

# BMSB in California: Current and future status

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# California produces...



In 2019, California's farms and ranches received more than \$50 billion in cash receipts from > 400 commodities (13% of US total ag value). Over a third of the country's vegetables and two-thirds of the country's fruits and nuts are grown in California .

Top commodities include:

Dairy Products, Milk — \$7.34 billion

➔ Almonds — \$6.09 billion

➔ Grapes — \$5.41 billion

Cattle and Calves — \$3.06 billion

Strawberries — \$2.22 billion

➔ Pistachios — \$1.94 billion

Lettuce — \$1.82 billion

➔ Walnuts — \$1.29 billion

Floriculture — \$1.22 billion

Tomatoes — \$1.17 billion

➔ Stone fruit — \$0.4 billion

# BMSB – Almonds



110 nuts/sq. ft.



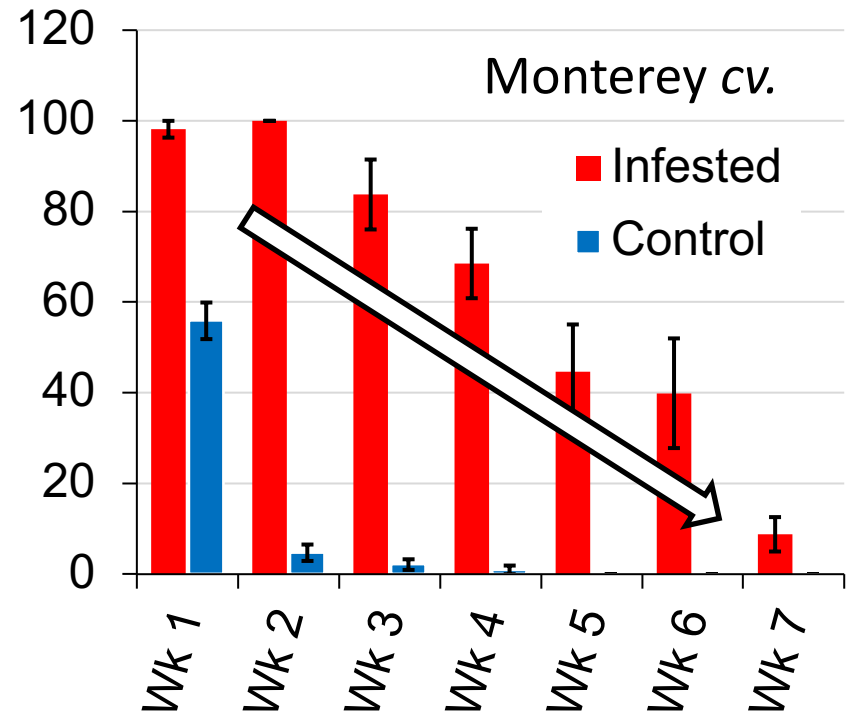
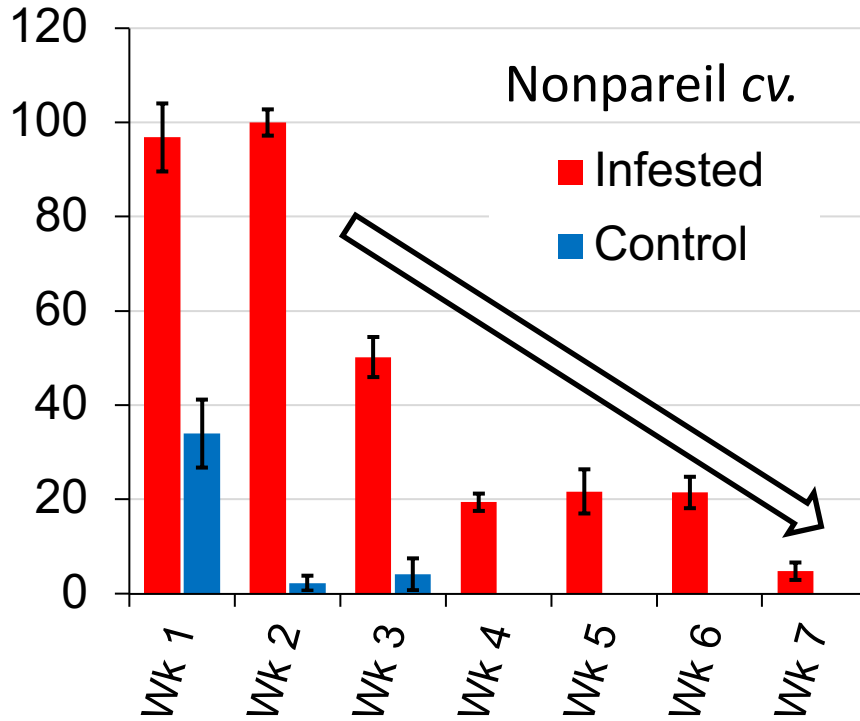


## **Temporal feeding study using cages**

- Nonpareil and Monterey almond varieties
- Cage at early fruit set (7-15 nuts/cage)
- 9 cages/variety, infested weekly
- 3 BMSB adults/cage
- March through harvest

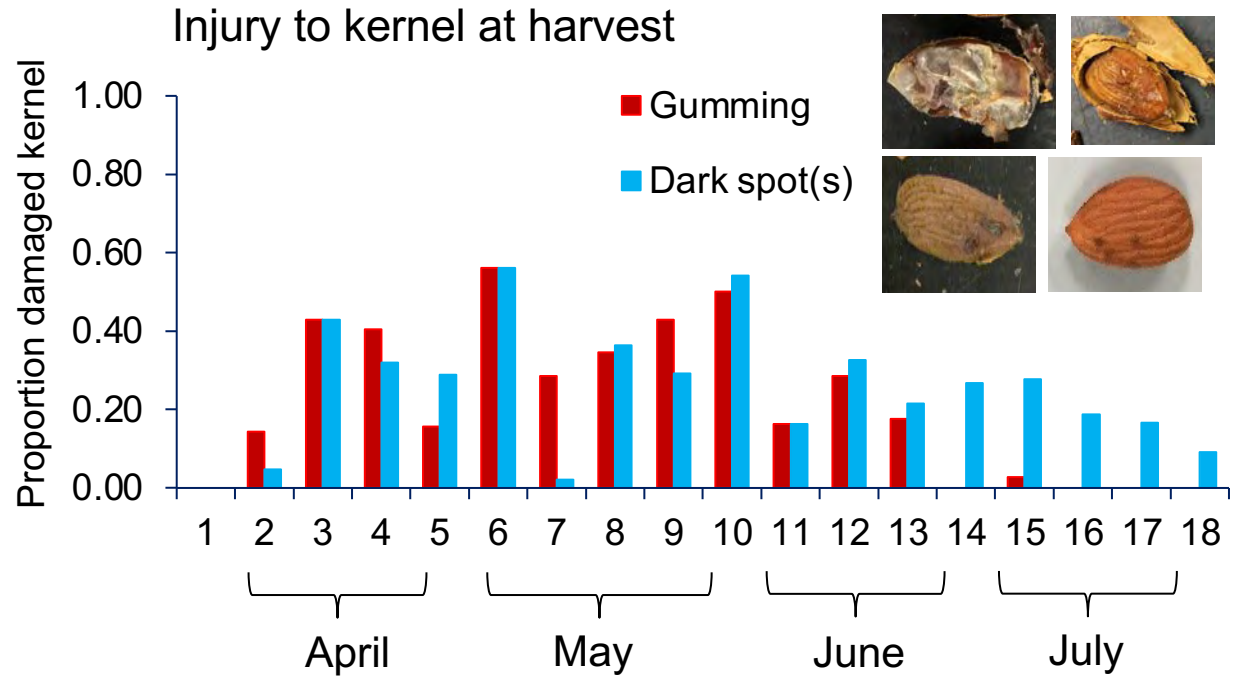
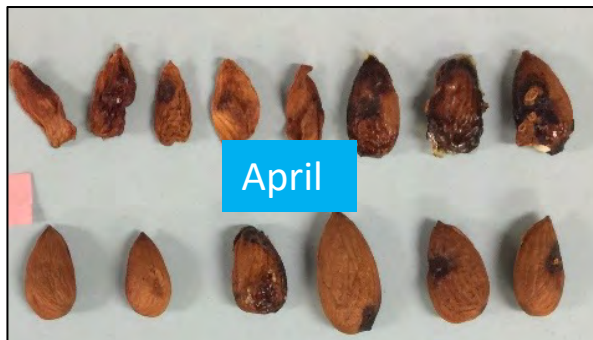
# Temporal feeding damage

## Nut drop in cages (%)

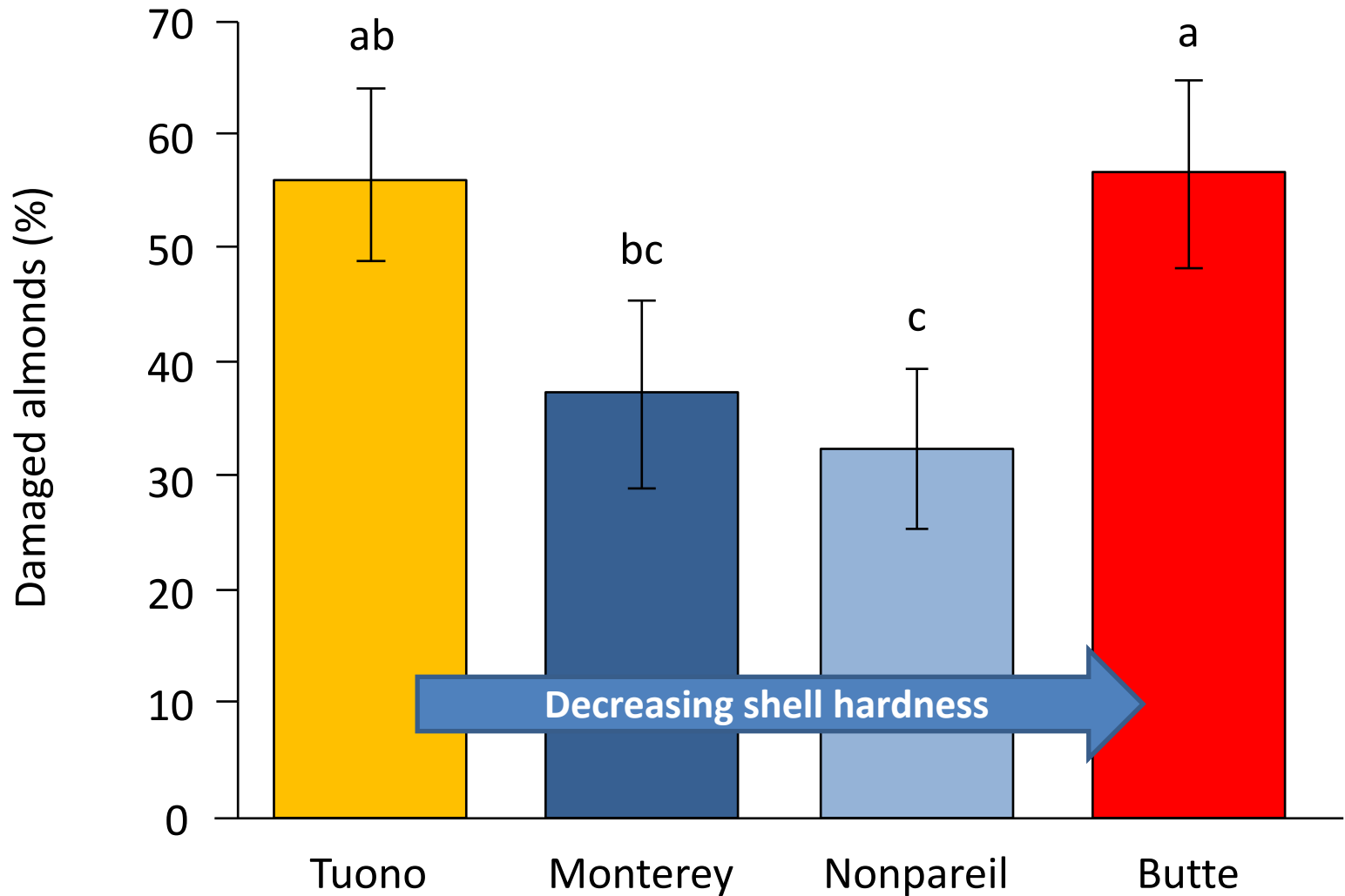


Conclusion: A lot of nut drop early in the season (March-April),  
40-98% drop in Nonpareil; 28-96% drop in Monterey

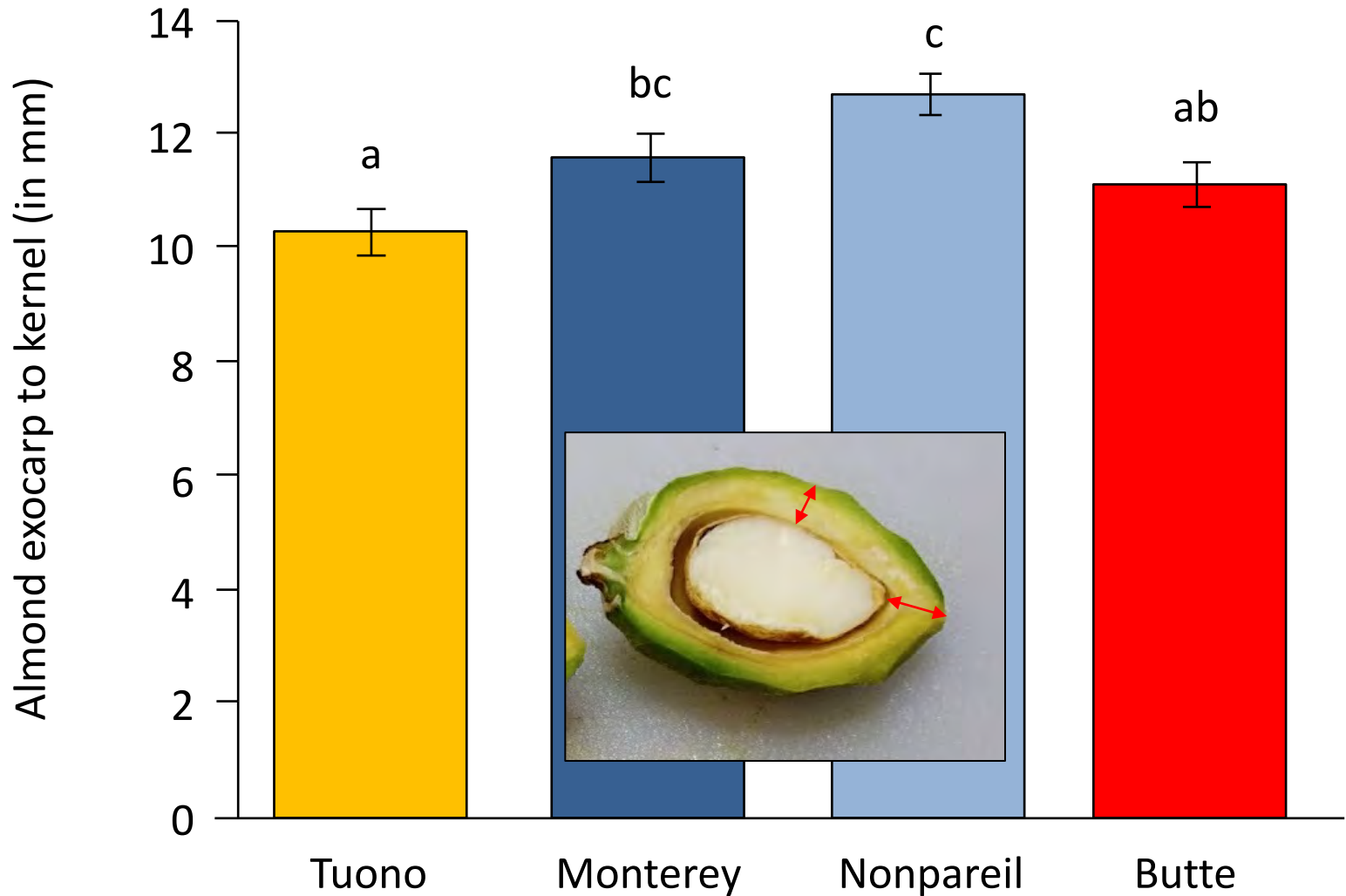
# Kernel damage by BMSB feeding in different times of the year



# Does BMSB feeding damage on almonds differ based on almond variety shell hardness?



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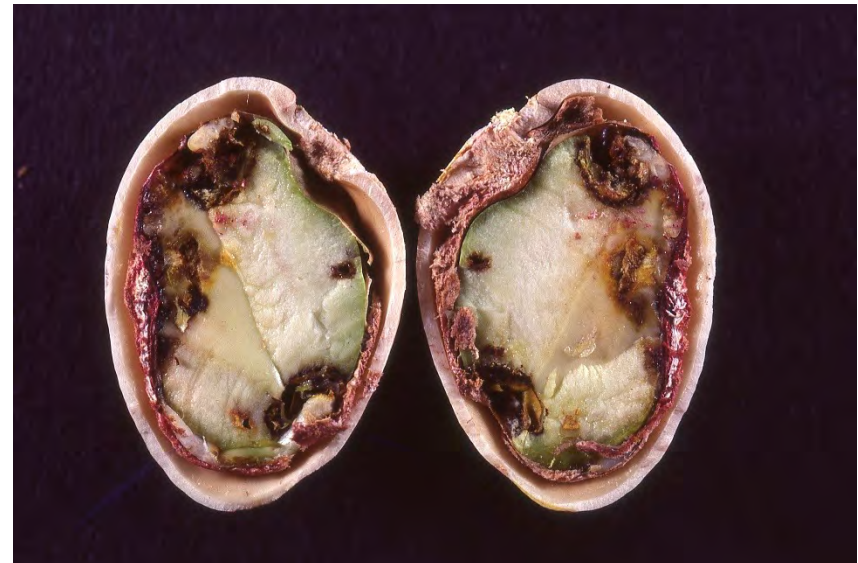
# Can BMSB damage walnuts?

Results of suggest no significant damage.



- Cage study enclosing BMSB on walnuts, along with a no-insect control
- No insect-specific damage found on cracked out nuts
- No difference in % black spots or shriveling on insect vs. control nuts

# BMSB – Pistachio





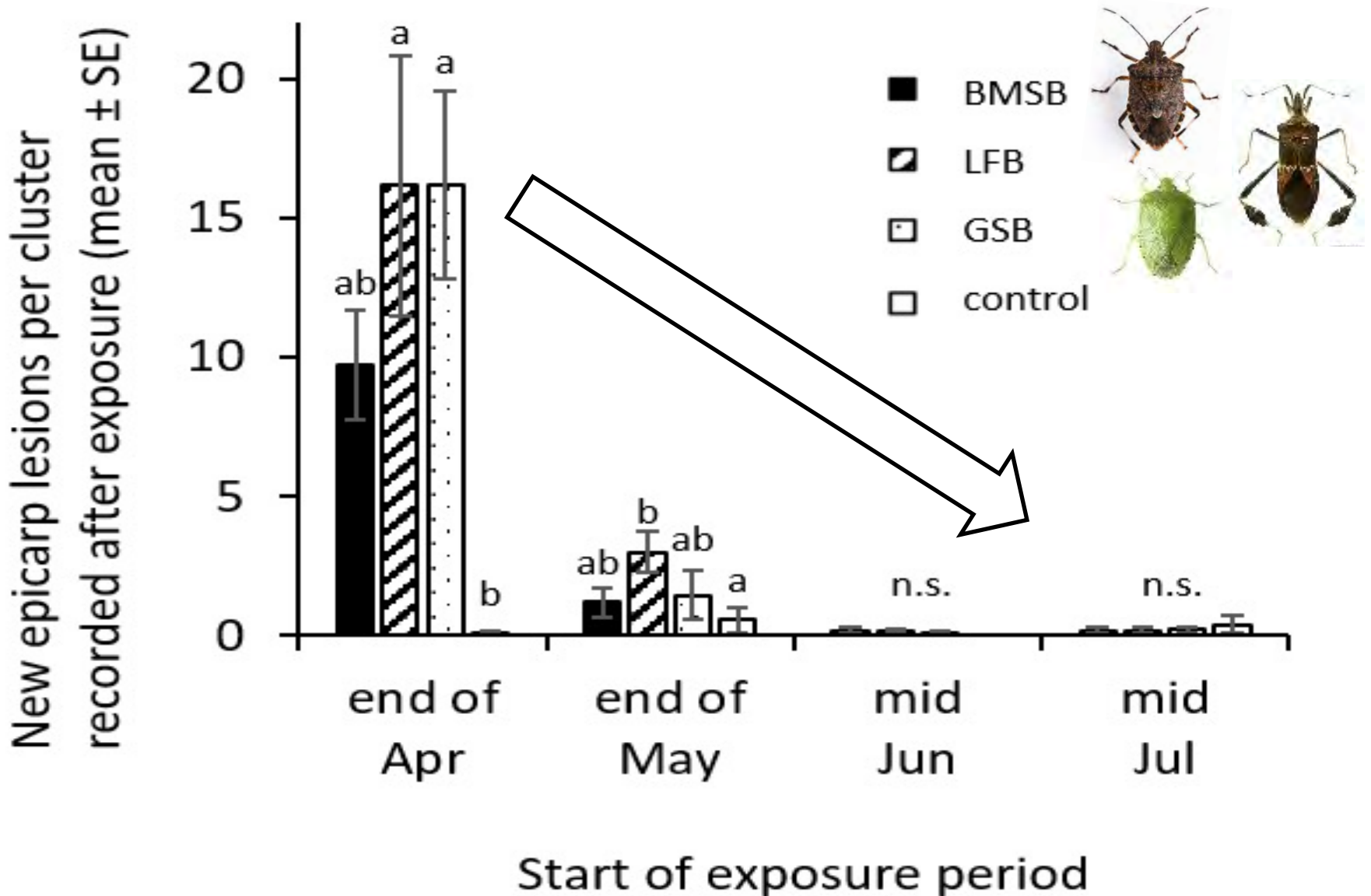
Temporal  
feeding study  
using cages

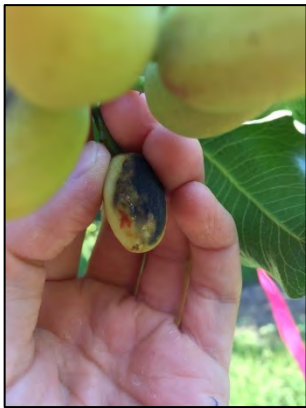
BMSB was compared  
to native stink bugs  
and a leaffooted bug



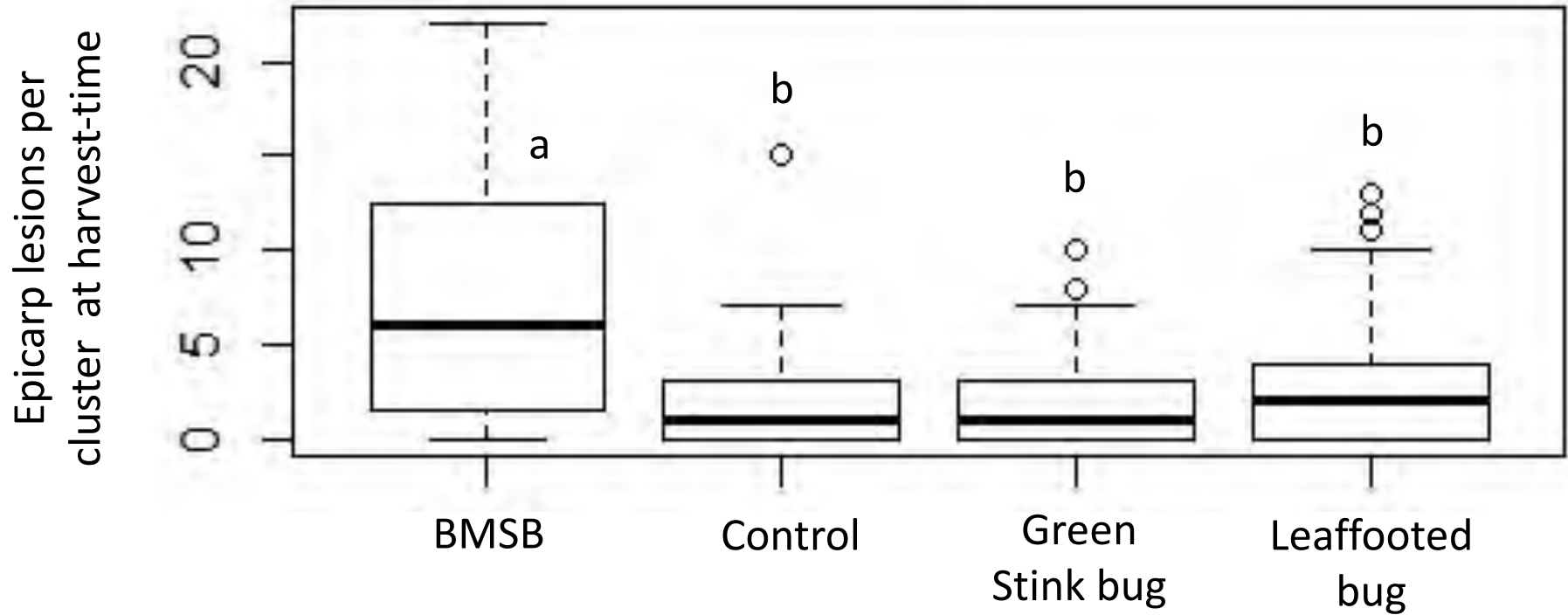
- Cage study
- Native insect spp. , BMSB, control
- Rated seasonal damage & harvest
- 2 –year study

# BMSB causes epicarp lesions like native species

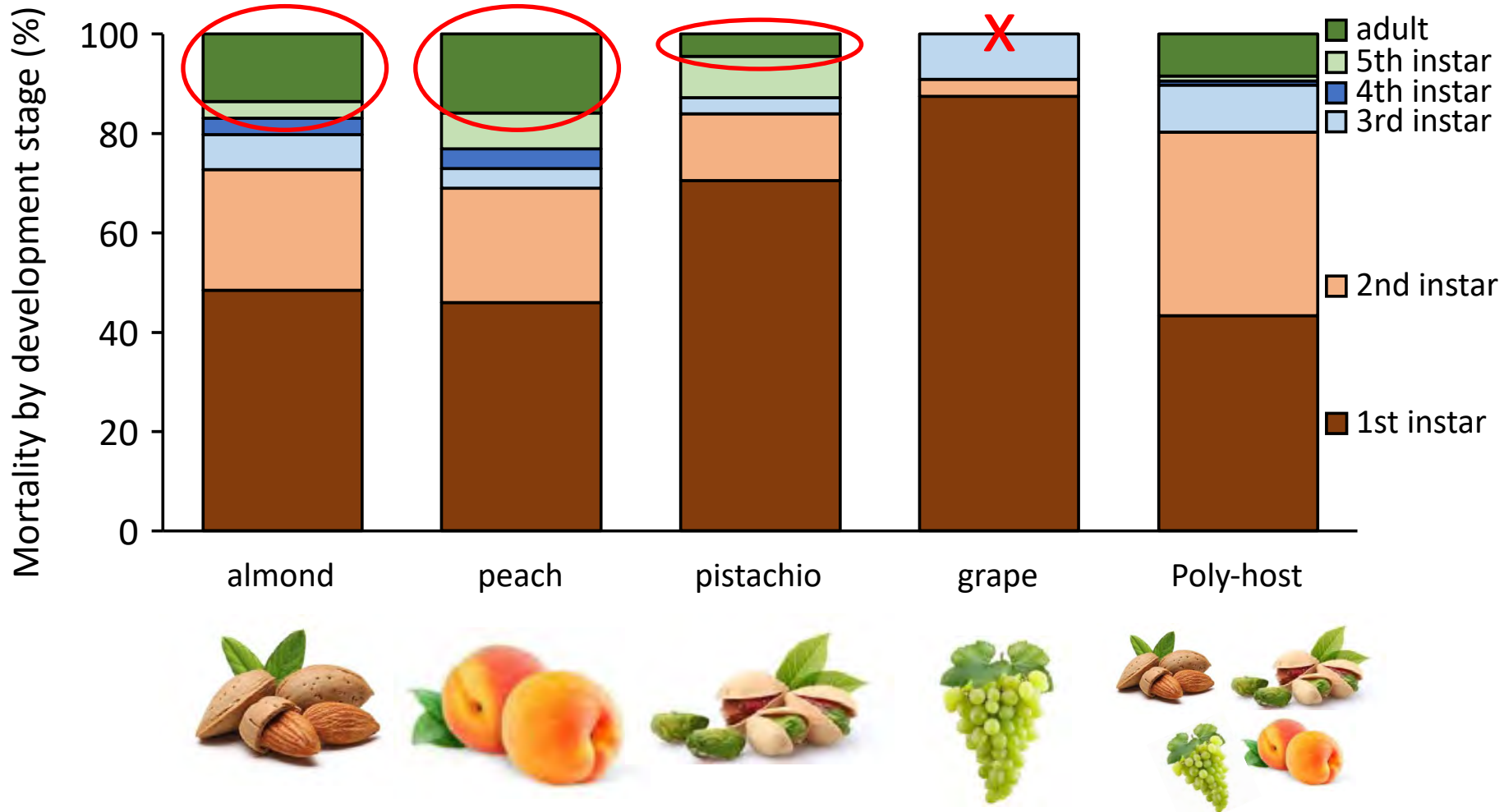




By harvest-time BMSB caused more epicarp lesions than native stink bug and leaffooted bug, but no difference in kernel damage

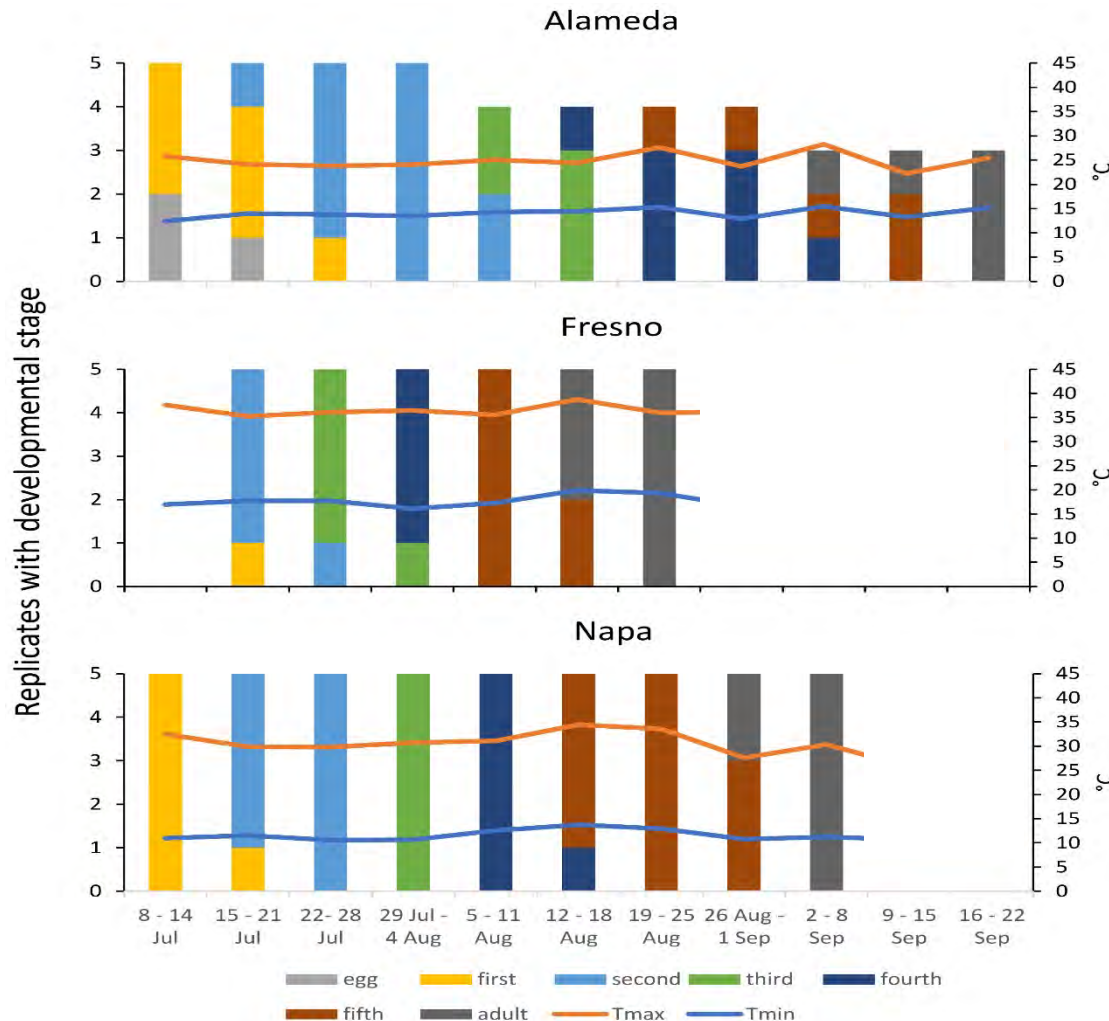


# BMSB field survival on Californian crops was low during the San Joaquin Valley summer



# But... there will be regional differences

## Example BMSB development across California



**Regional 'cage' study showed faster development in Fresno**

Conclusion to this point:  
damage in almond & pistachio,  
but... not walnuts (shell).

Q. Why should BMSB be a **major threat to almonds** (in one study) but a **minor threat to pistachios** (in another study)

# Impact of temperature and humidity on BMSB?



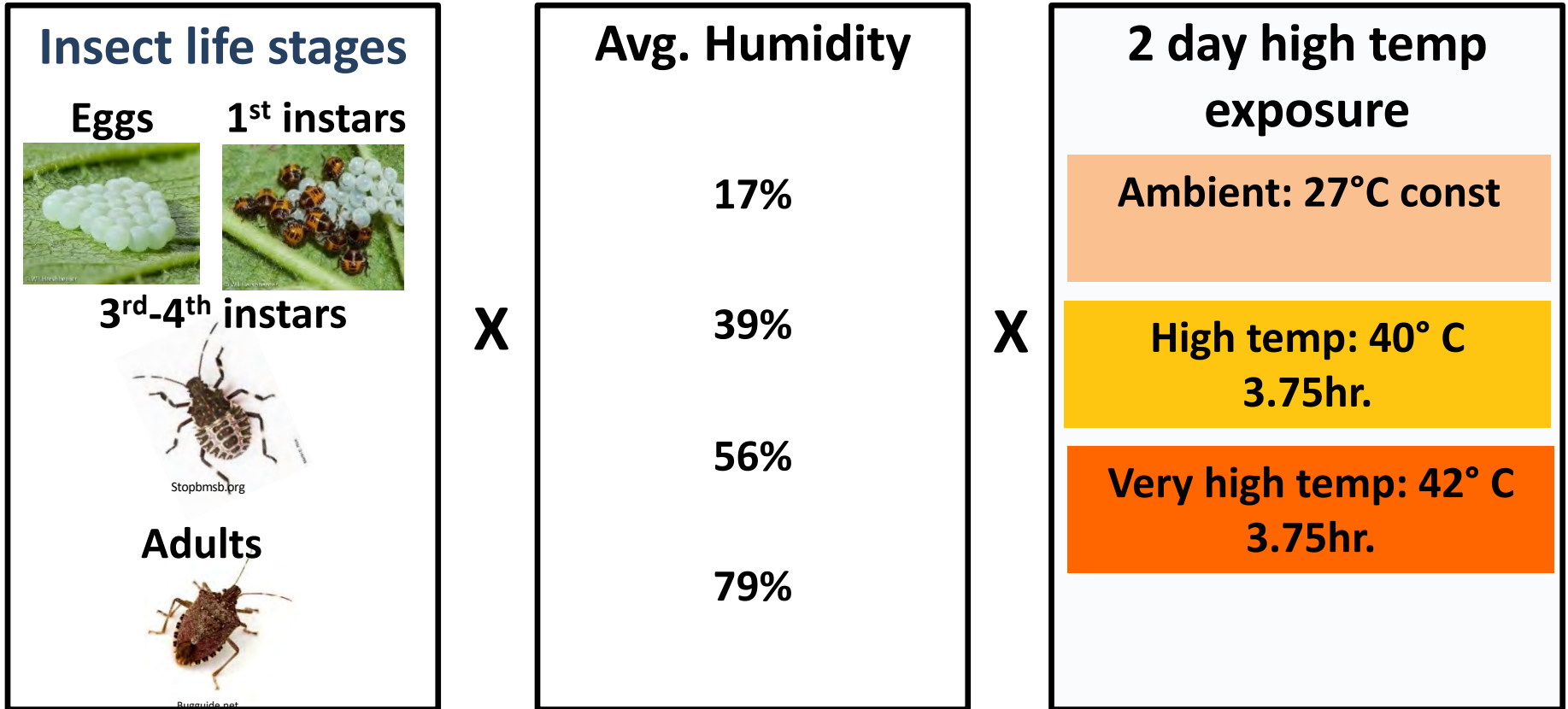
Bugguide.net



Bugguide.net

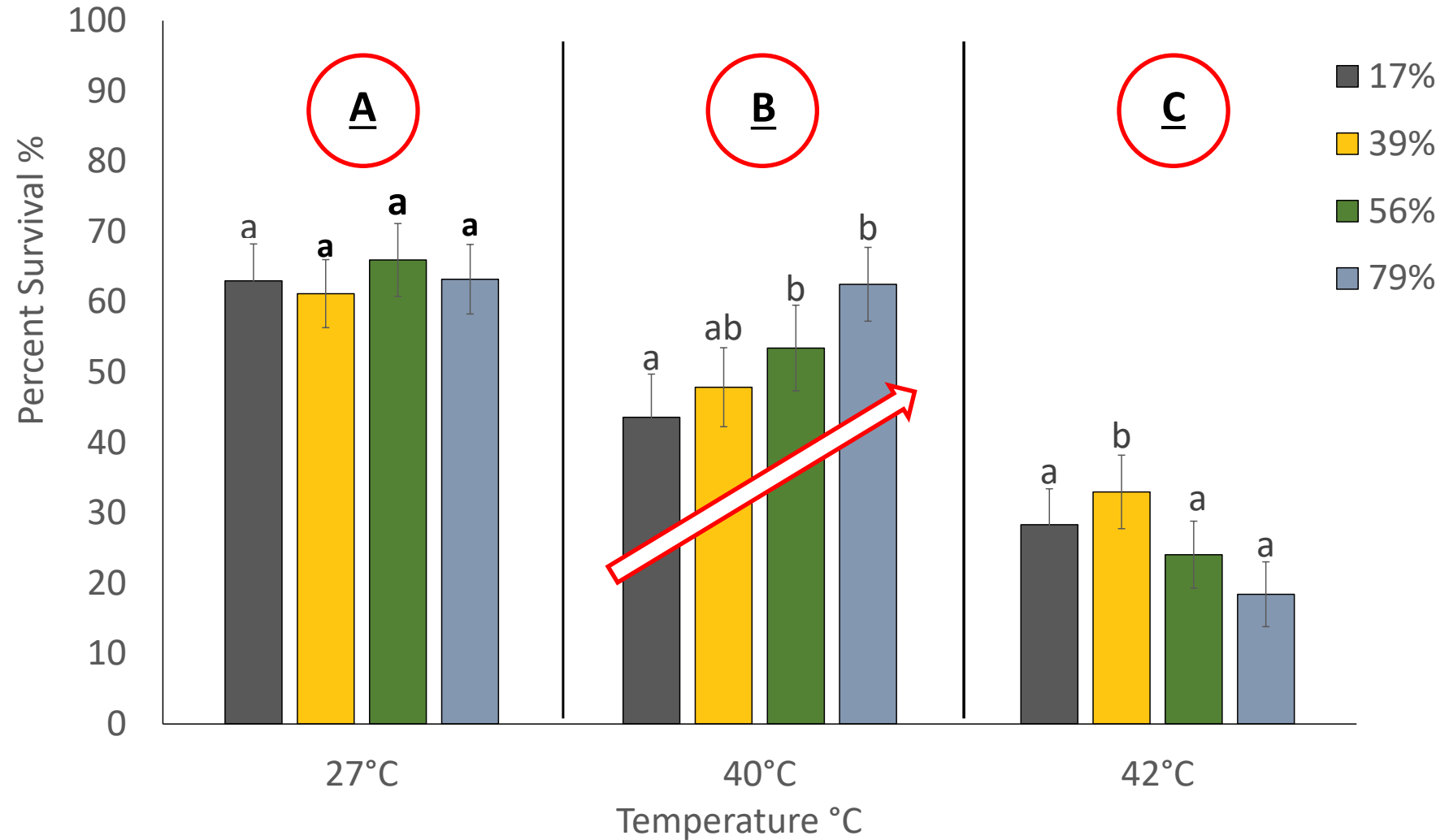


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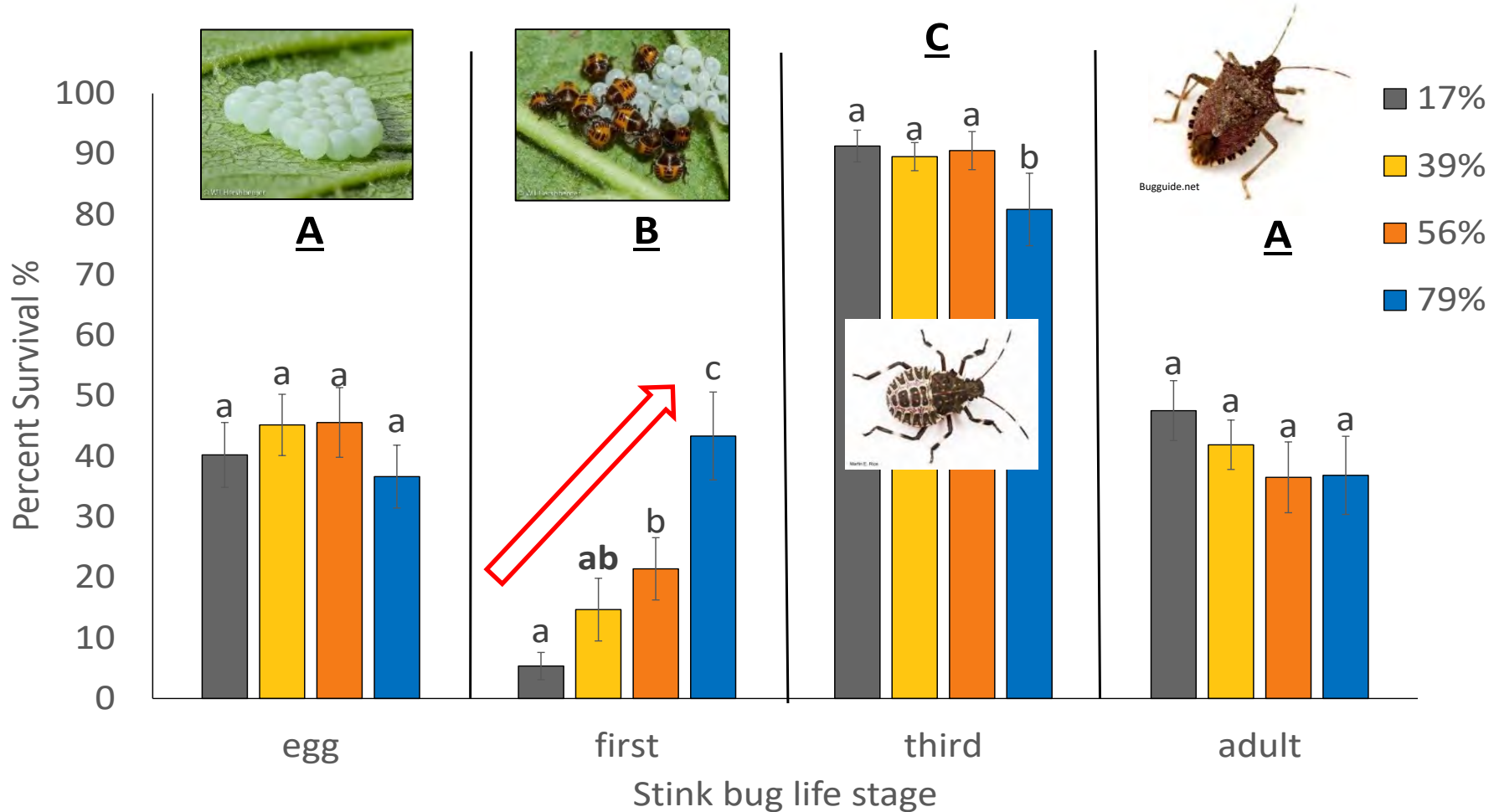
High T° exposure significantly decreased BMSB survival



# Impact of temperature and humidity on BMSB?

Humidity impact on BMSB survival depends on life stage

No impact adults and eggs, high impact 1<sup>st</sup> instars



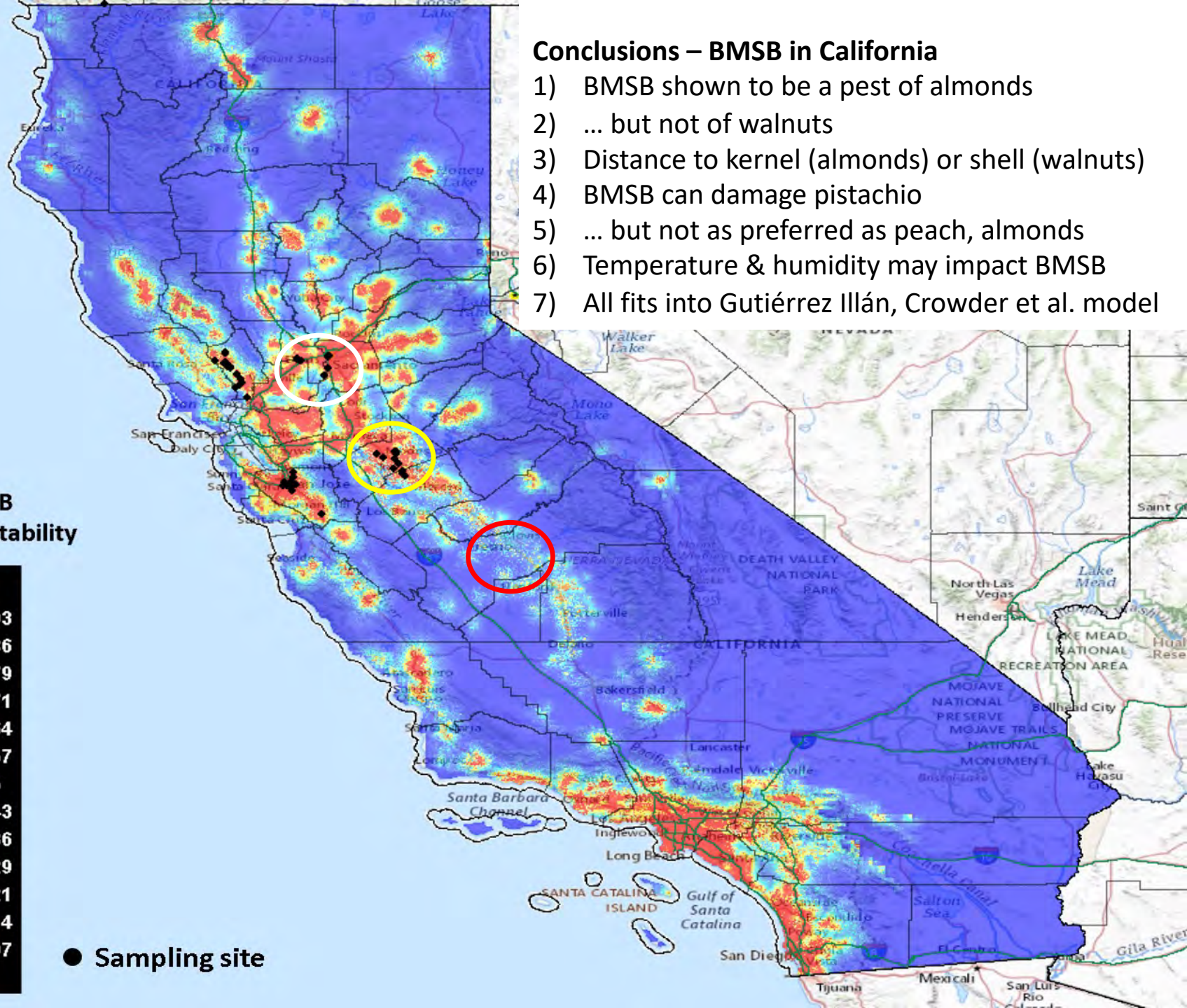
## Conclusions – BMSB in California

- 1) BMSB shown to be a pest of almonds
- 2) ... but not of walnuts
- 3) Distance to kernel (almonds) or shell (walnuts)
- 4) BMSB can damage pistachio
- 5) ... but not as preferred as peach, almonds
- 6) Temperature & humidity may impact BMSB
- 7) All fits into Gutiérrez Illán, Crowder et al. model

**BMSB  
habitat suitability**



● Sampling site



**Thank You**

**It's time for a few polling  
questions**