



Australian Government  
Department of Agriculture,  
Water and the Environment

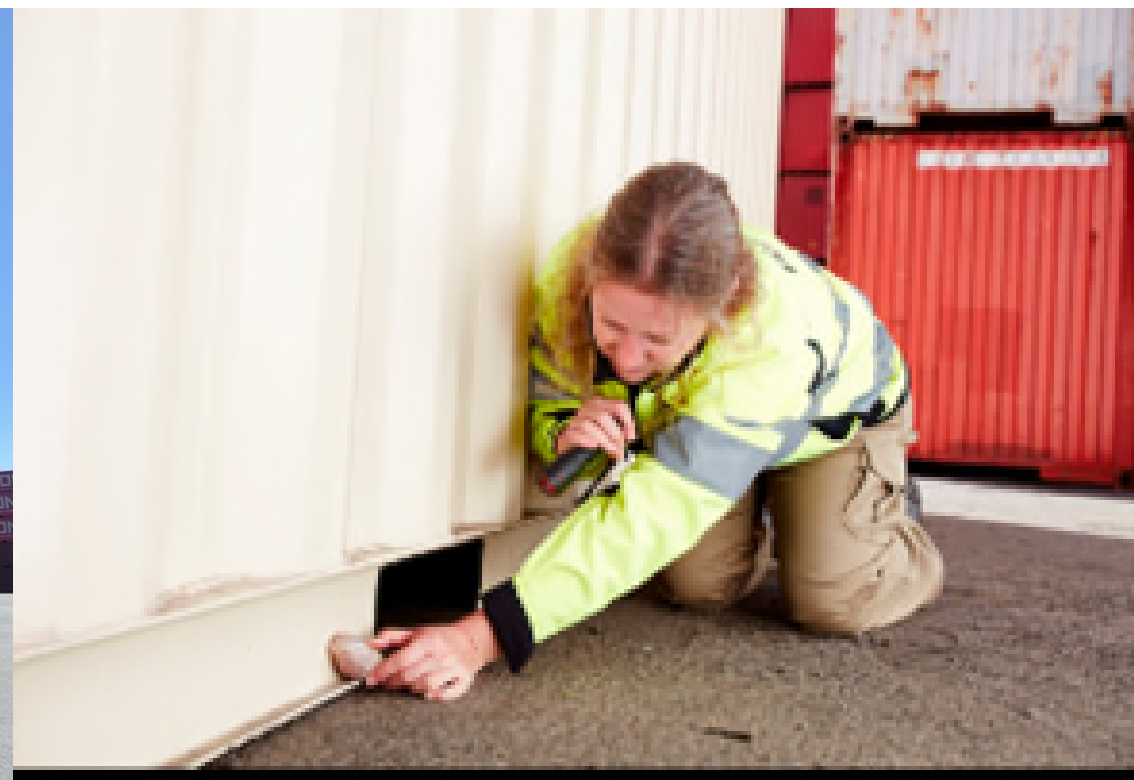
# New technologies for hitchhiker pest management



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# Innovations to improve detections

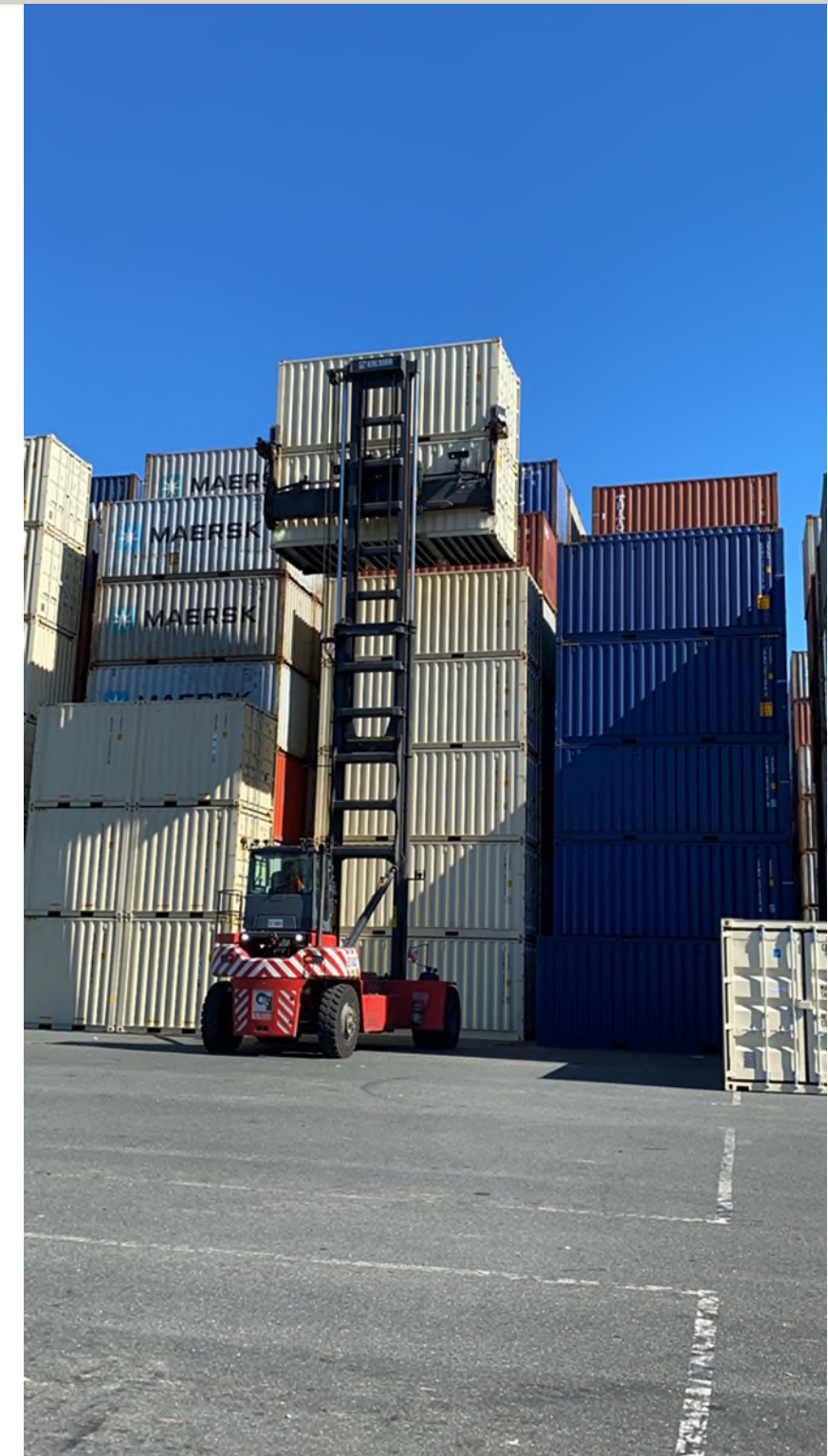
We are developing and testing new technologies to improve detection of hitchhiker pests in sea containers.



# Hand-held hyperspectral camera system

Development of a system using hand-held hyperspectral cameras for the fast, real-time scanning of difficult to inspect areas of containers and approved arrangement sites.

Hyperspectral imagery provides a higher level of spectral detail than multispectral imagery and consequently should improve our ability to identify species and distinguish between them.



# Biosecurity Automated Threat Detection System

Developing a camera system that will be installed on ship-to-shore cranes.



The cameras will combine with machine learning to scan the external surfaces of sea containers for pests and contaminants as they are unloaded from cargo ships.



Trial is scheduled to begin May 2022.

# Environmental DNA and Point-of-Care technology for container sampling

Testing and validation of the eDNA/eRNA and point-of-care (POC) technology to allow for the rapid, cost-effective and reliable detection of hitchhiker pests. To be used across a wide range of commodities.

To date, we have:

- Developed eDNA/eRNA assays for khapra beetle, brown marmorated stink bug (BMSB), electric ant and Asian gypsy moth.
- Established methods to collect environment (soil) samples from shipping containers using handheld vacuum cleaners.
- Screened **about 2000 container samples** for khapra beetle, BMSB and electric ant using eDNA/eRNA.

We are also investigating eDNA metabarcoding approaches to broadly screen for insect species in container samples.



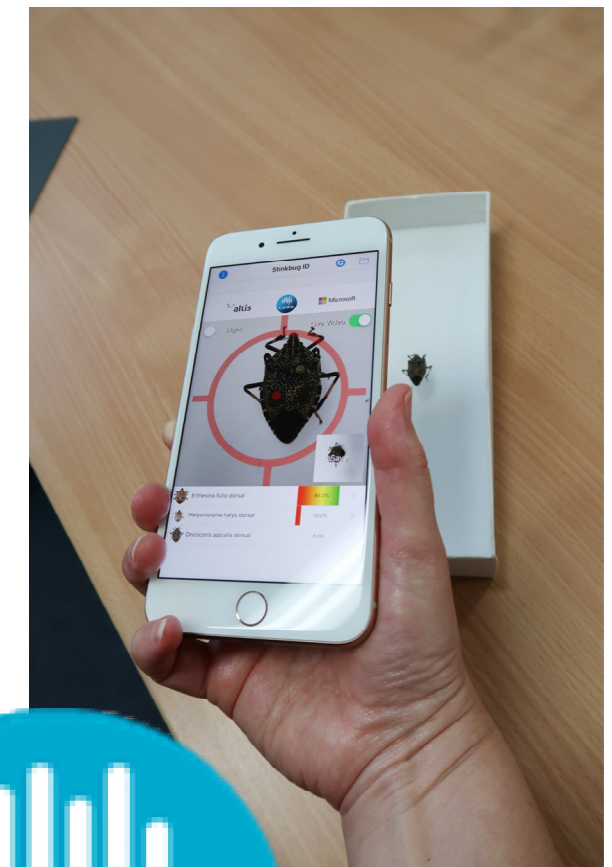
# Phone app to detect BMSB

We have partnered with the CSIRO (Australia's national science agency) to develop a species identification tool for use on mobile phones.

The app uses artificial intelligence to provide fast, accurate recognition of brown-marmorated stink bug (BMSB).

The app can learn to tell the difference between a destructive stink bug and a harmless one.

We are trialing the app with our biosecurity officers to figure out its use, reliability and accuracy.

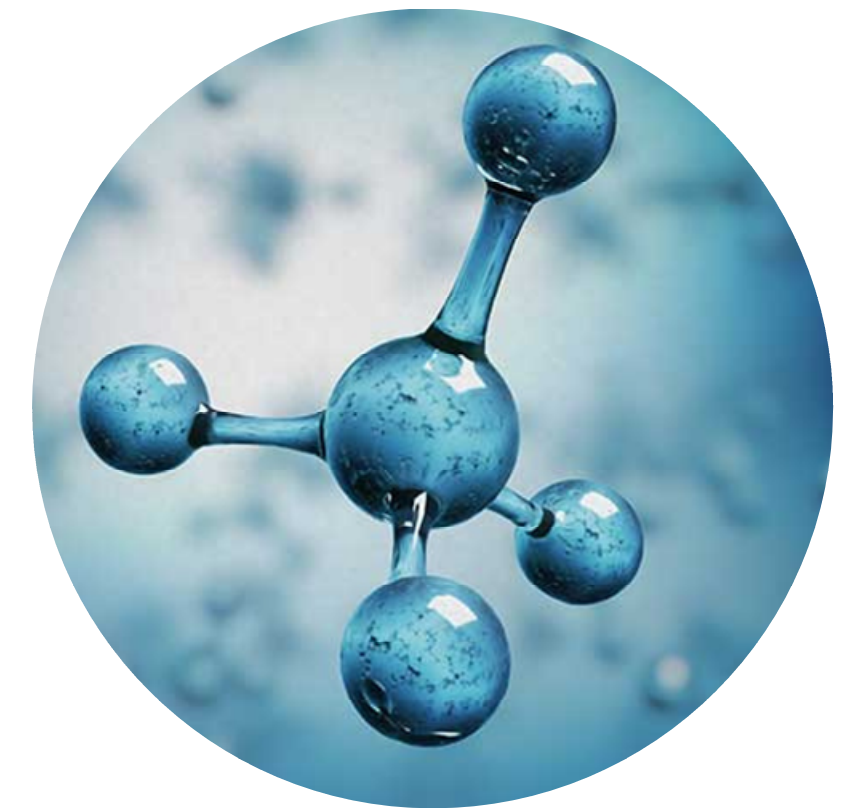


# Detection capability (RingIR)

In 2020-21 we confirmed that RingIR technology could detect methyl bromide, sulfuryl fluoride and phosphine.

We are now exploring whether it can be extended to detect hitchhiker pests associated with containers (e.g. BMSB or khapra beetle).

Currently, we are testing to see if it can detect native species. A future project may be funded to test on exotic pests of concern.



# Piloting 4WD robot for inspections

Piloting the use of the Hades-5Z robot as a supplementary tool when inspecting vehicles, heavy machinery and containers to increase our risk detection capabilities.

This removes the need to raise a vehicle, machinery or container, making inspections safer and more efficient.

The pilot commenced March 2022.







# Questions?



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Thank you!

