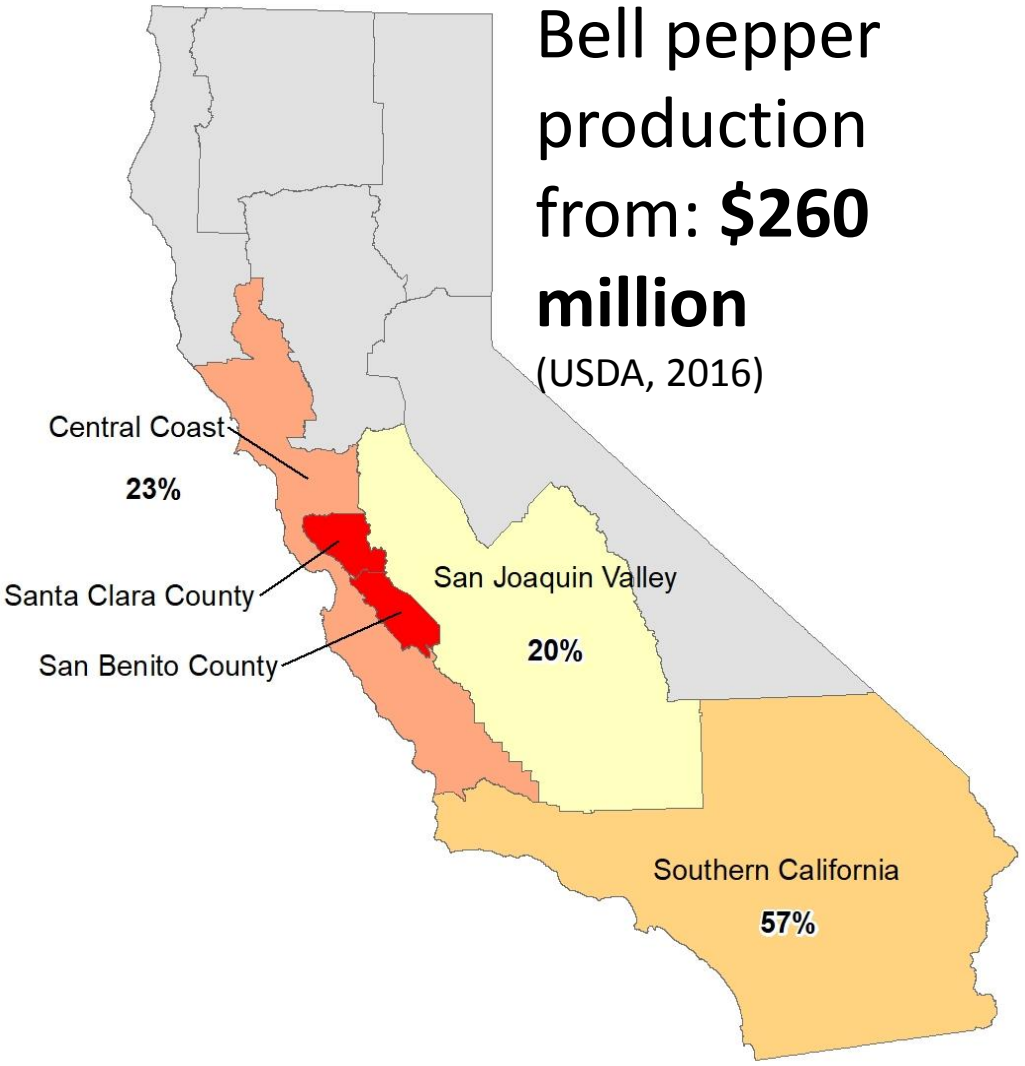
Understanding the Season Long Incidence of Pepper Weevil in the Santa Clara and San Benito Pepper Production Areas

Elisa Mineo, Aparna Gazula
Small Farm Program
UCCE Santa Clara County

UC CE University of California Agriculture and Natural Resources Cooperative Extension

The Pepper Production in Santa Clara and San Benito Counties

Bell pepper production from: **$260 million**
(USDA, 2016)



The Pepper Production in Santa Clara and San Benito Counties

- Period of production: from May to November
- Several varieties
- Irrigation: drip
- Market: fresh market and processing

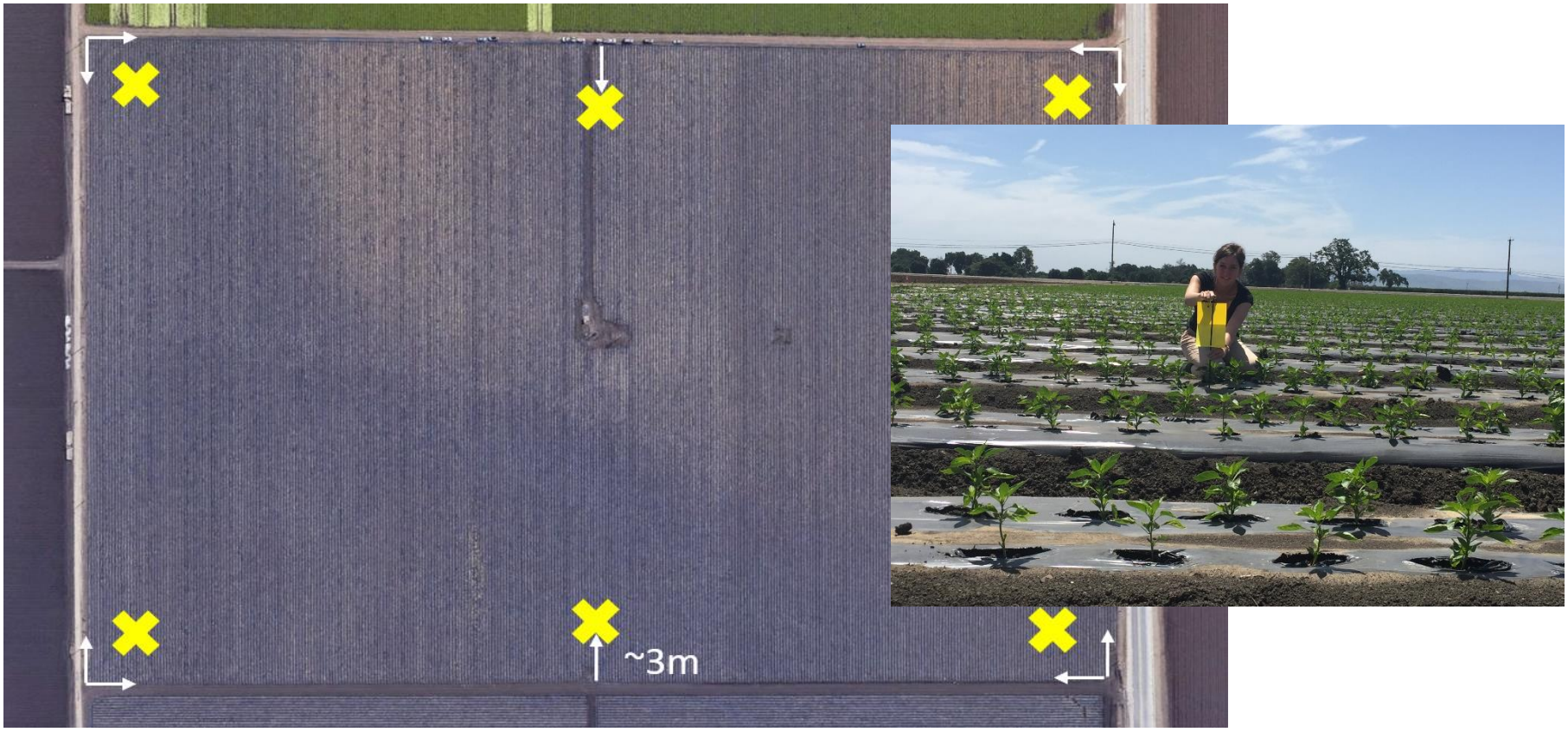
Problem

In 2015, heavy infestation of pepper weevil in two pepper fields in Santa Clara County

Materials and methods

1. Field Monitoring

Monitoring of 63 fields in 2016 and 60 fields in 2017 using pheromone baited yellow sticky traps.



Six traps in each field installed at 3m from the edge

1. Field Monitoring

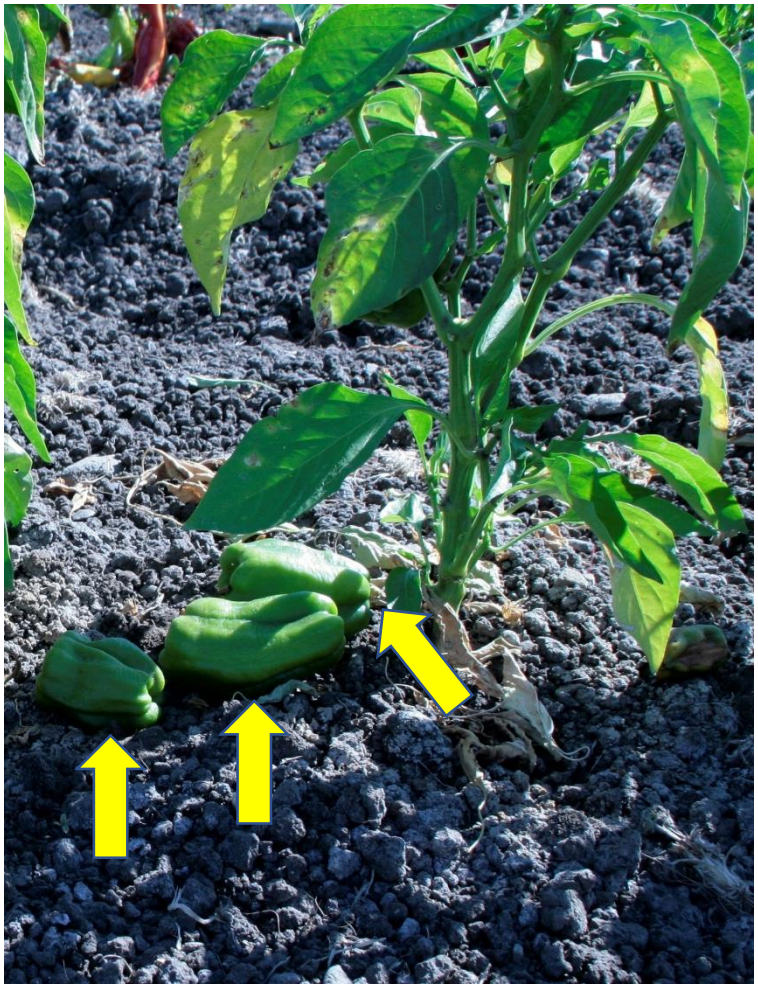
May 2017

October 2017

Pepper weevil on a trap

Trap height adjusted with plant growth

2. Fruit Dropping Monitoring



Infested fruits prematurely aborted in two fields in San Benito County

Results

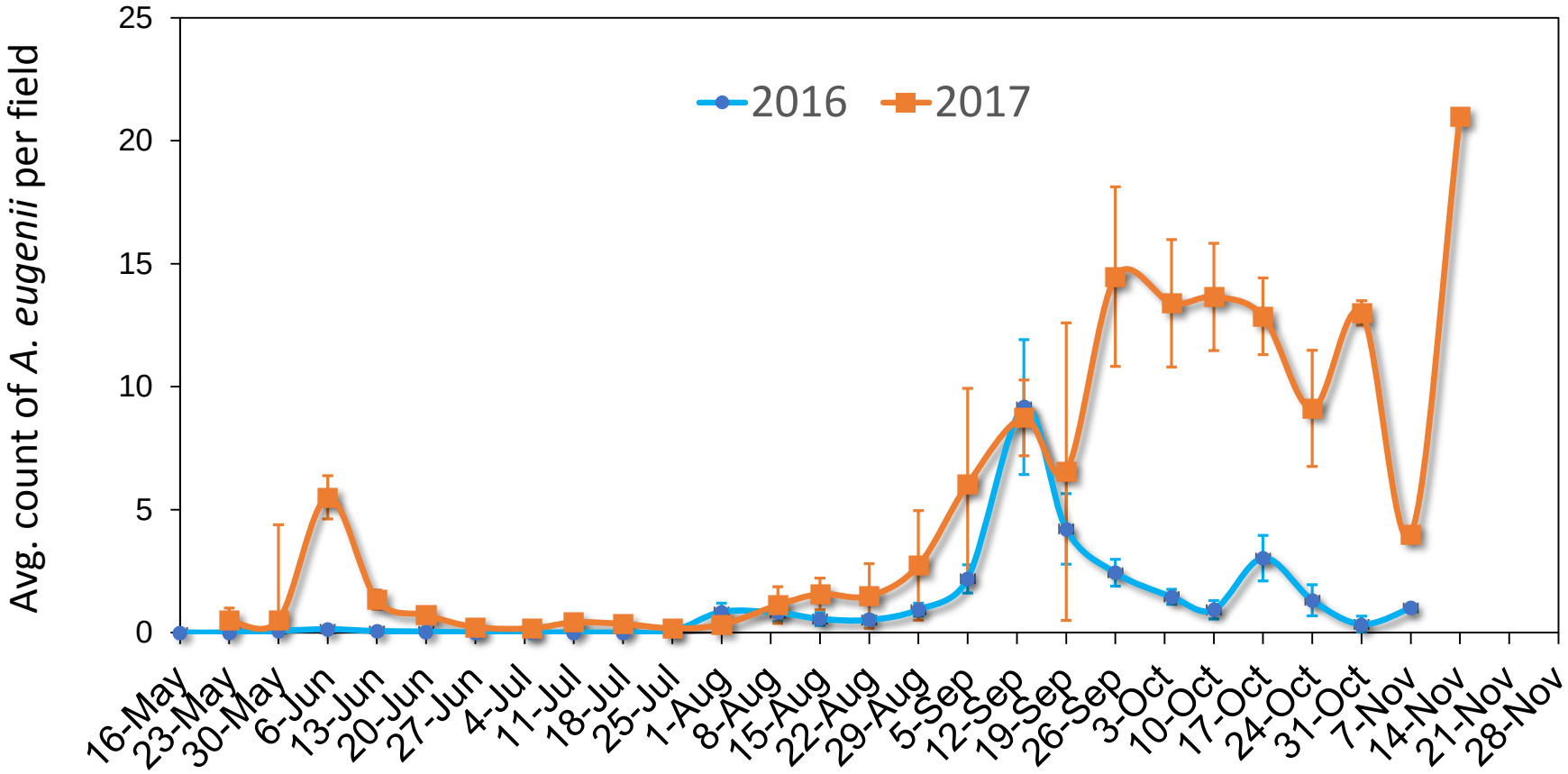
1. Dropped Fruits Inspection

Fruit decay around the calyx and adult pepper weevil

Adult pepper weevil and larva observed in the microscope

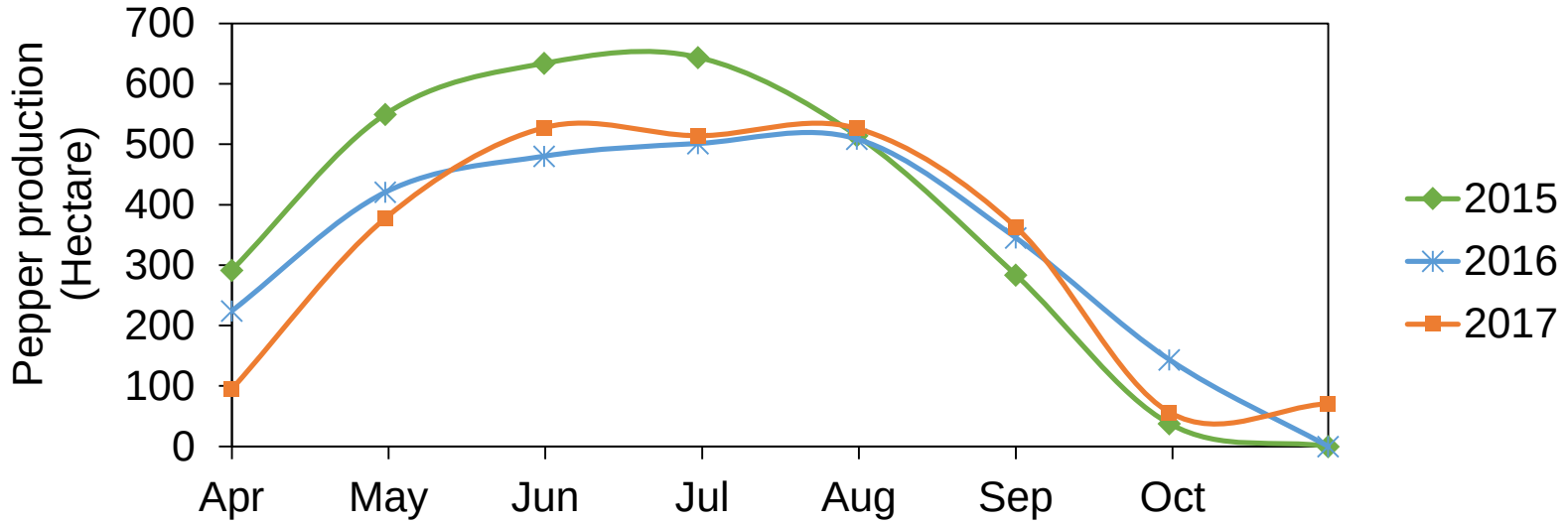
2. Weekly Counts

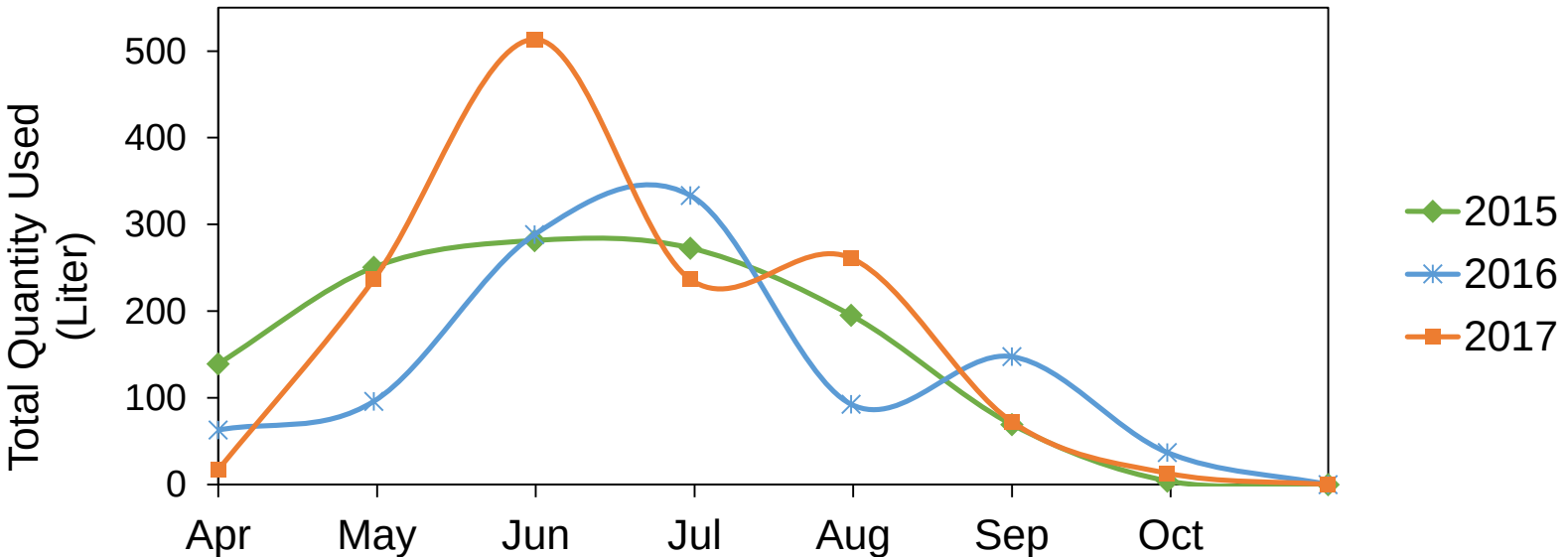
	2016	2017
Total Seasonal Weevil Counts in Traps	1,106	3,100
Percentage of Total Number of Fields Infested	85%	83%



What are the practices to manage pepper weevil?

Pepper weevil pesticides use from 2015 to 2017 in Santa Clara County (Santa Clara County Division of Agriculture, 2018)



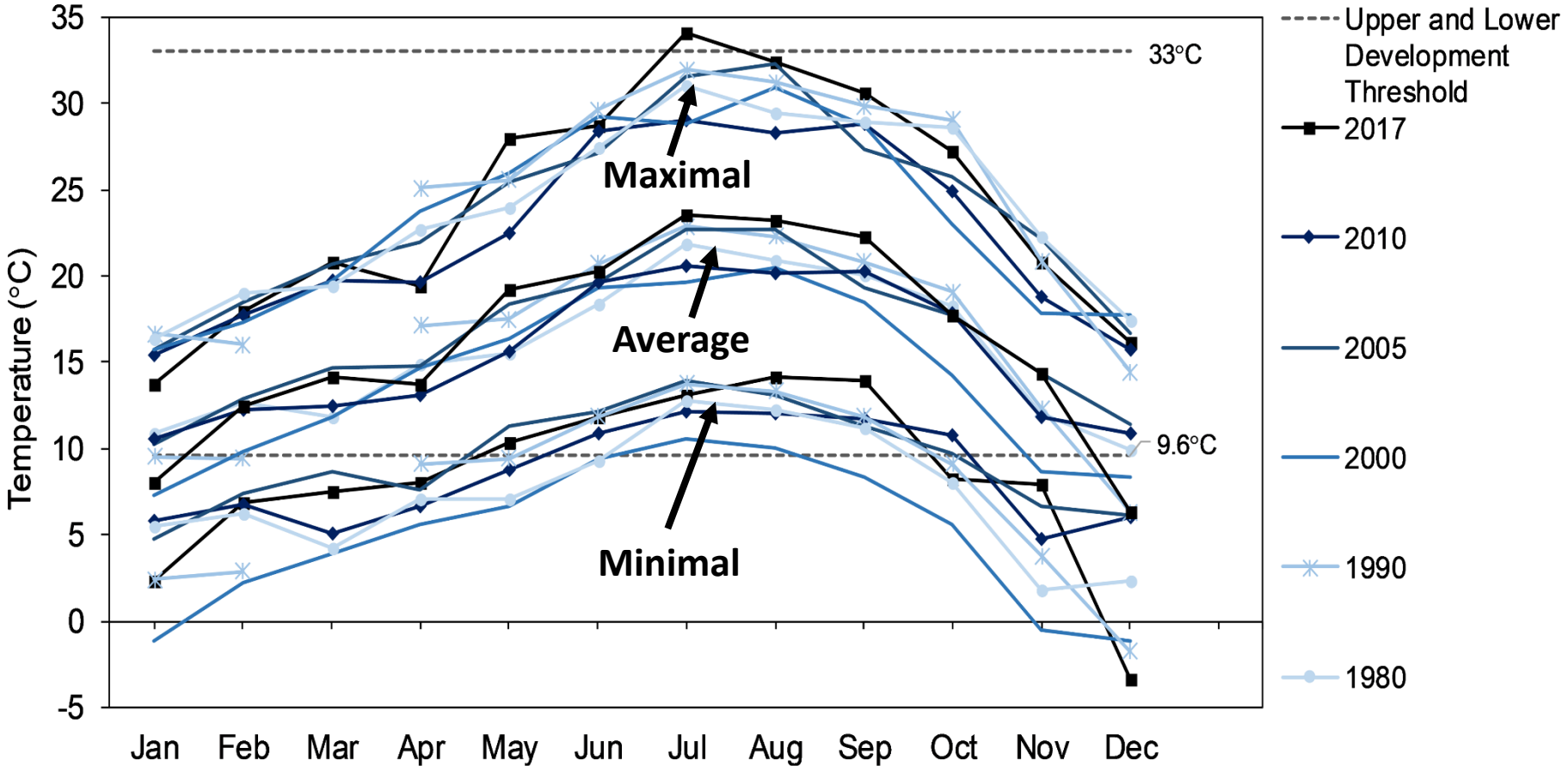


Why do these continuous and heavy infestations happen now?

- Prolonged and continuous infestations over several years never seen before
- Does the weevil overwinter? Two factors to consider: temperature and food

Is the pepper weevil overwintering?

Temperature in Gilroy, Santa Clara County from 1980 to 2017 (Agricultural Applied Climate Information System, Toapanta et al. 2005)



Potential alternative hosts in California

University of Cal. Integrated Pest Management, 2016

Silverleaf nightshade
(*Solanum elaeagnifolium*)

American black nightshade
(*Solanum americanum*)

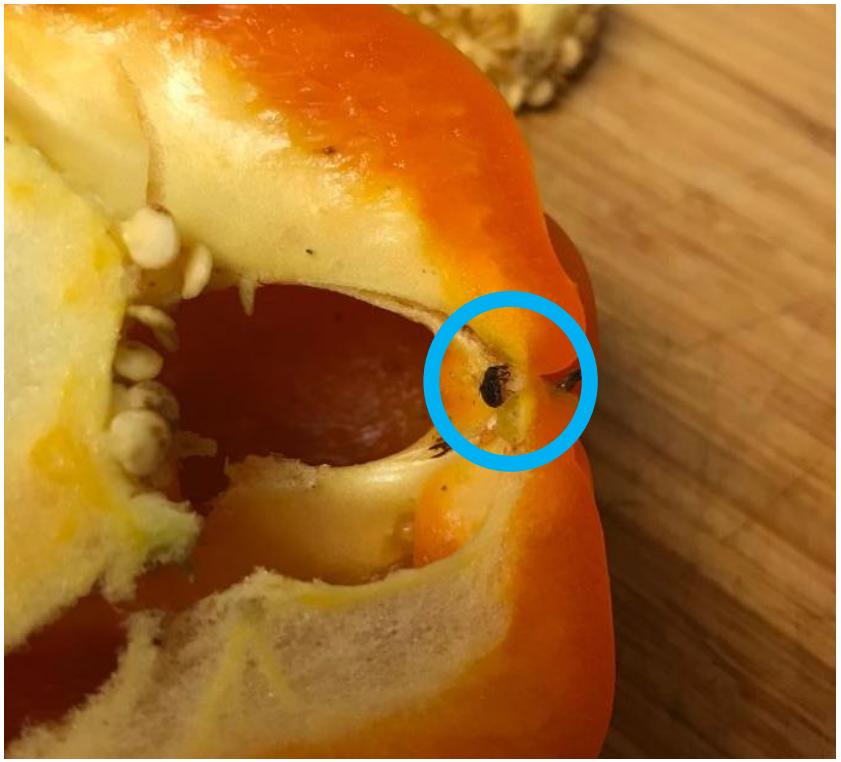
There is potential for the weevil to overwinter in the region. We still don't know why this is happening now.

Other regions where pest has recently become a problem: Example New Jersey, 2015

Is the pepper re-introduced each year from southern growing regions?

Pepper sometimes do not show any sign of infestation

Based on personal observation and literature (Ingerson-Mahar, J., B. Eichinger, and K. Holmstrom. 2015)



Imported pepper from Mexico infested with weevil

Conclusion

- Continuous infestation from 2015 and increased in 2017
- Further investigations to shape management plans
- Current management recommendations:
  - Spray early, mid and late season
  - Monitor for alternative hosts before transplanting