

Chilean flame creeper biocontrol leaps forward

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Manaaki Whenua
Landcare Research



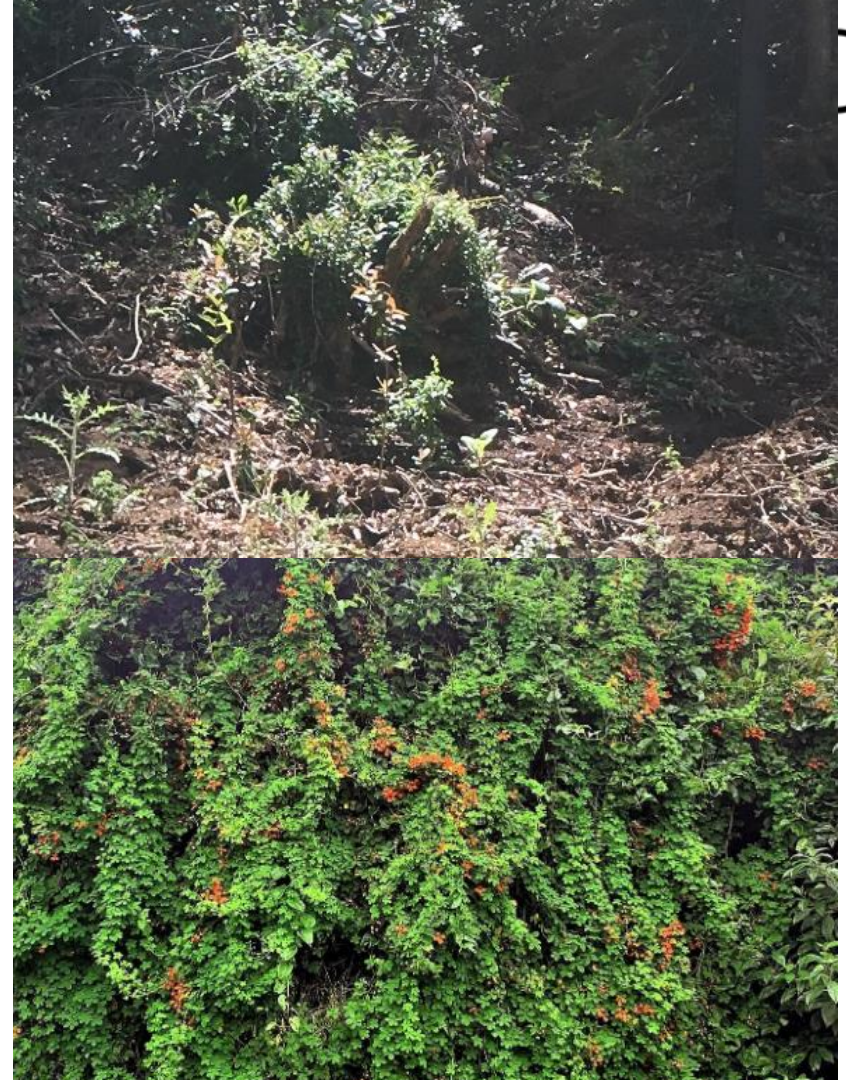
Ministry for Primary Industries
Manatū Ahu Matua



**National Biocontrol
Collective**

Meet the Weed

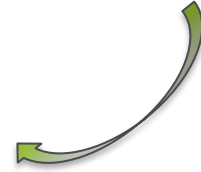
- Chilean flame creeper
Tropaeolum speciosum
- Native to Chile
- Problem mainly in
Otago & Southland
- Also in Canterbury &
Manawatū



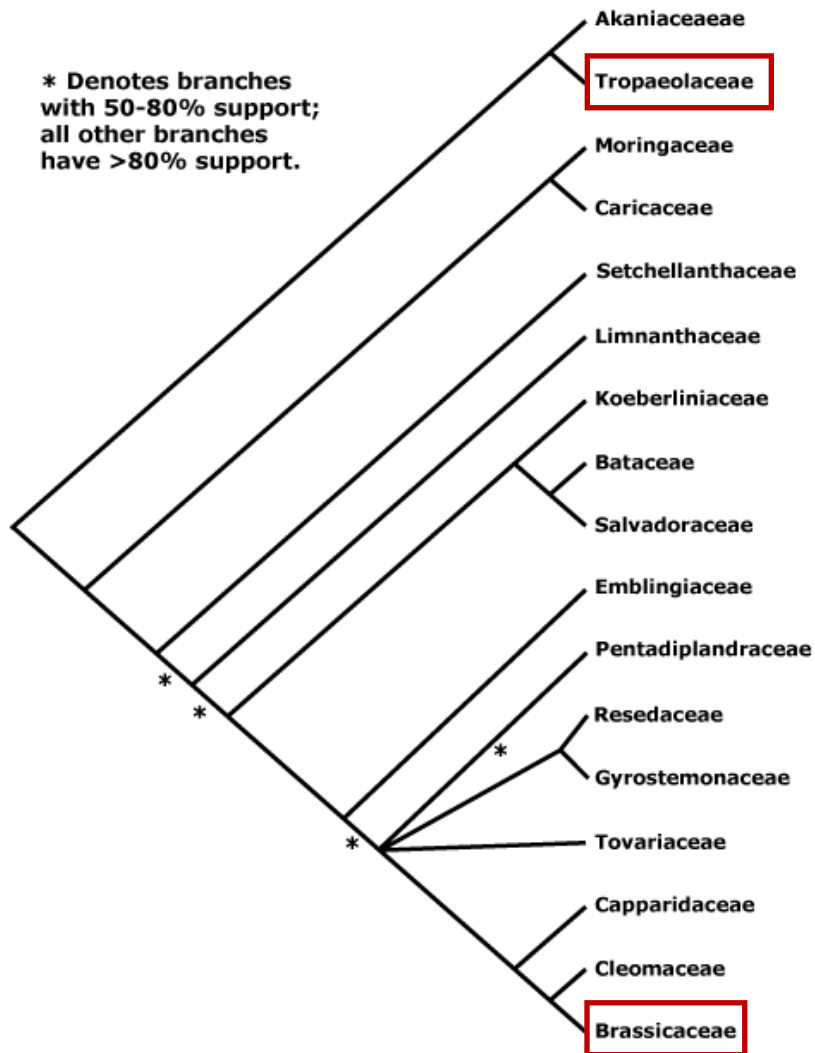
Meet the Agent

- Chilean flame creeper leaf beetle *Blaptea elguetai*
- Serendipitous discovery in 2019





* Denotes branches with 50-80% support; all other branches have >80% support.



Family absent from NZ (2 spp. Asia and Australia)

> 90 Tropaeolum spp. across Central and South America (3 weed spp. in NZ)

1 sp. present in NZ: Moringa oleifera occasional report (13 spp. Africa and India)

1 sp. present in NZ: Carica pubescens = papaya (35 spp. Africa, Central and South America)

Family absent from NZ (1 sp. Mexico)

2 exotic spp. present in NZ: Limnanthes douglasii, L. alba (8 spp. North America)

Family absent from NZ (2 spp. Central/North America and Bolivia)

Family absent from NZ (2 spp. tropical America, North Australia and New Guinea)

Family absent from NZ (11 spp. Africa and Asia)

Family absent from NZ (1 sp. Australia)

Family absent from NZ (1 spp. Africa)

4 exotic spp. naturalised in NZ: Reseda alba, R. lutea, R. luteola, R. odorata (107 spp. Central/North America, Africa, Europe and Asia)

Family absent from NZ (20 spp. Australia)

Family absent from NZ (2 spp. Central and South America)

Family absent from NZ (around 700 spp. tropical climate worldwide)

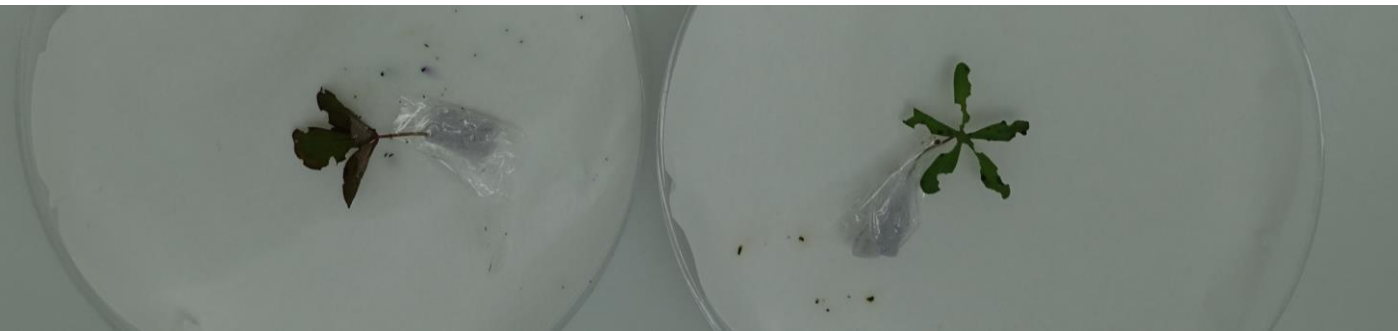
3 exotic spp. in NZ: Cleome viscosa, C. rutidosperma, C. hassleriana (300 spp. tropical and warm temperate)

77 native spp. and 79 exotic spp. (3501 species worldwide)

Test results – *Tropaeolum*



- All species of *Tropaeolum* support beetle development – some better than others
- Winter climbers equally suitable hosts, but unsynchronised with the beetle – enough to keep them safe?
- Potential biocontrol for other naturalised *Tropaeolum* species?

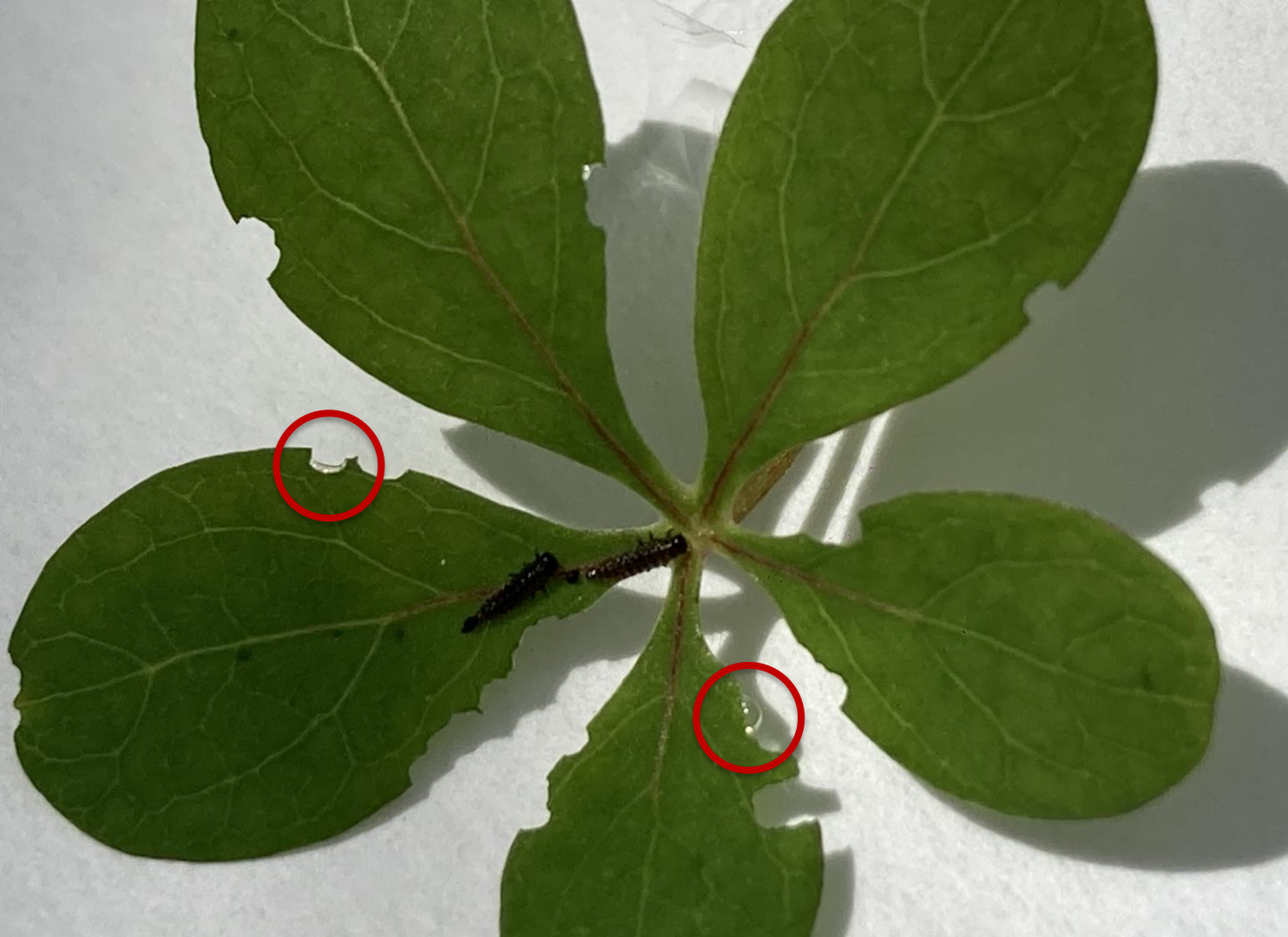


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- Potential biocontrol for other naturalised *Tropaeolum* species?
- Chilean flame creeper produces chemical defence?





Test results – other species

- Trace nibbling (<1%)
 - *Reseda odorata*
 - *Rorippa palustris*
 - None support development
- One adult completed development
 - *Moringa oleifera*
 - Likelihood of being field host <4%





Test results – Brassicaceae – non-*Brassica* spp.



- Trace nibbling (<1%)
 - *Lobularia maritima* (Sweet alyssum)
- Minor feeding (1%-5%)
 - *Lepidium solandri*
- Neither support development





Test results – Brassicaceae – *Brassica* spp. crops

- Trace nibbling (<1%)
 - *B. oleracea* (Savoy cabbage)
 - Does not support development
- Minor feeding (1%-5%)
 - *B. rapa* (pak choi 'Hon Tsai', turnip)
 - *B. juncea* (mustard)
 - None support development



Test results – Brassicaceae – *Brassica* spp. crops



- One individual completed development

- *B. chinensis* (pak choi 'Dark Dragon')

- Likelihood of being field host 24.4%

- *B. rapa* (Chinese cabbage)

- Likelihood of being field host 5.6%



- Additional testing for *B. chinensis*
- Field surveys in Chile
- Grey literature in Spanish



Focus on *B. chinensis*

- Additional testing: 84 more replicates
 - Trace nibbling (<1%) in 5 replicates
 - Minor feeding (1%-5%) in 1 replicate
 - All but one larva died as 1st instar. One larva died as 2nd instar
- Field surveys: No evidence of the beetle in unsprayed *Brassica* crops close to *T. speciosum* + beetle
- Grey literature in Spanish: No mention of any leaf beetle as a pest of *Brassica* crops in Chile





Conclusion – *Blaptea elguetai* is a safe agent

- Feeding on non-target hosts in artificial testing environment is important to determine the fundamental / physiological host range
- The field host range is a subset of the fundamental host range
- Our challenge: Avoid rejecting safe agents
- **All evidence suggest that the field host range of *B. elguetai* is limited to the genus *Tropaeolum***
- Seasonal asynchrony – limit to *T. speciosum*???

Next steps

- Consultation underway with:
 - Brassica growers
 - Māori
 - Horticulturalists who grow *Tropaeolum* as ornamentals
- Additional testing – choice tests – Oct/Nov 2024
- Application to the EPA expected in Feb/March 2025
- Hope to be able to make first releases in spring 2025

