

**OREGON SAMURAI: STATEWIDE  
REDISTRIBUTION EFFORTS AND  
PROSPECTS FOR BIOCONTROL  
IN ORCHARDS**

**BMSB SCRI SAP MEETING  
HEATHER ANDREWS**



# **WILL SAMURAI WASP DISPERSE AND LOCATE BMSB EGGS?**

- Identify distribution through placing sentinel eggs
- **Release wasps and investigate host location over short distances**
- Investigate dispersal in orchard and small fruit crops

# DISPERSAL DIFFERENCES BY CROP?

**Hazelnut**



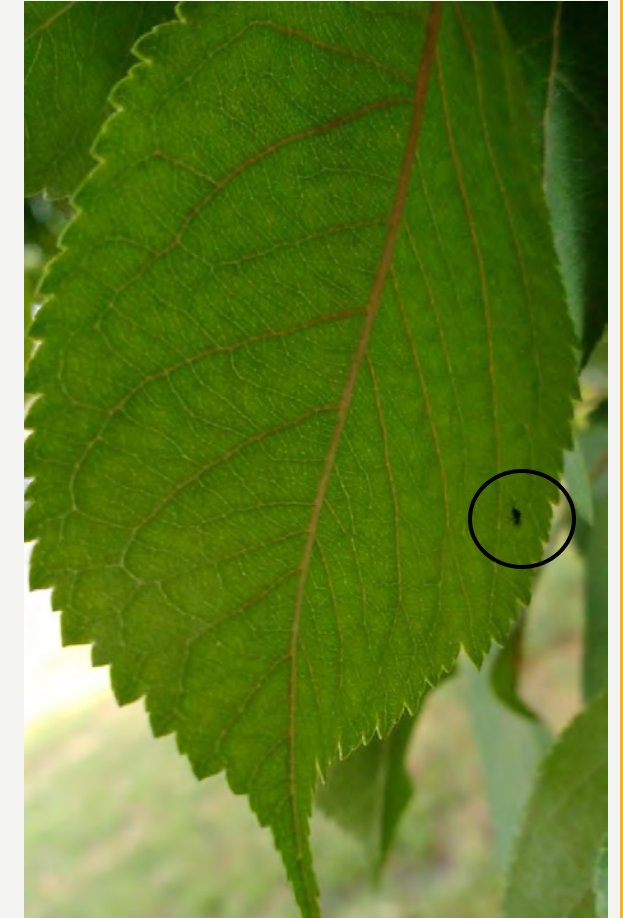
**Caneberry**





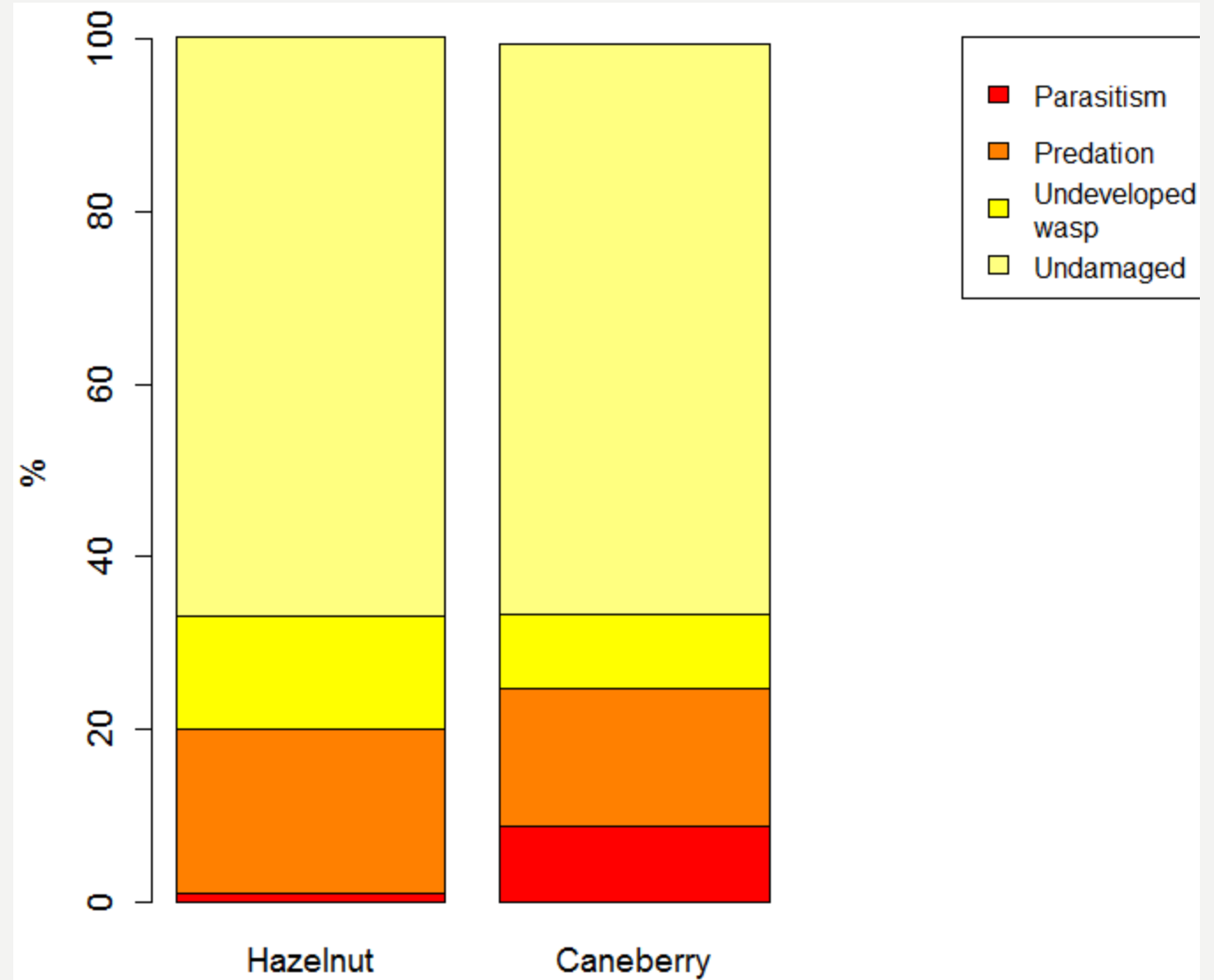
# WASPS RELEASED AND PARASITISM/PREDATION MEASURED ALONG 60 – 100 M TRANSECTS

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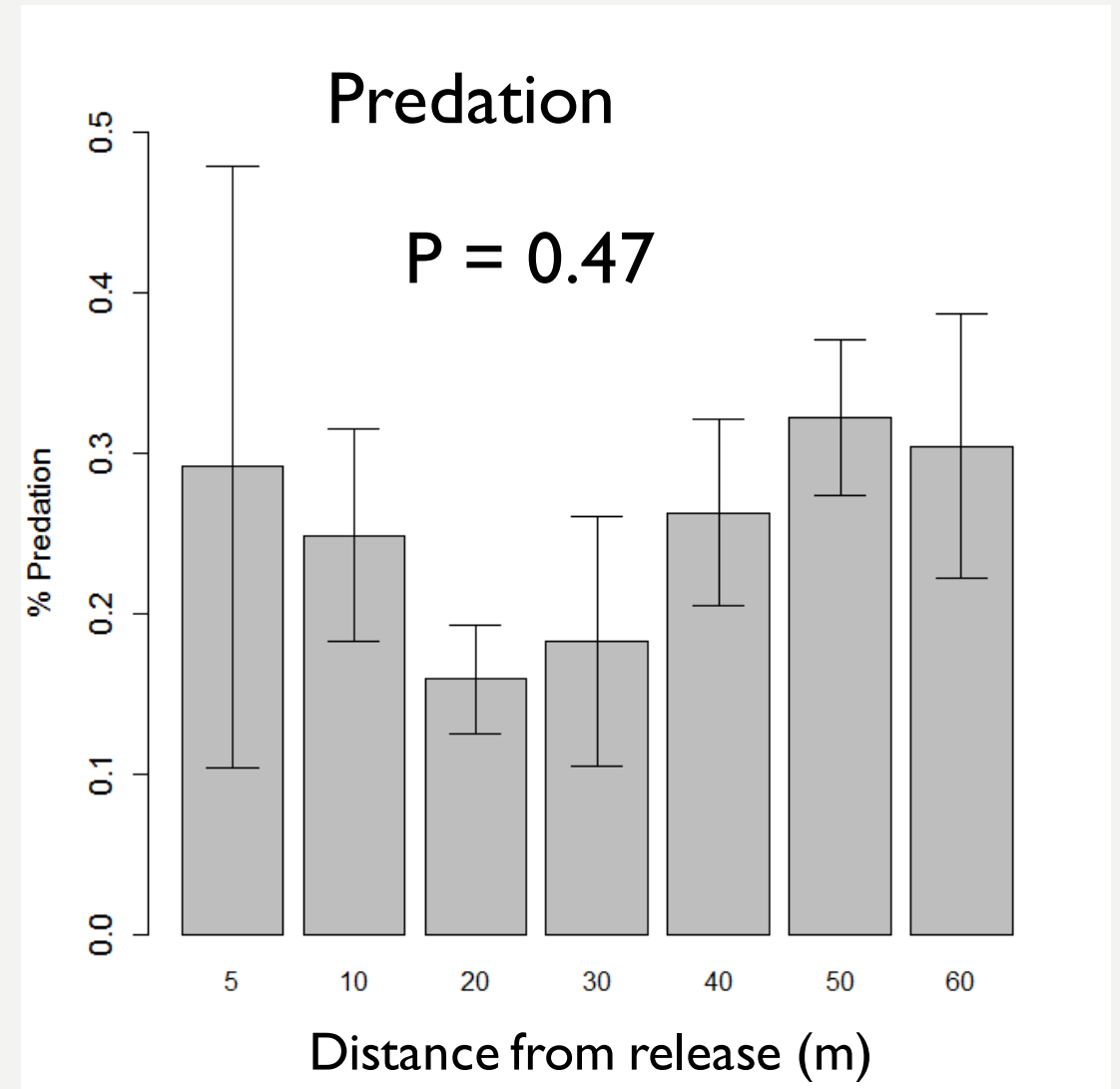
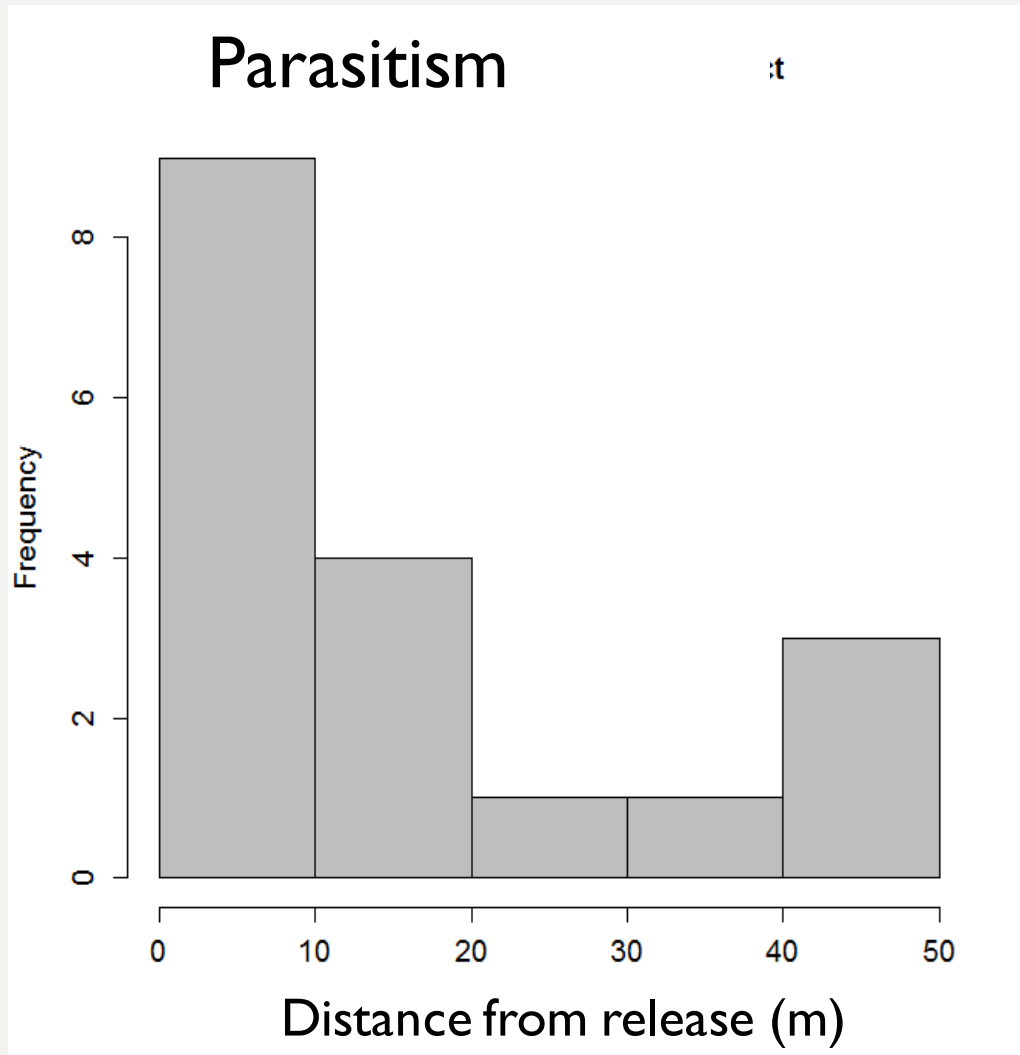


# MOST BMSB EGGS UNDAMAGED

- 10% of sentinel eggs parasitized in caneberry
- Only 2/137 eggs parasitized in hazelnut
  - Harder to detect wasps in broad canopy
- 15% of eggs with predation



# GREATER PARASITISM NEAR WASP RELEASE SITES IN CANEBERRY

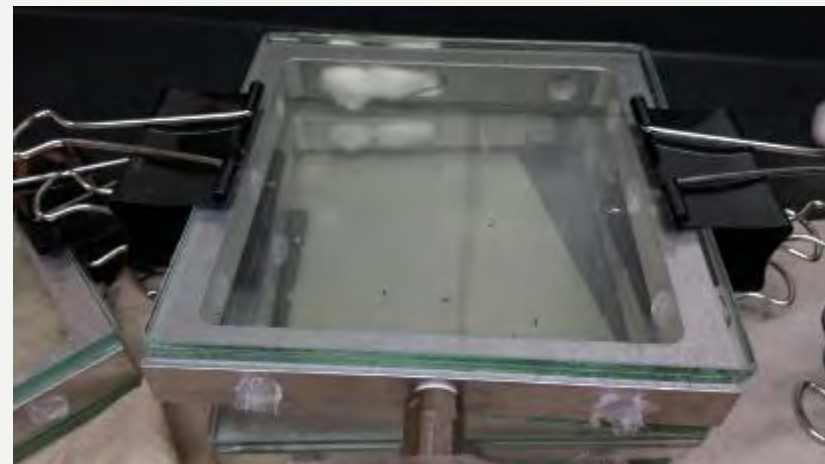
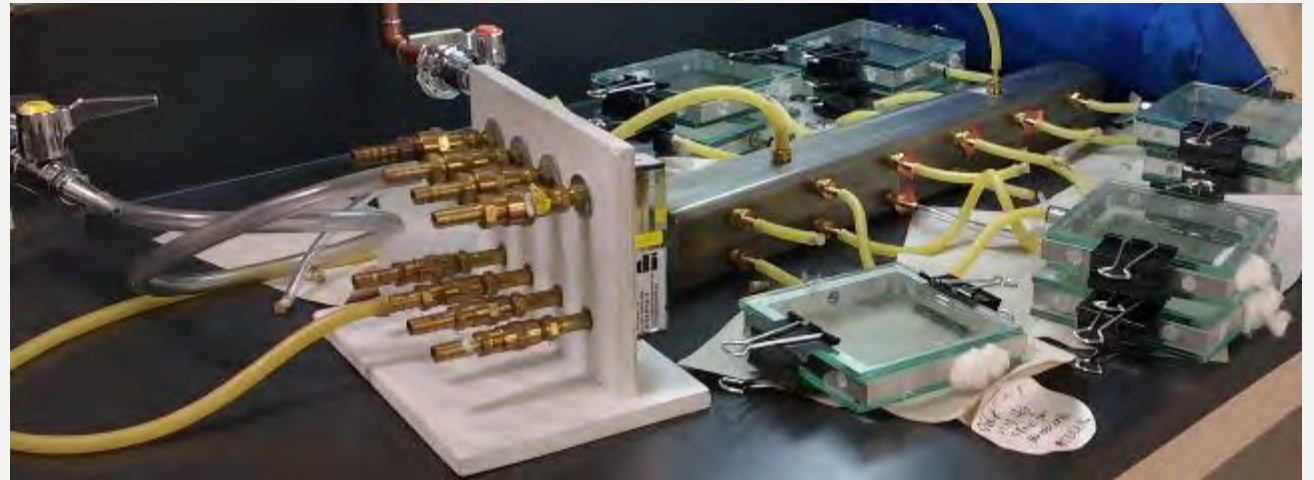


# SUMMARY OF SAMURAI WASP DISPERSAL

- Unclear if low parasitism rate from dispersal experiments is:
  - Challenge of detecting small wasp
  - low #s of released wasps
  - wasps parasitizing wild BMSB egg masses



# EVALUATING SAMURAI WASP COMPATIBILITY WITH INSECTICIDES LAB ASSAY





# EVALUATING SAMURAI WASP COMPATIBILITY WITH INSECTICIDES FIELD ASSAY



Wasps contained in clip cages

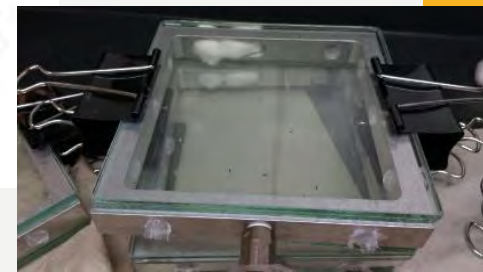
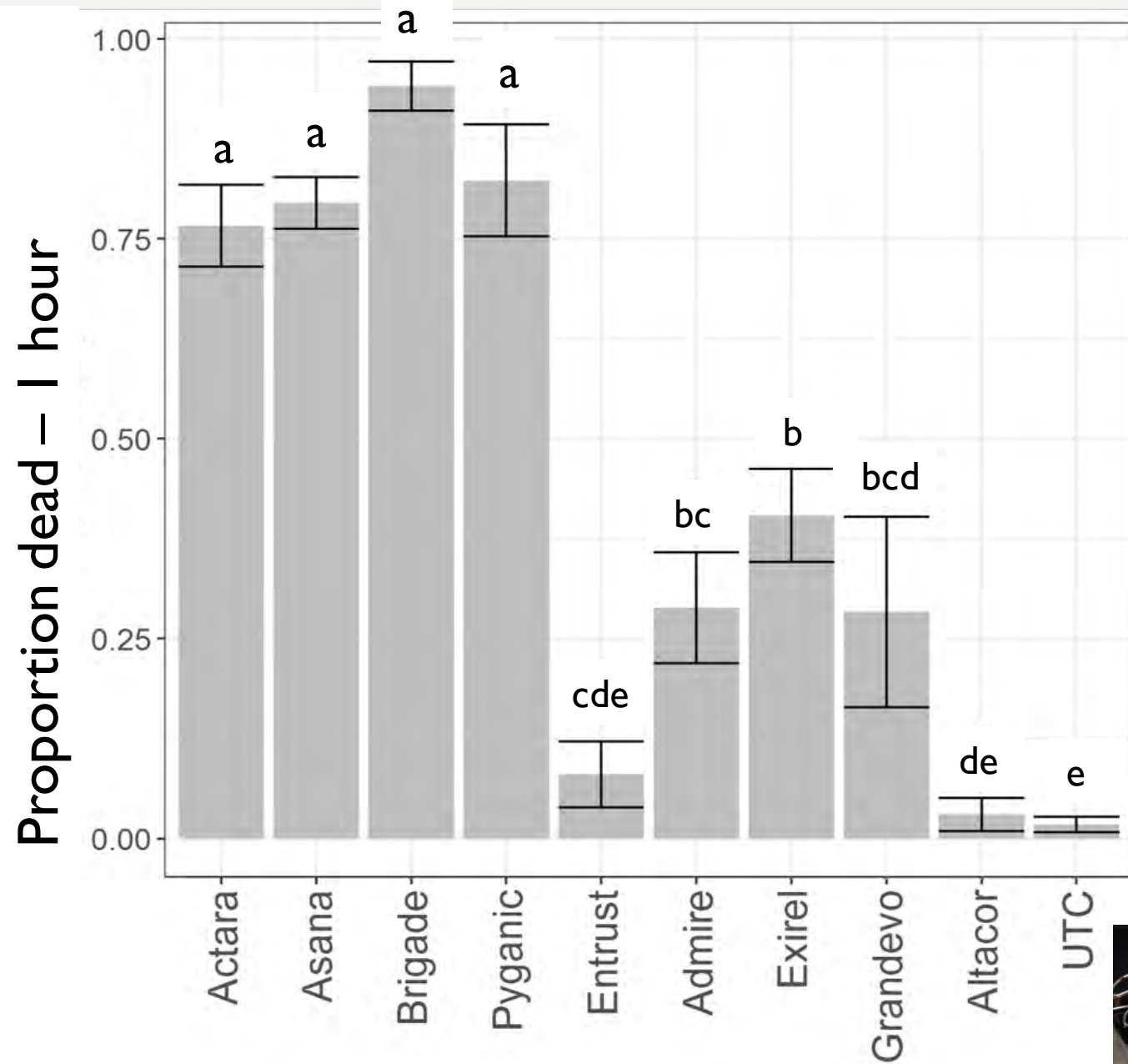


Placed in field and collected 24 hours after application

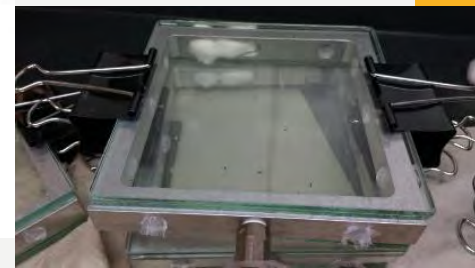
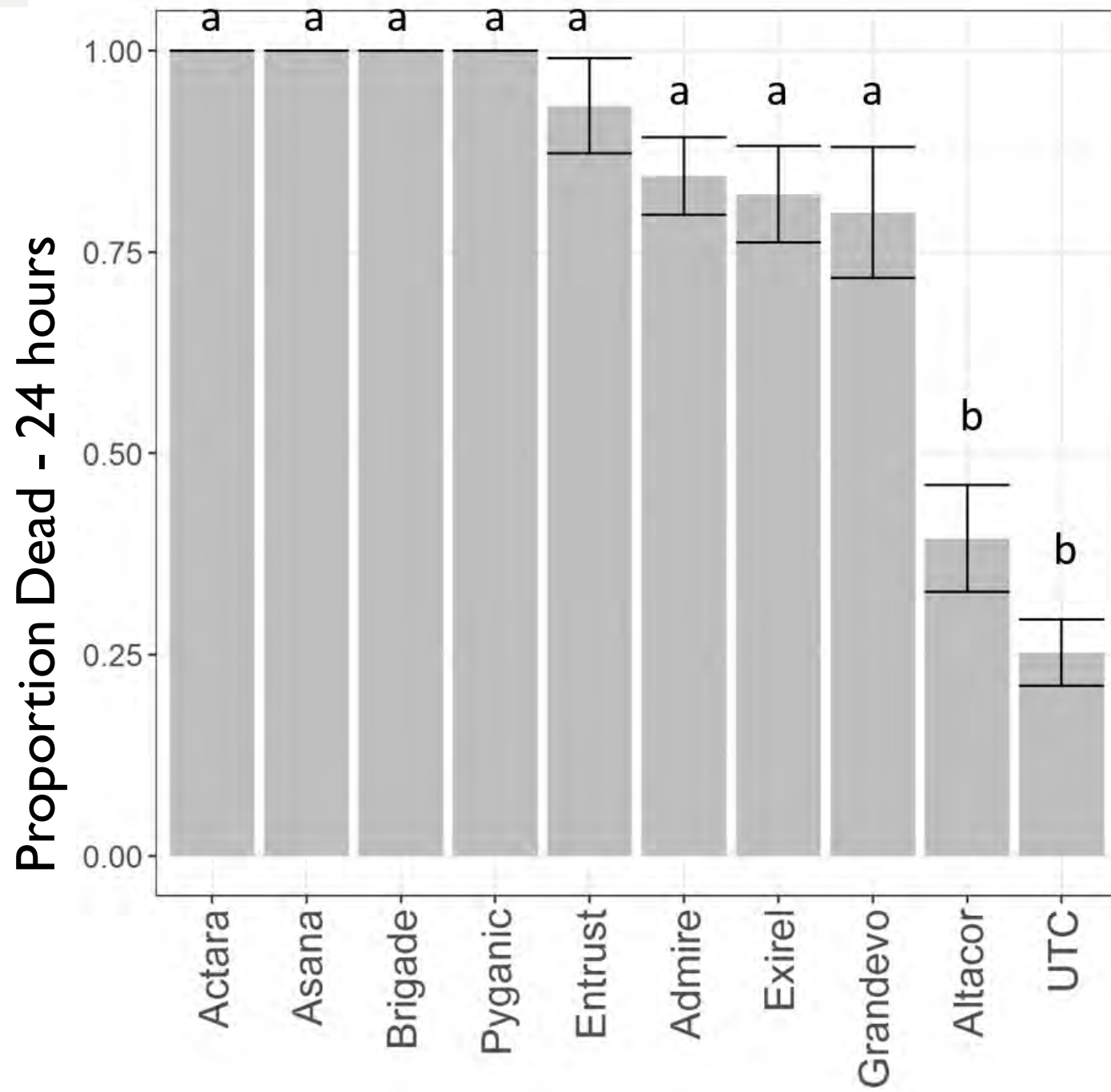


Spray gun with air compressor at 100 psi

SEVERAL  
COMPOUNDS  
ARE  
IMMEDIATELY  
LETHAL

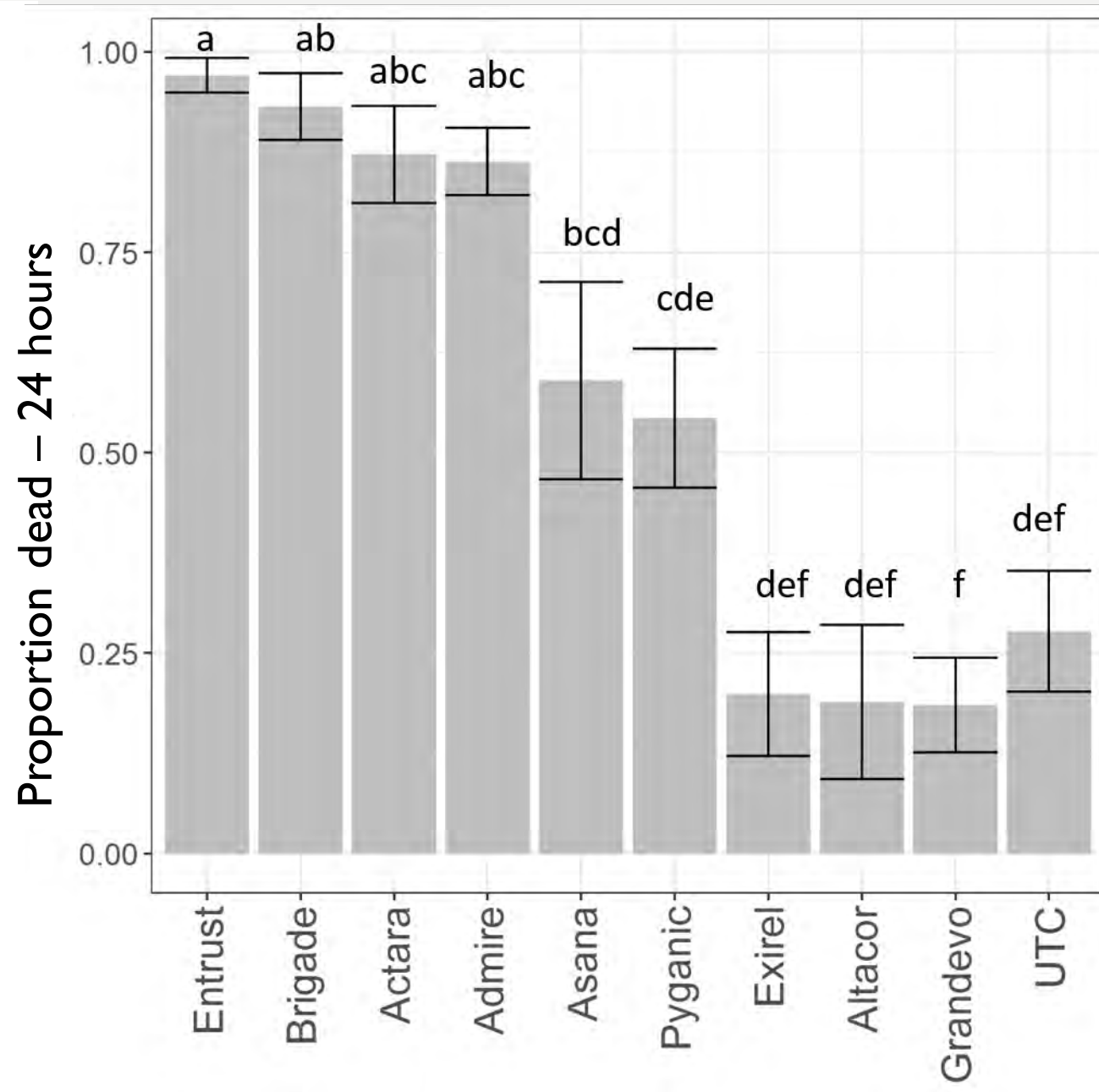


After 24 hours, most insecticides cause high mortality



# LOWER WASP TOXICITY IN FIELD

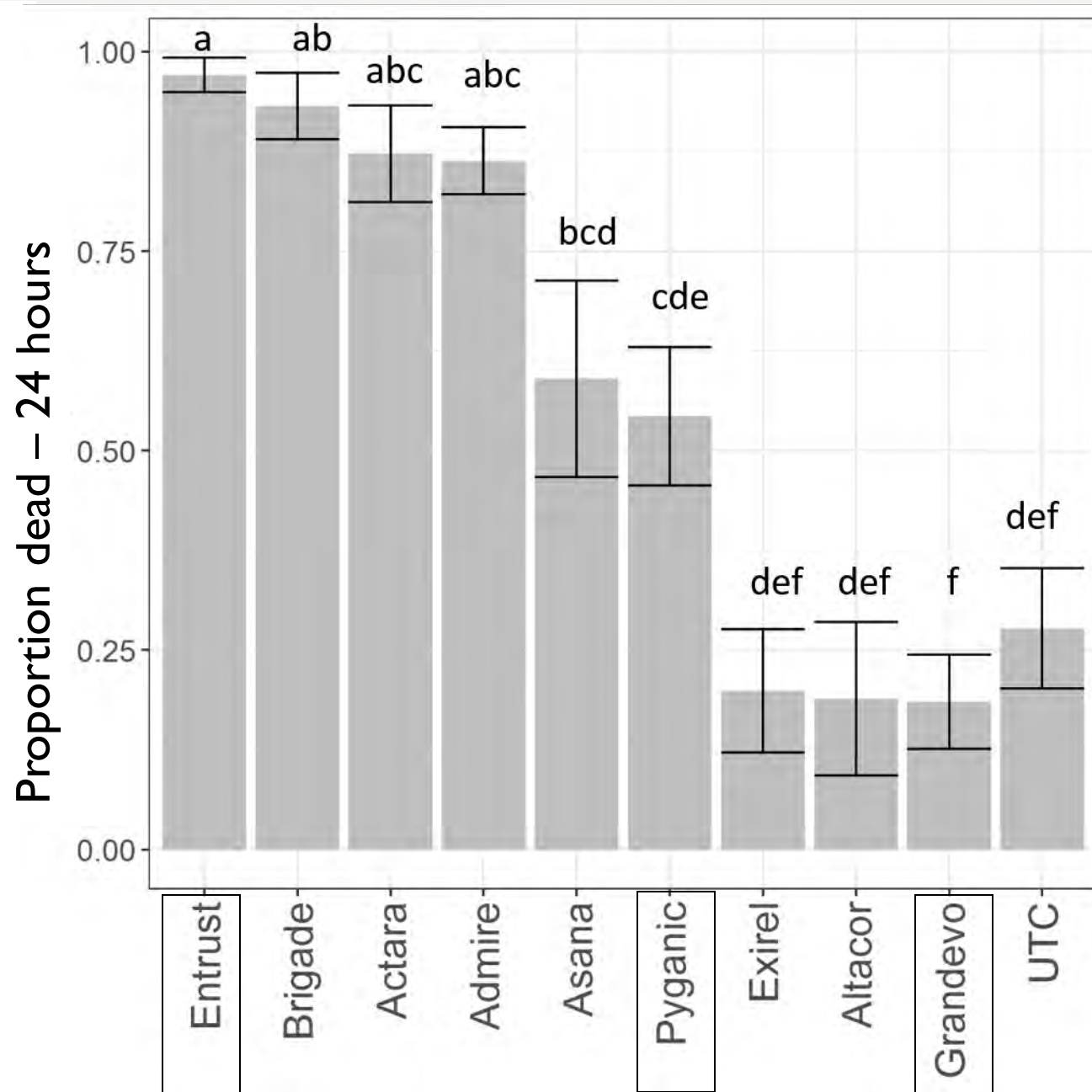
- Diamides and bioinsecticide with lowest mortality





# LOWER WASP TOXICITY IN FIELD

Mixed results for non-target effects from organic compounds



# EDGE HABITAT CRITICAL FOR BIOCONTROL

- Wasps most likely to find and parasitize BMSB eggs near field border
- Capable of moving at least 164 feet (50 m)
- Low compatibility with insecticides indicates BMSB management through biocontrol most effective beyond borders



# MONITORING ORCHARDS WITH SENTINELS

- Sentinels placed near pyramid traps in hazelnut, pear and cherry orchards:
  - Outside, border, middle
- 5 out of 66 egg masses had guard wasps
- All located on borders or outside orchards
- Have not yet been identified but most are likely natives





# OVERWINTERING SURVIVAL



- Samurai wasps kept in leaf litter and bark materials in outdoor cages and growth chamber
- Survival decreased more rapidly in leaf litter compared with bark in outdoor sites, likely due to decomposition and precipitation
- Survival in growth chamber was longest in leaf litter
- Wasps that survived overwintering parasitized egg masses at a higher rate than expected





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Rick Hilton

Dalila Rendon

## Growers

Miller and Birkemeier orchards



Compound – trade name	Insecticide class	Active ingredient	Field rate	Lab rate	Lab Sample size
Actara	4A	Thiamethoxam	4.5 fl oz / acre	4.5 fl oz / acre	12
Admire Pro	4A	Imidacloprid	2.4 fl oz / acre	2.4 fl oz / acre	19
Altacor	28	Rynaxapyr	4.5 fl oz / acre	4.5 fl oz / acre	15
Asana XL	3	Esfenvalerate	15 fl oz / acre	7.6 fl oz / acre	35
Brigade 2EC	3A	Bifenthrin	6.4 fl oz / acre	6.4 fl oz / acre	10
Entrust	5	Spinosad	10 fl oz / acre	4, 6 fl oz / acre	17
Exirel	28	Cyantraniliprole	20.5 fl oz / acre	20.5 fl oz / acre	20
Grandevo		Chromobacterium subtsugae strain PRAA4-1	3 lb / acre	3 lb / acre	17
Pyganic	3A	pyrethrins	15 fl oz / acre	15 fl oz / acre	14
Untreated control		Deionized water			35

# RATES IN LAB AND FIELD