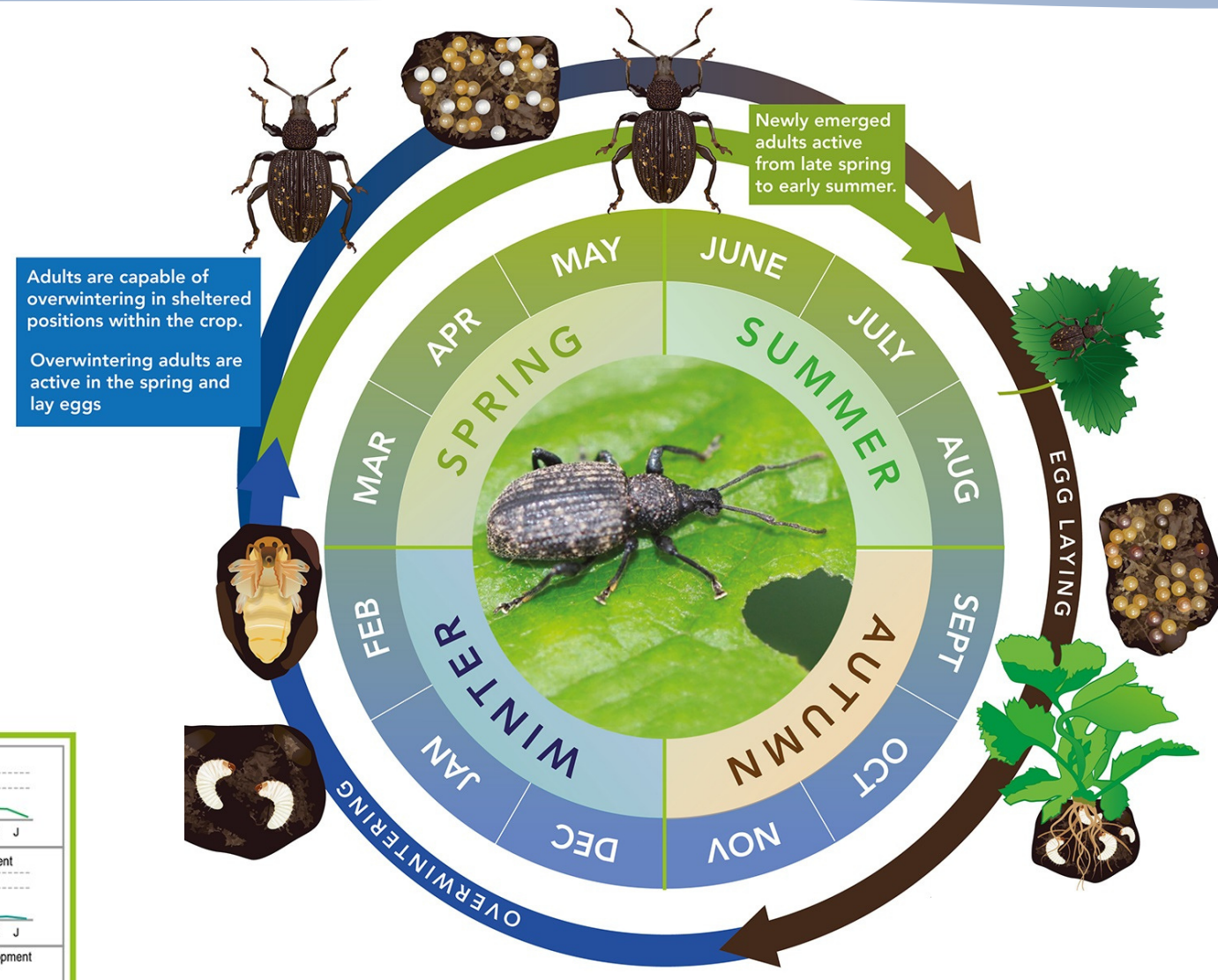


Developing a semiochemical baited “smart” trap to monitor vine weevil (*Otiorhynchus sulcatus*)

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Background:

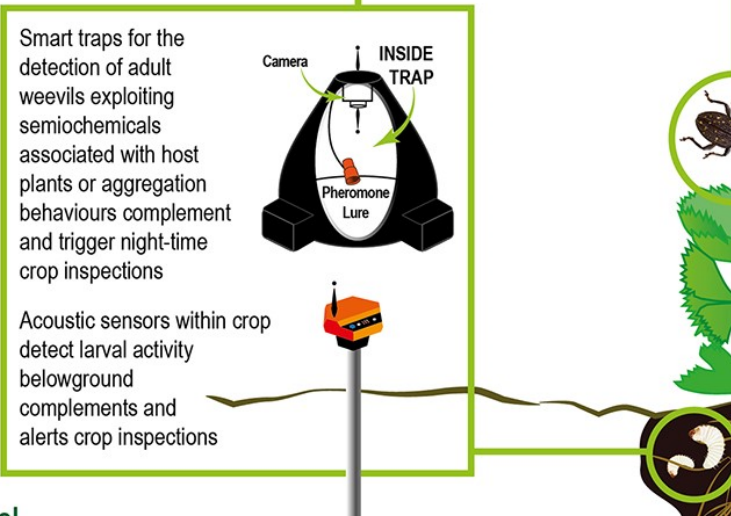
- Vine weevil is one of the most serious pests of soft-fruit and hardy ornamental crops globally.¹
- The host range of this species has been reported to include over 150 species.²
- Vine weevil adults are nocturnal and reproduce parthenogenetically (one female - 3000 eggs during its lifetime).
- Vine weevil larvae are subterranean, feeding on the roots of plants.



An overview of a proposed IPM programme for vine weevil

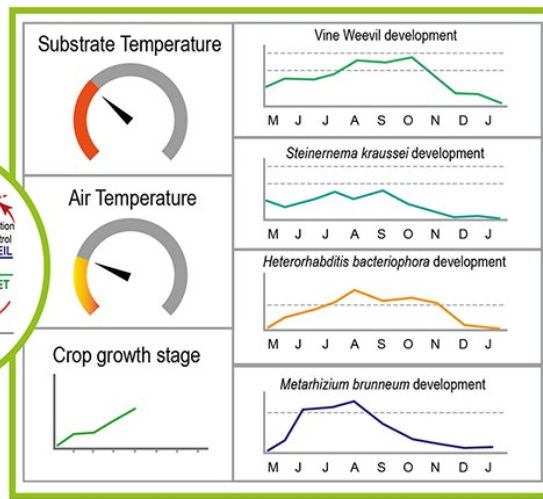
1. Identify/Monitor

Reliable early detection of vine weevil adults before egg laying commences and detection of resident larval populations within crop.



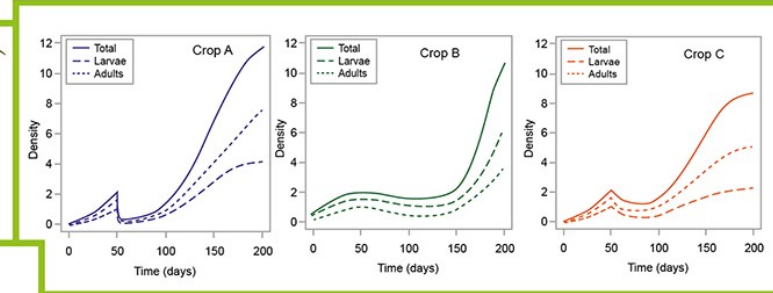
2. Thresholds

Dynamic economic thresholds based on pest populations, crop status/value and abiotic factors



3. Forecast

Population modelling and forecasting to time monitoring and control activities within each crop

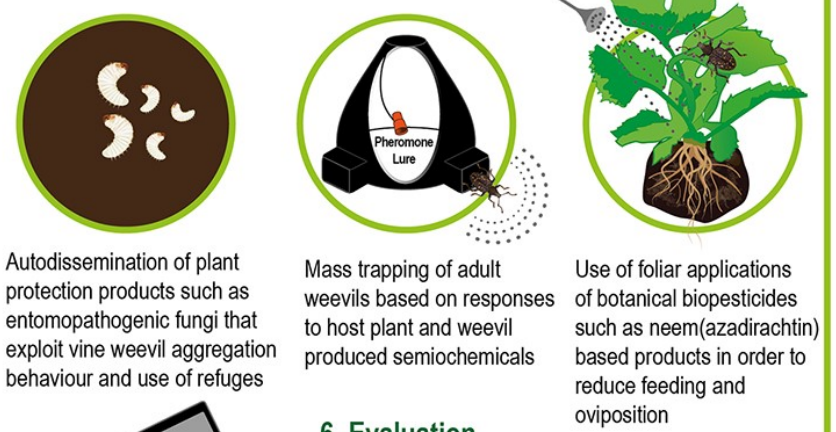


The Problem:

- Early detection within crops is complicated by the nocturnal feeding behaviour of adults as well as the subterranean lifestyles of both larvae and pupae.¹
- Monitoring methods (e.g., night time and leaf notching assessments) are inefficient and unreliable.³
- Development of successful integrated pest management (IPM) programmes for vine weevil has been limited by the inability to effectively monitor and forecast pest outbreaks.¹
- No effective semiochemicals have been identified to be used as a lure to date.¹

5. Control

Complement existing biological controls through the use of entomopathogenic nematodes and fungi with which to control the larvae with autodissemination techniques, mass trapping and use of botanical biopesticides with which to control the adults



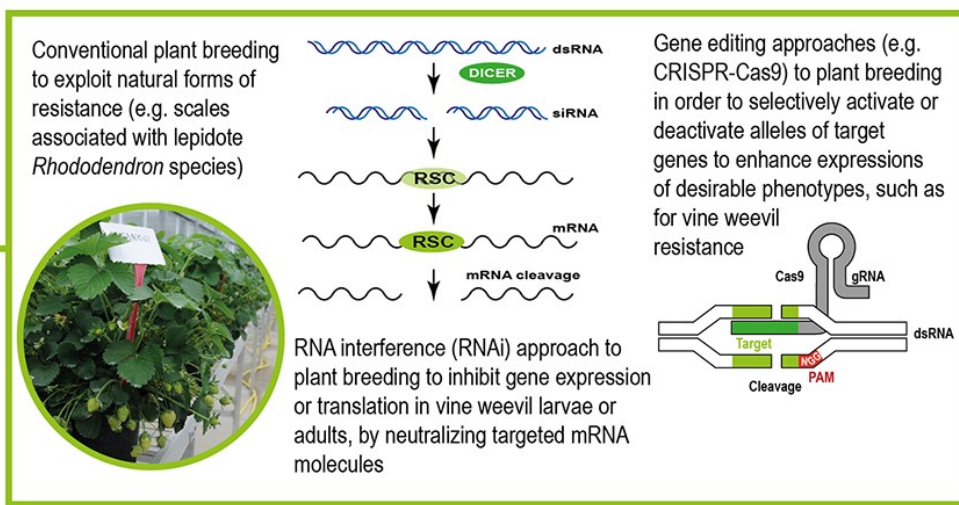
6. Evaluation

Record keeping and assessment of IPM programme to enable assessment of existing programme and modifications for next cropping season to be made

(iPad with some graphs on and maybe a hand holding it)

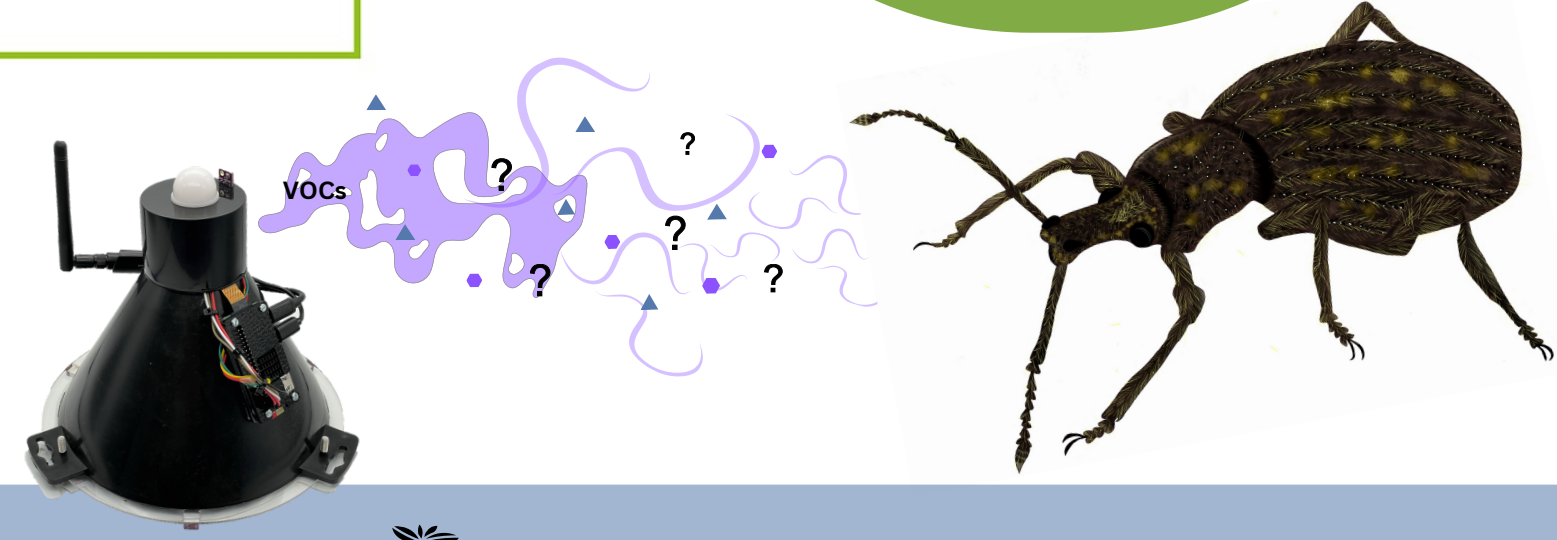
4. Prevent

Conventional and molecular plant breeding approaches to produce varieties that either deter or prevent weevil damage. Complement plant breeding approaches with use of physical barriers to prevent movement between crops.

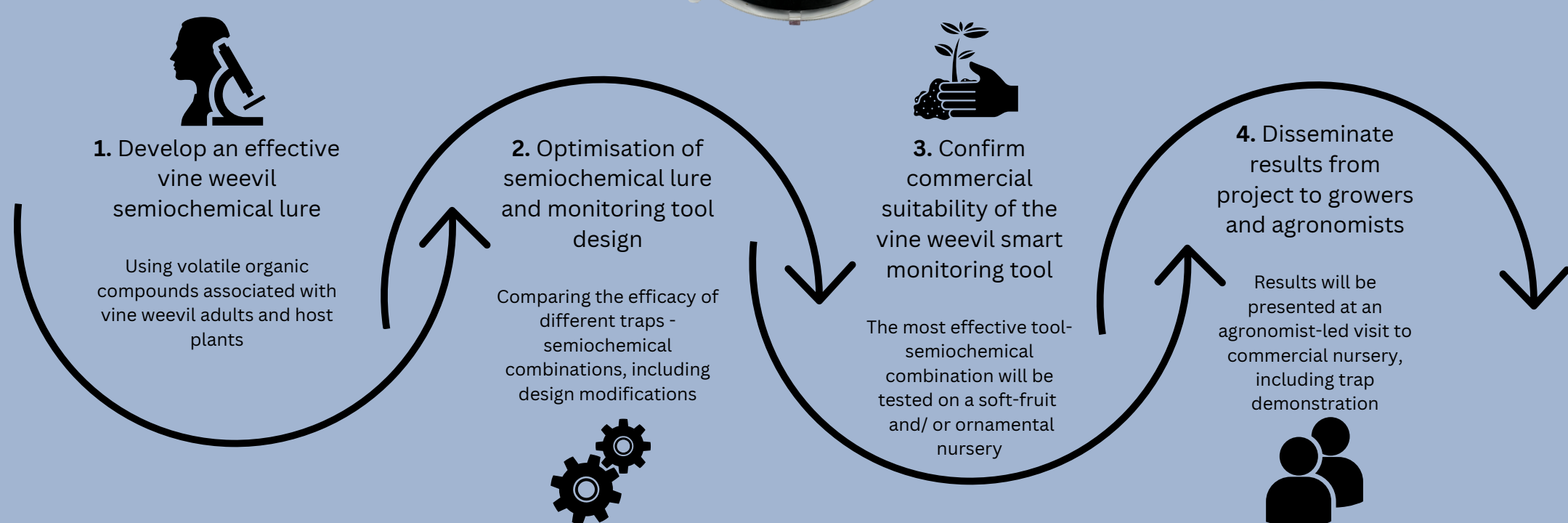


in reality....

The 'smart' monitoring tool
 - Captures images and uses these to determine pest presence.



Project Aims:



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“Horticulture: Smart trap for improved early detection of vine weevil to enable successful application of integrated pest management”.

References:

¹ Pope, T.W. Roberts, J.M (2022). Vine Weevil, *Otiorhynchus sulcatus* (Coleoptera: Curculionidae), Management: Current State and Future Perspectives. Annual Review of Entomology.
² Buxton, J. Pope, T.W. (2011). Host plant range of vine weevil. Horticulture development company.
³ Roberts, J.M. Kundun, J. Rowley, C. Hall, D.R. Douglas, P. Pope, T.W. (2019). Electrophysiological and behavioral responses of vine weevil, *Otiorhynchus sulcatus* (Coleoptera: Curculionidae), adults to host plant odors. Journal of Chemical Ecology.