# Groundbreaking project aims to revolutionise tomato crop management



A groundbreaking research and development project is underway in the UK, aimed at revolutionising the management of crop health, particularly in tomato cultivation. The initiative, titled ‘TomatoGuard: Advanced AI-Driven Pest and Stress Detection for Sustainable Tomato Cultivation’, is being funded by the Department for Environment, Food and Rural Affairs (DEFRA) and Innovate UK.

The project utilises state-of-the-art artificial intelligence technology to foster early detection and management of crop stress, addressing significant challenges faced by growers in maintaining sustainable and efficient agricultural practices. Bringing together a consortium of specialists, the project includes collaborations between the UK Agri-Tech Centre, Altered Carbon (AC), Fargro Limited, and the commercial tomato producer APS Produce.

At the core of TomatoGuard's innovation is the development of machine learning capabilities to detect specific volatile compounds in tomatoes that indicate stress. This sophisticated monitoring system is powered by AC’s K9sense chip, a novel chemical sensor designed to operate within an AI framework. The chip has the capability to identify unique patterns of volatile organic compounds (VOCs) emitted by stressed plants, facilitating timely interventions prior to the emergence of visible symptoms.

The project specifically targets Red Spider Mites (RSM), a notorious pest that significantly impacts tomato production. While biological treatments exist for RSM, their efficacy is enhanced with early detection. The past few years have seen many chemical treatment options being withdrawn due to environmental, safety, and regulatory concerns, amplifying the need for solutions like TomatoGuard. By employing both supervised and unsupervised learning methods, the system is designed to effectively identify RSM infestations and detect anomalies in plant health.

Dr. Andy Evans, Innovation Lead for Crop Health at the UK Agri-Tech Centre, emphasised the potential outcomes of this initiative, stating, “The outcomes from this project will lead to the detection of issues arising within tomato crops at a very early pre-symptomatic stage, allowing interventions to be deployed in the areas where issues are arising. From a grower perspective this would cut down on costs due to unnecessary pesticide use by targeting the areas that need treatments, optimising the nutritional requirements of the crop and maintaining a high quality and yielding product.”

The developments stemming from this project are anticipated to implement significant advancements in sustainable agricultural practices, marking a transformative step towards more efficient pest and stress management in the cultivation of tomatoes.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

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3. <https://hortnews.com/improving-tomato-cultivation-with-ai-technology/> - Explains the role of AC’s K9sense chip in detecting volatile organic compounds (VOCs) emitted by stressed plants and the focus on Red Spider Mites (RSM).
4. <https://hortnews.com/improving-tomato-cultivation-with-ai-technology/> - Discusses the use of both supervised and unsupervised learning methods for detecting RSM infestations and anomalies in plant health.
5. <https://www.fruitnet.com/eurofruit/new-project-aims-to-improve-tomato-growing-with-ai/264273.article> - Quotes Dr. Andy Evans on the potential outcomes of the project, including early detection of issues and cost savings through targeted treatments.
6. <https://hortnews.com/improving-tomato-cultivation-with-ai-technology/> - Highlights the environmental, food safety, and commercial concerns leading to the withdrawal of chemical treatment options and the need for solutions like TomatoGuard.
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