



KB34-2A-6. Emerging viral diseases in tomatoes and cucurbits: implementation of mitigation strategies for durable disease management (VIRTIGATION)

Project Team: René van der Vlugt (WPR), Lotte Caarls (WPR), Yuling Bai (WU)



Background

Viral diseases cause severe losses to vegetable crop production which has an estimated annual value of 34,5 billion EUR in Europe. Billions are lost every year due to the prominence of viral diseases and the emergence of new viruses. Viral diseases also lead to the extensive use of pesticides, thereby exposing European growers and consumers to pesticide residues.

The VIRTIGATION project aims at developing rapid and lasting solutions to emerging viral diseases caused by begomoviruses (whitefly-transmitted) and tobamoviruses (mechanically transmitted) on cucurbits and tomato in Northern Europe and the Mediterranean Basin as well as at increasing knowledge to better control and manage these viral diseases.



Project objectives

The project, which runs from June 2021 – May 2025, is structured in 6 objectives :

1. Knowledge sharing and engagement of stakeholders in research activities (Short term impact).
2. Develop robust diagnostic tests, quarantine measures and identify ecological factors driving disease outbreaks (Short term impact)
3. Understand plant-virus(es)-vector interactions (Medium term impact)
4. Develop IPM solutions (Medium term impact)
5. Pyramidize natural resistance (Long term impact)
6. Train the value chain (Medium term impact)

The objectives will build on:

- detailed study of virus biology and transmission under climate change conditions
- development of classical solutions (IPM and natural resistance) to control viral diseases with two distinct modes of transmission.
- testing novel approaches (biopesticides, biological control, cross-protection) to mitigate viral diseases and to reduce pesticide usage. In order to take into account the diversity of vegetable cropping systems and viral diseases, VIRTIGATION will implement a bottom-up approach with several actors, which will involve extension services, commercial companies and growers, to help co-design research activities and mitigation strategies and tailor them to the needs of the entire value chain of tomatoes and cucurbits.

Results so far

Given the very recent start of the project (June 2021), no hard output is available yet. Work on Objectives 1, 2 and 4 has started.

Expected impacts

Expected impacts (both short- and long term):

- Understanding of drivers of plant virus emergence and spread including the influence of climate change.
- Development of efficient tools for prevention, detection and control of pests/diseases.
- Development of environmentally sound and long-lasting solutions for effective pest/disease management in farming in-line with the principles of integrated pest management (IPM) within a systems.
- Reduction of economic, social and/or environmental losses for Europe.
- Support for relevant EU plant health data management and policies, i.e. enable rapid response from decision-makers by creating a network on emerging plant virus detection, knowledge exchange and advisory tools.
- Outputs will help the agricultural sector to remain productive and contribute to sustainable agriculture.

Research and outreach plans remaining time

Outreach and practical applications for VIRTIGATION:

- Workshops as well as online focus groups will be set up to advice and provide feedback on research activities and results.
- NKBs will involve stakeholders in the co-design of research activities and train them to reduce the impact of viral diseases.
- Stakeholders and growers will be reached through the National Knowledge Brokers (NKBs) in Europe, Morocco and Israel using various communication channels including extension services, growers' associations, public research centres, private companies and social media.

