

VIRTIGATION

Analysing threats imposed by vegetable viruses under current and future climate conditions.



INSPIRATION

Tomato and cucurbits are among the most produced vegetable crops in the world. These crops are affected by global emerging risks related to viruses, such as begomoviruses and tobamoviruses, which reduce vegetable crop value quantitatively and qualitatively, as well as increase production costs and environmental impacts due to mitigation measures and pesticide use.

INNOVATION

VIRTIGATION aims to provide a deeper understanding of the plant-virus vector interactions by taking into account physical consistent and regional numerical climate change projections. From this understanding and in-depth diagnosis, solutions will be proposed, including plants vaccines and biopesticides against virus vectors, as well as integrated pest management strategies taking advantage of the natural resistance of plants in various agro- and ecosystems. In particular, LIST researchers will use their climate chamber to simulate future climate conditions in order to get a holistic understanding of the plant-virus vector interactions by using molecular analyses of plant and virus material.

IMPACT

VIRTIGATION will not only lead to reduced losses due to viral diseases in tomato and cucurbit vegetables but will also enable a significant decrease in the use of pesticides to control virus vectors under current and future climate conditions. It is anticipated that losses due to diseases caused by begomoviruses (e.g. Tomato leaf curl new Delhi virus) and tobamoviruses (e.g. Tomato brown rugose fruit virus) can be reduced by 80%, and even eradicated in Europe and Israel.

This European project, gathering more than 20 partners, could halve, or even eliminate under certain circumstances, the use of pesticide to control vector population and transmission. Appropriate Integrated Pest Management (IPM), including natural resistance against viruses and vectors as well the development of natural pesticides, would be instrumental in making the vegetable agrosystems more resilient and sustainable. Because environmental conditions can impact both vector and virus spread, the project will also develop preventive measures against emerging whitefly-transmitted geminivirus and mechanically transmitted tobamovirus diseases in countries at risk of pandemics.

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