controls for plant health
- [HORIZON-CL6-2024-FARM2FORK-02-4-two-stage](#): Tackling outbreaks of plant pests
- [HORIZON-CL6-2024-BIODIV-01-6](#): Promoting pollinator friendly farming systems

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