

# Halyomorpha Halys Encroaches into Northern Europe: Automated Insect Pest Monitoring System with Artificial Intelligence on Edge Devices

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## Halyomorpha Halys (HH) Spreads Northwards

- Invasive shield bug that is native to regions in East Asia
- Both adults and nymphs feed by piercing and sucking on a great variety of fruits and seeds, rendering products unmarketable
- First discovered in Europe in 2004. First found in Italy in 2012. In 2019, Italian orchards recorded an estimated loss of €588 million to their production. Two male adults were captured in Essex and in London in August of 2020. South East and Eastern England is set to reach climatic conditions that can sustain a population of HH. Ireland is unlikely to be spared



Figure 1 : Halyomorpha Halys

## Automated Insect Monitoring

- Monitoring for insects and insect damage is time consuming and, while an important part of IPM programmes, it is a task that needs to be simplified and automated
- This project utilises machine learning to monitor for pests and to utilise technologies such as unmanned aerial vehicles and static cameras to conduct pest monitoring and to report directly to growers on pest populations and crop damage

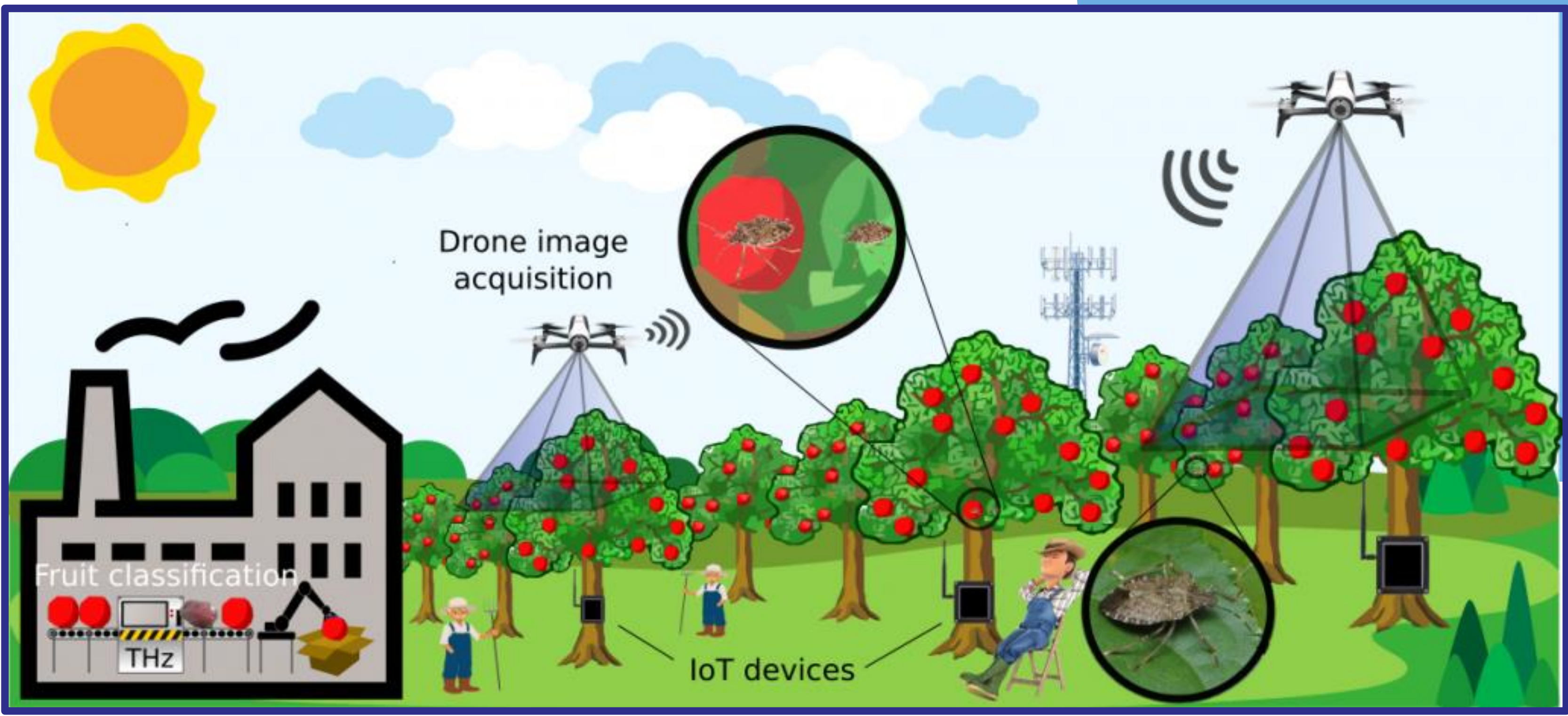


Figure 2 : Automated Insect Monitoring

## Carrot Root Fly Model Pest

- The Irish component of the project focuses on Carrot Root Fly, as model pest to test and develop the technology
- The presence Carrot Root Fly is usually monitored manually with orange sticky traps
- The proposed system aims to automate this process with state-of-the-art technology

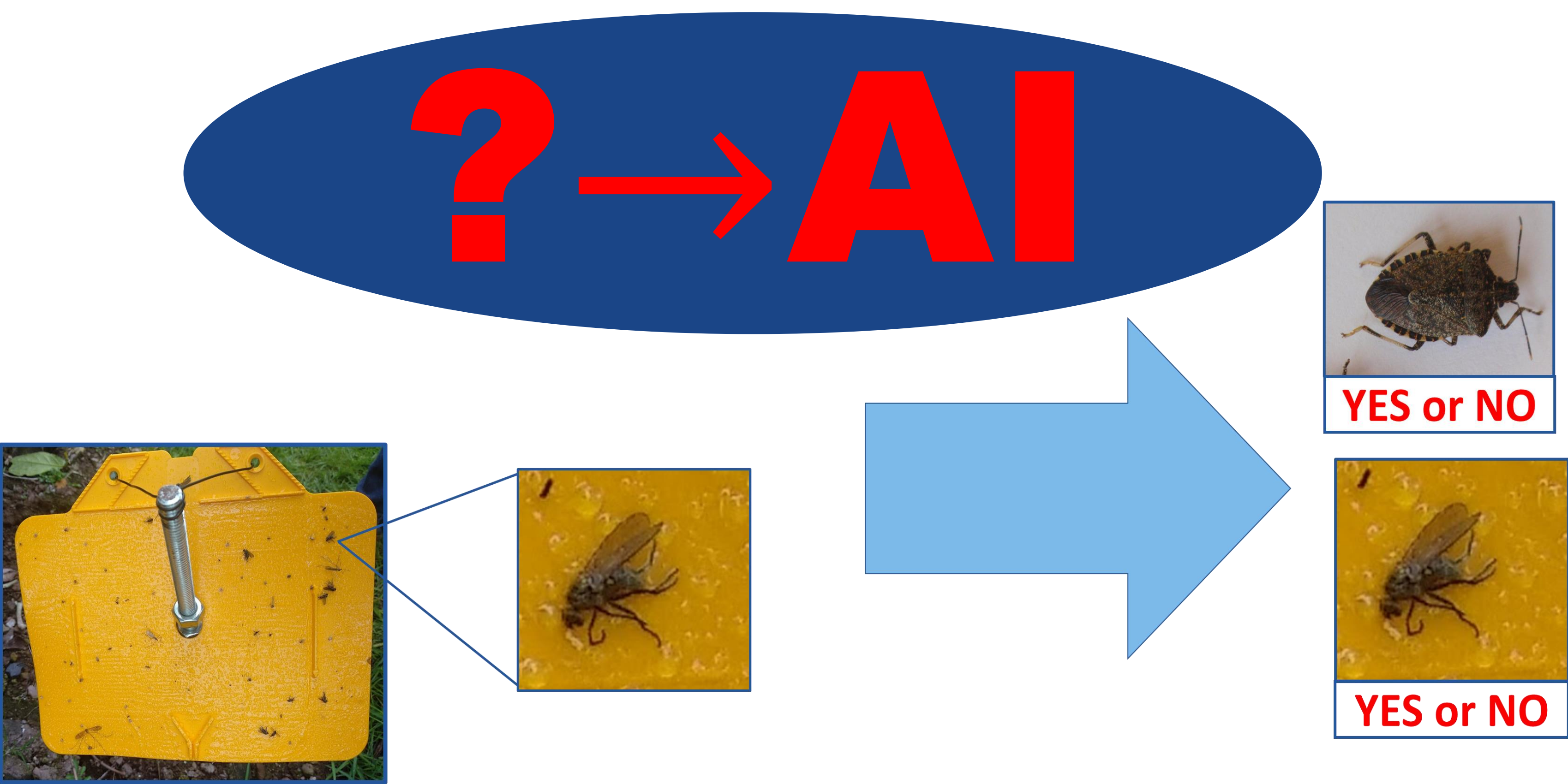


Figure 3 : Automating the Carrot Root Fly Monitoring Process



Figure 4 : Automated Carrot Root Fly Detection and Identification System