# Ultrasound beetle detection

**A collaboration between Plense Technologies & NPPO The Netherlands**

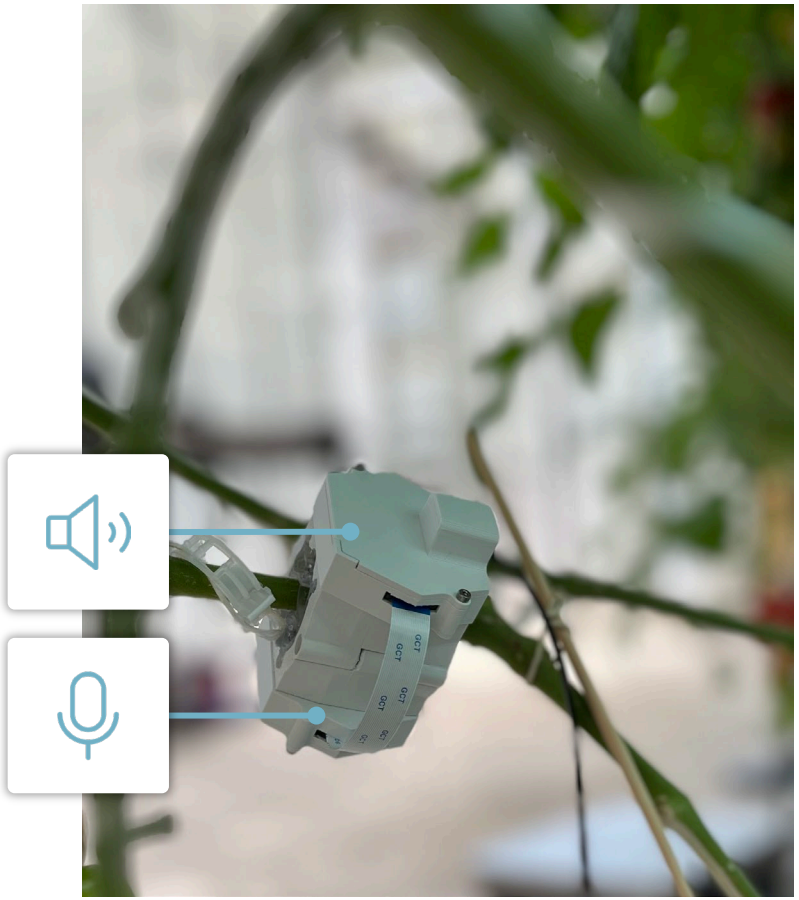
Plense

Netherlands Food and Consumer Product Safety Authority
*Ministry of Agriculture, Nature and Food Quality*

## Background Plense Technologies

- Spin-off founded in 2023
  - Delft University of Technology
  - Wageningen University & Research
- Ultrasound sensors for agriculture
  - Diseases in plant stems (e.g. fusarium)
  - Insects in wood

Responsible Societal advancement



## How does it work: “electronic woodpecker”

**Passive**

- Listen to insect activity
- Assess if insect is alive

**Active**

- Assess damage of insect (e.g. tunnels, necrosis)

Larvae of longhorn beetle in wood for NPPO the Netherlands

Necrosis from fusarium in corn stalks for plant breeding company

Passive

- Semi-stationary
- Long measurement time
- Assess if insect is alive

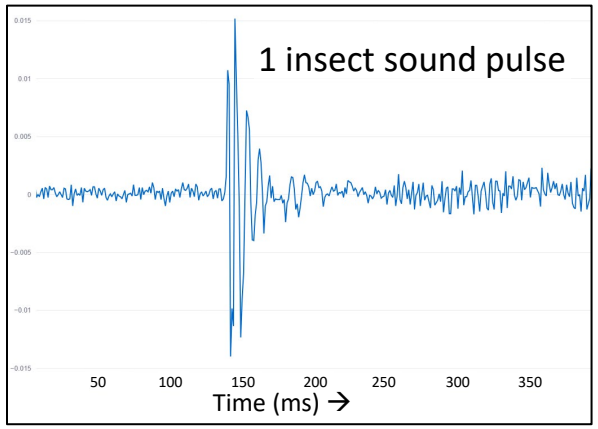
## Preliminary results

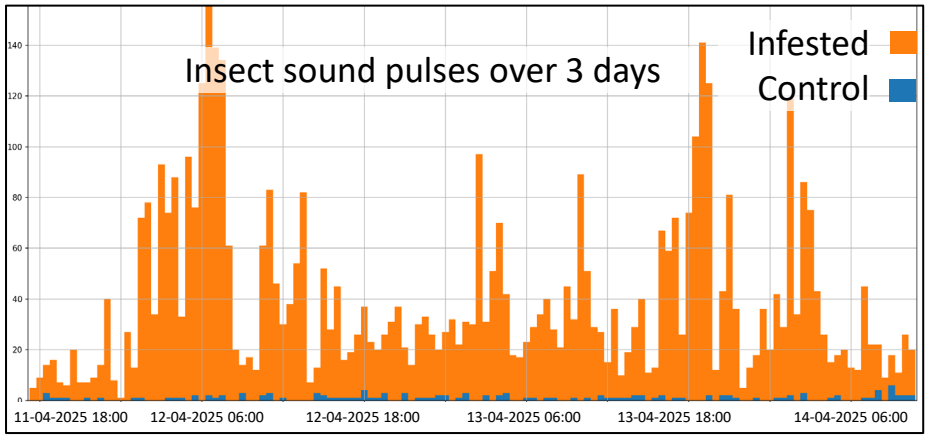
30 minute measurement

Sensitivity*: 87,0%

Specificity**: 77,1%

Larvae of longhorn beetle in wood
for NPPO the Netherlands



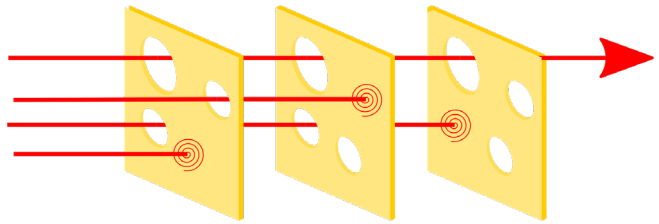

*Sensitivity = percentage of logs classified correctly (true positives / (true positives + false negatives)
**Specificity = percentage of control logs classified correctly (true negatives / (true negatives + false positives)

## How can this be used?

- Extra layer in current ‘swiss cheese model’
- Less destruction of material while increasing confidence

### Not to be used as:

- Replacement of destructive inspection
- 100% guarantee method



### Current method

Visual inspection → Destructive inspection for large sample

### New method

Visual inspection → Acoustic inspection → Destructive inspection for small sample

## We are looking for:

Pilot projects

Funding

Tell us your challenge

Food and Agriculture Organization of the United Nations

SUSTAINABLE DEVELOPMENT GOALS

# Thank you