Optimizing traps for SWD monitoring

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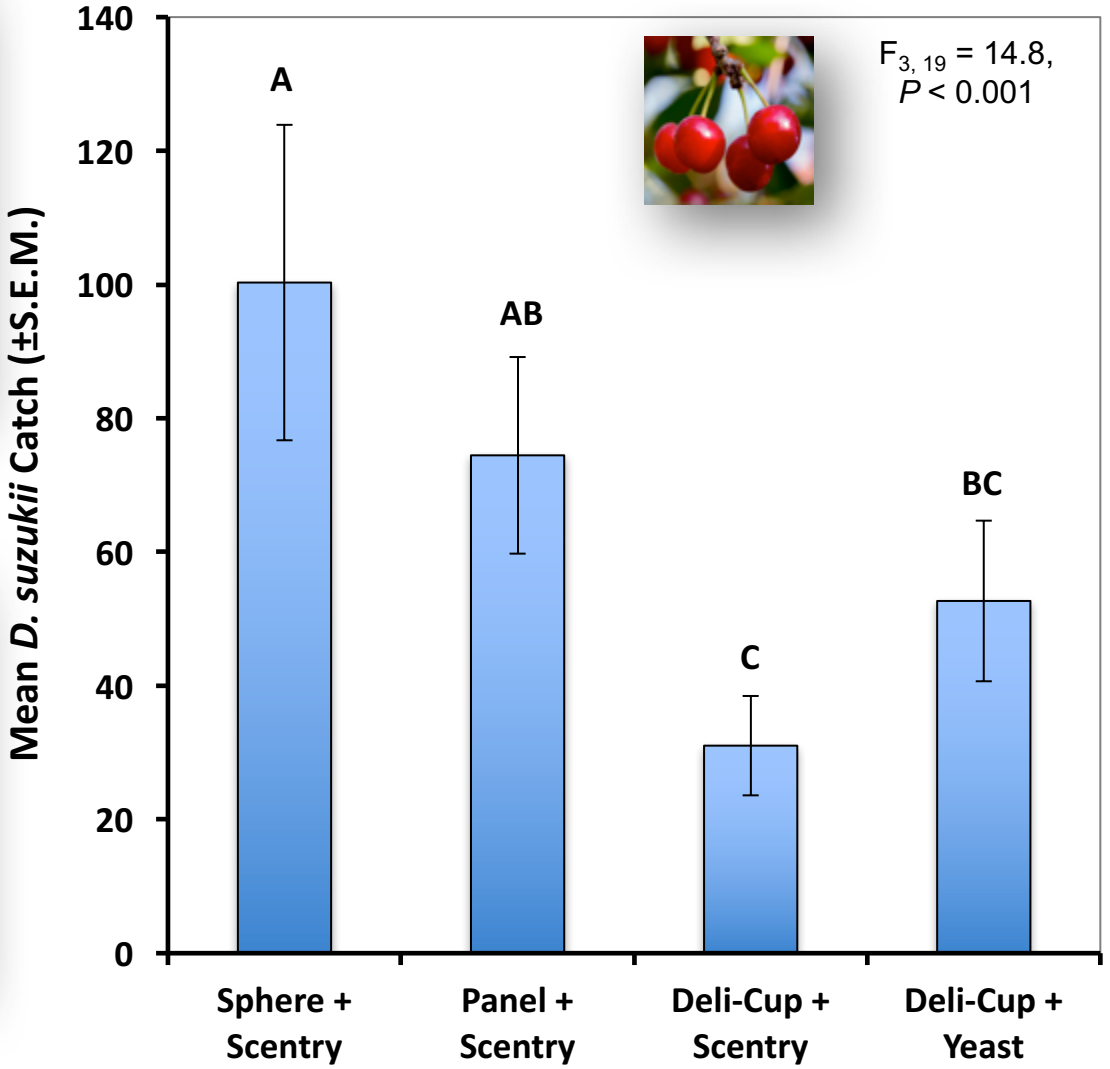
Previous studies revealed a preference for red and higher catches in sticky sphere and panel traps

Sphere + Scentry

Panel + Scentry

Deli-Cup + Scentry

Deli-Cup + Yeast



2017 trap type comparison study

Combo Panel

Red Panel

Cup Trap

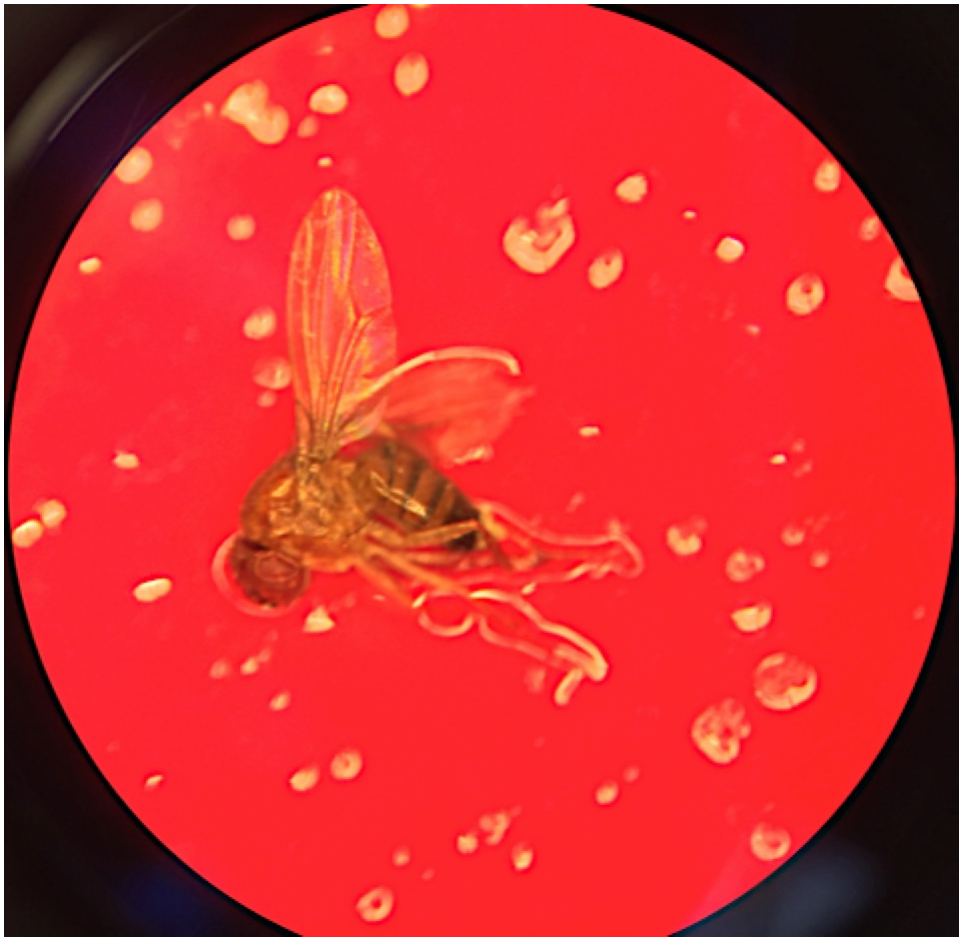
White Panel

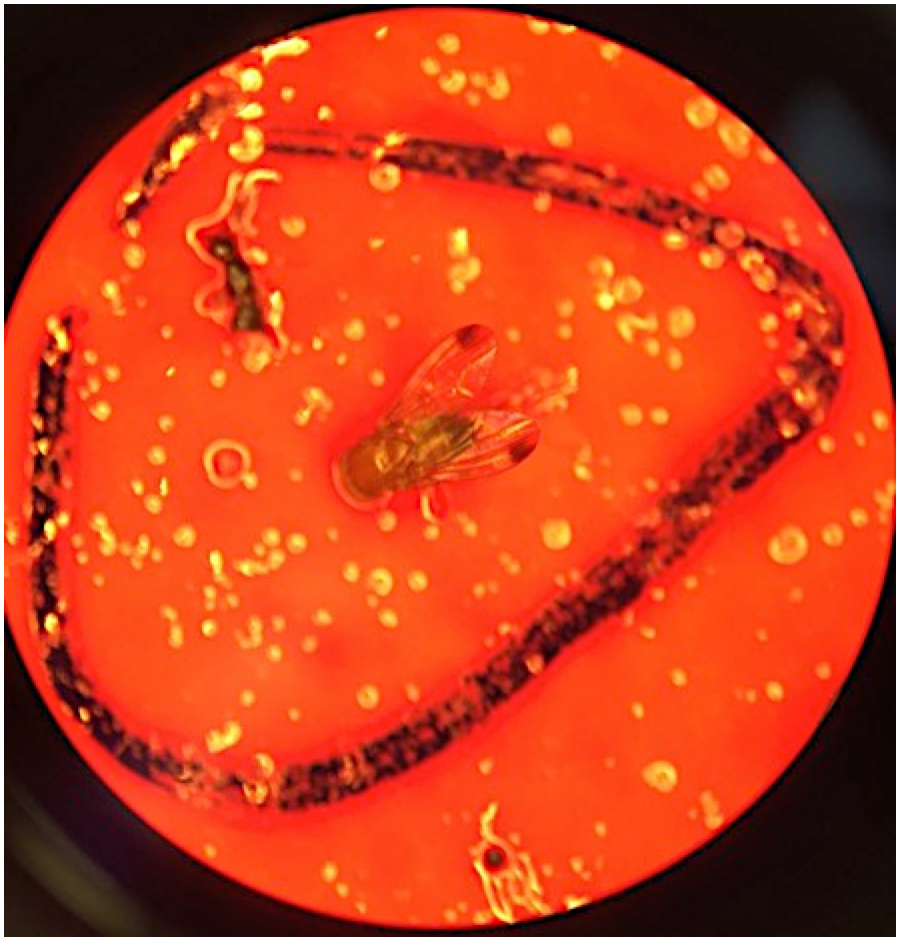
Yellow Panel

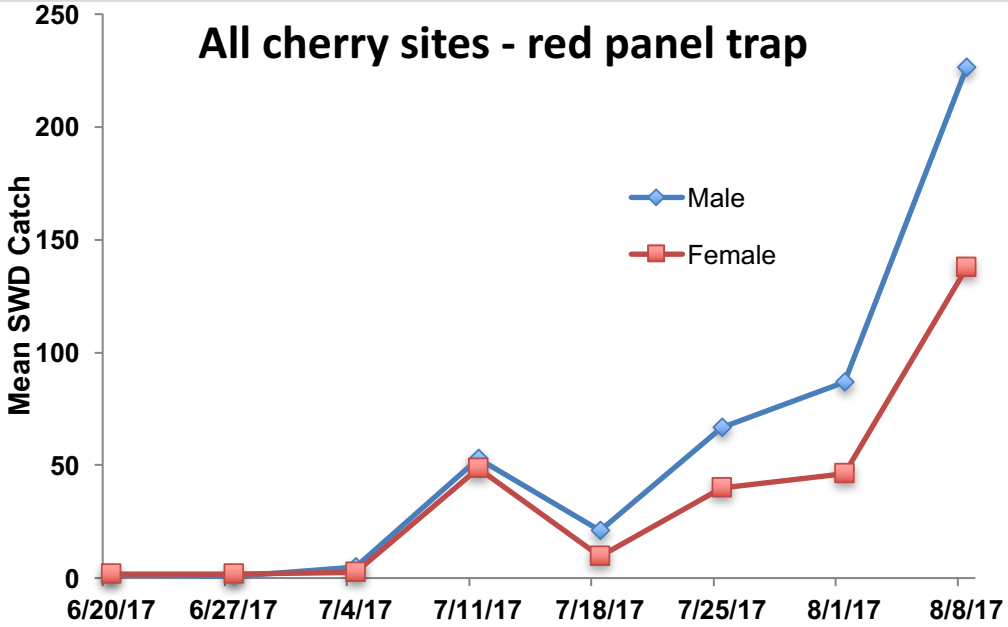
Green Panel

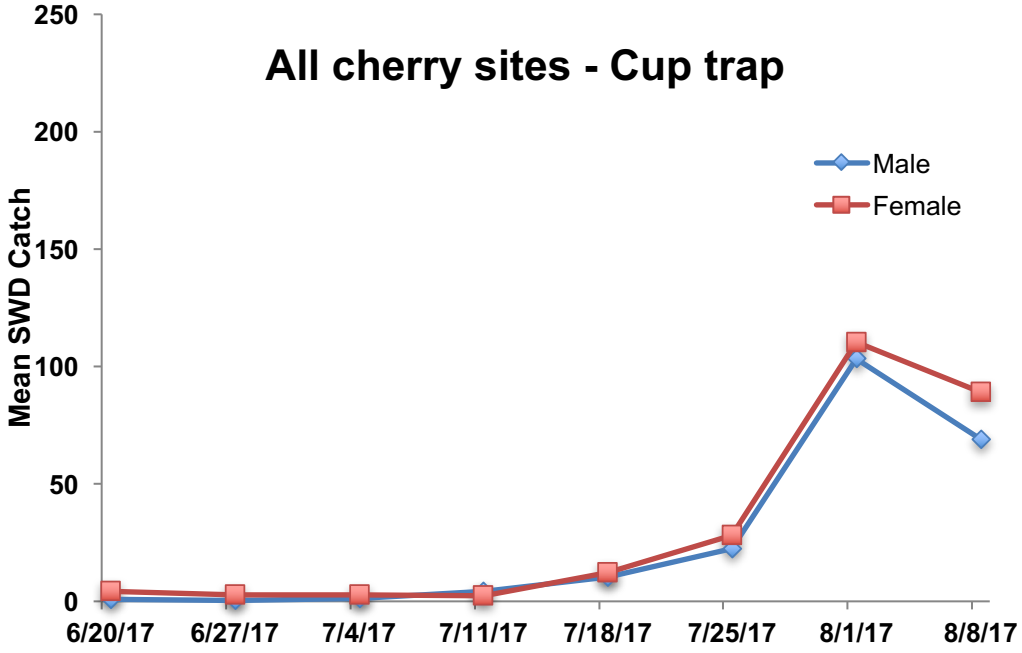
Trap comparison study results in cherry

Female and male SWD identification on panel traps in the field



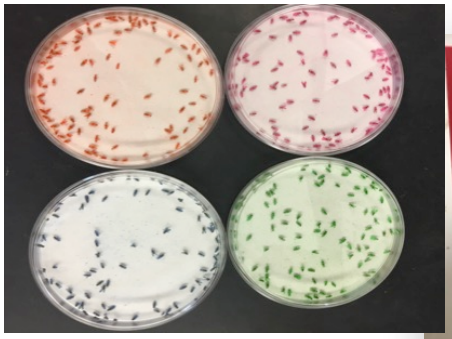


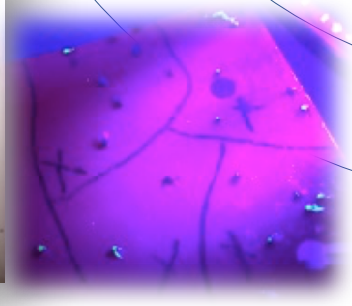

All cherry sites - red panel trap
Mean SWD Catch
250
200
150
100
50
0
Male
Female
6/20/17
6/27/17
7/4/17
7/11/17
7/18/17
7/25/17
8/1/17
8/8/17


All cherry sites - Cup trap
Mean SWD Catch
250
200
150
100
50
0
Male
Female
6/20/17
6/27/17
7/4/17
7/11/17
7/18/17
7/25/17
8/1/17
8/8/17

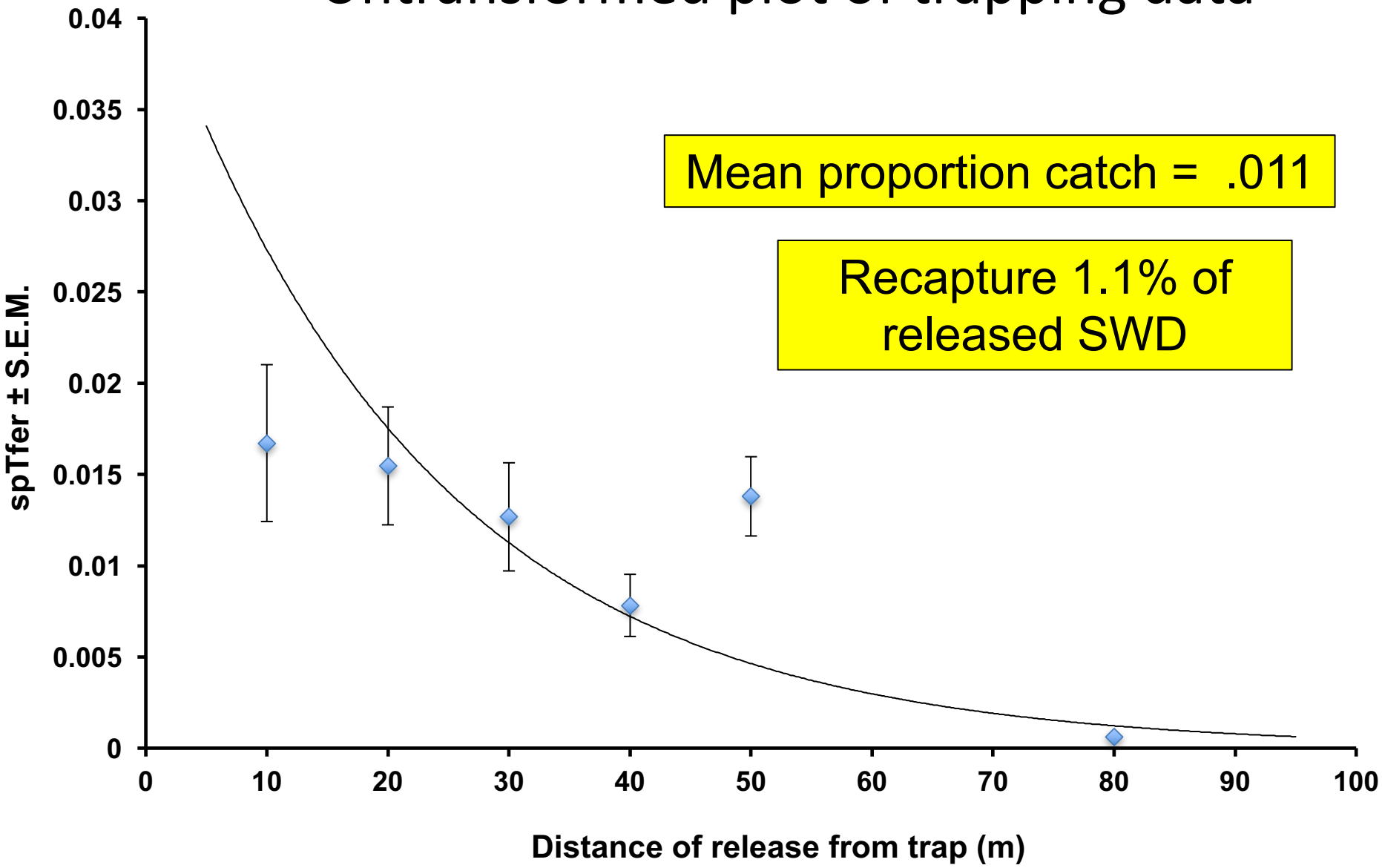
Mark-Release-Recapture of SWD

Single trap, multiple release

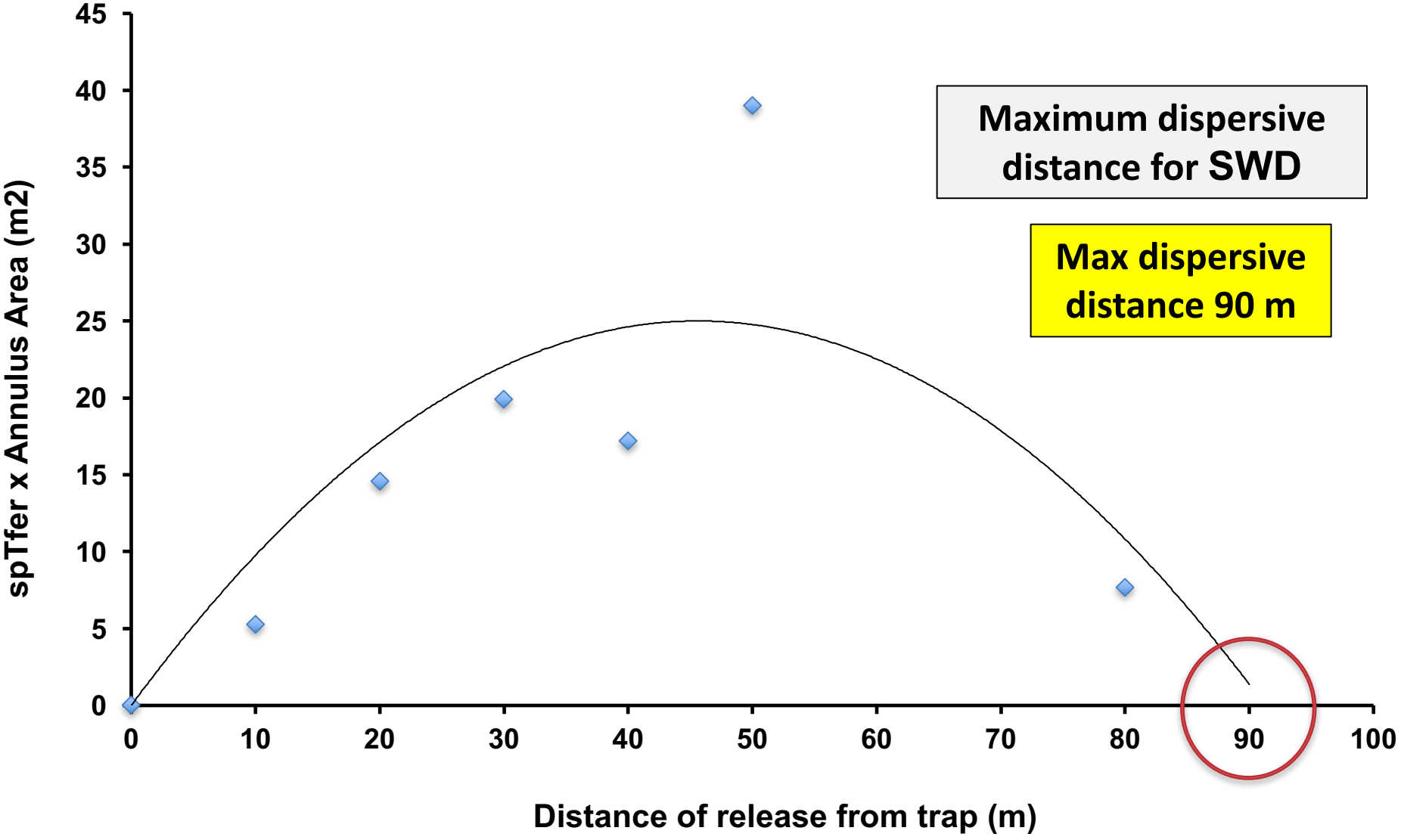




Untransformed plot of trapping data



Transformed data: Miller Plot



Maximum dispersive distance for SWD: 90 m

Plume reach for red baited panel trap: < 3 m

One red panel trap samples:

6.7 acres

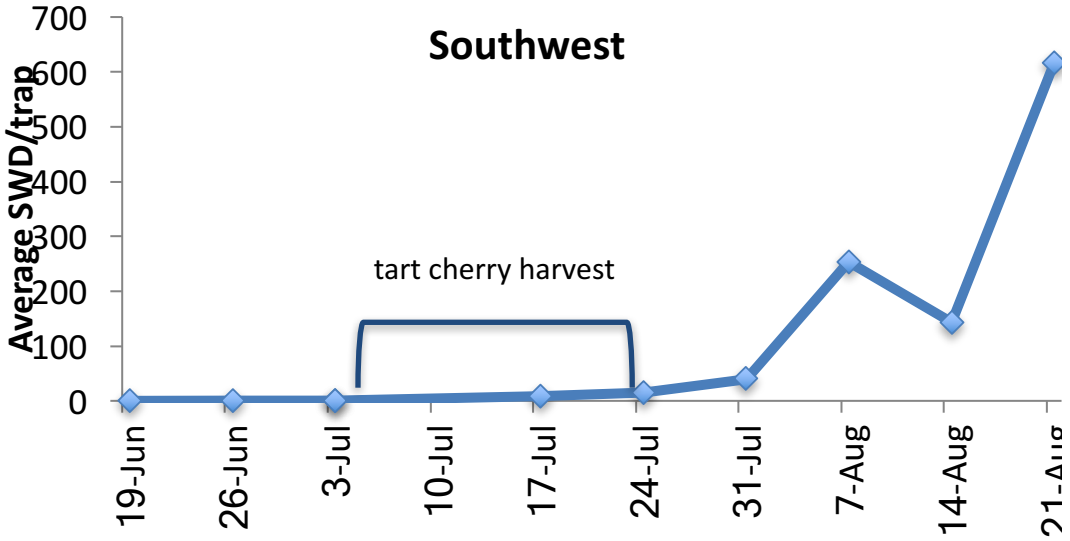
SWD per Trapping Area = Catch in Trap / Proportion Caught

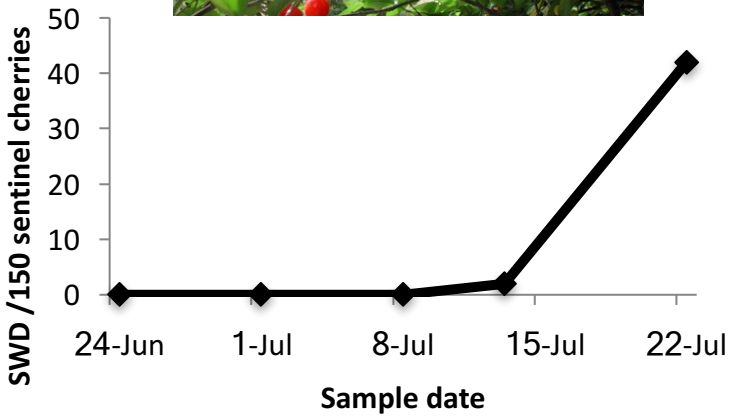
Catch per single monitoring trap	SWD per trapping area (2.7 hectares)	SWD per acre
1	**194**	**29**
10	**1940**	**291**
100	**19403**	**2909**

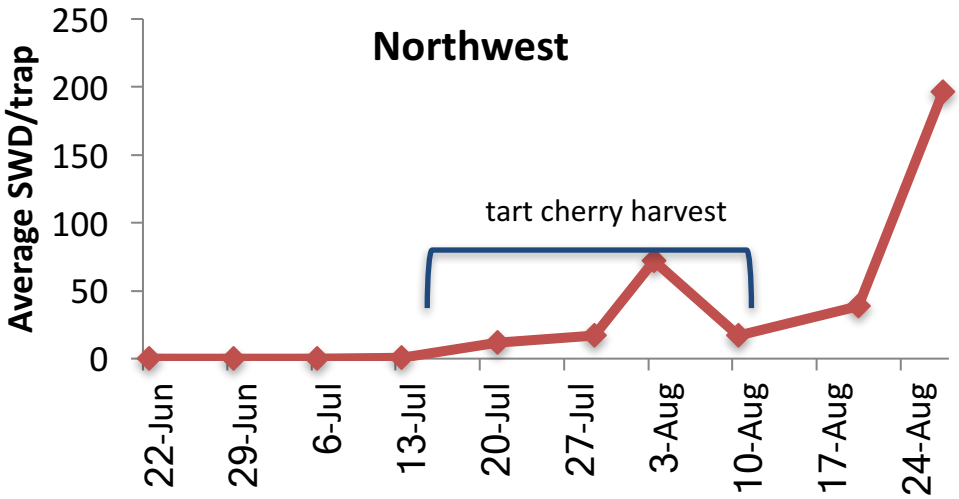
Is trapping worth the effort?

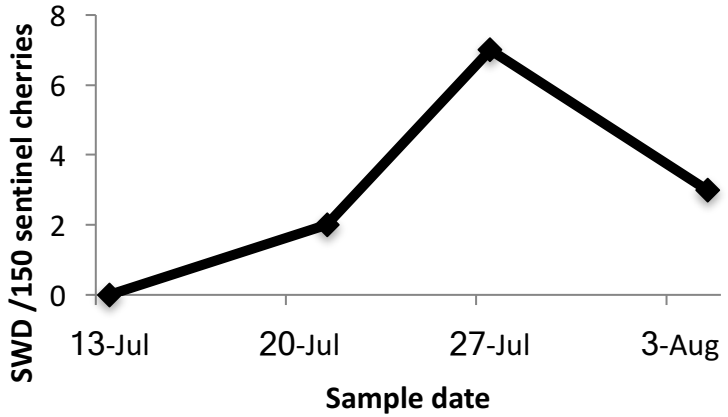
Why should we continue to look for better traps and attractants?

In some years/regions, SWD may not be present until very near or after harvest

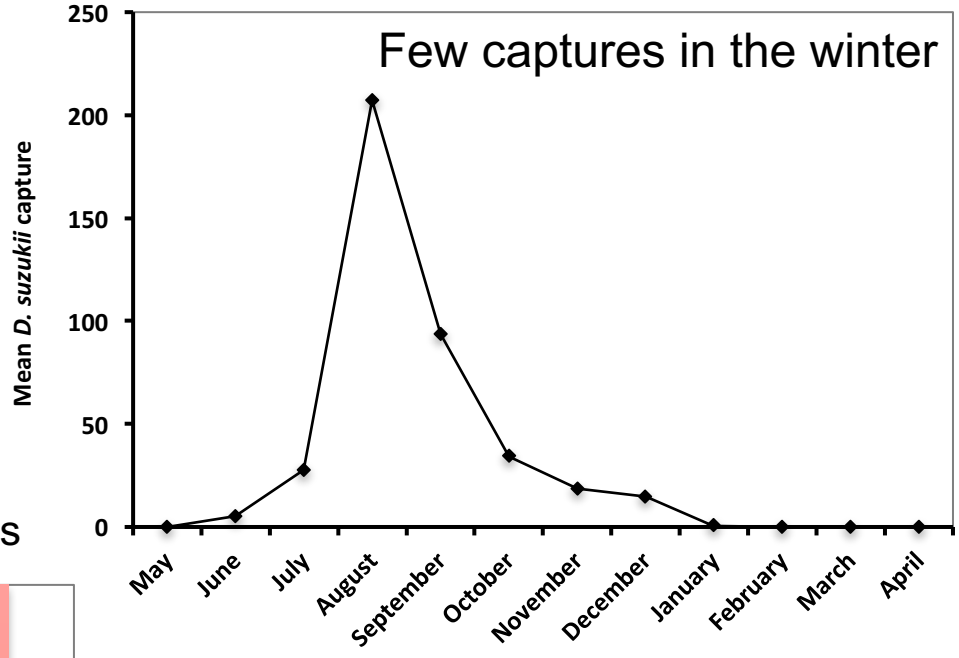




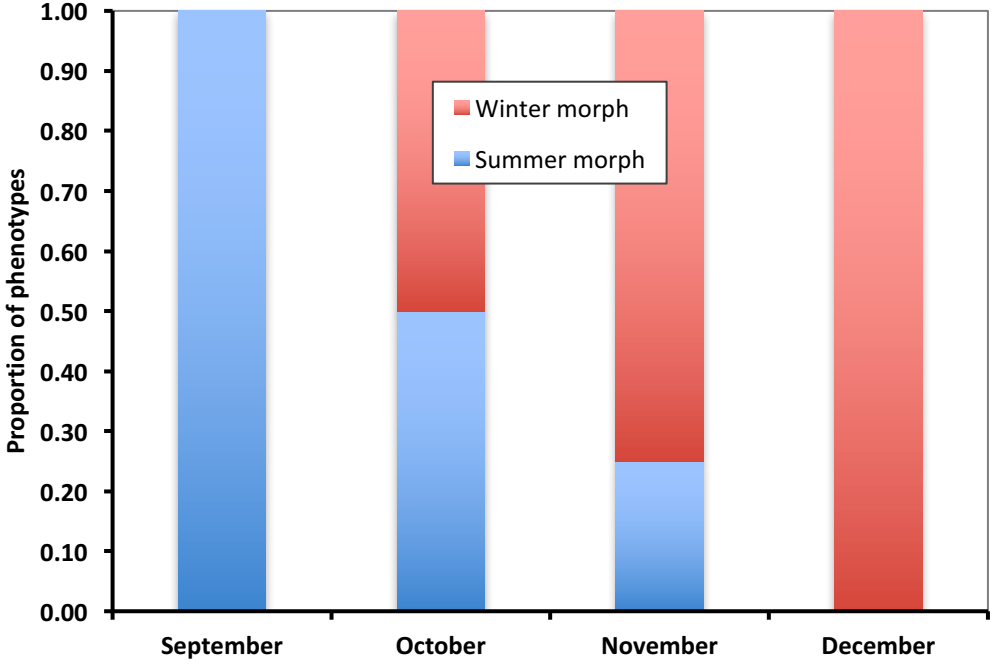


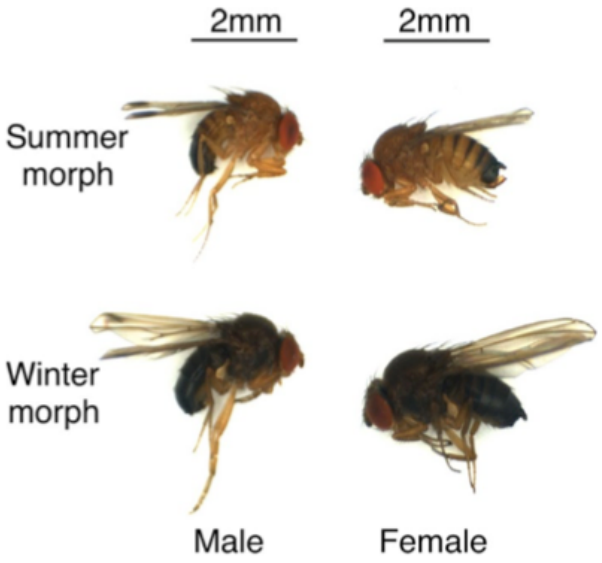


We need to know where and how many SWD are present in the winter and spring



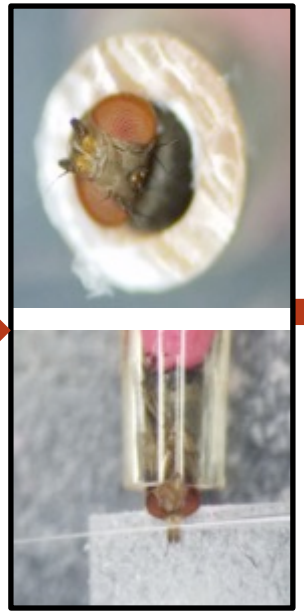
Proportion of summer and winter morph captures

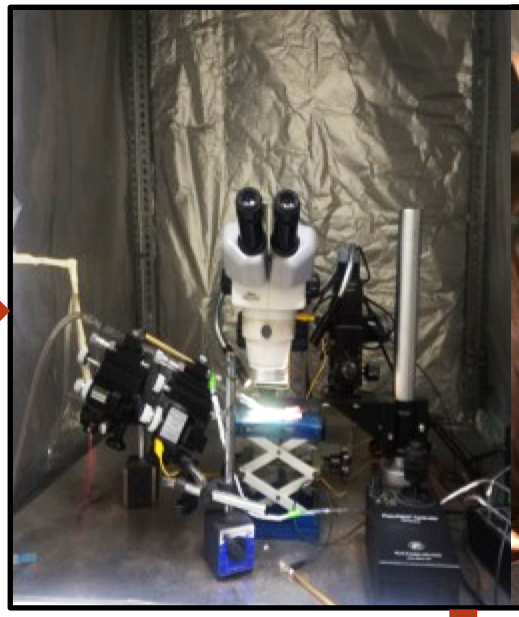


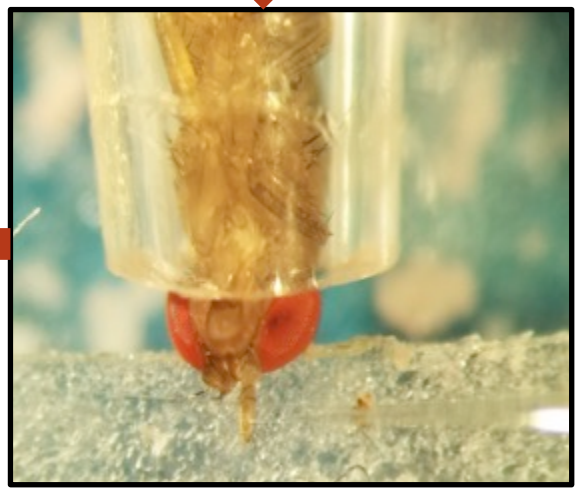


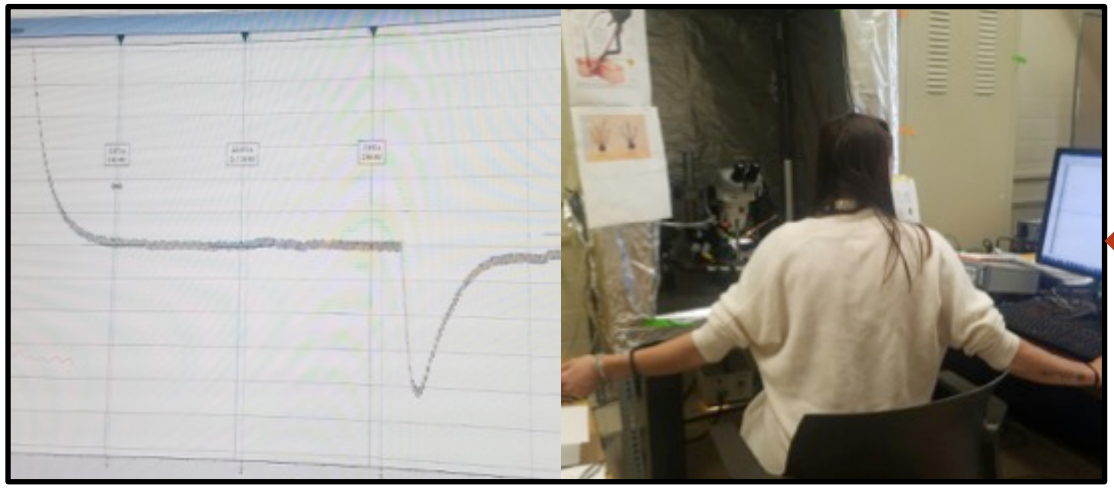
DO SUMMER AND WINTER MORPHS RESPOND DIFFERENTLY TO ECOLOGICALLY RELEVANT VOLATILES?

Comparing morphs using EAG





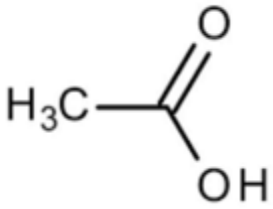




EAG Volatiles tested

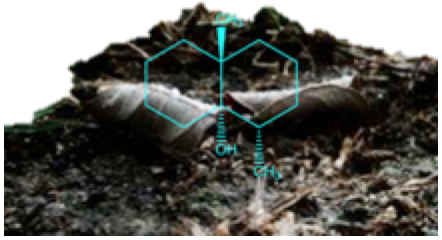
Acetic Acid

Vinegar



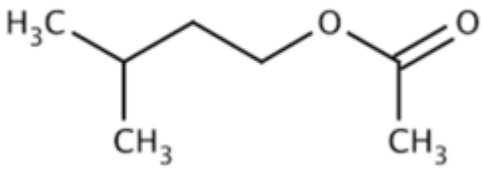
Geosmin

Earth



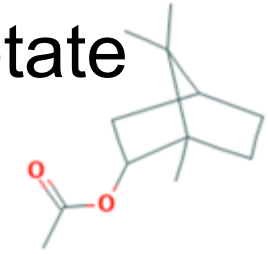
Isoamyl Acetate

Banana



Bornyl Acetate

Pine

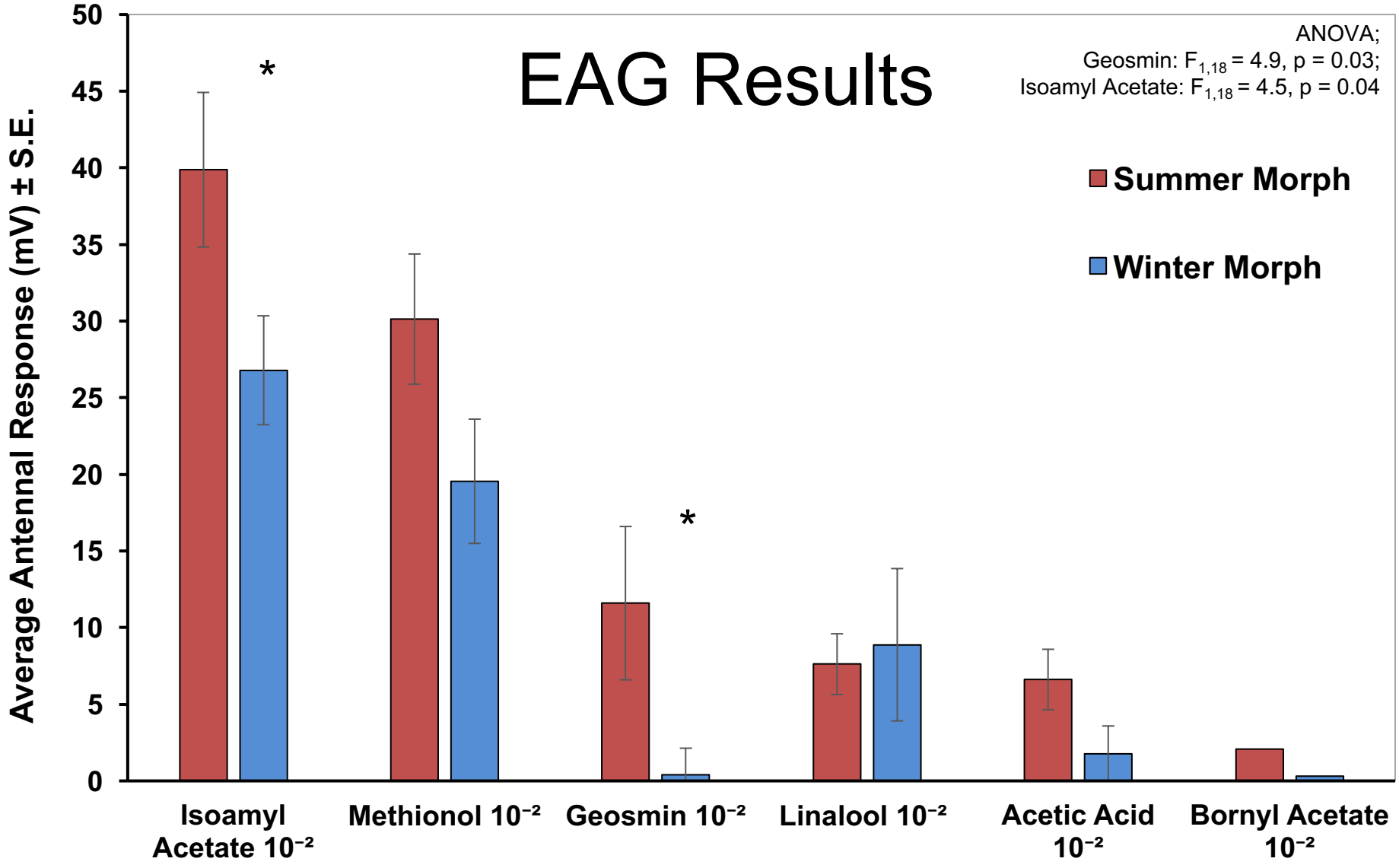


Methionol

Fermentation

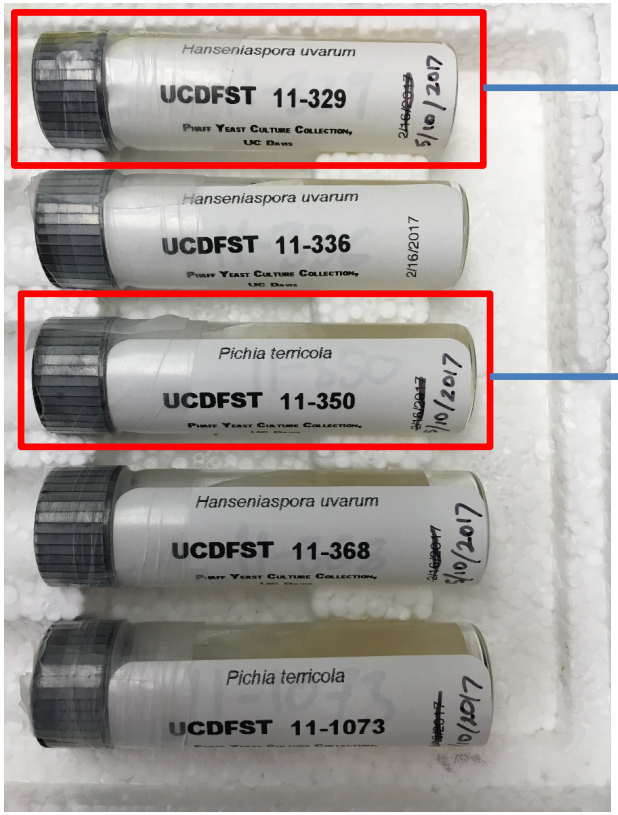
Linalool

Floral


EAG Results
ANOVA;
Geosmin: $F_{1,18} = 4.9$, $p = 0.03$;
Isoamyl Acetate: $F_{1,18} = 4.5$, $p = 0.04$
Summer Morph
Winter Morph
Average Antennal Response (mV) ± S.E.
50
45
40
35
30
25
20
15
10
5
0
*
*
Isoamyl Acetate 10^{-2}
Methionol 10^{-2}
Geosmin 10^{-2}
Linalool 10^{-2}
Acetic Acid 10^{-2}
Bornyl Acetate 10^{-2}

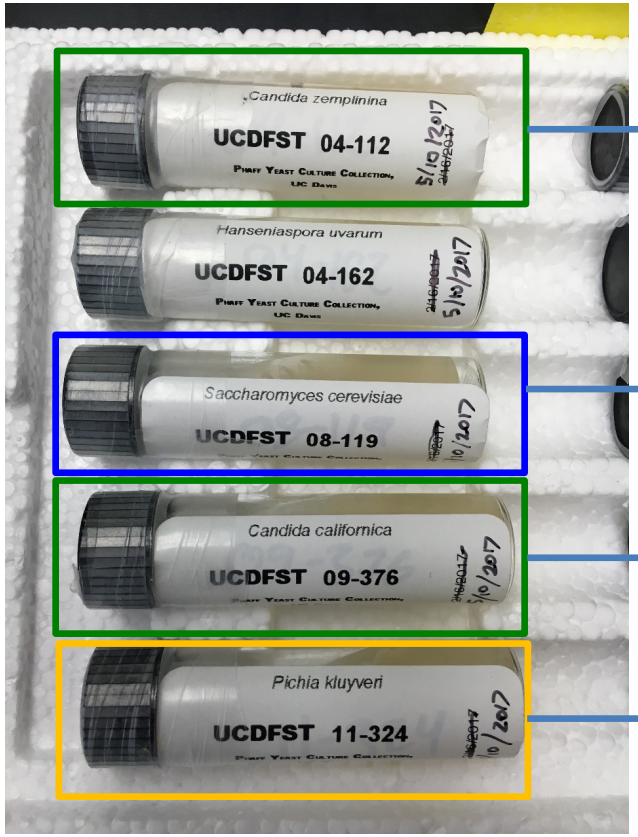
We need better attractants for use in trapping, insecticidal baits or attract and kill

Yeast strains



H. uvarum

P. terricola



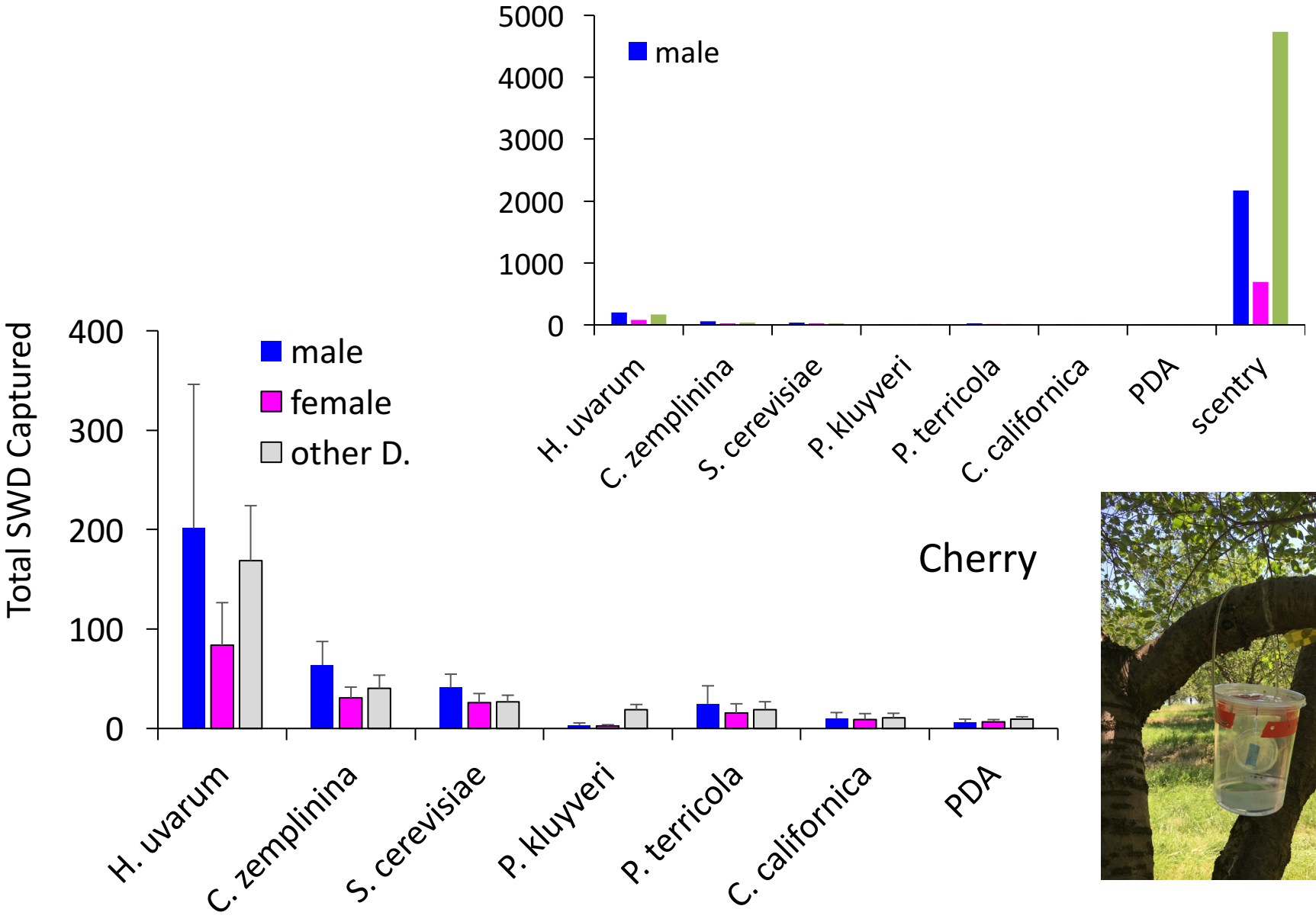
C. zemplinina

S. cerevisiae

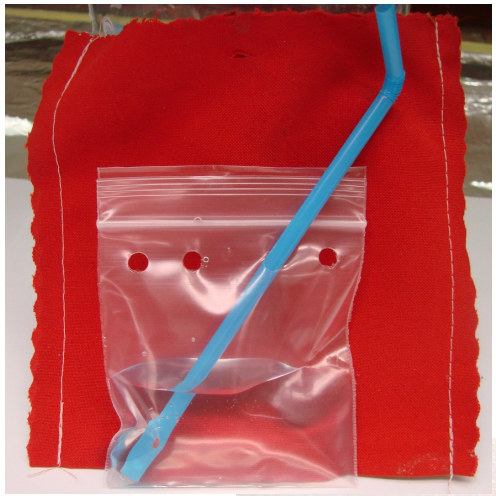
C. californica

P. kluyveri

Attractions to Yeast Strains by SWD

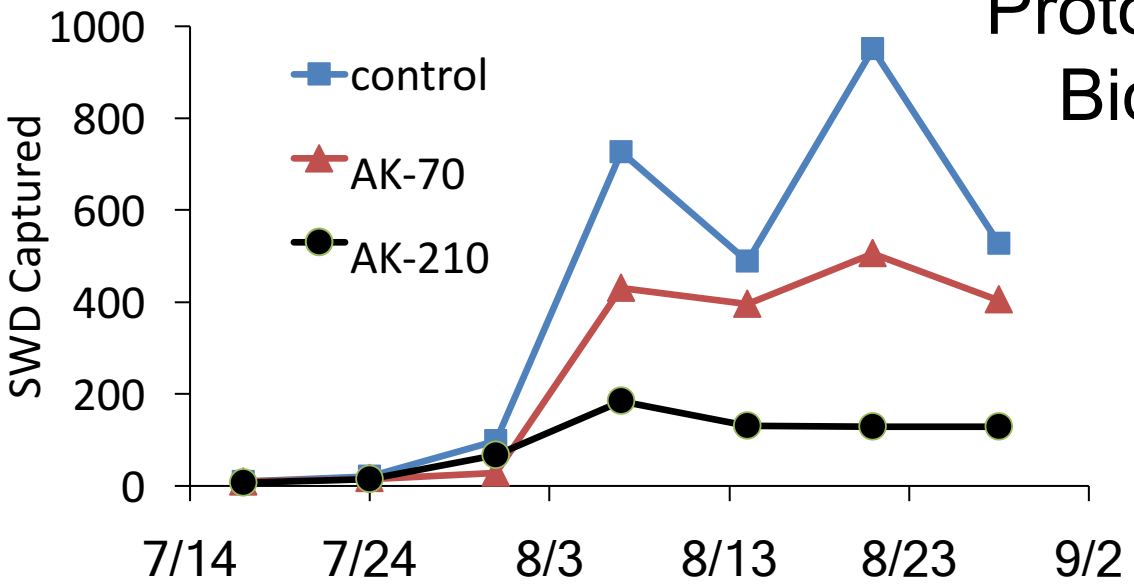

5000
4000
3000
2000
1000
0
male
H. uvarum
C. zemplinina
S. cerevisiae
P. kluyveri
P. terricola
C. californica
PDA
scentry
Total SWD Captured
400
300
200
100
0
male
female
other D.
Cherry
H. uvarum
C. zemplinina
S. cerevisiae
P. kluyveri
P. terricola
C. californica
PDA

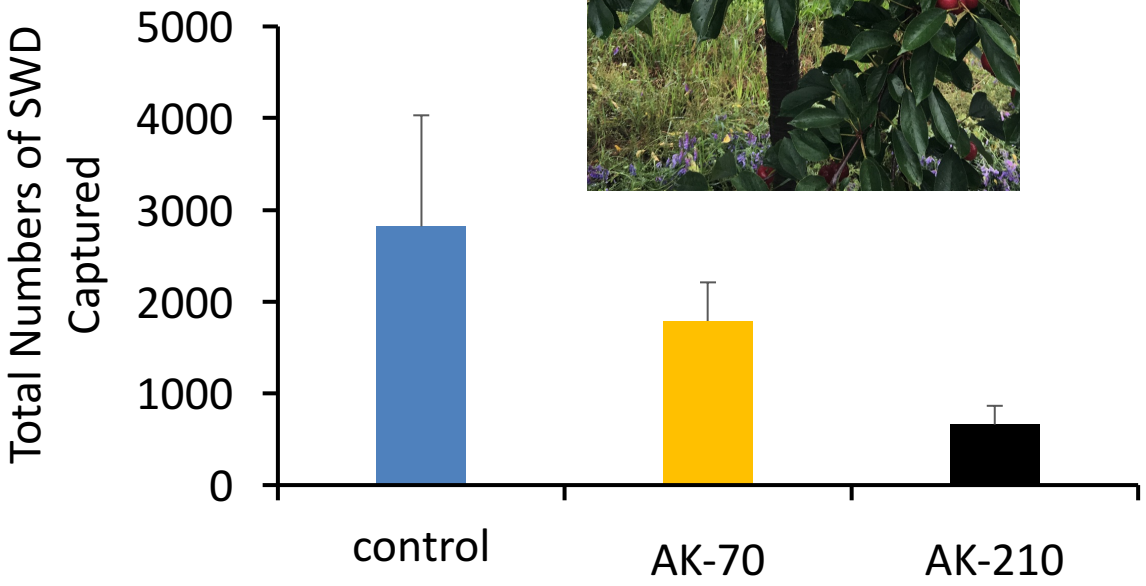
Attract-and-kill



SPLAT® SWD

Prototype from SinoGreen Biological Technology





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  - MI Cherry Committee
  - MI Horticultural Society
  - MI Project GREEEN
- Julianna Wilson
- Terrific staff
  - Gut lab: Michael Haas, Juan Huang, Chris Adams, John Po
  - Rothwell lab: Karen Powers
  - Dong lab
  - Many summer assistants

- MSU field team:

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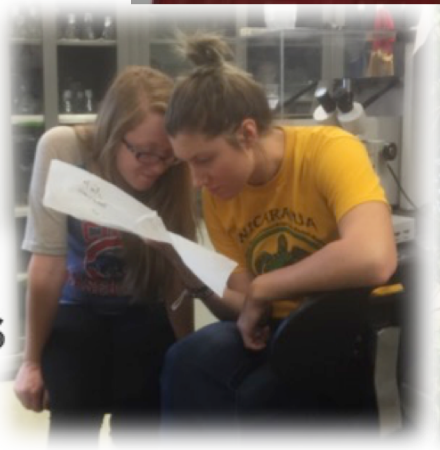
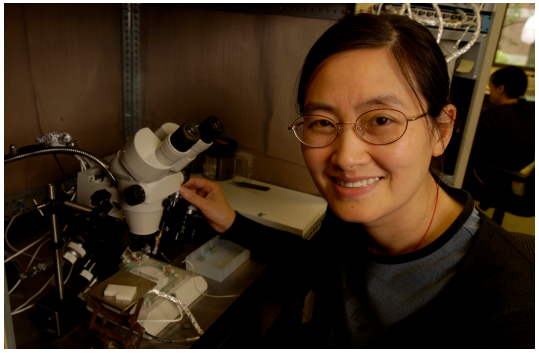


Project GREEEN

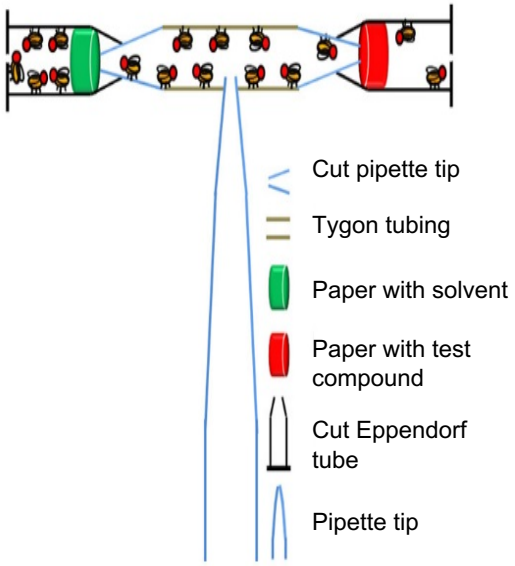
Montmorency Tart Cherries

Potential repellents

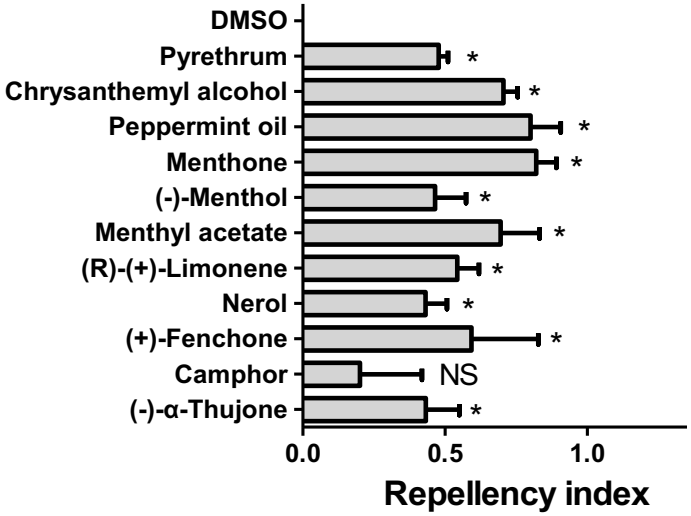


Ke Dong lab

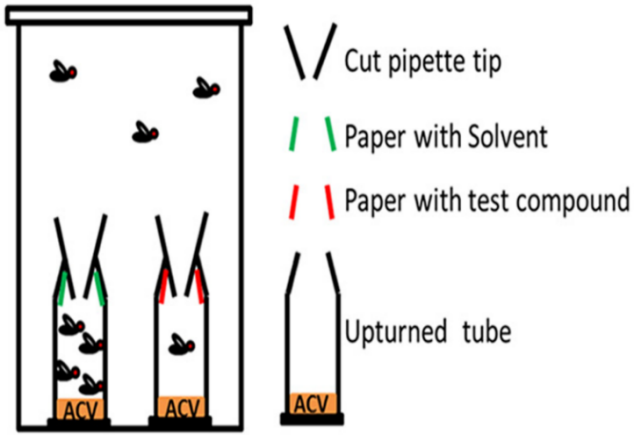
T-maze assay



D. suzukii



Two-choice assay



D. suzukii