



Drosophila suzukii: An update on the current research (18 months down the line)

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Student team



← Students:

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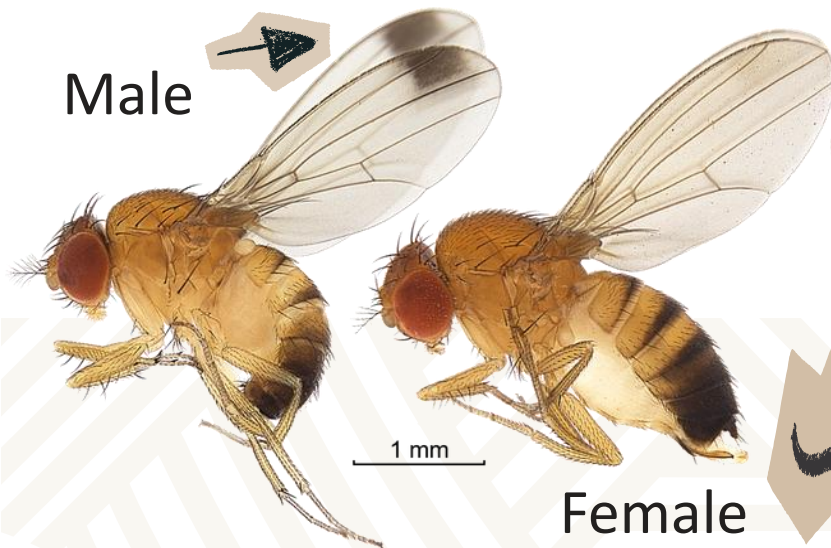
Technicians: →

Chloe Paderes

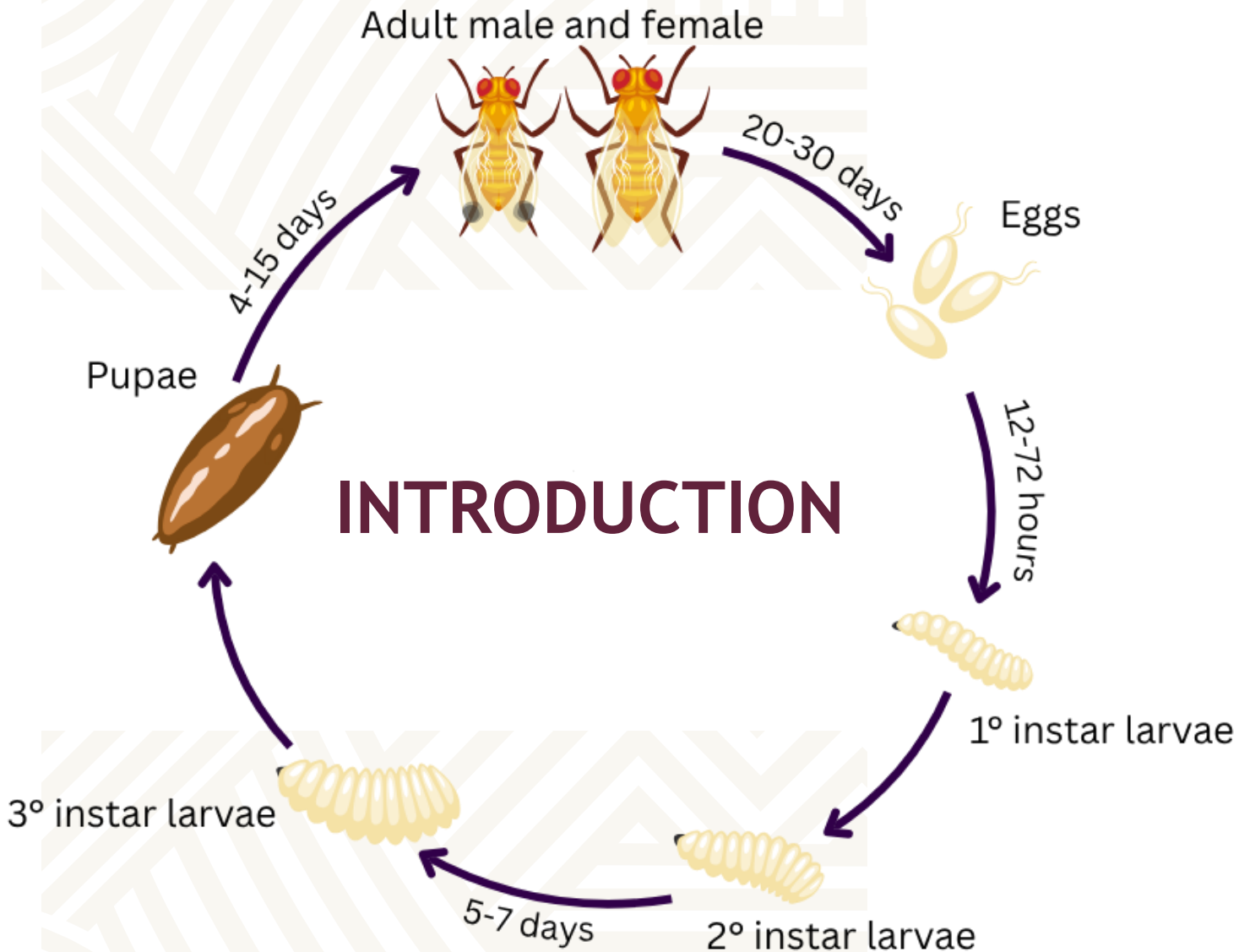
James Britz



INTRODUCTION

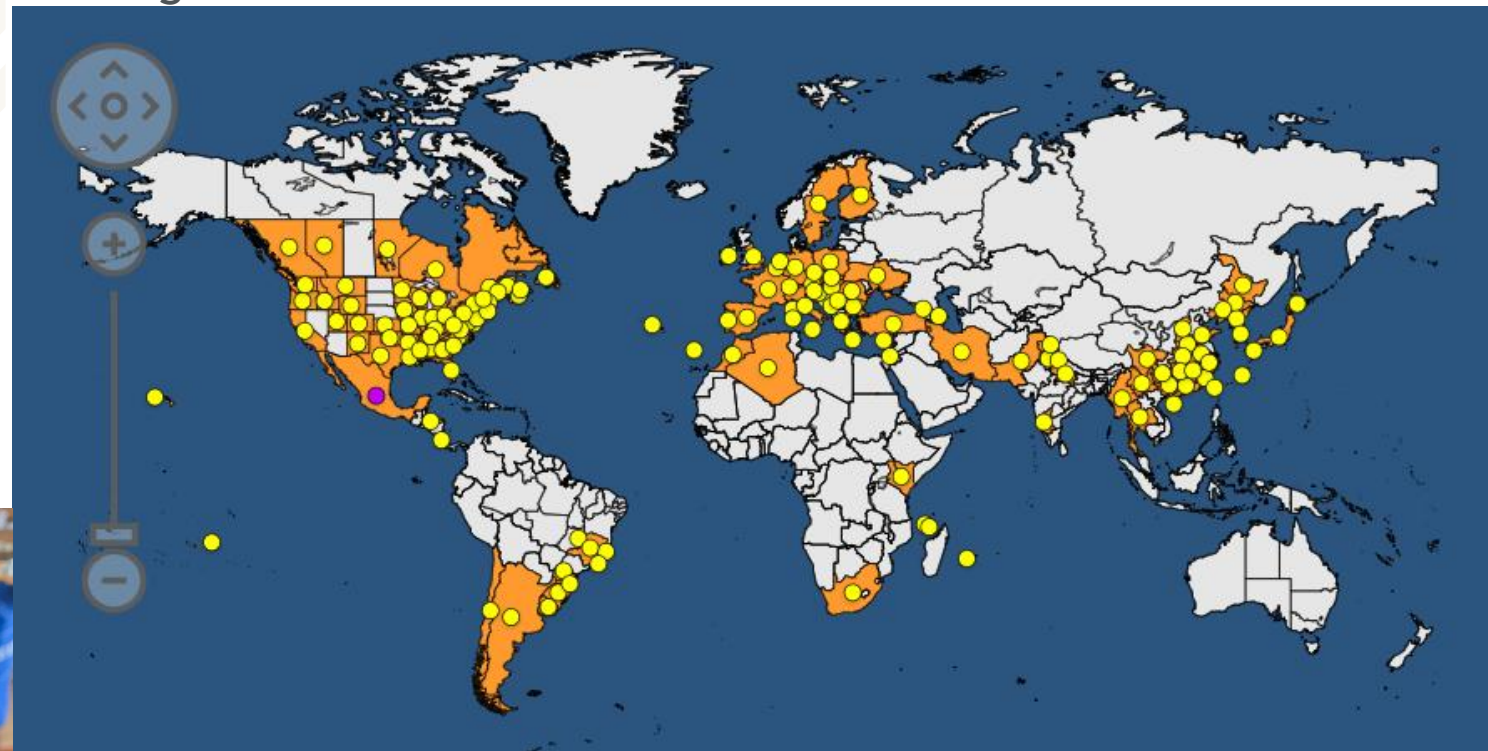


- Spotted wing drosophila (SWD) is native to southeast Asia
- Female infests undamaged, soft-skinned, ripe fruits (mostly berries)
- Long-term eradication after outdoor establishment unsuccessful globally
- Significant losses in Europe and North America (up to 80%; 511mill US\$ in 2011)
- IPM strategies: insecticides (resistance!), mass trapping, exclusion netting & field sanitation



- Short life cycle / high reproductive rate:
 - 13 generations/year
 - Egg to adult development: 10 days @ 28° C

EPPO global database



INTRODUCTION



- First discovered in April 2022 in the Langkloof
- Monitoring problematic - lures not species-specific

DAMAGE:

INTRODUCTION



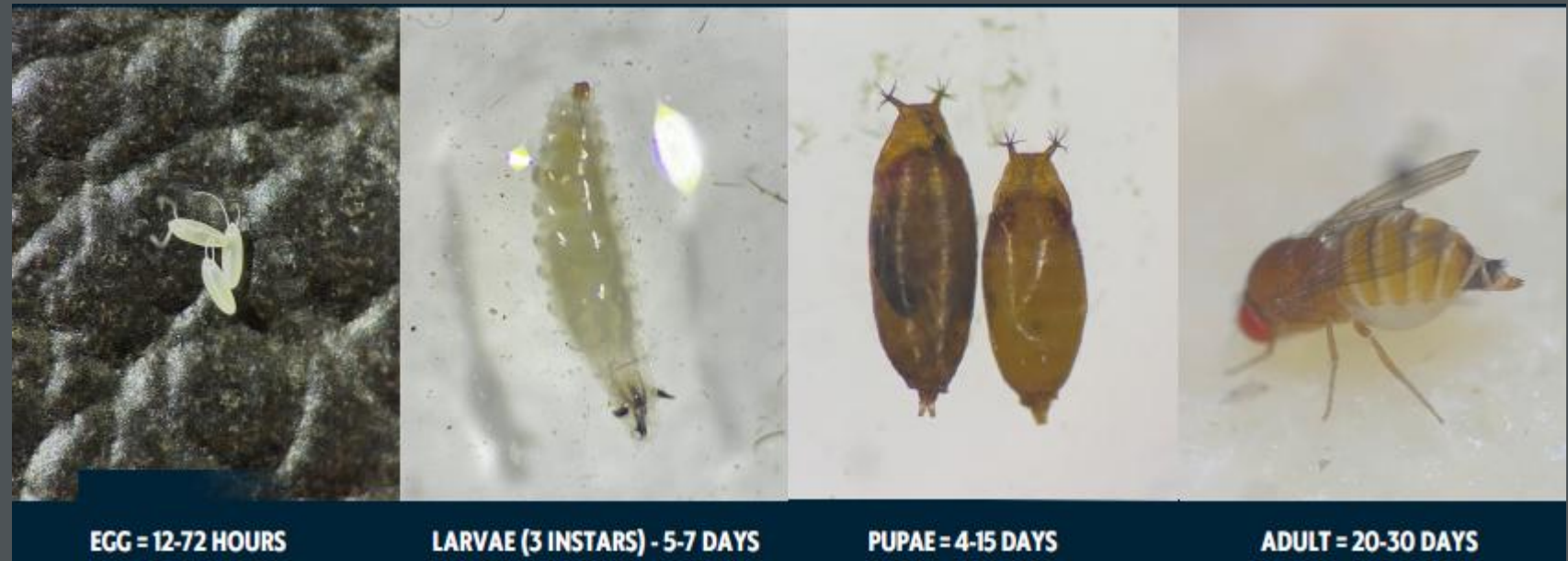
OBJECTIVES

- **PROJECT 1: Explore IPM practices for SWD**
 - Develop attractants using *Hanseniaspora uvarum* (yeast)
 - Assess commercial attract-and-kill products
 - Survey naturally-occurring parasitic wasps (in progress)
 - Screen pathogens in laboratory experiments
- **PROJECT 2: Risk management system for SWD to inform management decisions**
 - Determine fruit type/cultivar/ripeness stage susceptibility
 - Determine SWD population dynamics in the field (crops and alternate hosts)

Colony establishment and maintenance

- Abiotic Conditions
 - 20°C
 - 70% Relative Humidity
 - 16:8 Photoperiod
- Artificial Diet
 - Agar
 - Corn meal
 - Sugar
 - Nutritional yeast
 - Preservatives

Life cycle



MSc thesis 1: Chloe Meck

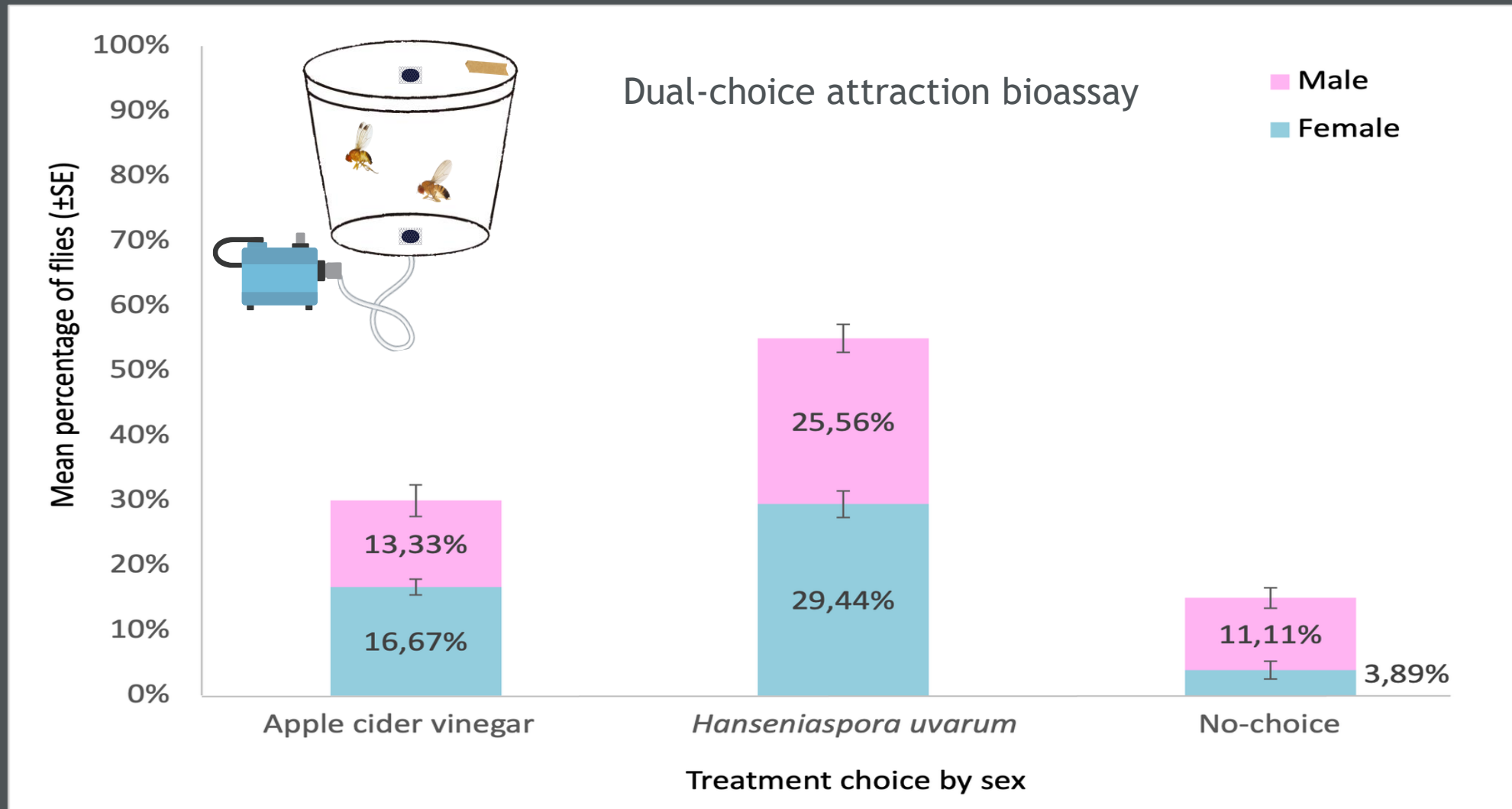
Project 1:

1. To test *Hanseniaspora uvarum*'s attractiveness and compatibility with insecticides
2. To assess the efficacy of existing commercial attractants in field trials across South African soft-fruit crops



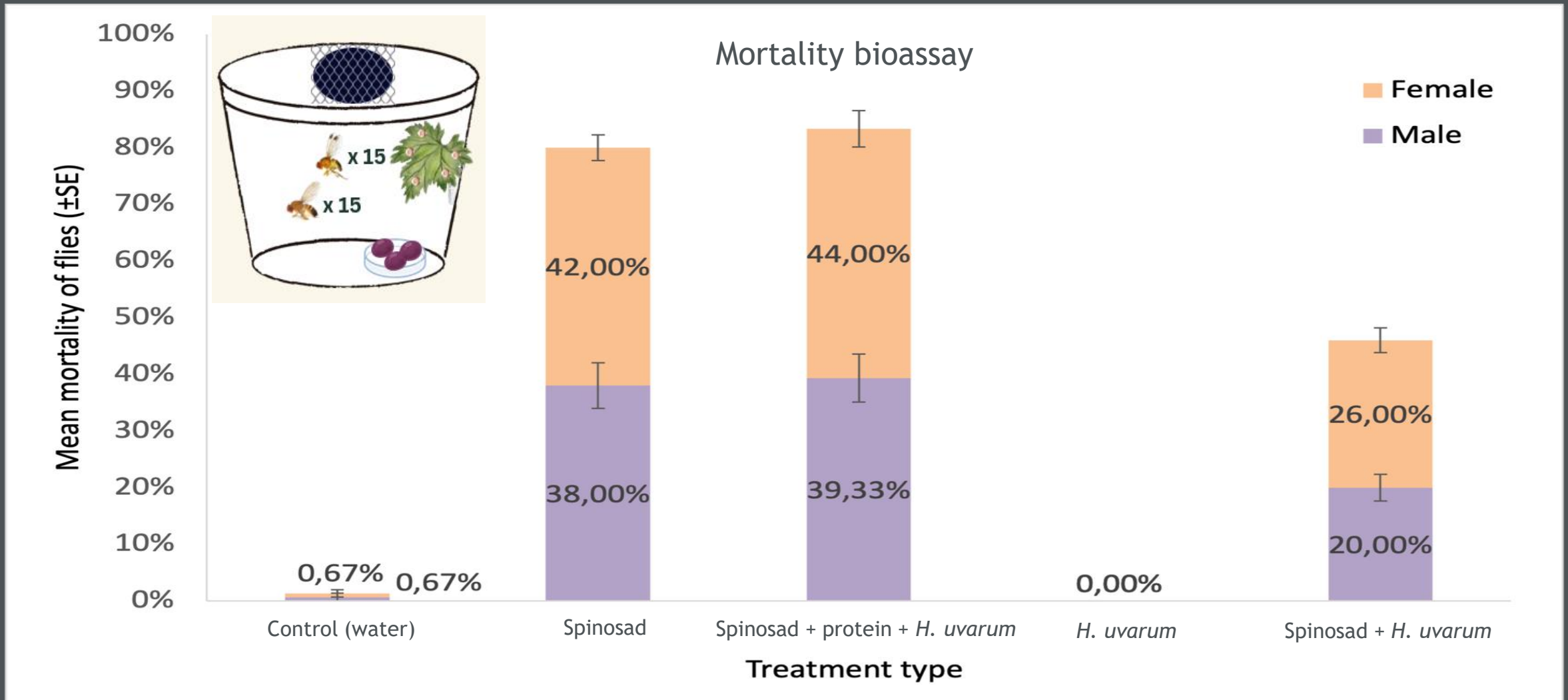
PROJECT 1

Develop attractants using *Hanseniaspora uvarum*



PROJECT 1

Assess commercial attract-and-kill products (bioassay)

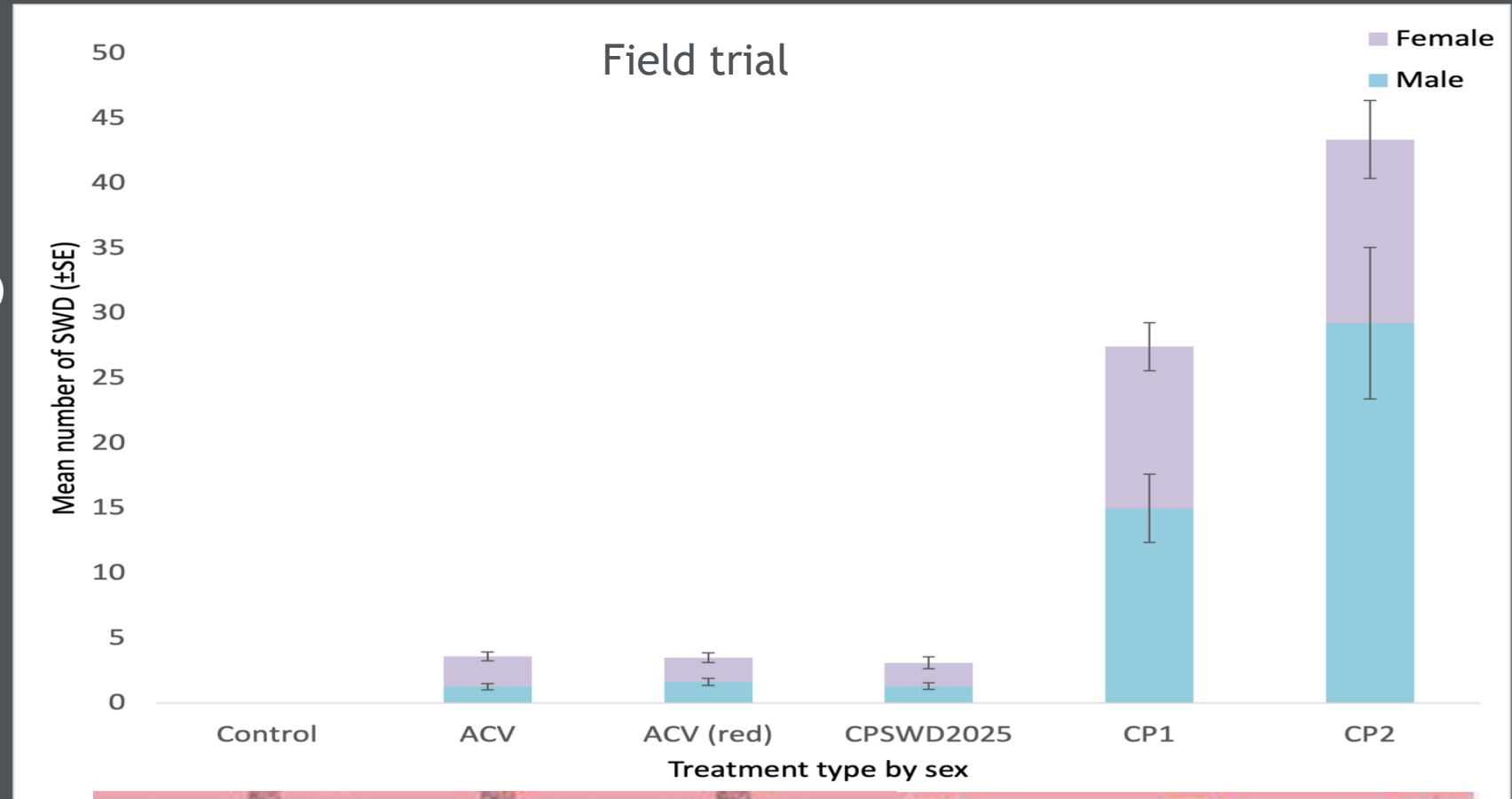


PROJECT 1

Assess commercial attractants

1. Control (water + transparent jar)
2. ACV (transparent jar)
3. ACV (transparent jar + red stimulus)
4. CPSWD2025 (Lure + DB + custom trap)
5. CP1 (Lure + DB + McPhail trap)
6. CP2 (Lure + sticky trap)

DB = dichlorvos block





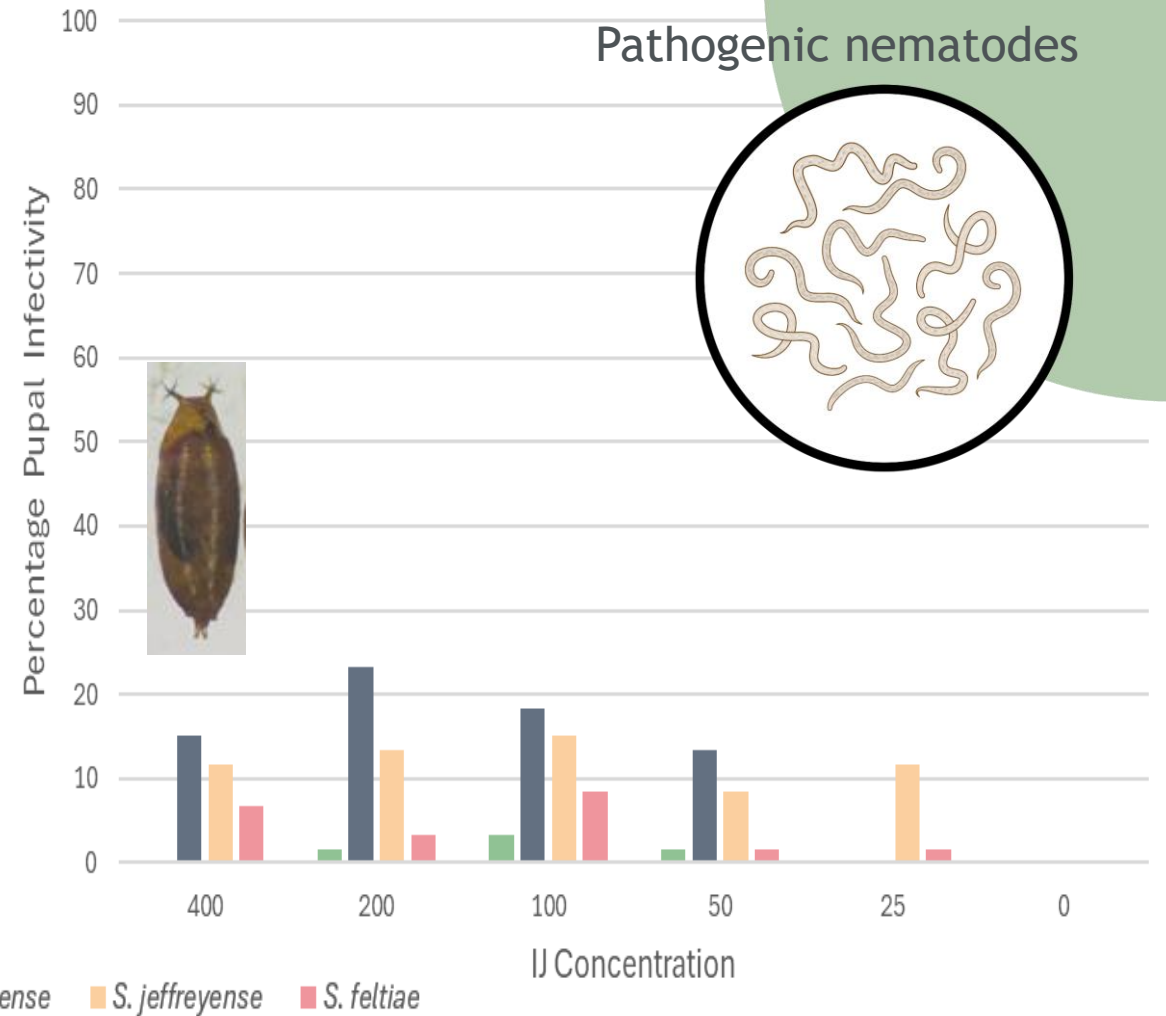
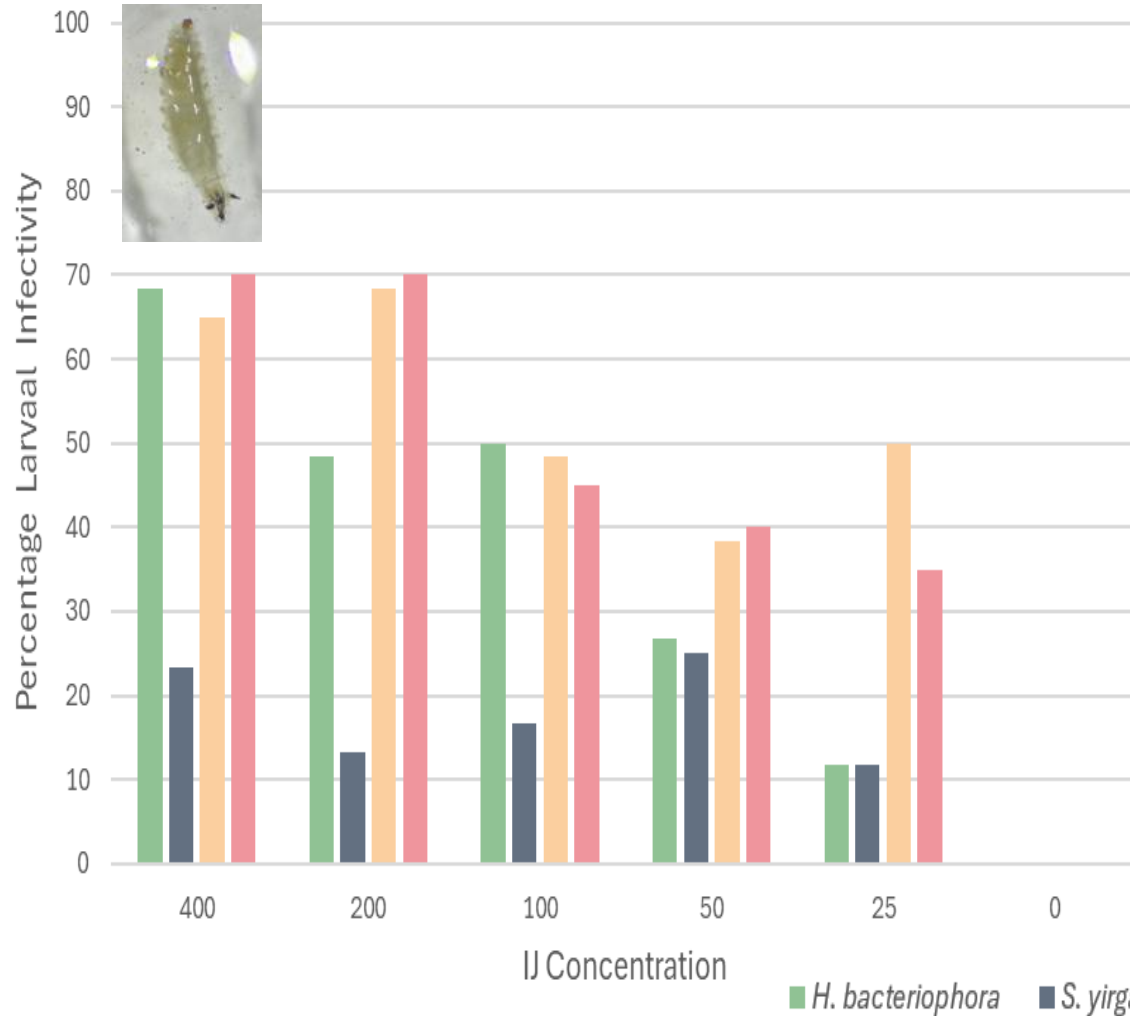
Project 1:

MSc thesis 2: Andrea Bennett

1. Survey for parasitic wasps (Stellenbosch, Somerset West, Hemel-and-Aarde valley)
2. Laboratory screening of entomopathogenic nematodes (EPNs) and -fungi (EPF)

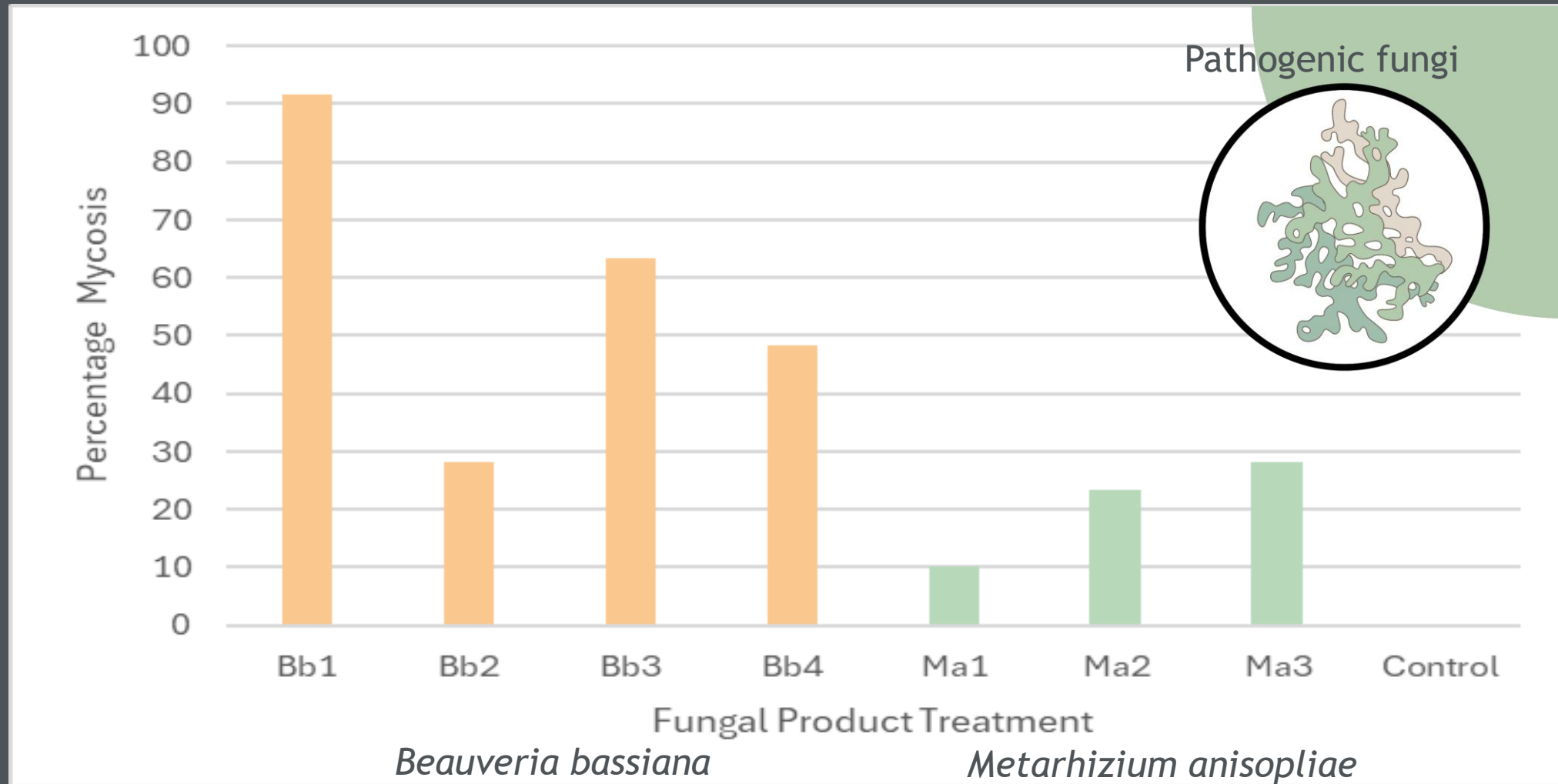
PROJECT 1

Screen pathogens in laboratory experiments



PROJECT 1

Screen pathogens in laboratory experiments



MSc thesis 3: Lisa Kleyn

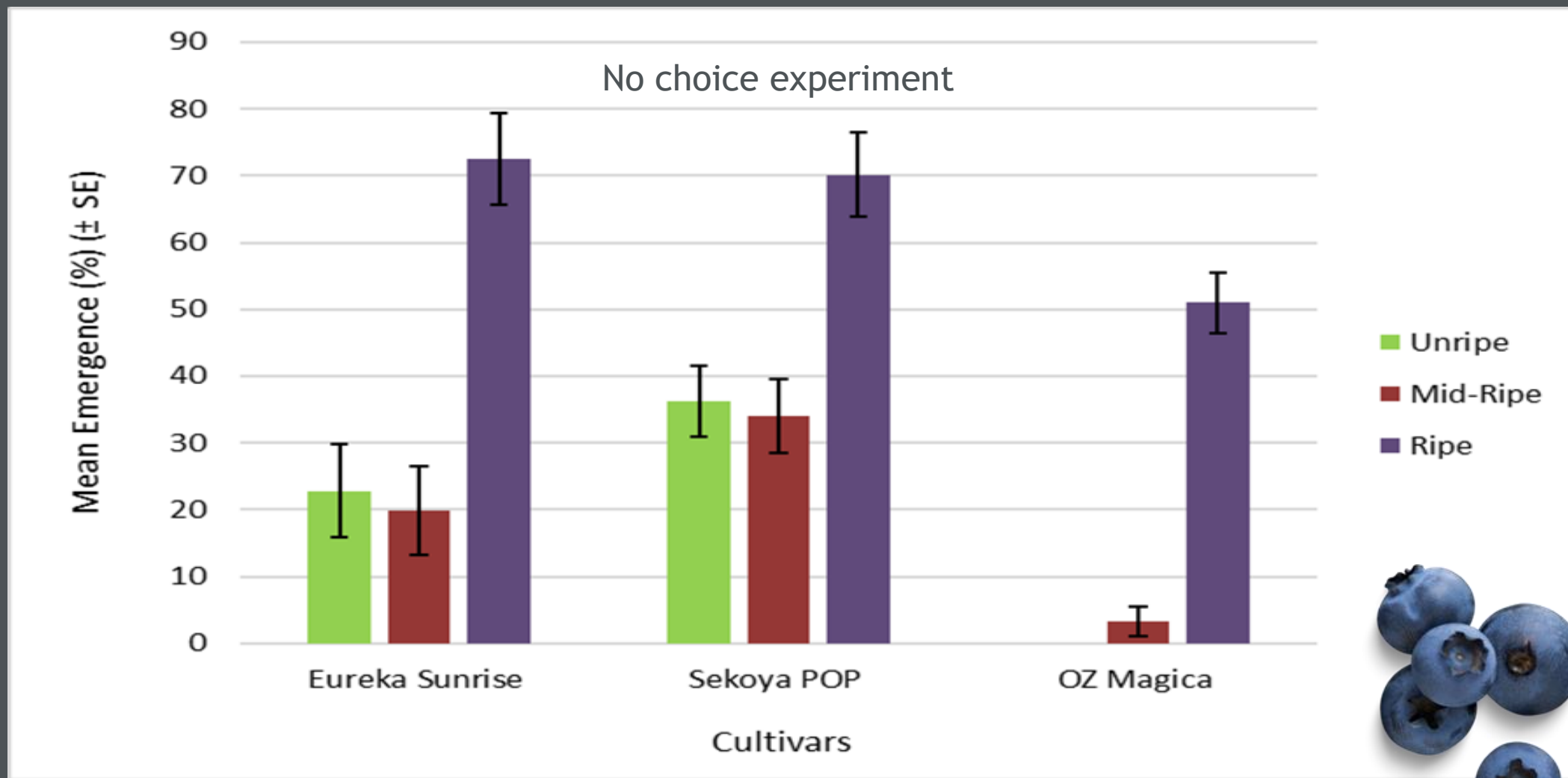
Project 2:

1. To determine the susceptibility of soft-skinned fruit types and cultivars at different ripeness stages to *D. suzukii*



PROJECT 2

Determine fruit type/cultivar/ripeness stage susceptibility

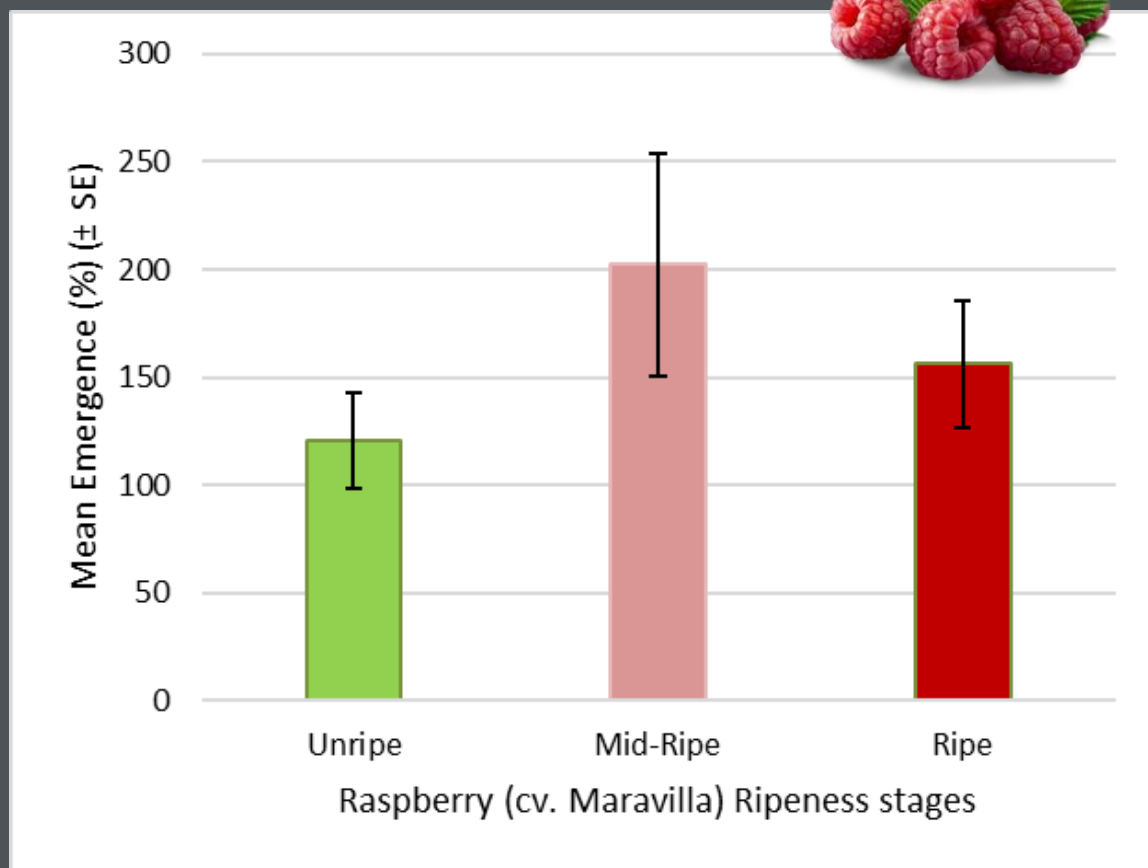


PROJECT 2

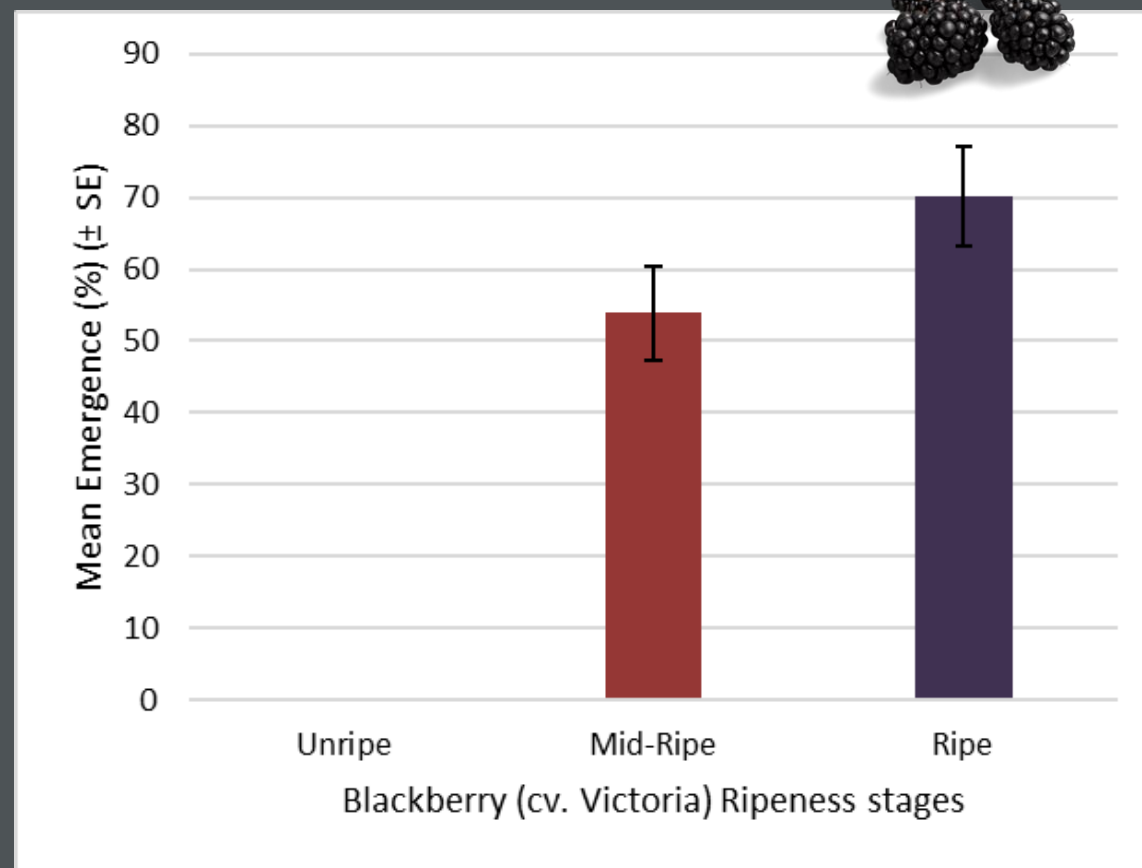
Determine fruit type/cultivar/ripeness stage susceptibility

No-choice experiments

Raspberry



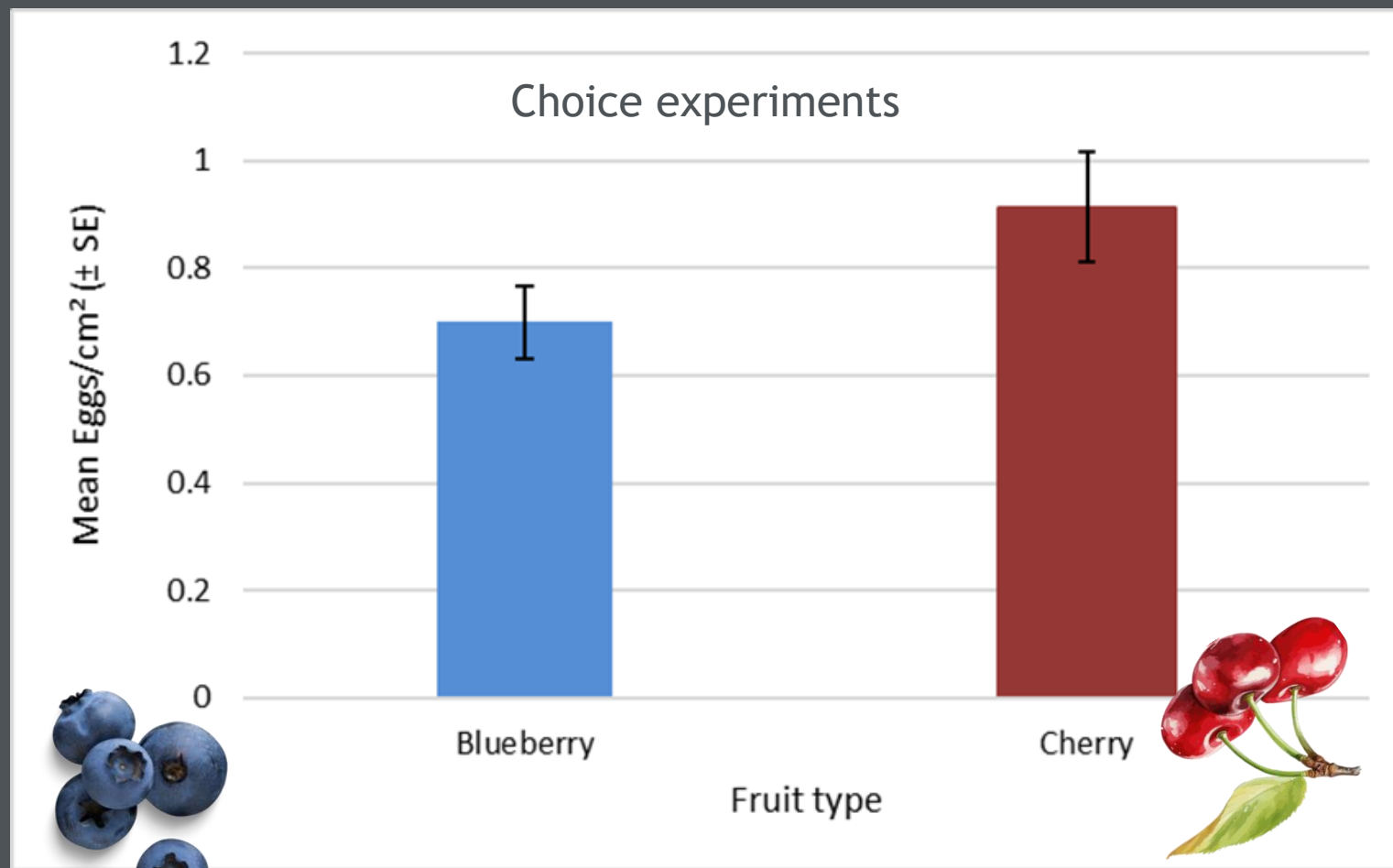
Blackberry



PROJECT 2

Determine fruit type/cultivar/ripeness stage susceptibility

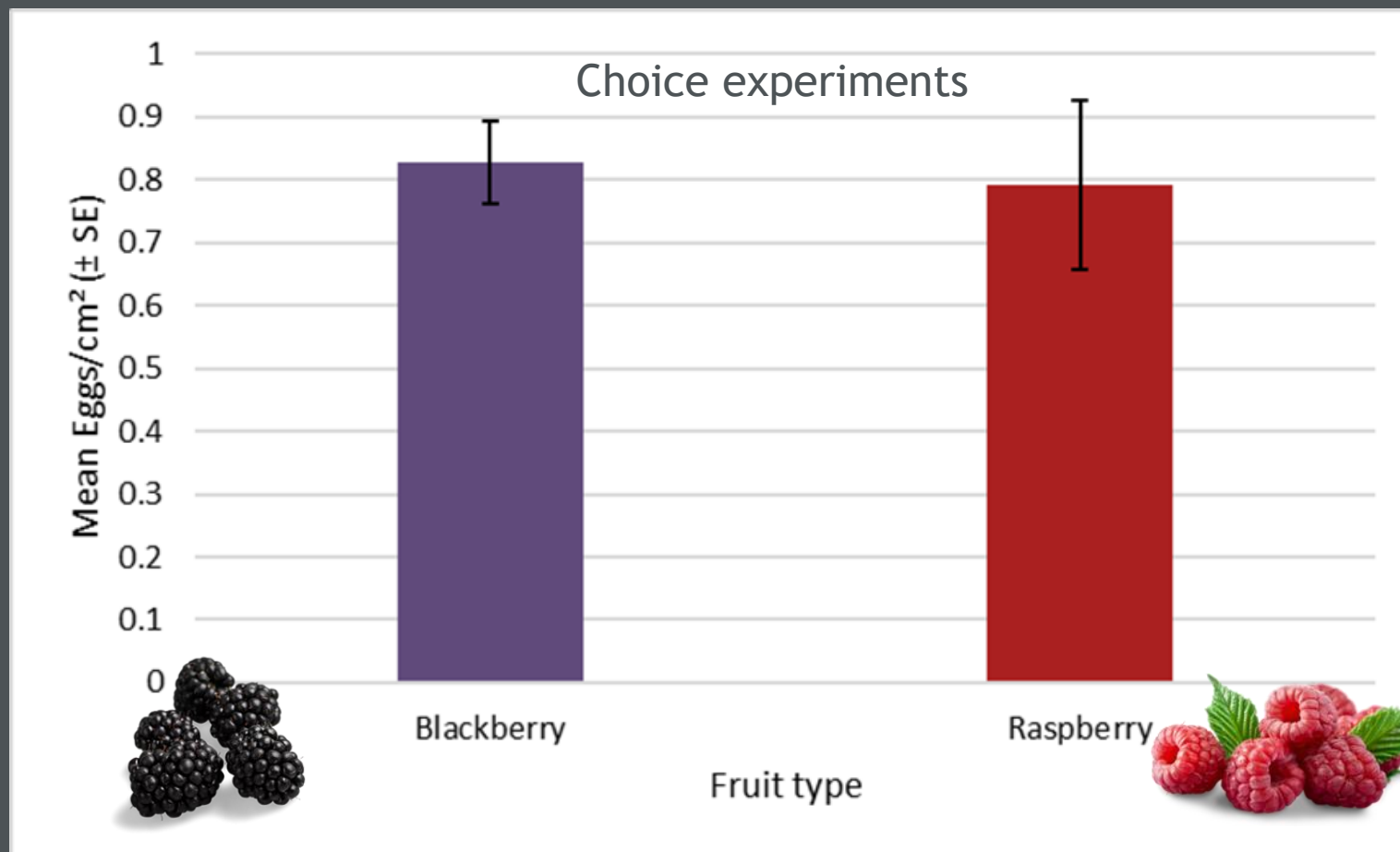
Blueberry vs Cherry



PROJECT 2

Determine fruit type/cultivar/ripeness stage susceptibility

Blackberry vs Raspberry



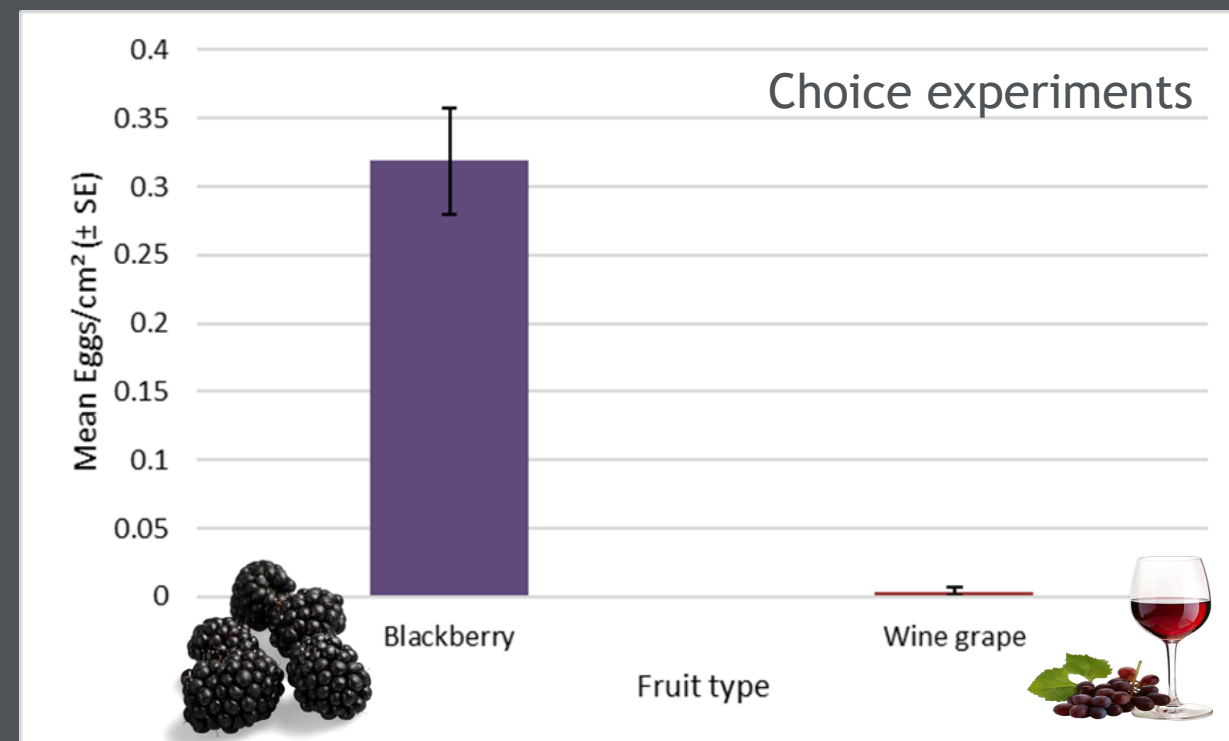
PROJECT 2

Determine fruit type/cultivar/ripeness stage susceptibility

Raspberry vs Wine grape



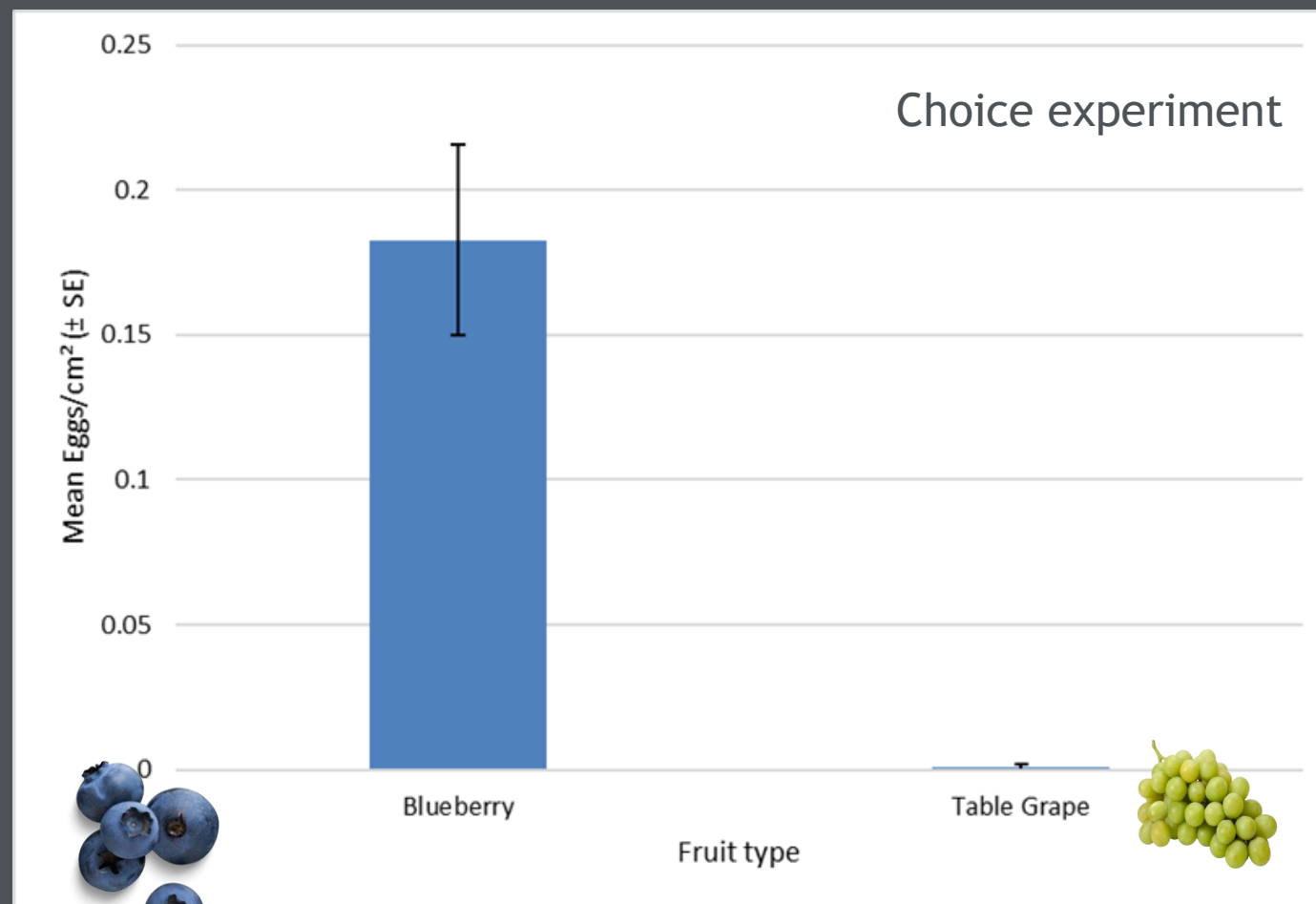
Blackberry vs Wine grape



PROJECT 2

Determine fruit type/cultivar/ripeness stage susceptibility

Blueberry vs table grape



MSc thesis 4: Heinrich Haase

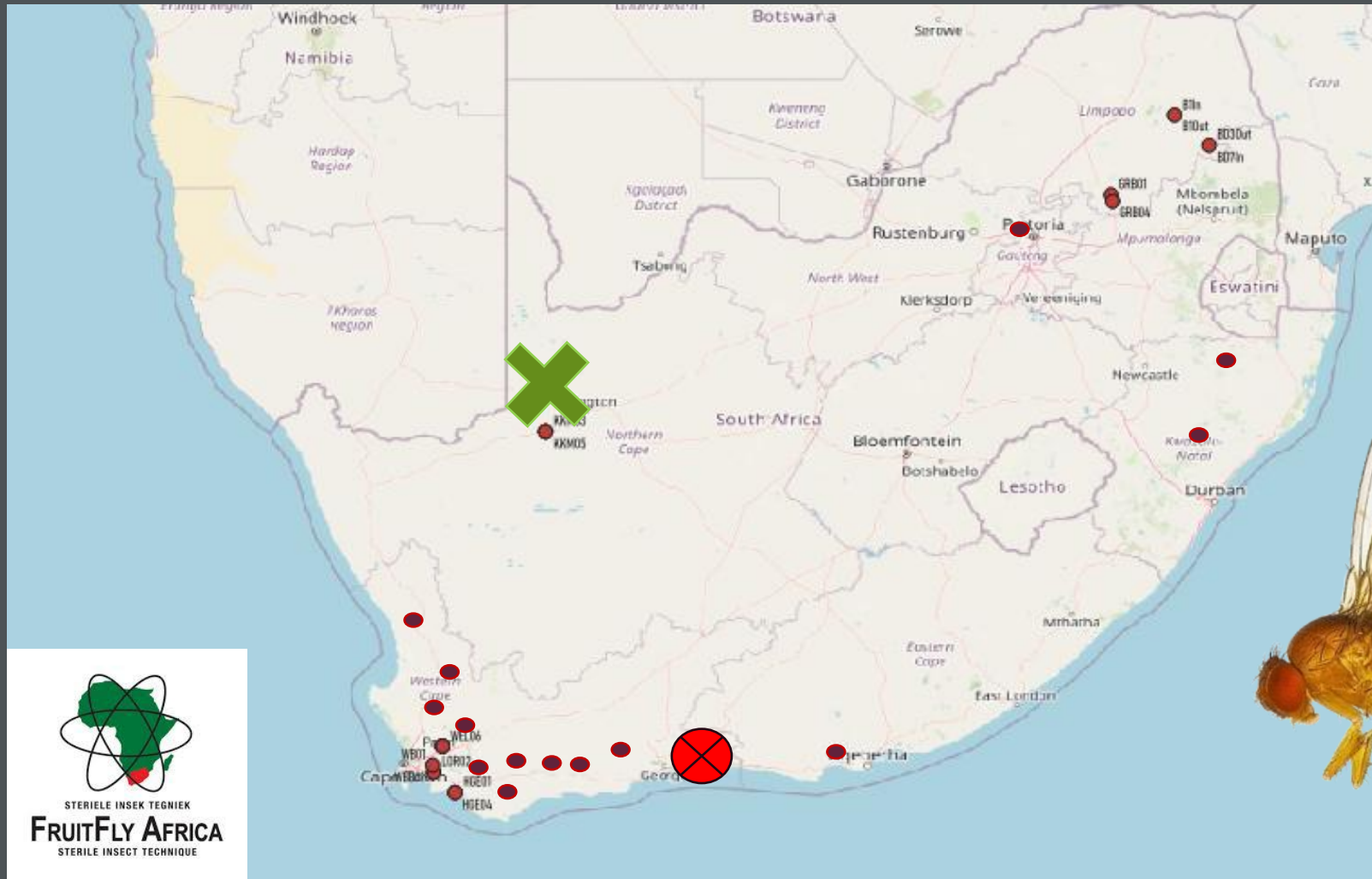
Project 2:



1. Determining population dynamics of the invasive SWD in different fruit-producing regions and non-crop hosts
2. Integrating fruit susceptibility, alternate host status together with monitoring data into a GIS-based risk mapping model for risk analysis

PROJECT 2

Determine SWD population dynamics



Alternate host fruit sampling



Ficus rubiginosa

D. suzukii♂



Vinegar fly from
genus *Lissocephala*

PROJECT 2

Determine SWD population dynamics



Potential alternative hosts	Nr of emerged flies so far
<i>Podocarpus latifolius</i> (Real yellowwood)	1
<i>Rhamnus prinoides</i> (Shiny-leaf buckthorn/Gesho)	1
<i>Ekebergia capensis</i> (Cape ash)	?
<i>Dovyalis afra</i> (Kei apple)	0
<i>Euphorbia</i> sp. (Spurges)	0
<i>Ficus rubiginosa</i> (Rusty fig)	0
<i>Ficus sur</i> (Cape fig)	0
<i>Rauvolfia afra</i> (Quinine tree)	0
<i>Solanum lineaeum</i> (Bitter apple)	0
<i>Solanum mauritianum</i> (Bugweed)	0
<i>Syzigium cordatum</i> (Waterberry tree)	0



Thank you
Enkosi
Dankie