



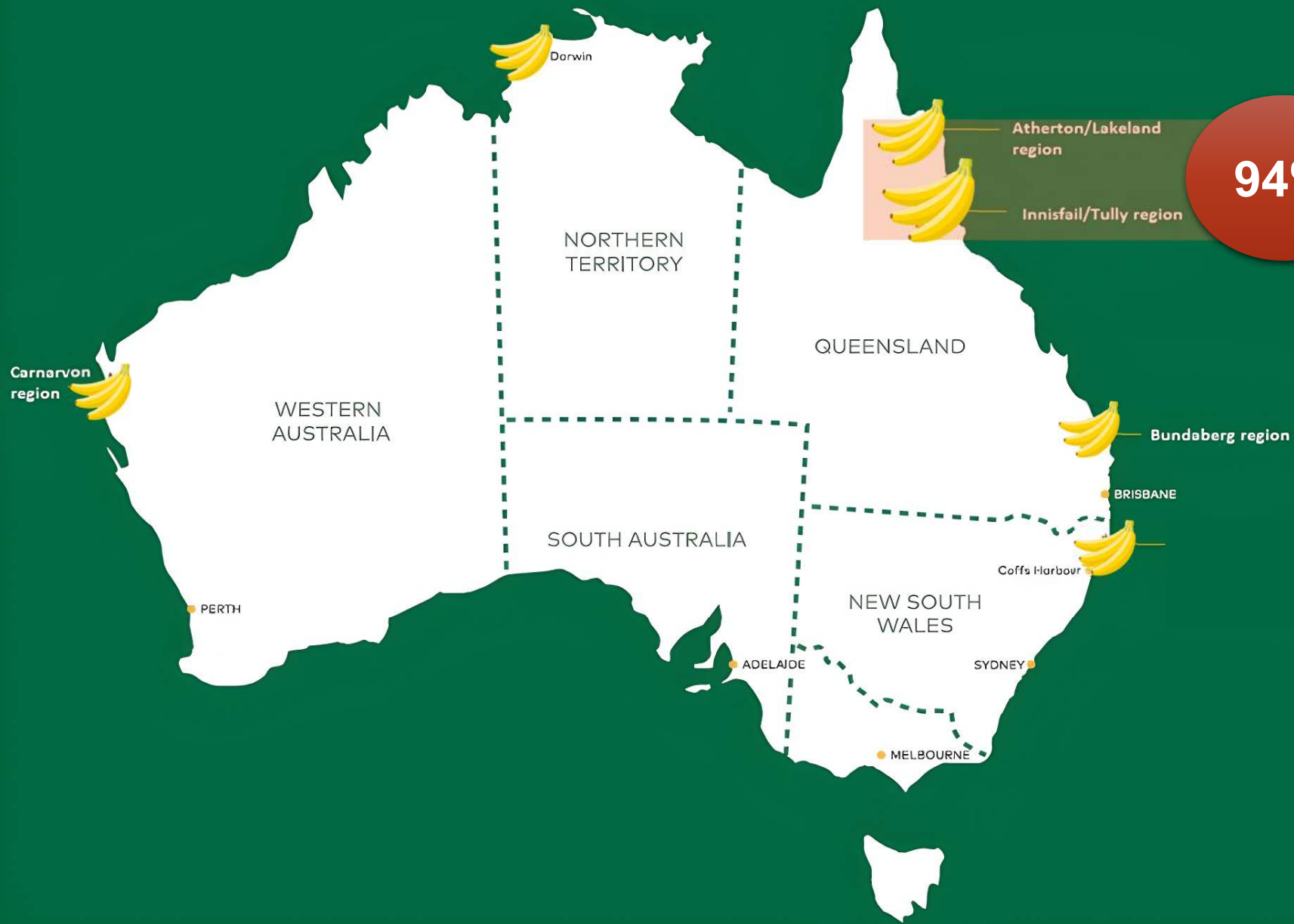
Developing a Systems Approach for Integrated Pest and Disease Management of Banana Bunch Pests

Richard Piper, David East
Department of Primary Industries

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**Hort
Innovation** **BANANA
FUND**





94%

***“I grow
peels on this
farm”***

Anon.



Banana Scab Moth

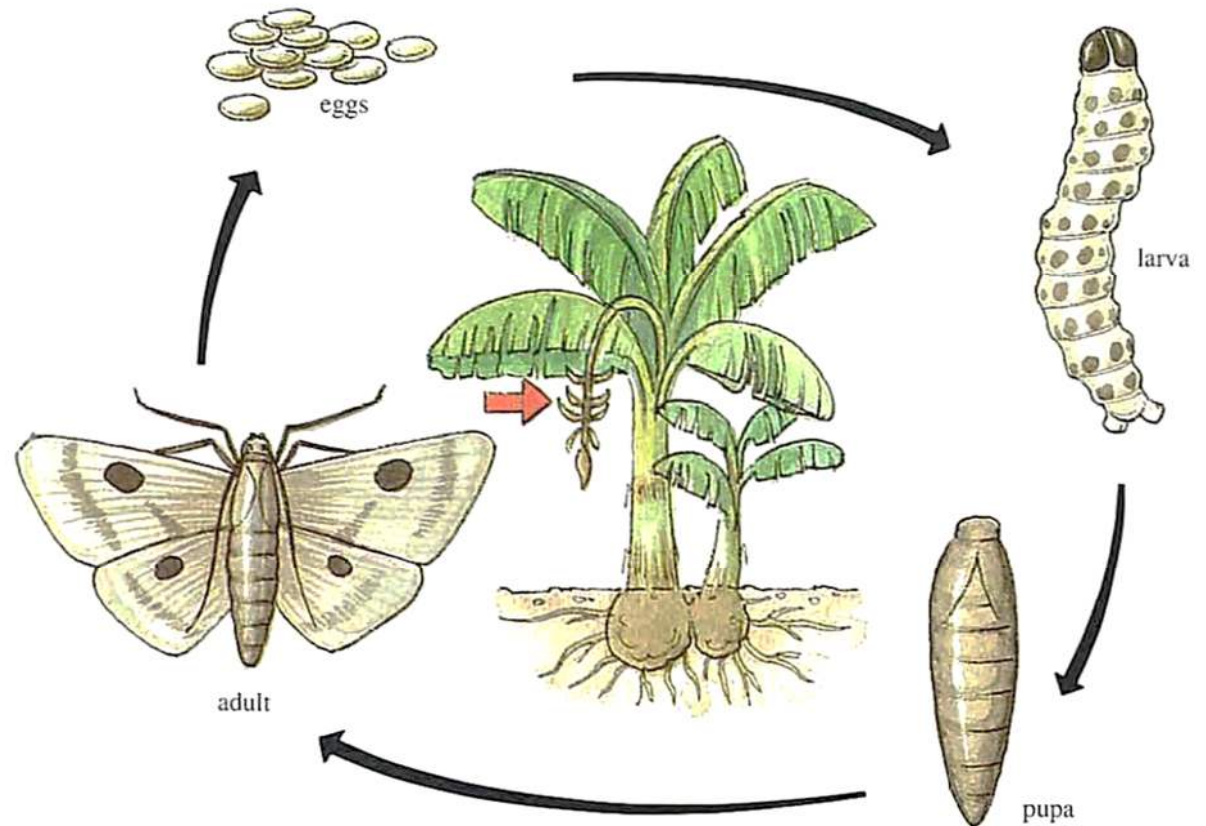
Nacoleia octasema

Severe damage to bunch

One egg mass can lead to complete loss of bunch

Reproduces all year round

Larva are the most damaging stage





Banana Rust Thrips

Chaetanaphothrips signipennis

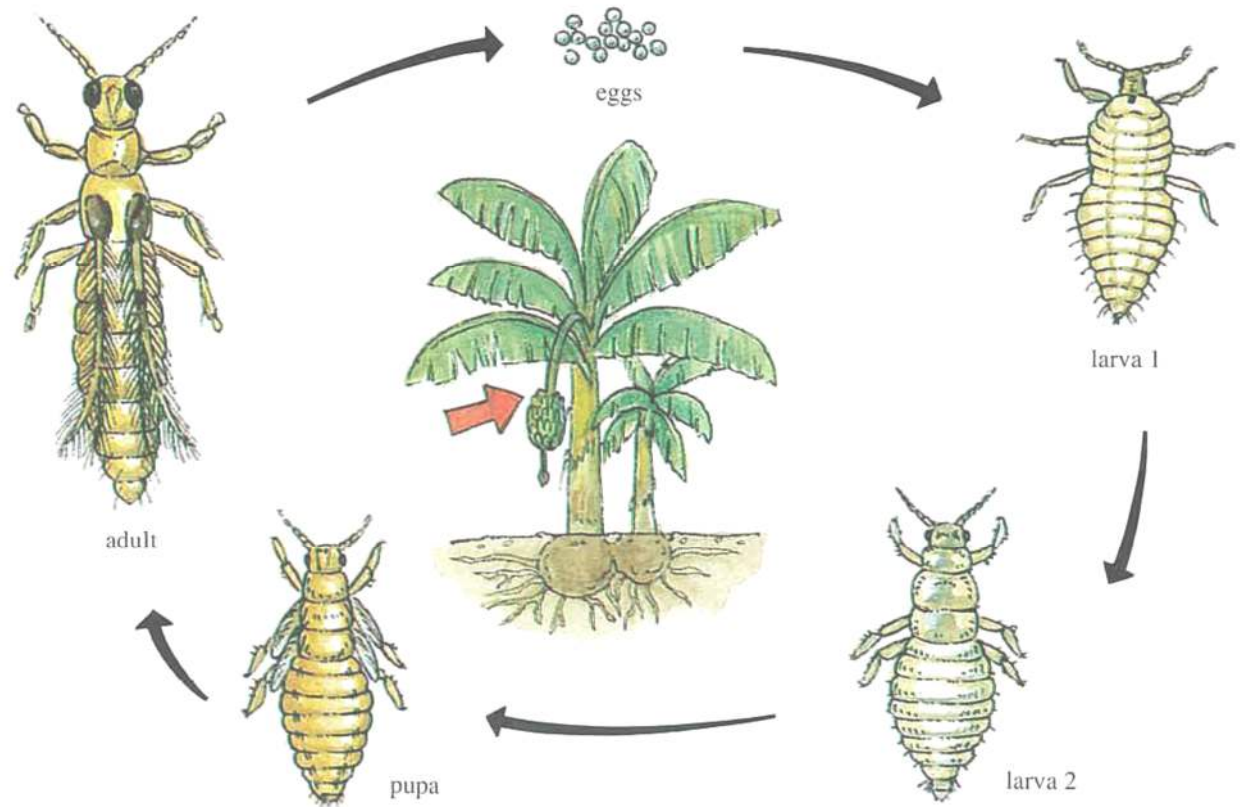
Severe damage to bunch

Also attacks plant pseudostem

Reproduces all year round
completing

Pupates in soil, close to plant
base

Adults and nymphs are the
damaging stages





Banana Flower Thrips

Thrips hawaiiensis

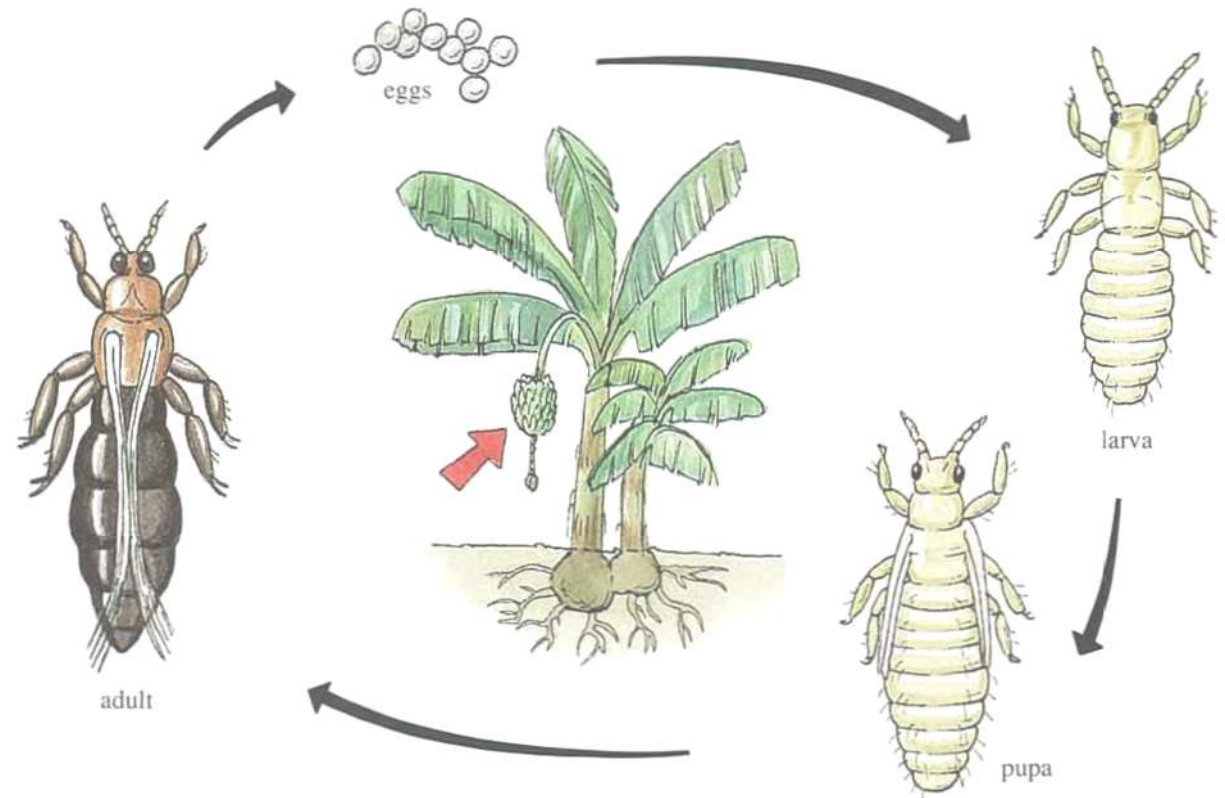
Severe damage to bunch

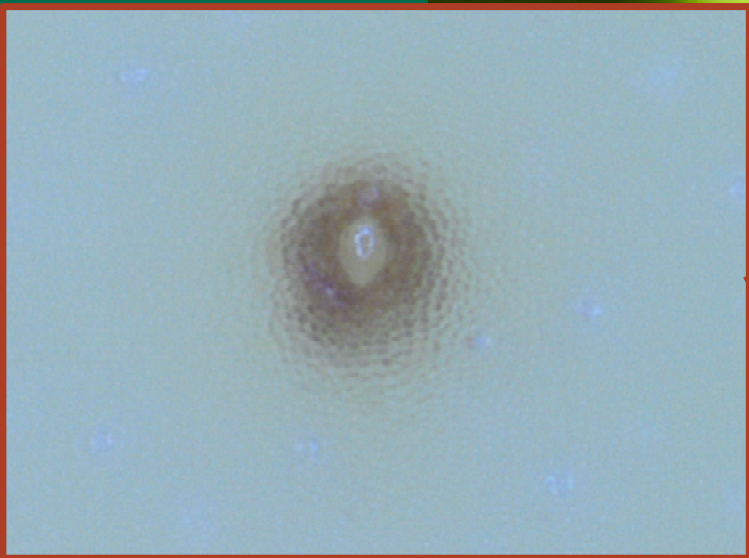
Reproduces all year round

Entire life cycle on bunch

One egg mass can lead to complete loss of bunch

Larva is the damaging stage







Bell injection



Bunch covers



Bunch spray



Bunch dusting

Montdorensis



Cucumeris



Hypoaspis



Californicus

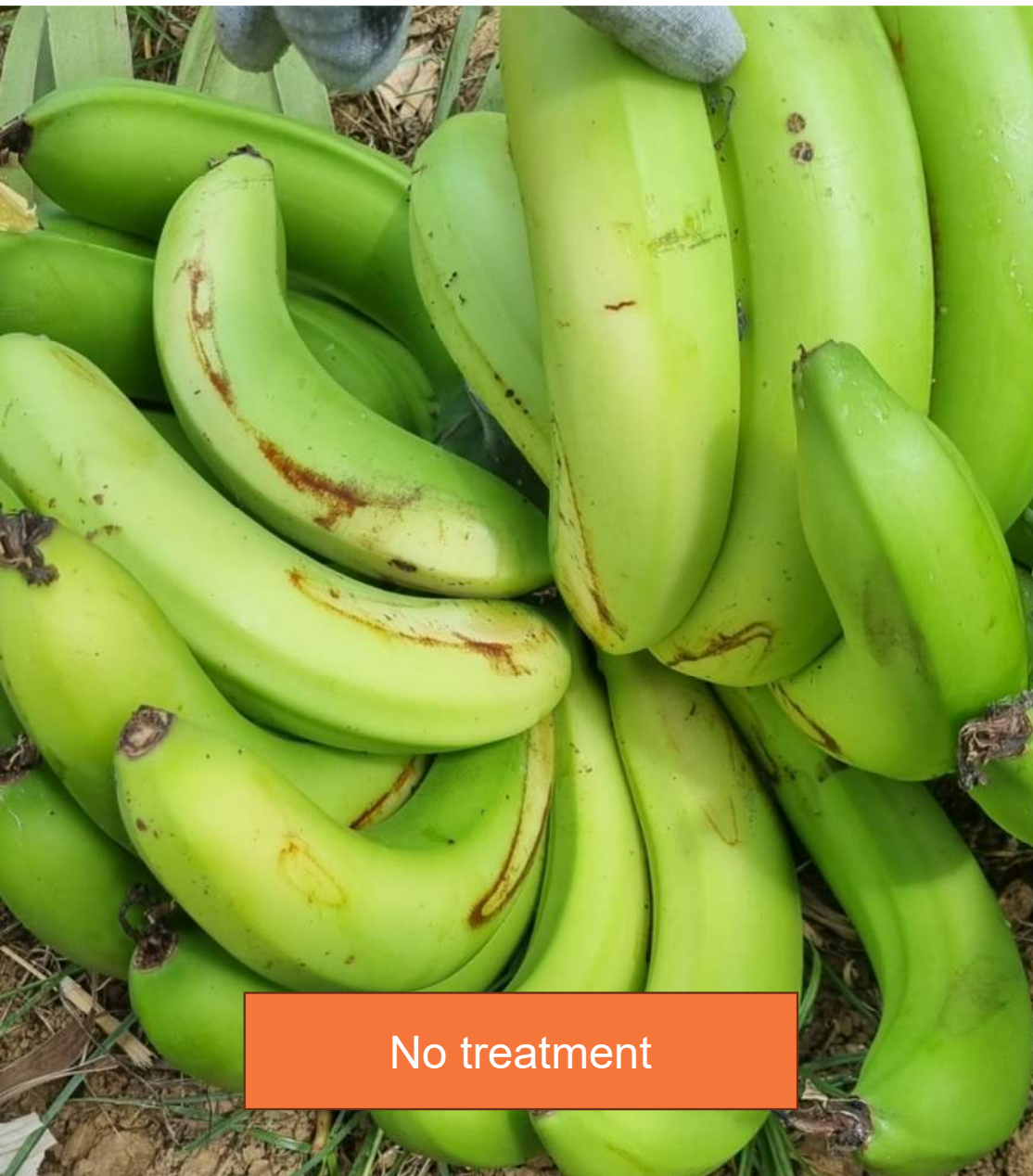


Green lacewing



Orius - Pirate bug



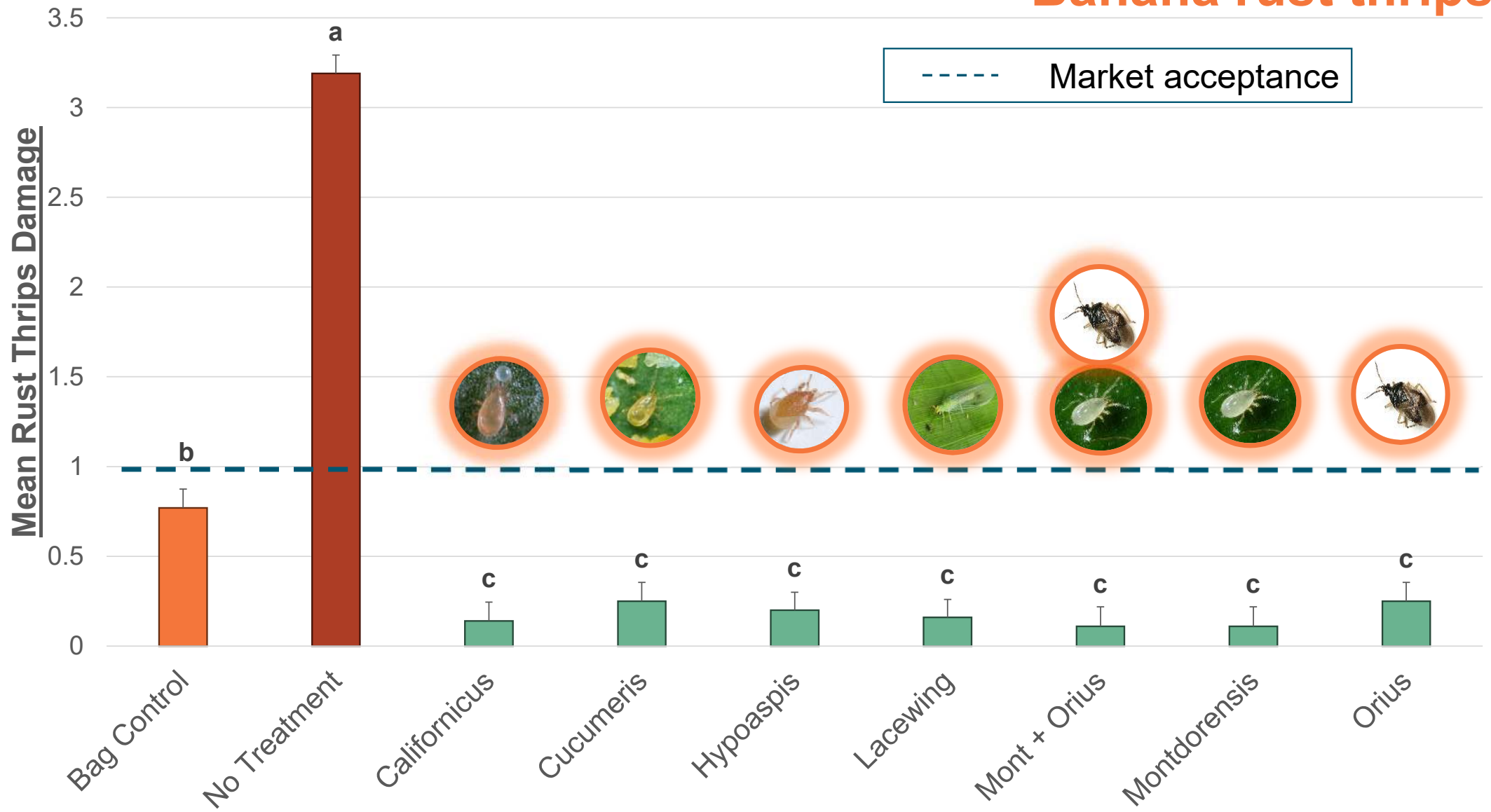


No treatment

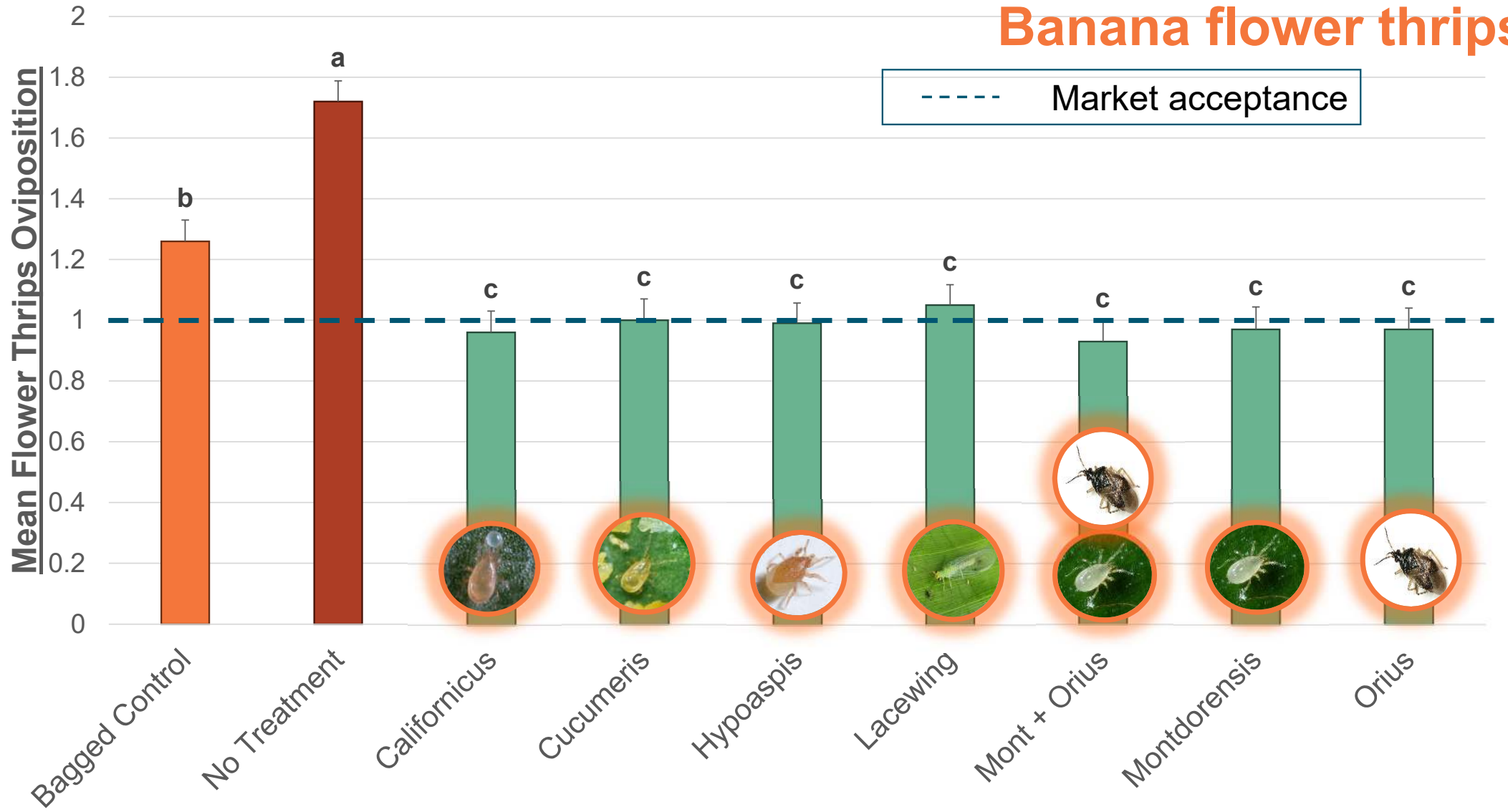


Predatory mite treatment

Banana rust thrips



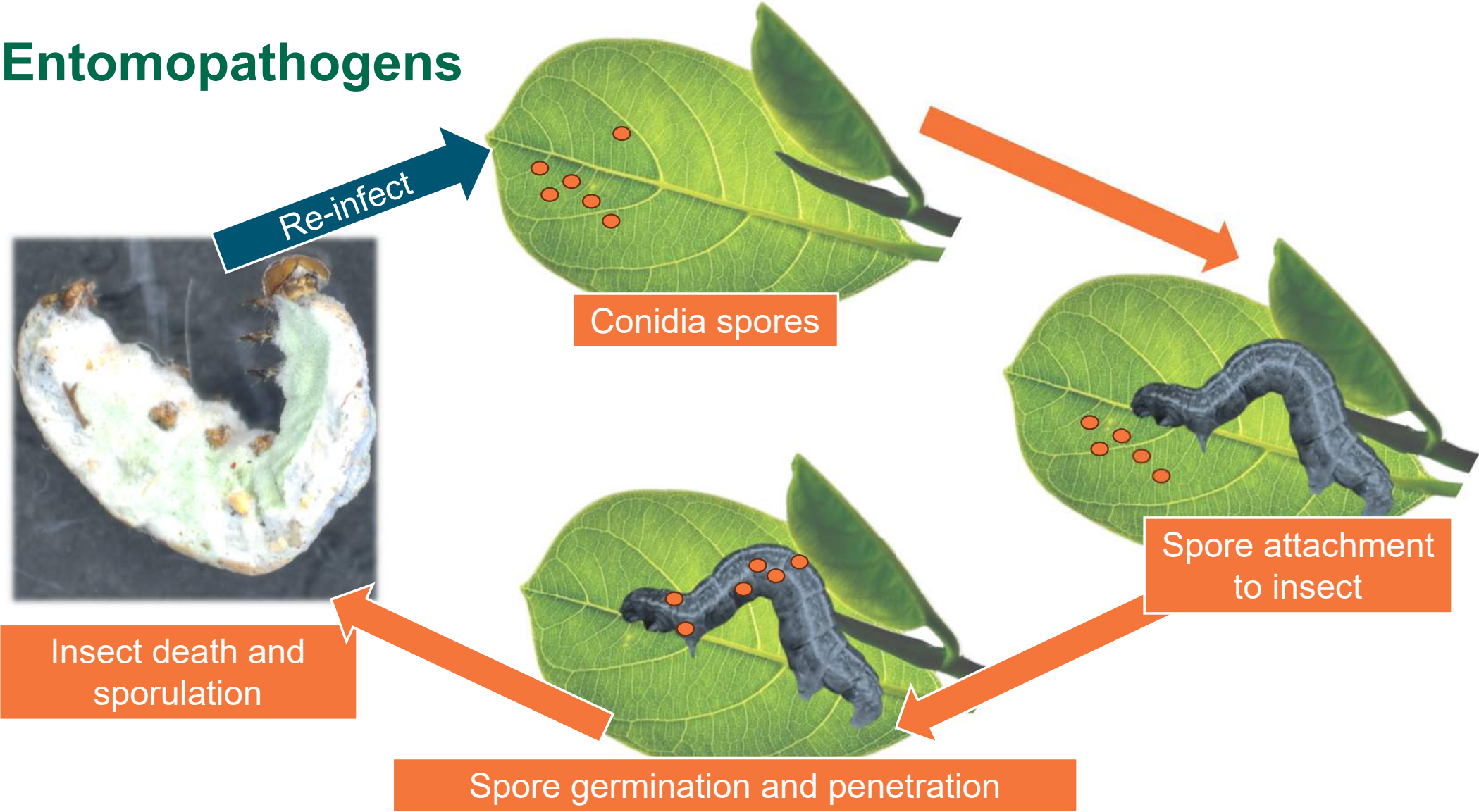
Banana flower thrips



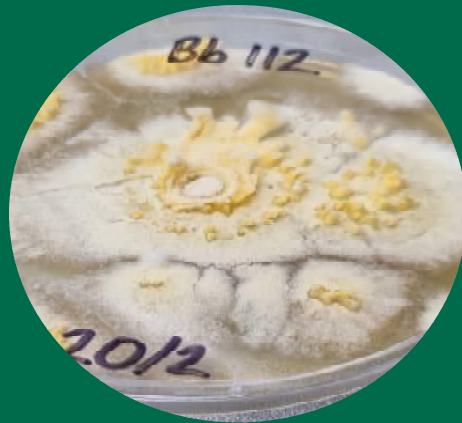
Biopesticides Trial



Entomopathogens



Beauveria sp.



Metarhizium sp.



Production of spore solutions



Streak spores on media



Incubated to promote fungal development



Replicate for mass production



Scrape plate and homogenise solution



Spore solution

Spore count





Inoculating plants with rust thrips populations



Shadehouse layout



Mature damage

Early damage

Trial 1

Beauveria bassiana
Bb112
9.2 x 10⁵ conidia/mL

Beauveria bassiana
Bb120
5.6 x 10⁵ conidia/mL

Metarhizium rileyi
Mr22b
1.1 x 10⁶ conidia/mL

25mL per plant



Single hand-spray application

Trial 2

Beauveria bassiana
Bb112
2.9 x 10⁶ conidia/mL

Beauveria bassiana
Bb120
3.4 x 10⁶ conidia/mL

Metarhizium lepidiotae
MI3
2.4 x 10⁵ conidia/mL

30mL per plant



Applied directly as a pseudostem and soil spray

Trial 3

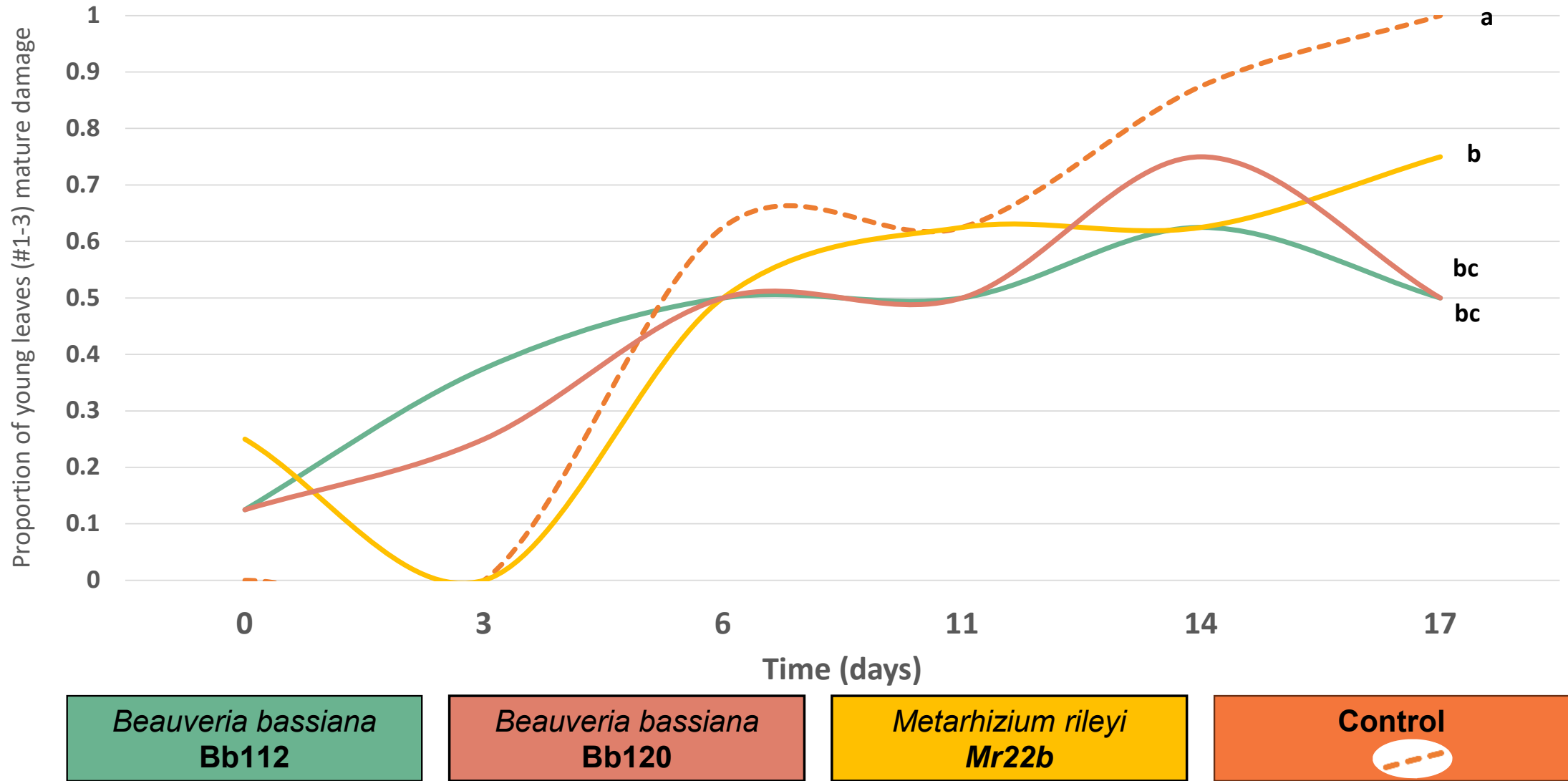
Beauveria bassiana
Bb113
1.1 x 10⁵ conidia/mL

Beauveria bassiana
Bb120
3.7 x 10⁴ conidia/mL

Metarhizium lepidiotae
MI3
3.7 x 10⁴ conidia/mL

50mL per plant

Trial 1 Results



Trial 2 Results

Control plant



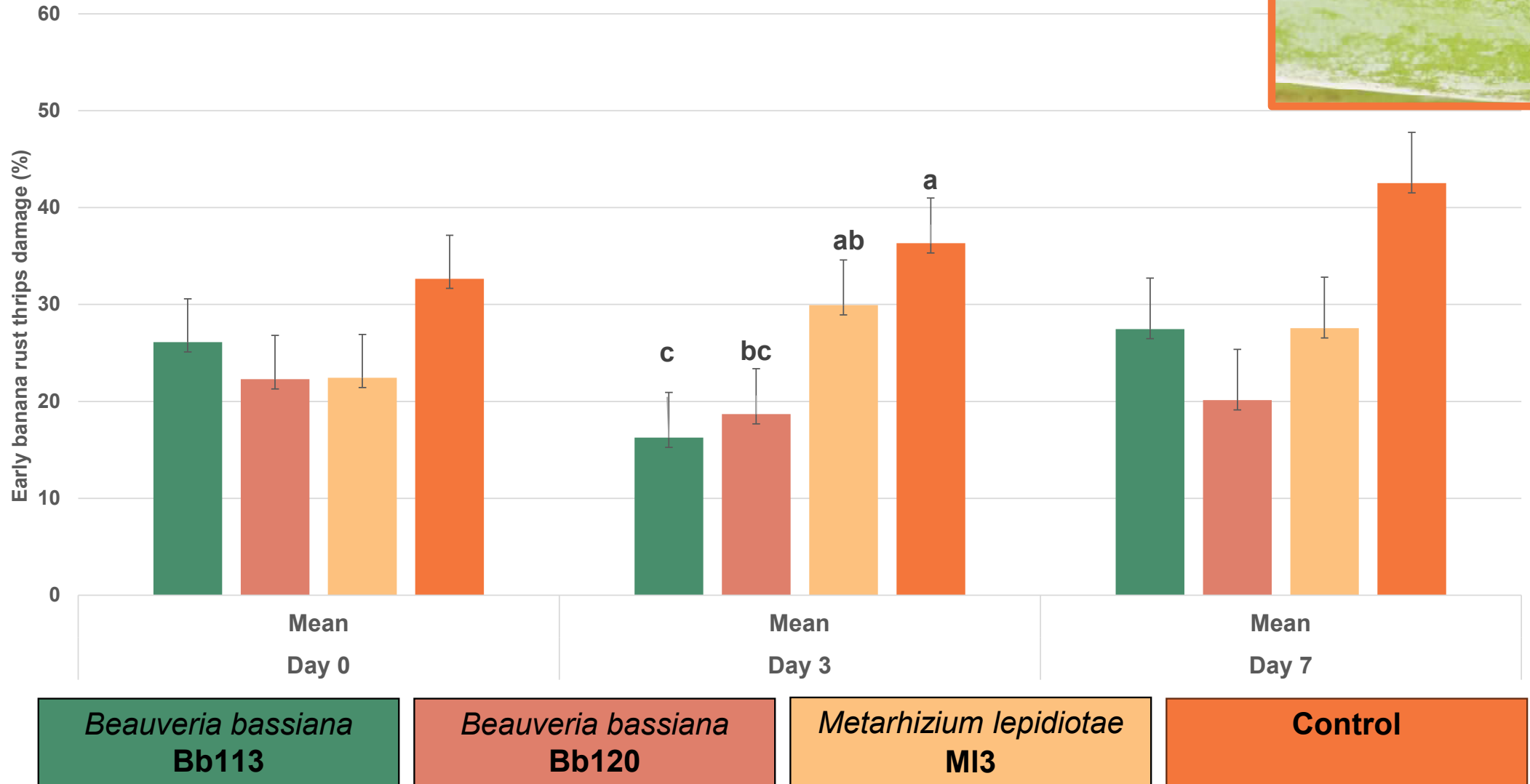
Beauveria treated



Metarhizium treated



Trial 3 Results





Key learnings



Application volume per plant



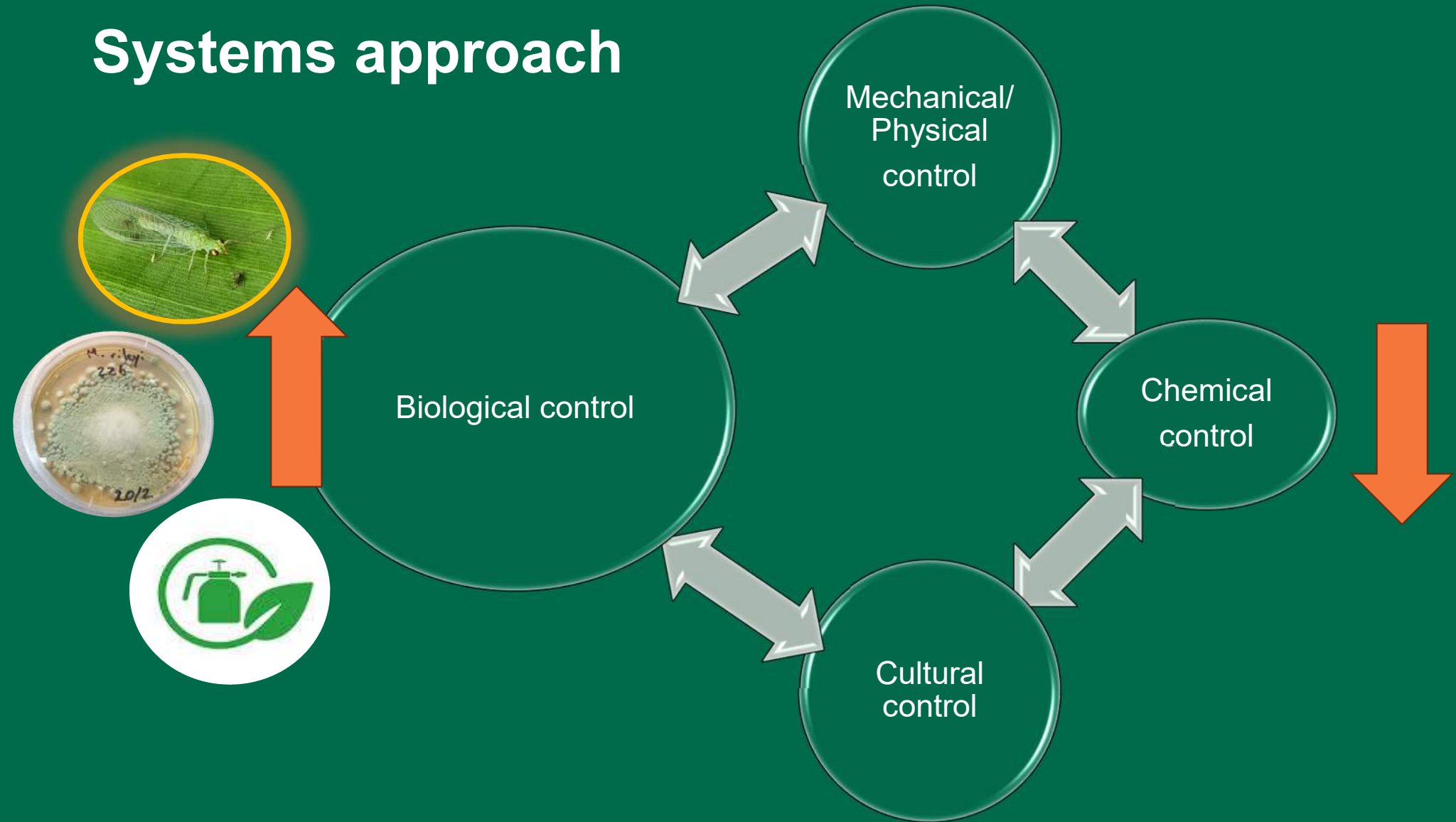
Spore concentration



Consistency of spore production

Are multiple applications required?

Systems approach



BA21004: Banana Integrated Pest and Disease Management Program Team (DPI)



For more
banana
research



Acknowledgments

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- 🔍 Natural Solutions
- 🔍 Biological Services (South Australia)
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**Queensland
Government**



Thank you!

Contact the researchers:

David.East@DAF.QLD.GOV.AU

Richard.Piper@DAF.QLD.GOV.AU