



# *Strawberry pre plant meetings, 2020*

## Pest management considerations

## Pollination biology

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# Pest management considerations

## Pre plant

*Examine transplants  
for pests &  
communicate with  
nursery if detected*



## Post plant

*Scout weekly through  
at least November*



## Spring

*Begin weekly scouting  
once temperatures  
exceed 50F*



## Pre plant observations

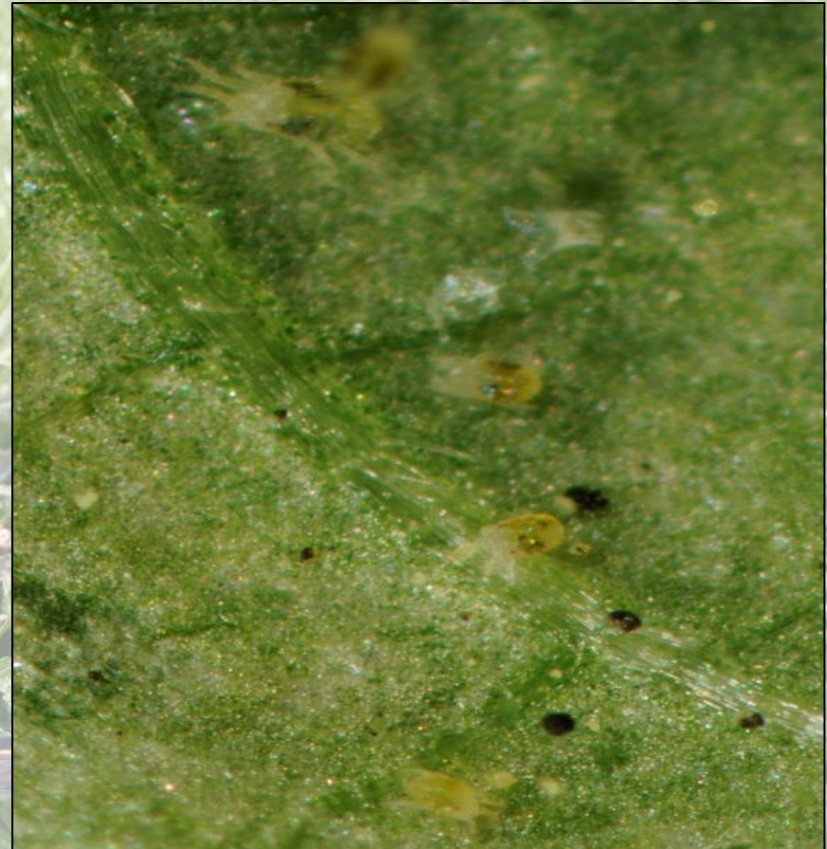
- Check for spider mites using a minimum 10x hand lens and observing 10% of plants, distributed through flats





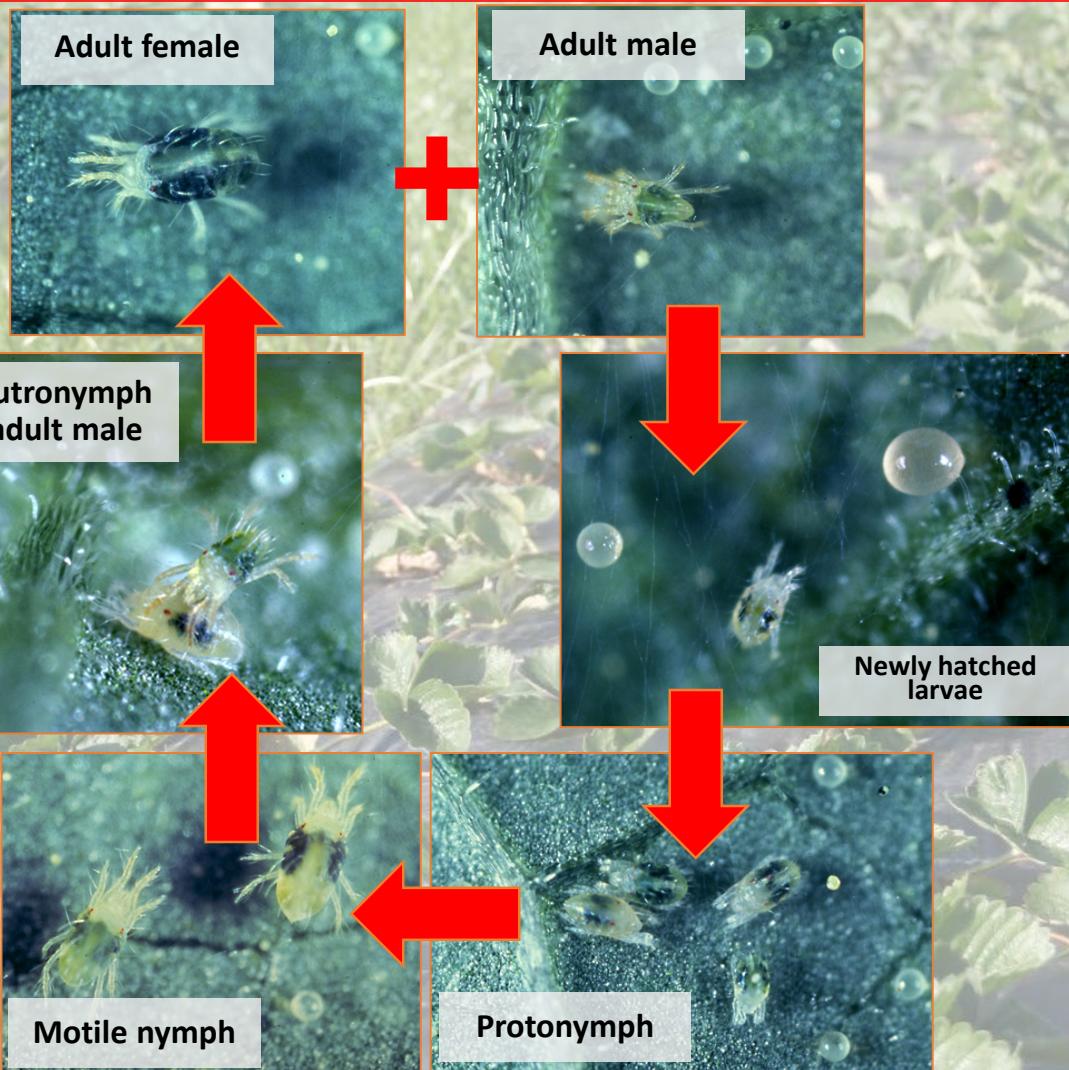
## Pre plant observations

- Check for spider mites using a minimum 10x hand lens and observing 10% of plants, distributed through flats
- Also note aphids or any deformed new growth (a sign of cyclamen mites)





# Twospotted spider mite life cycle



**7 to 40 days,  
depending on  
temperature**

**Development  
occurs at 50F**



# If you find mites in the fall, what should you do?

## Treat!

### Conventional spider mite control options

Material	IRAC Group	Target life stage	Efficacy Rating (1-4)
Agri-Mek	6	Motiles	3
Savey	10A	Immatures	3
Zeal	10B	Immatures	3
Acramite	20D	Motiles, some egg	4
Vendex	12B	Motiles	2
Kanemite	20B	Motiles, some egg	4
Oberon	23	Immatures, some adult	4
Portal	21A	Motiles	3
Nealta	25	All stages	4

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Acceptable for use in greenhouses and/or strawberry nurseries.

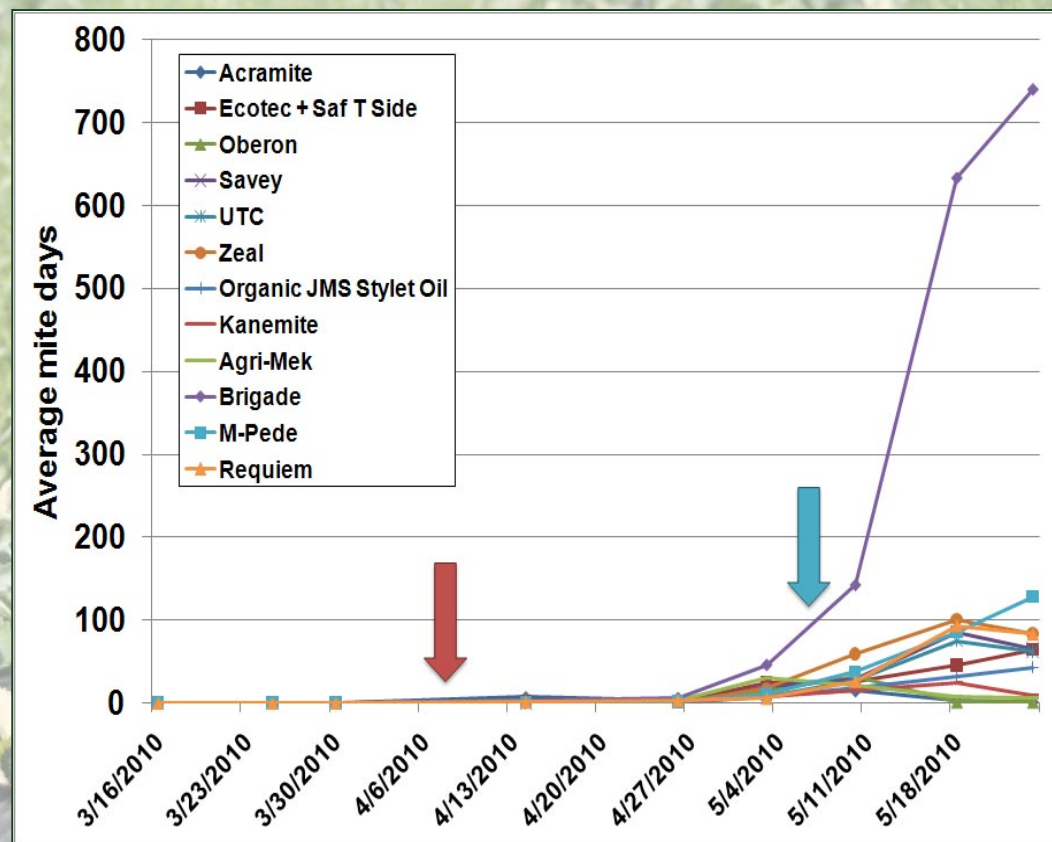
Avoid use in fall on contaminated plants or check with plant supplier to determine prior miticide use



## Conventional spider mite control options

**Avoid pyrethroids  
(IRAC 3) in fall or  
spring when mites  
are present**

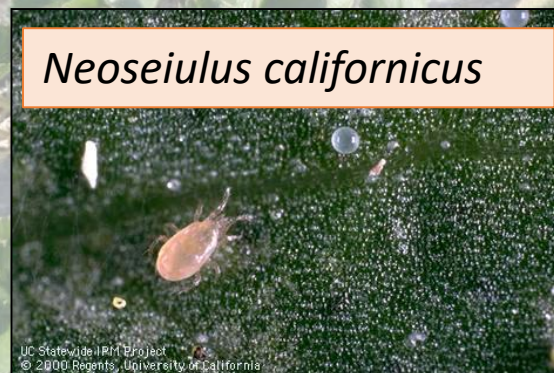
**Spring treatment  
threshold is 5  
TSSM/leaflet**





## Biological spider mite control options

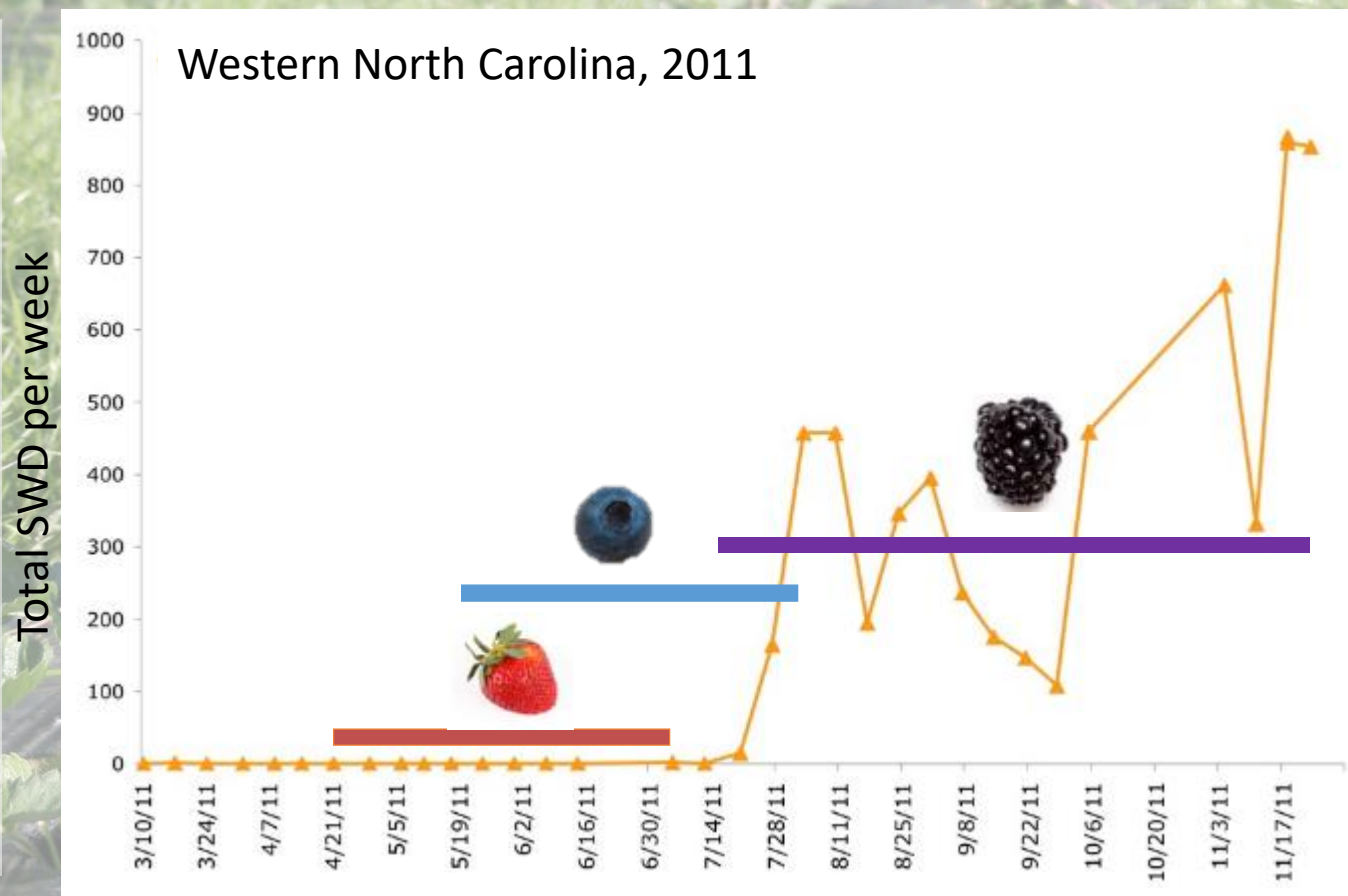
**Biological control is unlikely to suppress populations due to contamination in the fall and winter, but can be a good option in spring when temperatures begin to exceed 50F**





# SWD in strawberries

- Spotted wing drosophila (SWD) is not a consistent pest in spring-fruiting strawberries
- Fall fruiting berries are at high risk
- In most years, the small infestation present can be managed through cultural control





# SWD in strawberries – Post harvest concern?

Slides - hjbu... X | M Burack 6-ac... X | ENT 510 Con... X | North Caroli... X | G part of a blue... X | Are There Re... X

buzzfeed.com/kristatorres/little-bugs-live-in-strawberries-so-you-should-al

Apps PINS Sponsored P... North Carolina Stat... CALS Business Ope... NCSU Zoom

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Food • May 19, 2020


## If You Wash Berries In Salt Water, Little Bugs Will Start To Crawl Out

It's true. I saw it happen before my very own eyeballs.

by **Krista Torres**  
BuzzFeed Staff

View 518 comments

TikTokers have recently started saying that you should wash your strawberries in salt water because bugs live inside them.



Slides - hjburack... X | M Burack 6-ac... X | ENT 510 Contin... X | North Carolina... X | G part of a bluebe... X | Are There Really... X | Have flies infest... X

vitals.lifehacker.com/are-there-really-little-bugs-in-your-strawberries-1843607740

Apps PINS Sponsored P... North Carolina Stat... CALS Business Ope... NCSU Zoom

## Are There Really Little Bugs in Your Strawberries?

Beth Skwarecki  
Friday 11:45AM • Filed to: FOOD SAFETY





Photo: Shutterstock

The internet is freaking out about a [TikTok video](#) (and accompanying [Buzzfeed article](#)) showing what appear to be little worm-like bugs crawling out of fresh strawberries soaked in salt water. Is this for real? Have we been unknowingly enjoying larvae in our triple-berry parfaits? Should we just *never eat fruit again*? I talked to some experts to find out.

Here's the short answer: this is a real thing that can happen, but it's not common. And neither the food safety experts nor the bug experts advise washing your fruit in salt water.

### What is actually happening in this video?




**Brain Breaks.**  
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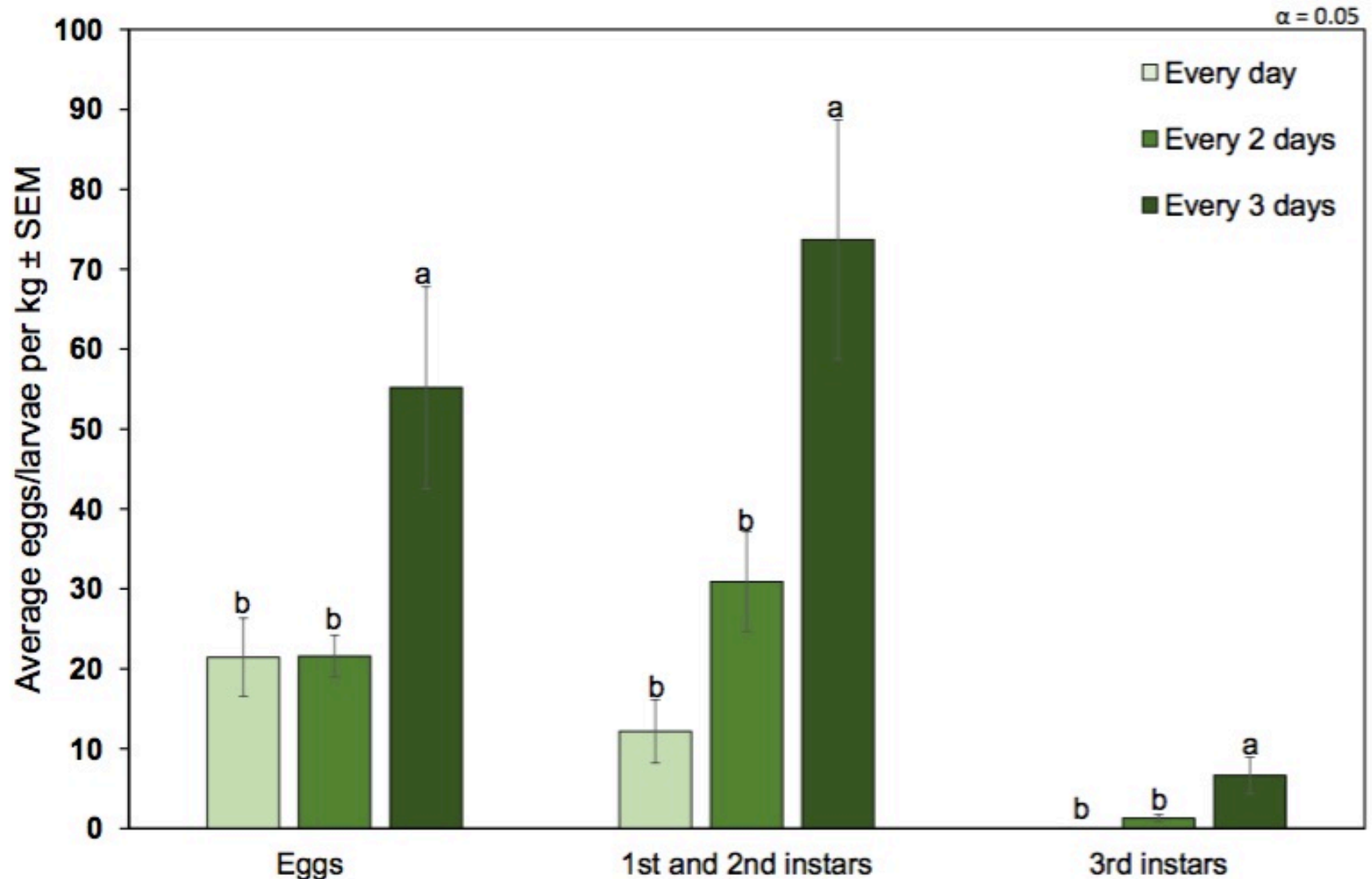
**How to Finally Start That Creative Project**  
Joel Kahn 1

**You may also like**





# Increasing Harvest Frequency Reduces Detectable Larvae: 2015





# Post harvest cold storage reduces infestation

**Field-Infested Fruit**

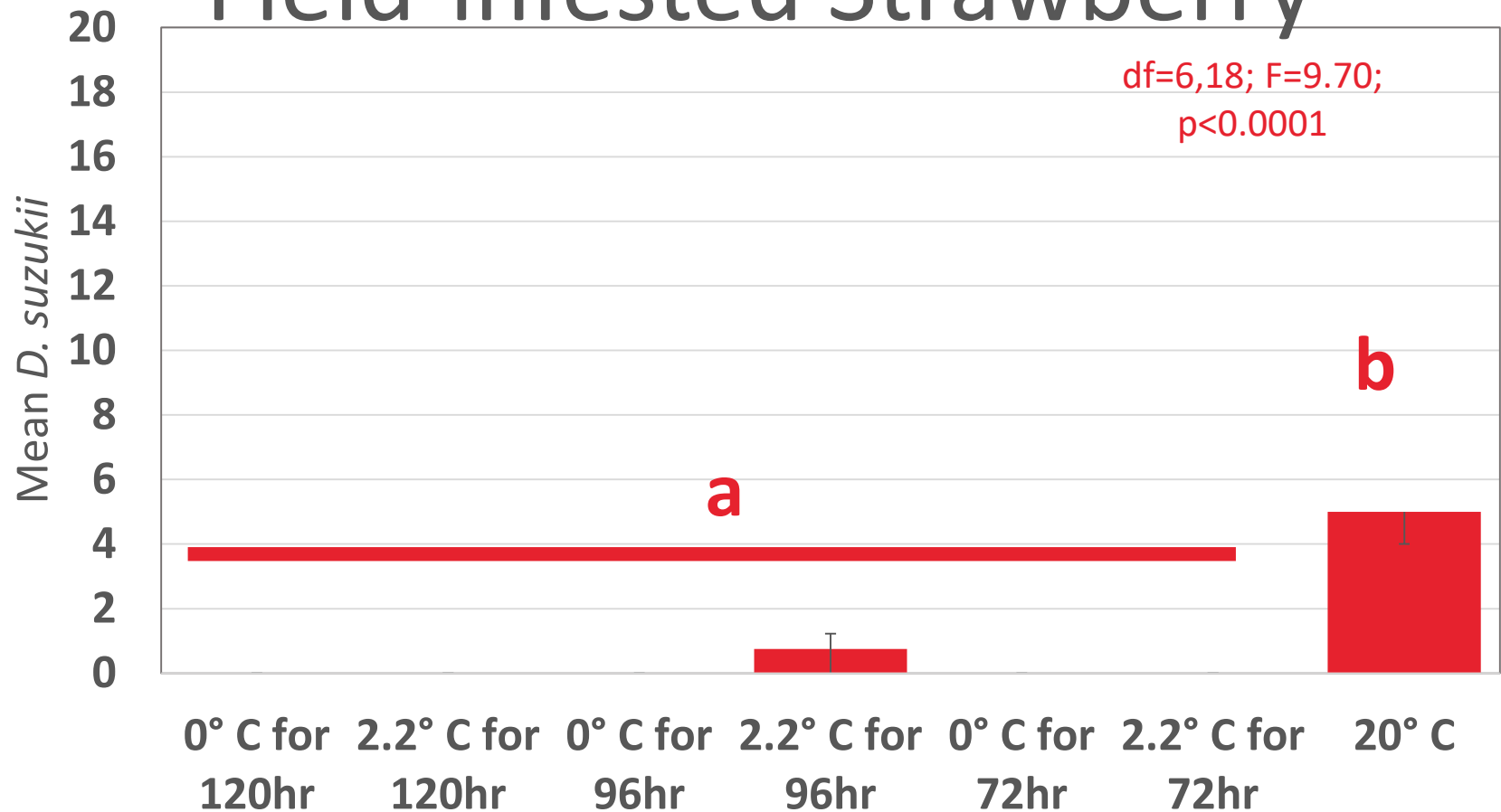


**Laboratory-Infested Fruit**



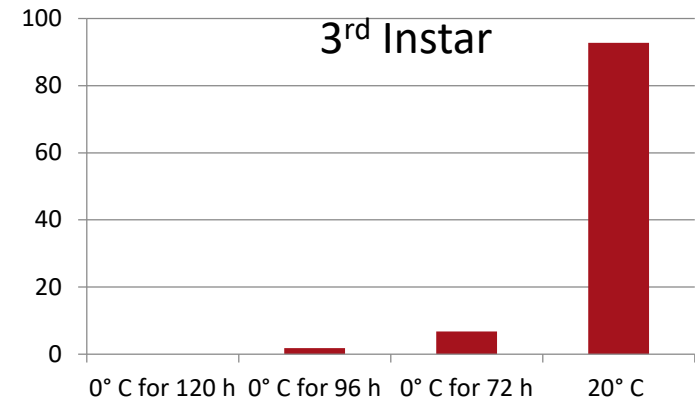
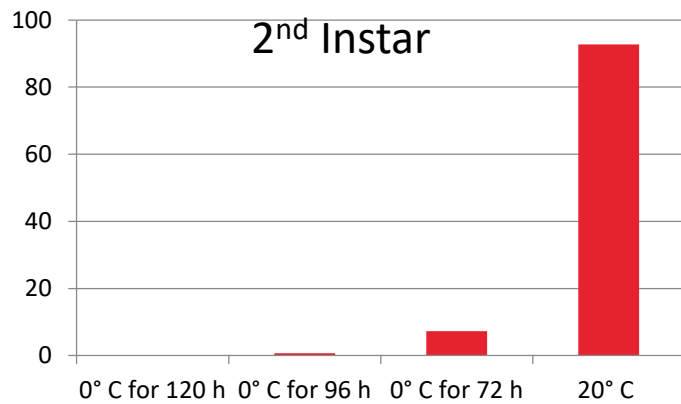
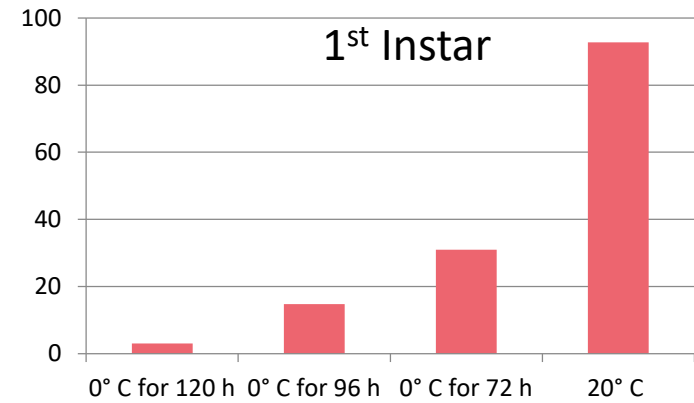
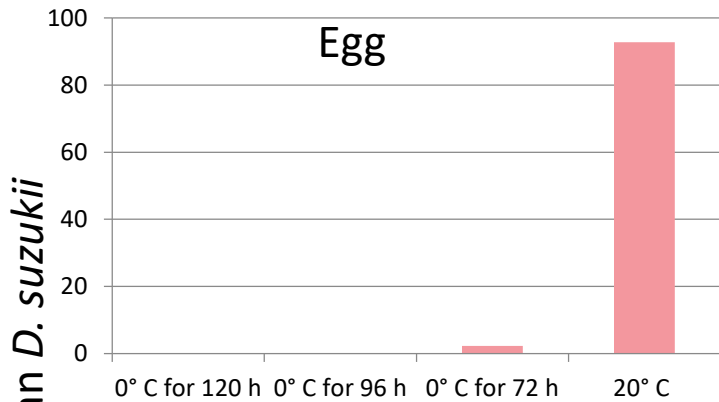


# Field-infested Strawberry





# Laboratory-Infested Strawberry





# Who pollinates strawberries?

## *Managed Honey Bees*

- Social hive nester
- Social species

## *Wild bees*

- We collected 12 different bee genera
- Mostly solitary ground nesters

## *Flies*

- Syphid (bee mimic) flies
- Other flies





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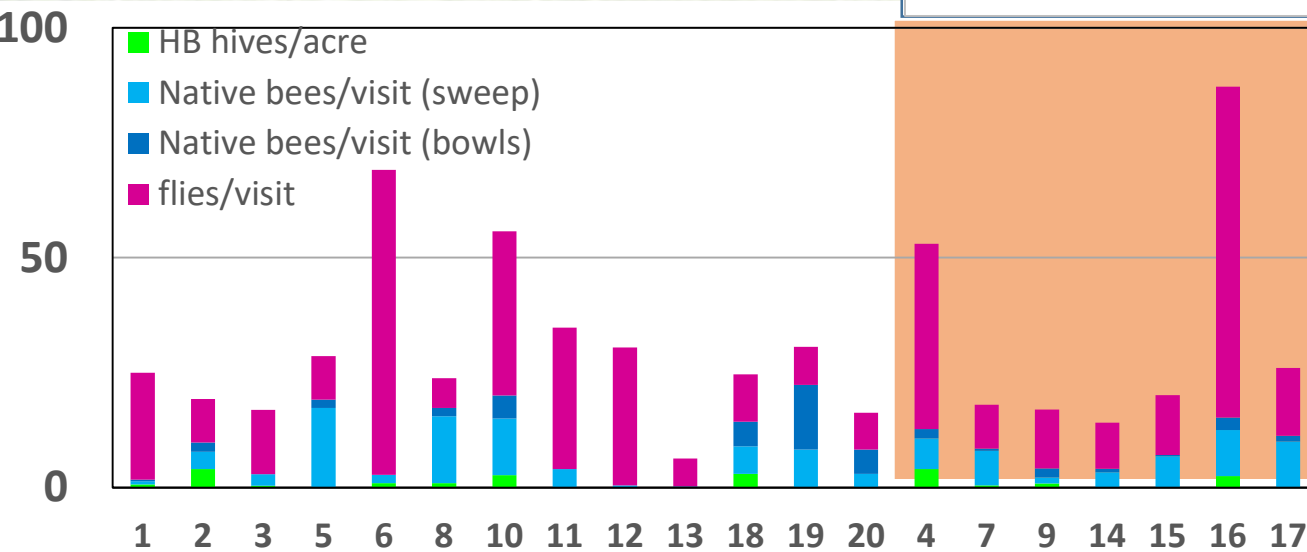
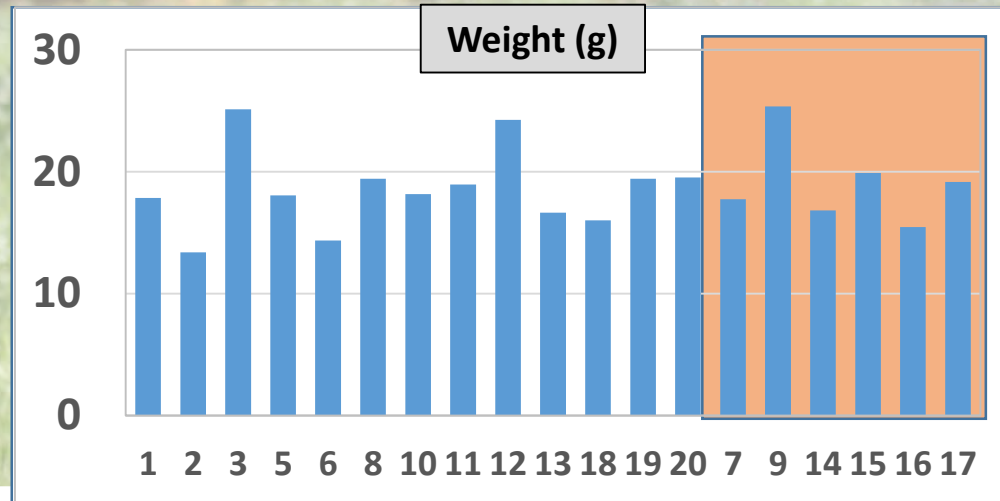
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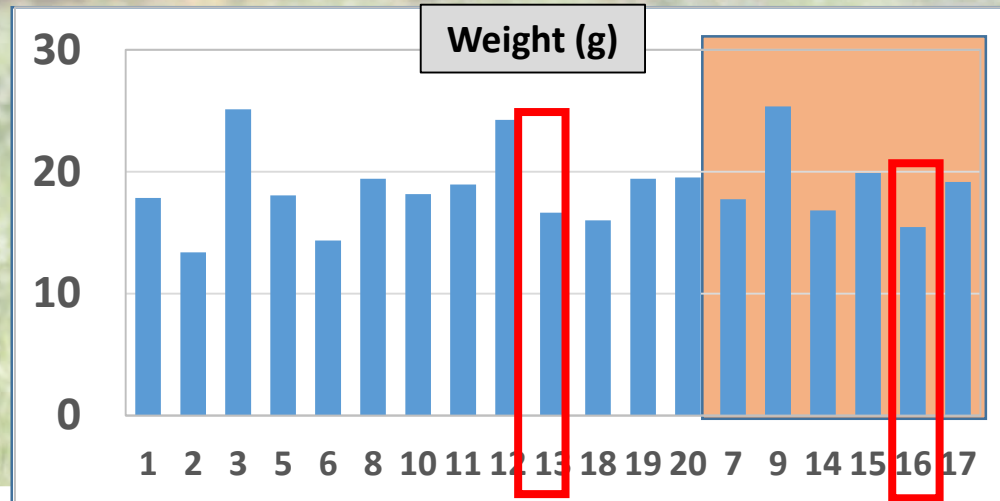
Highly variable pollinator numbers  
unrelated to strawberry weight  
and symmetry

2017

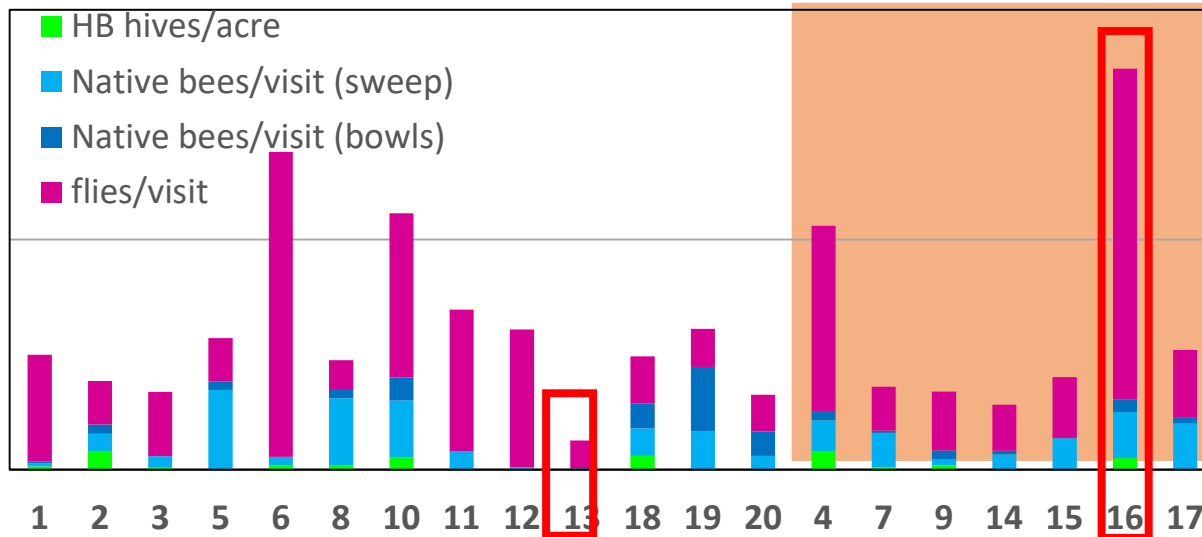


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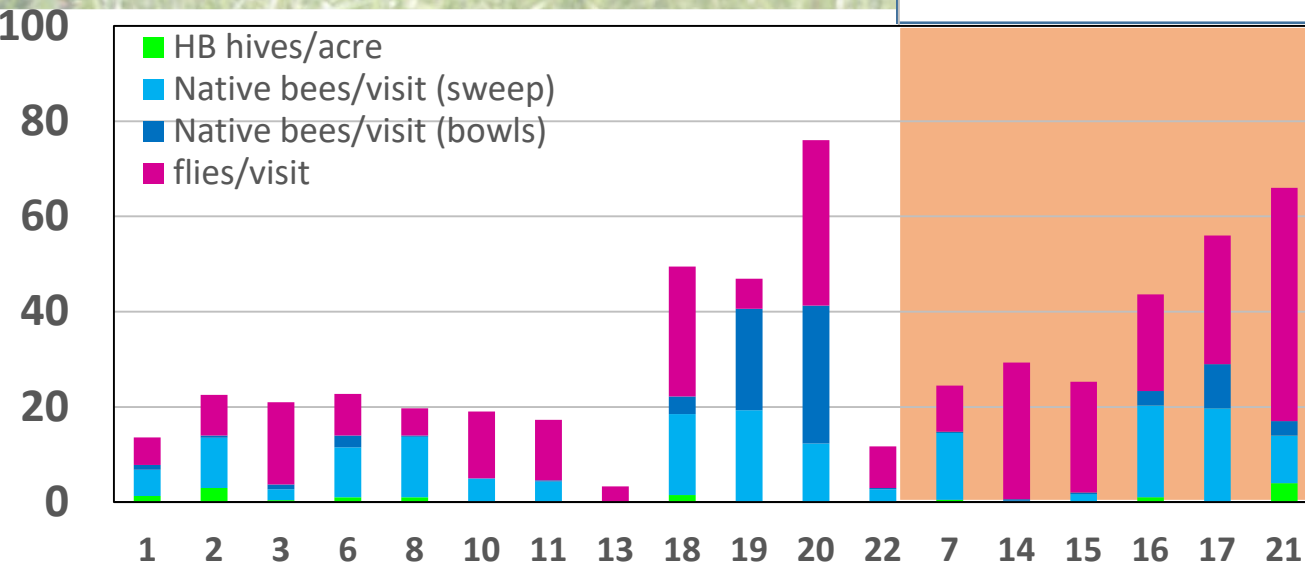
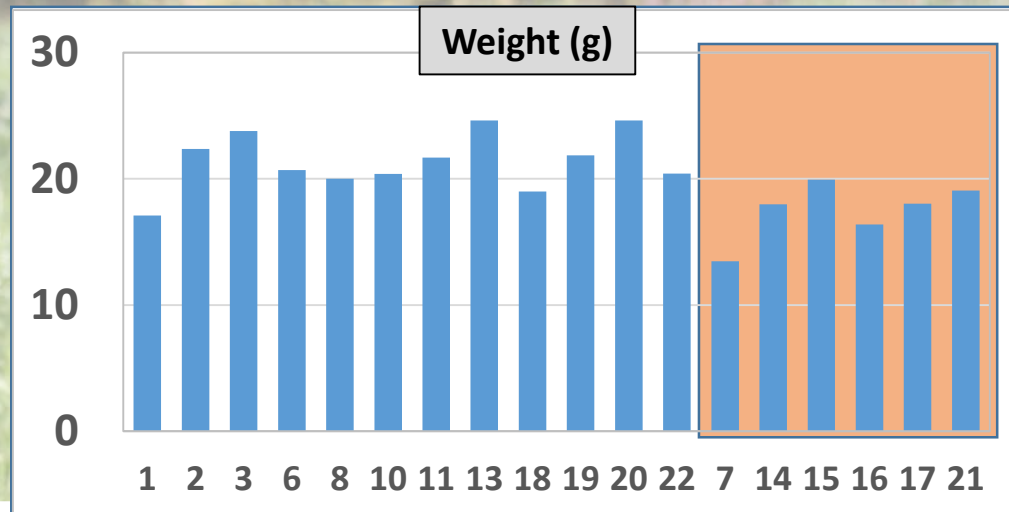
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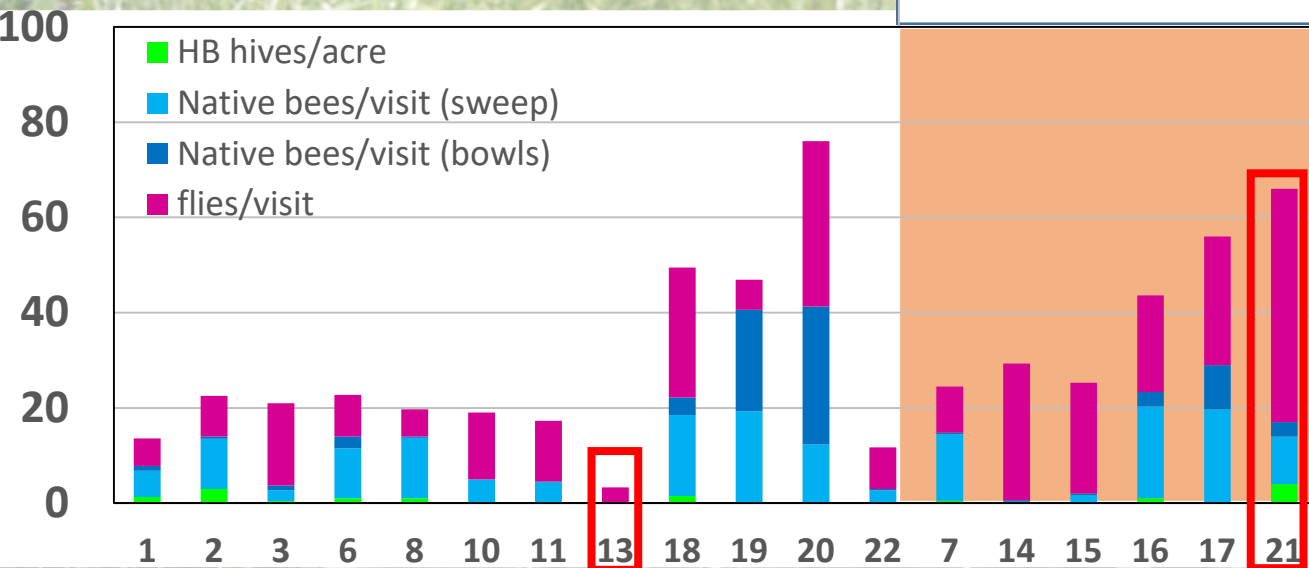
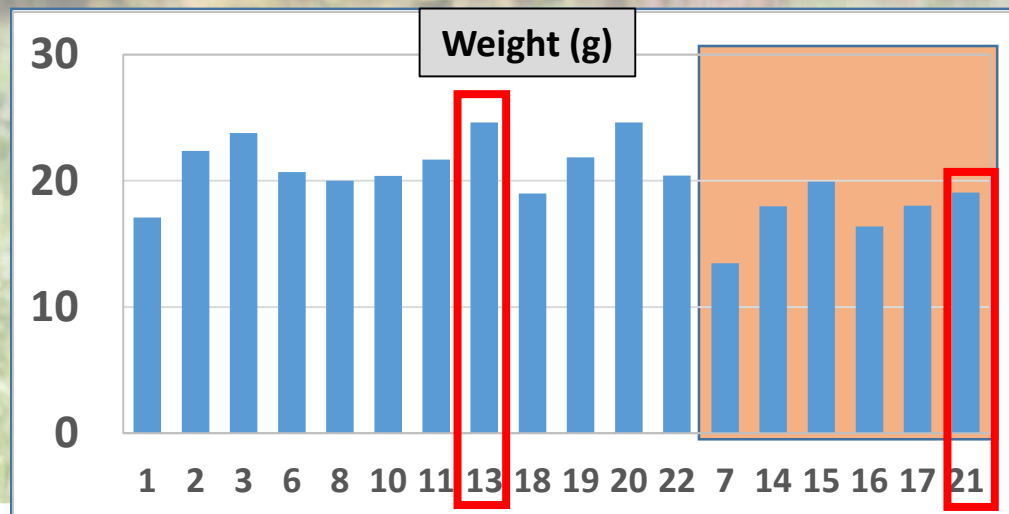
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2018



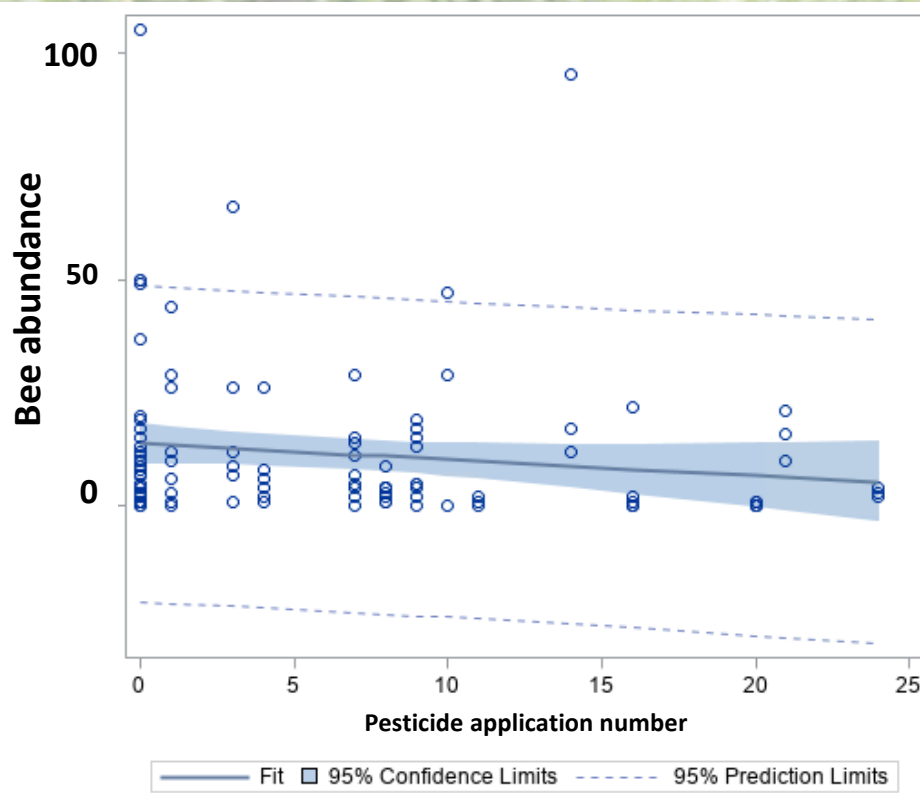
Highly variable pollinator numbers  
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and symmetry

2018





# Pesticide intensity



- Bee abundance decreased with increasing pesticide application number.
  - $-0.1858 \pm 0.044$
- Bee abundance was higher on conventional farms.
  - $1.33 \pm 0.61$



# Strawberry size and quality

- Greater proportions of agricultural land had a **positive** effect on berry symmetry





# Pollination Conclusions

- Pesticides (most were fungicides) can negatively impact pollinators in strawberries
- Insect pollinators do not appear to benefit strawberry weight or symmetry
- Therefore pesticide impacts on pollinators may be more important for other crops within a farm.
- Unless honey bees are needed for other crops at the same time, stocking them may be unnecessary in strawberries



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