

Emergence of adult brown marmorated stink bug from overwintering shelters



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A return to sustainable crop protection programs in fruit orchards vulnerable to BMSB will require applied and basic research on monitoring and management tactics



**When do BMSB emerge
from overwintering sites?**

(presence, risk to crops, intervention timing)

Do captures in traps reflect emergence?
(optimize traps as decision tool)



Overwintering adult BMSB collected in January and held at 4°C



- Bugs marked on thorax
- Re-settled in shelters
- 300 per shelter (150/gender)



- Shelters placed individually in square, screened cages
- One cage with top on, other with top removed
- Cages placed in apple crates with metal screen insert
- Deployed in pairs in protective domes at six woodland sites in mid-February

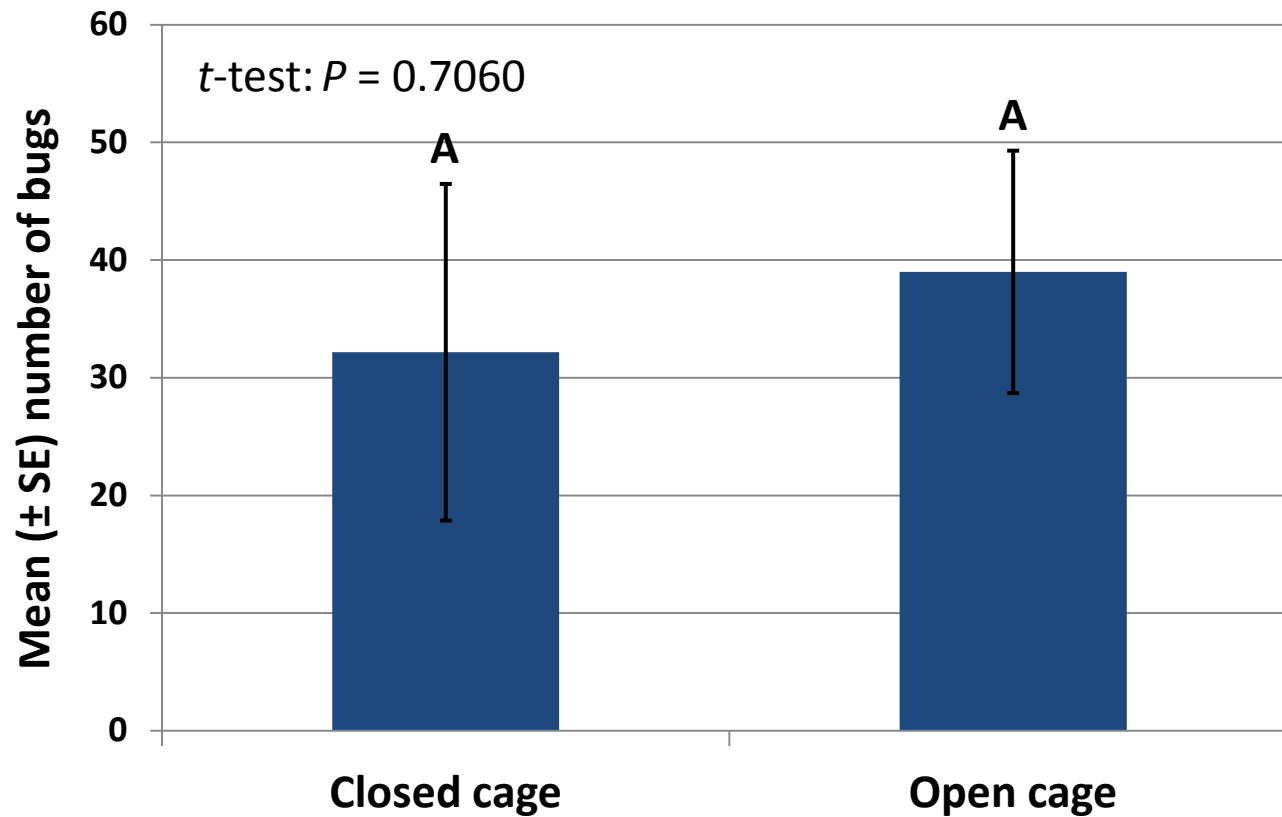


- Temperature/humidity sensors placed inside one shelter and suspended beneath one plastic dome

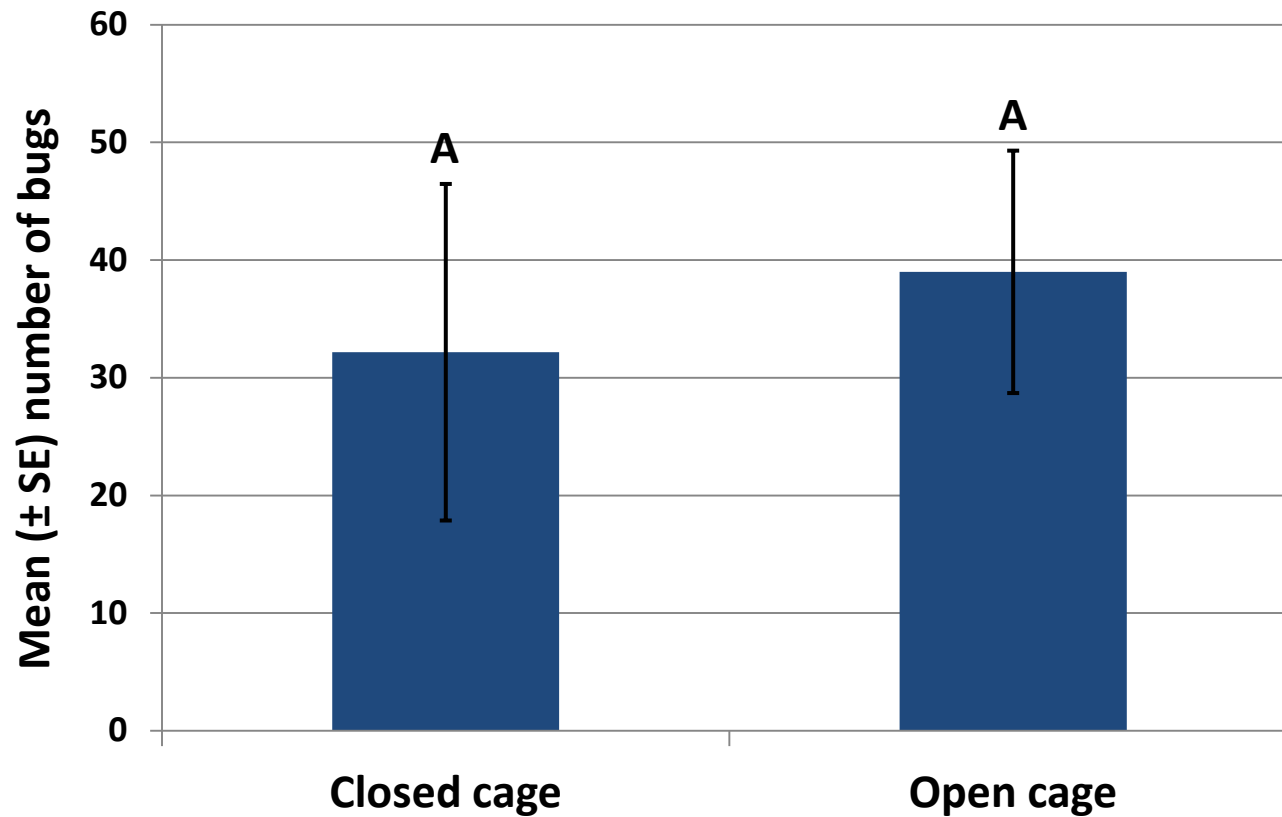
- Shelters encircled by 8 alternating baited and un-baited traps
- Captures in traps and number of bugs emerged from shelters in closed cages recorded weekly, then twice weekly thro' early July



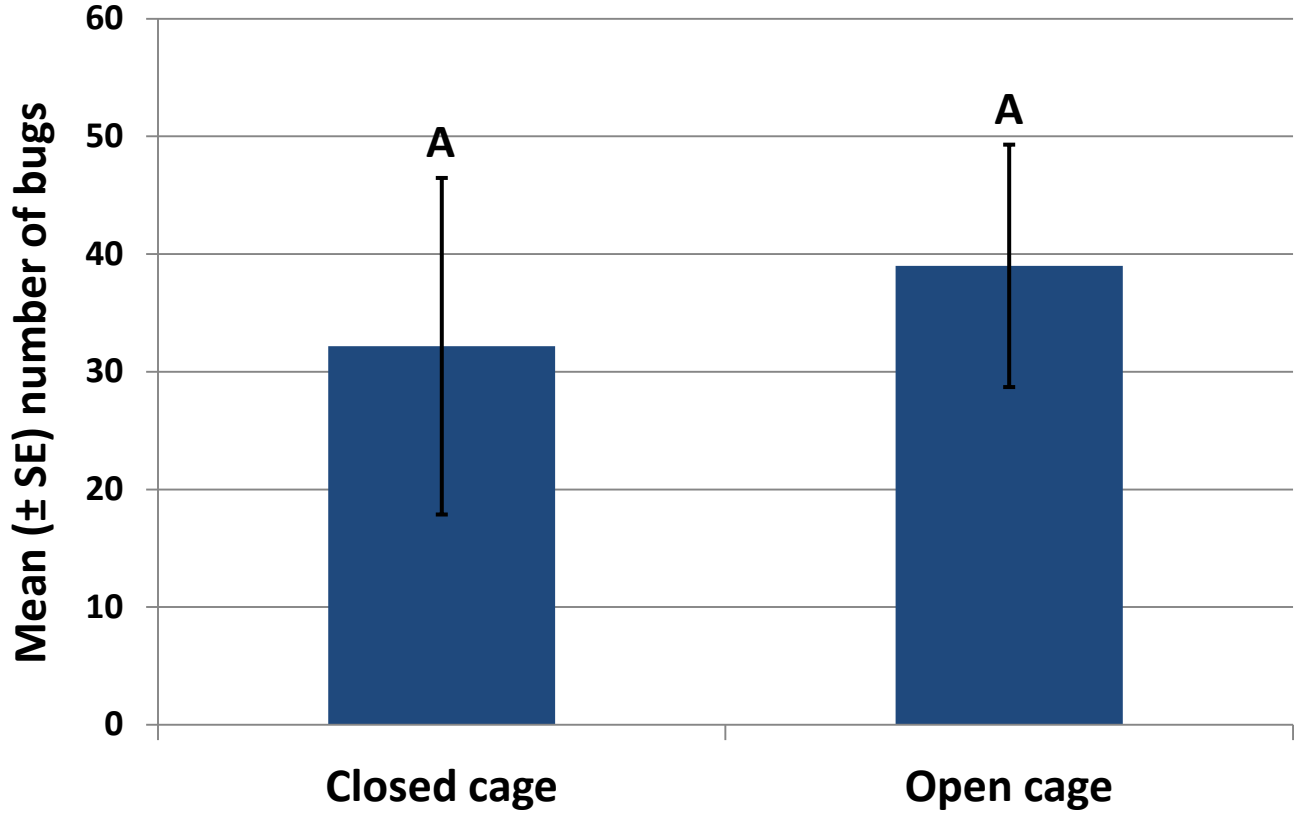
Number of BMSB remaining in shelters at end of study in early July



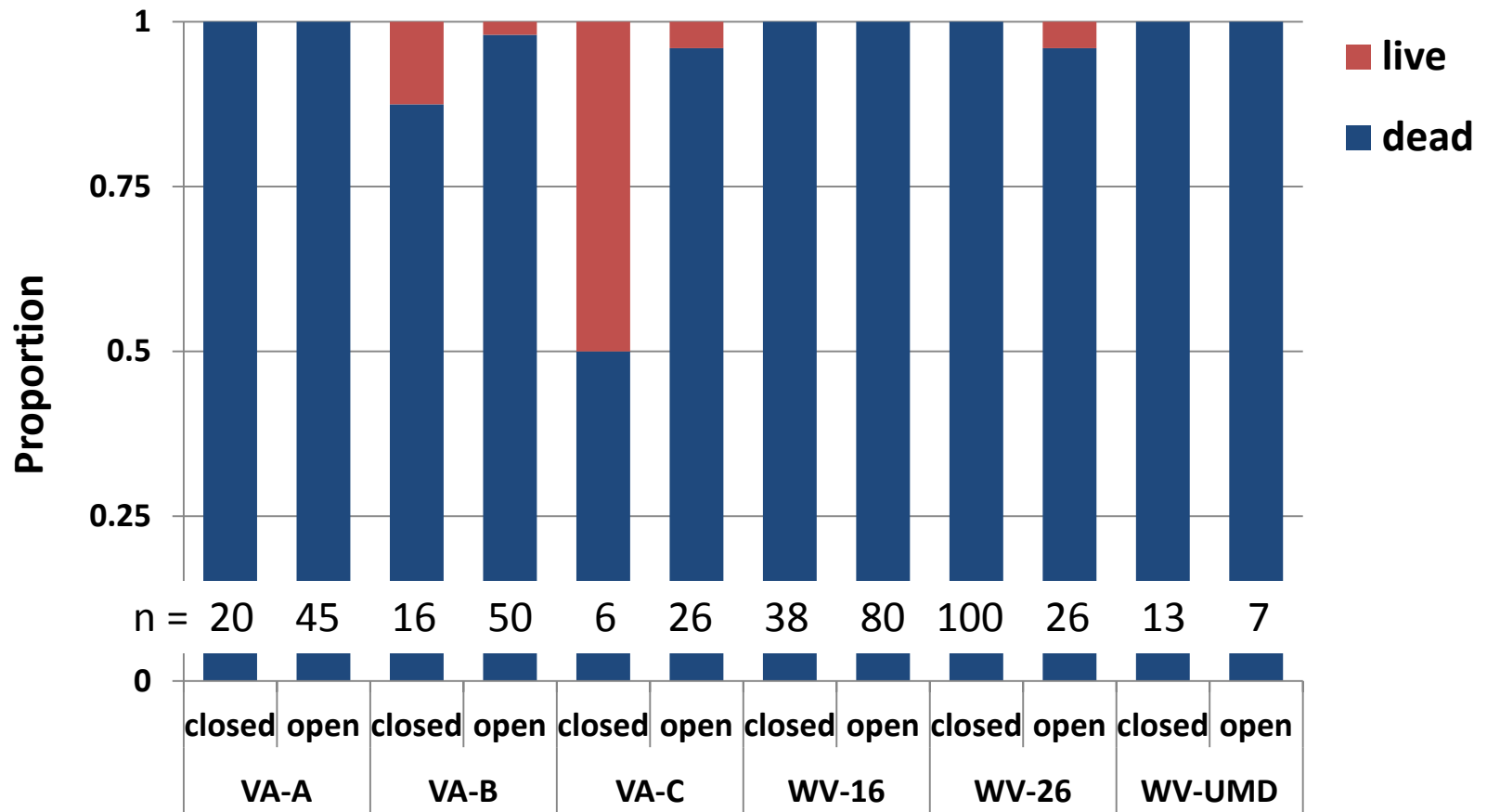
The majority of bugs emerged from the shelters during the study



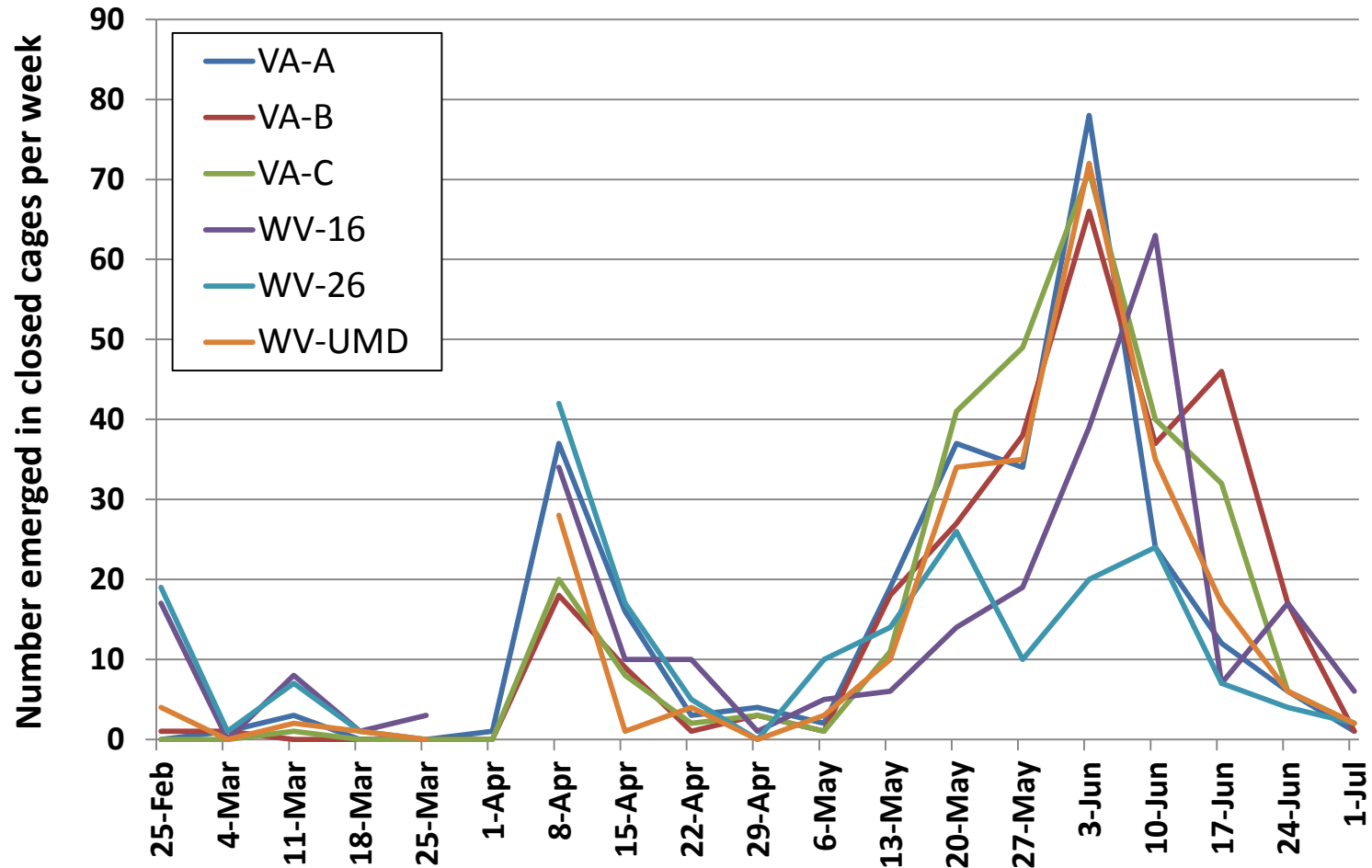
Similar numbers of bugs emerged from shelters in closed and open cages during the study



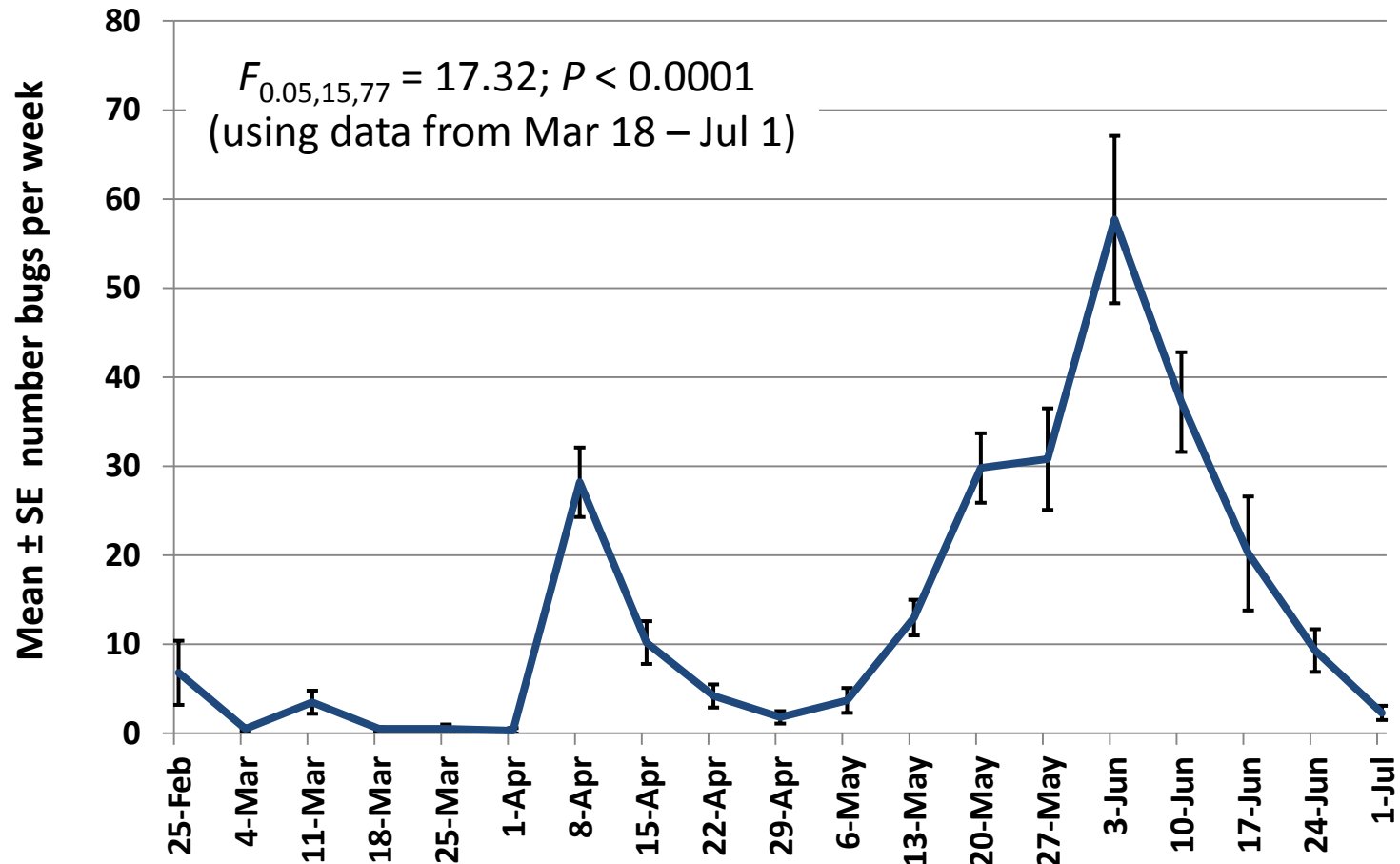
Status of BMSB remaining in shelters at end of study in early July

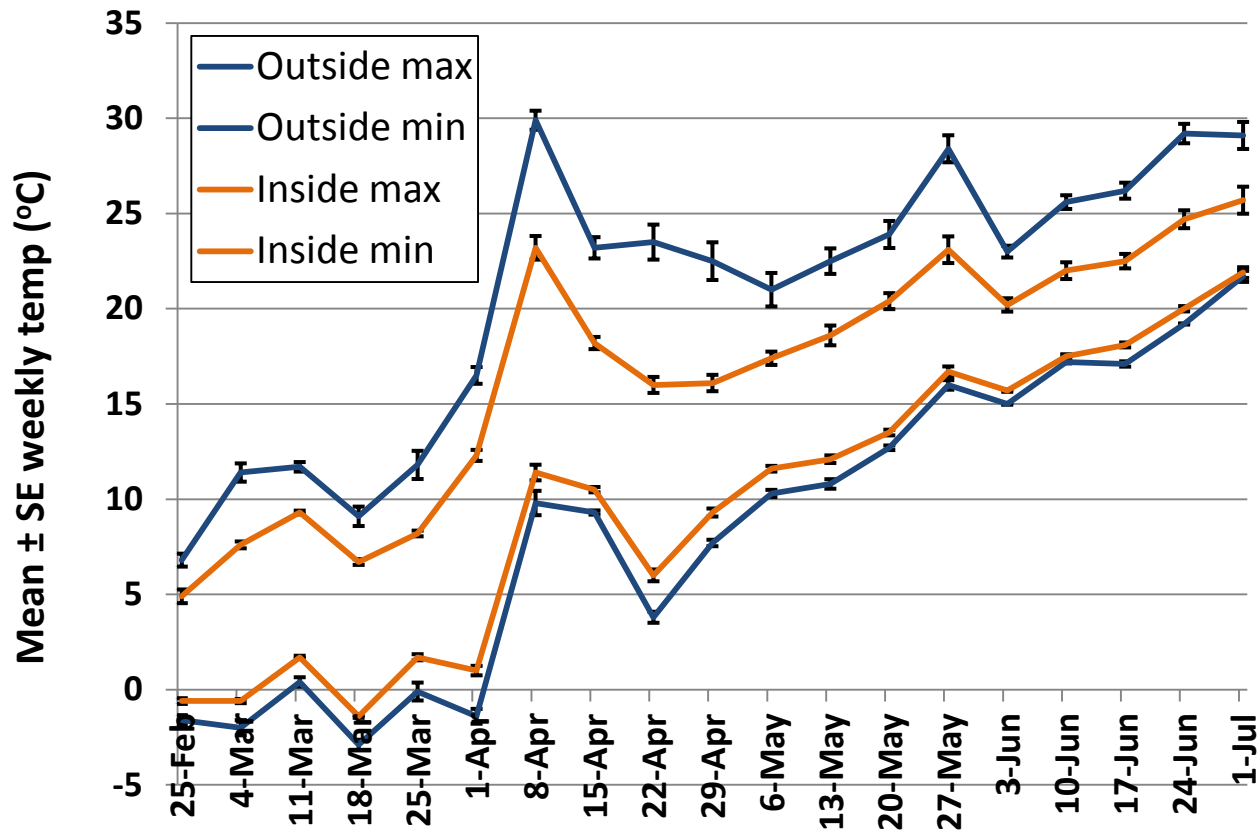


Emergence of BMSB from shelters in closed cages

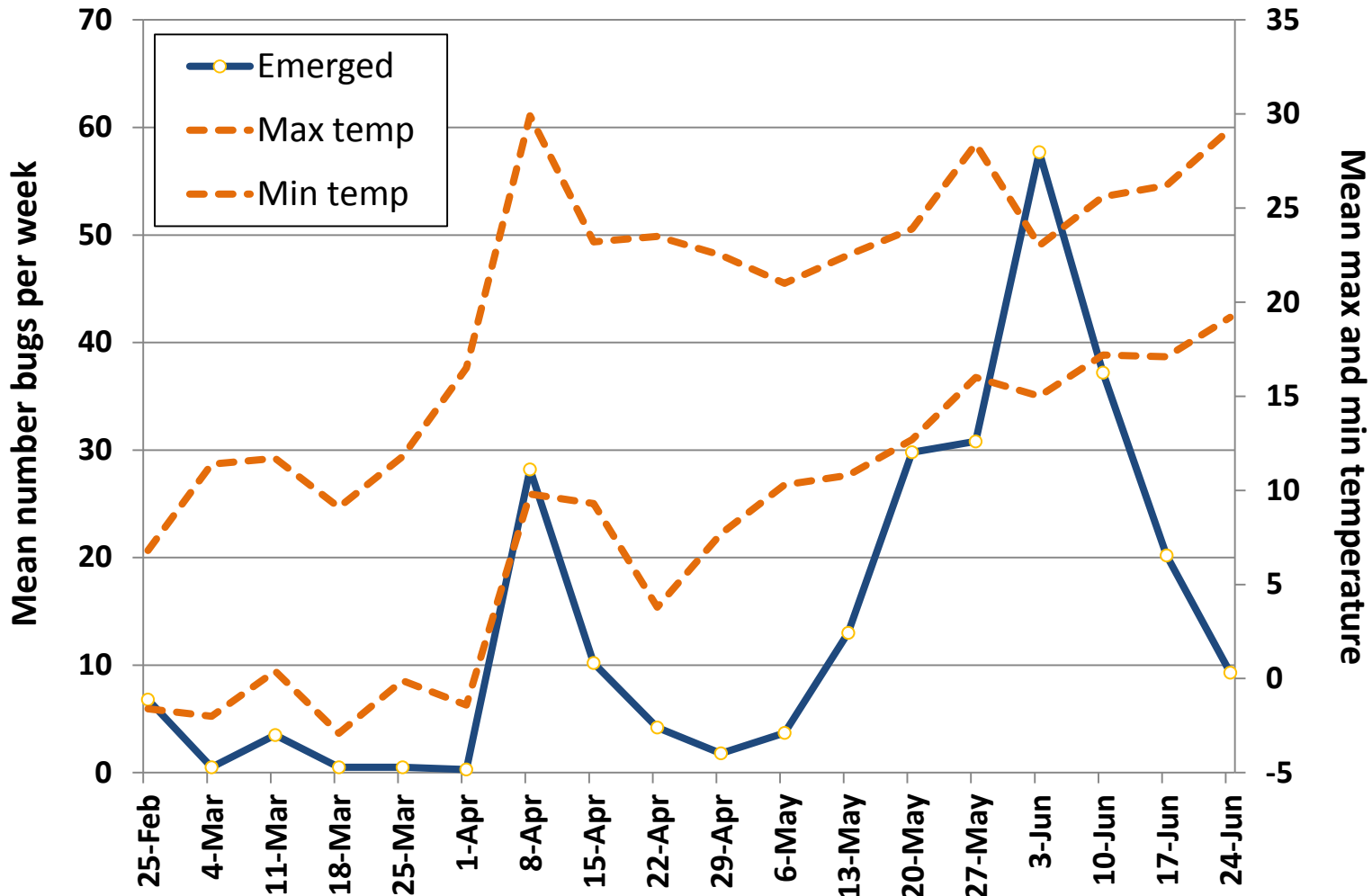


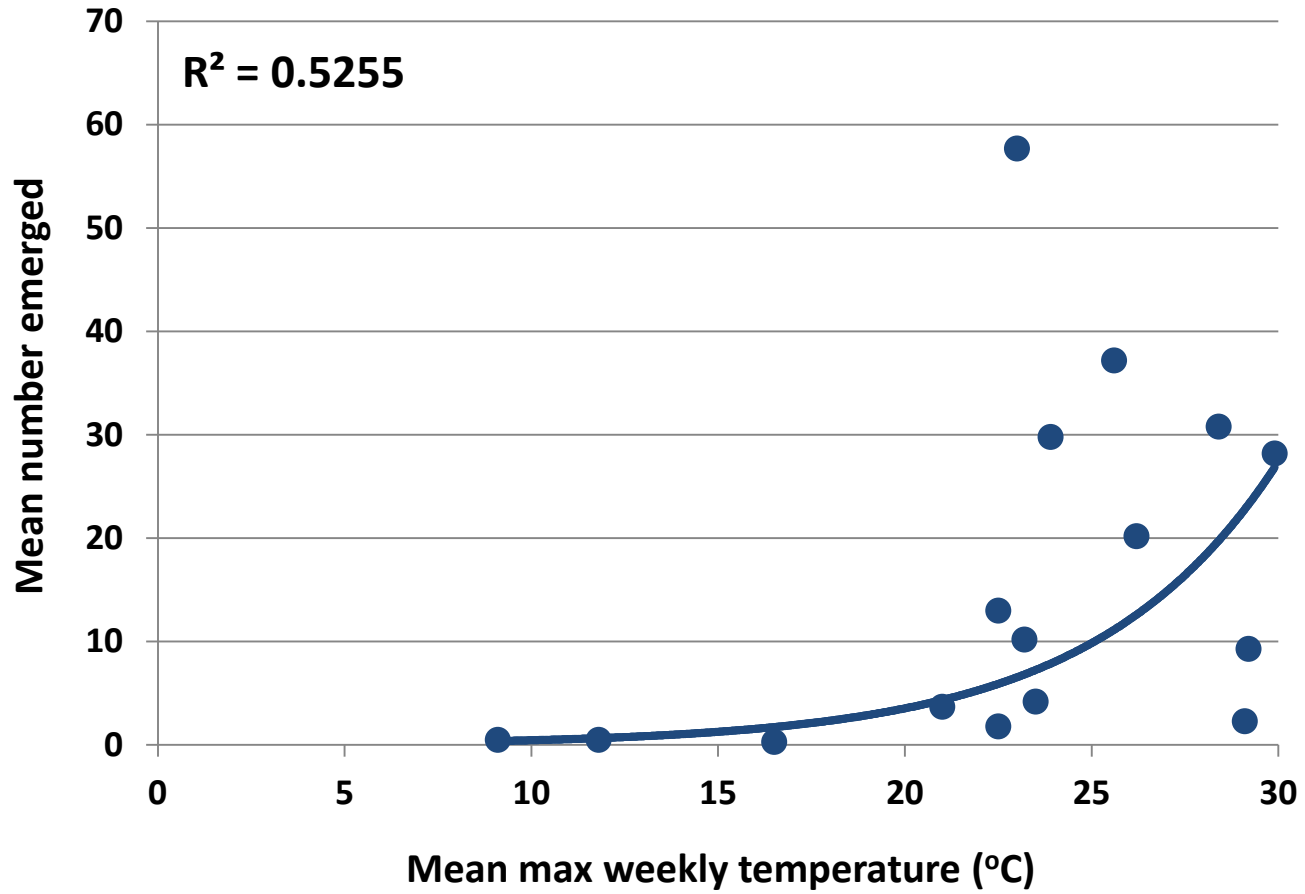
Emergence of BMSB from shelters in closed cages



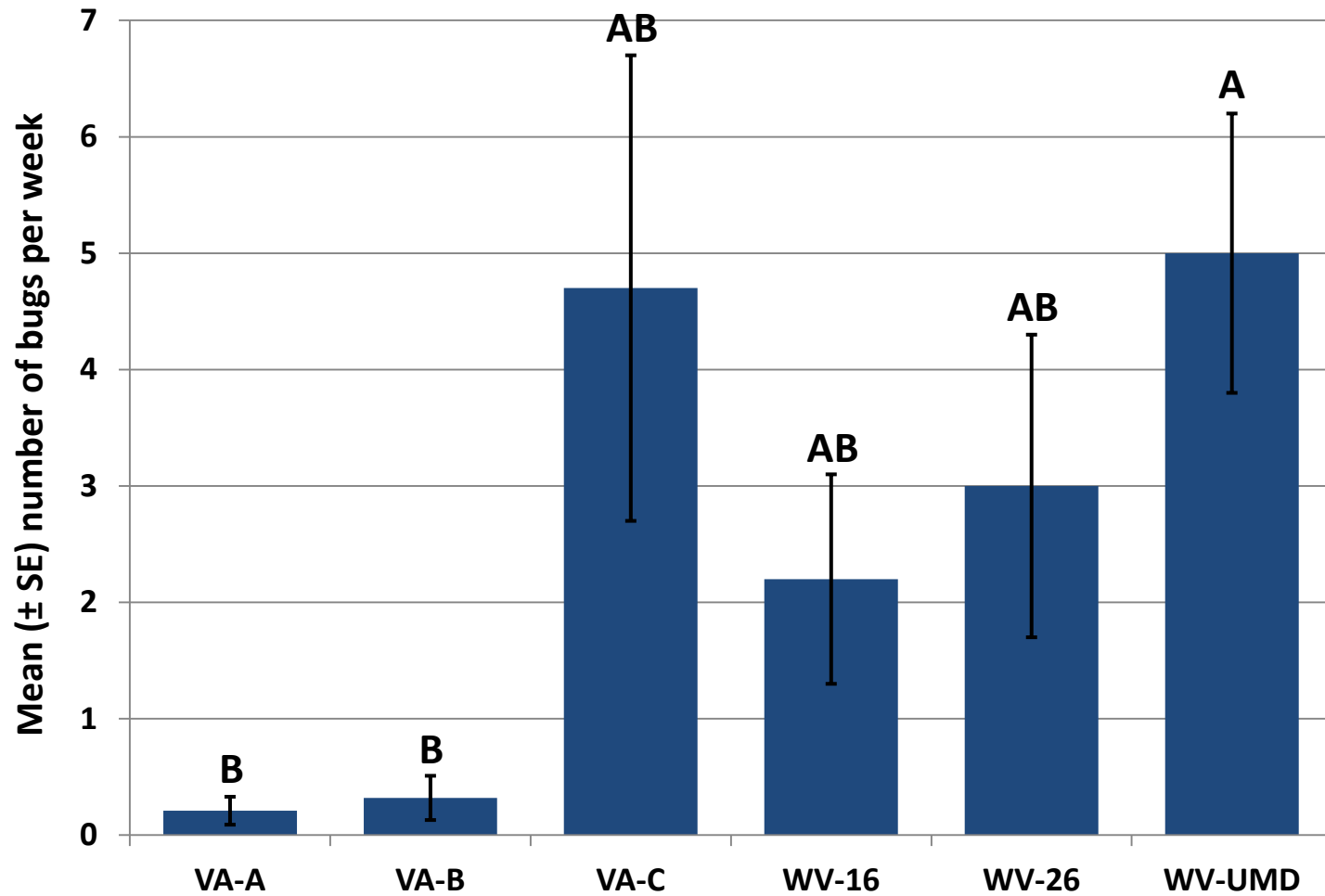


Site	Mean weekly max			Mean weekly min		
	in	out	<i>p</i>	in	out	<i>p</i>
VA-A	14.9	18.7	0.101	8.5	7.5	0.672
VA-C	17.4	20.5	0.195	10.2	9.1	0.652
WV-16	15.9	20.7	0.039	9.6	8.3	0.611
WV-26	16.3	21.0	0.051	9.5	8.1	0.606
WV-UM	17.4	22.1	0.047	10.0	8.5	0.560



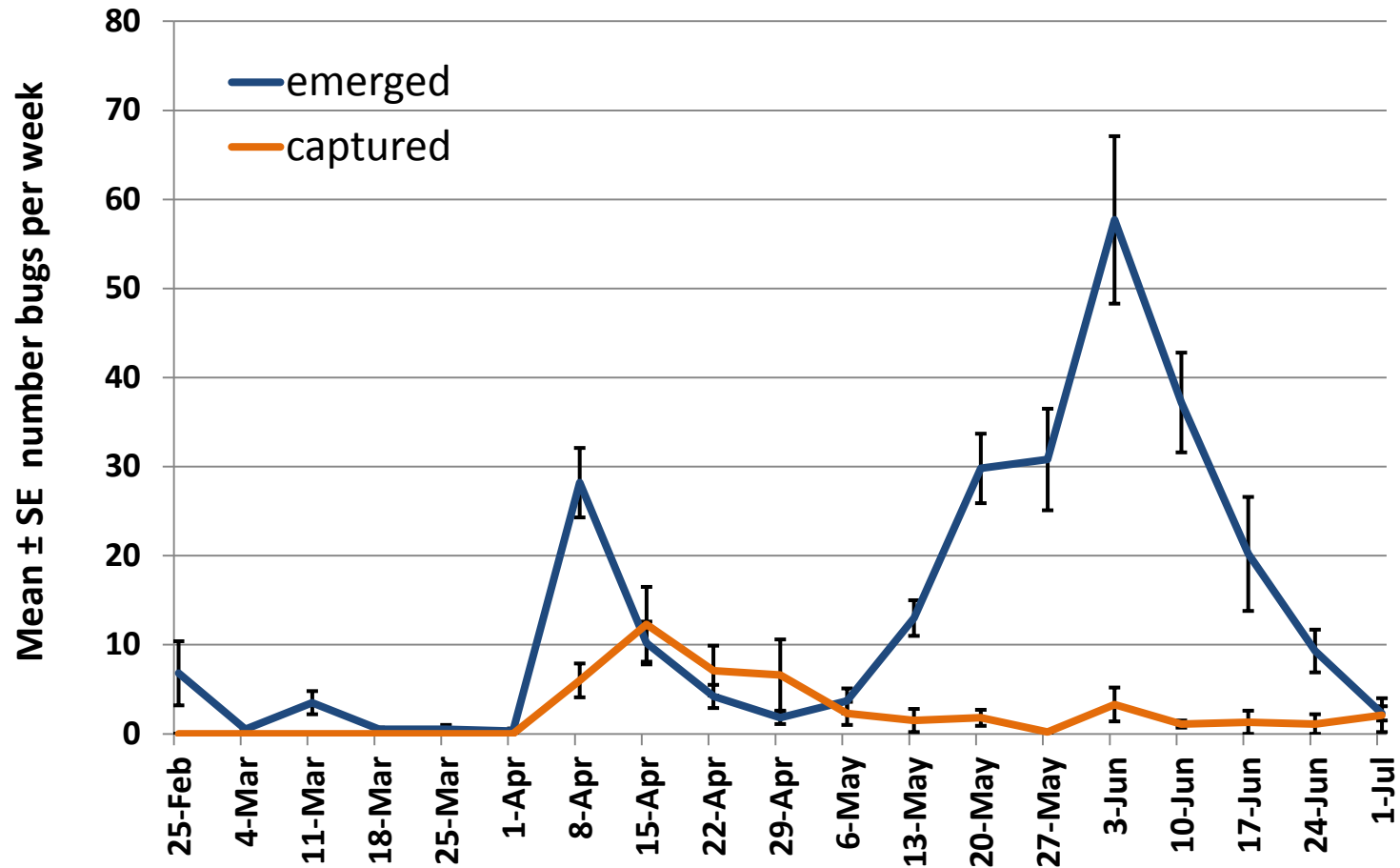


BMSB captures in pyramid traps

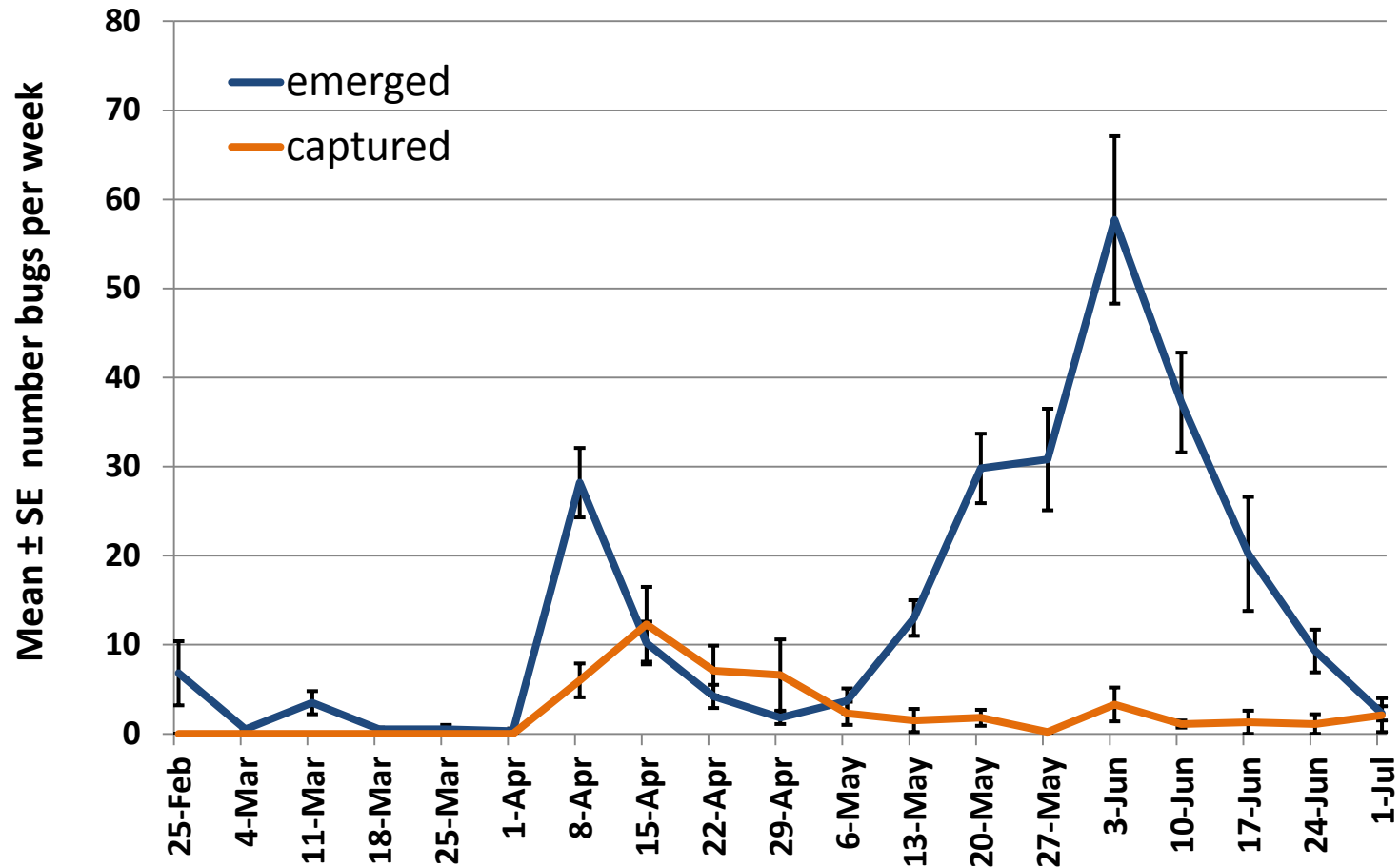


ANOVA (log transformed): $F_{0.05, 5, 105} = 4.73$; $P = 0.0006$

Emergence of BMSB from shelters in closed cages and captures in pyramid traps

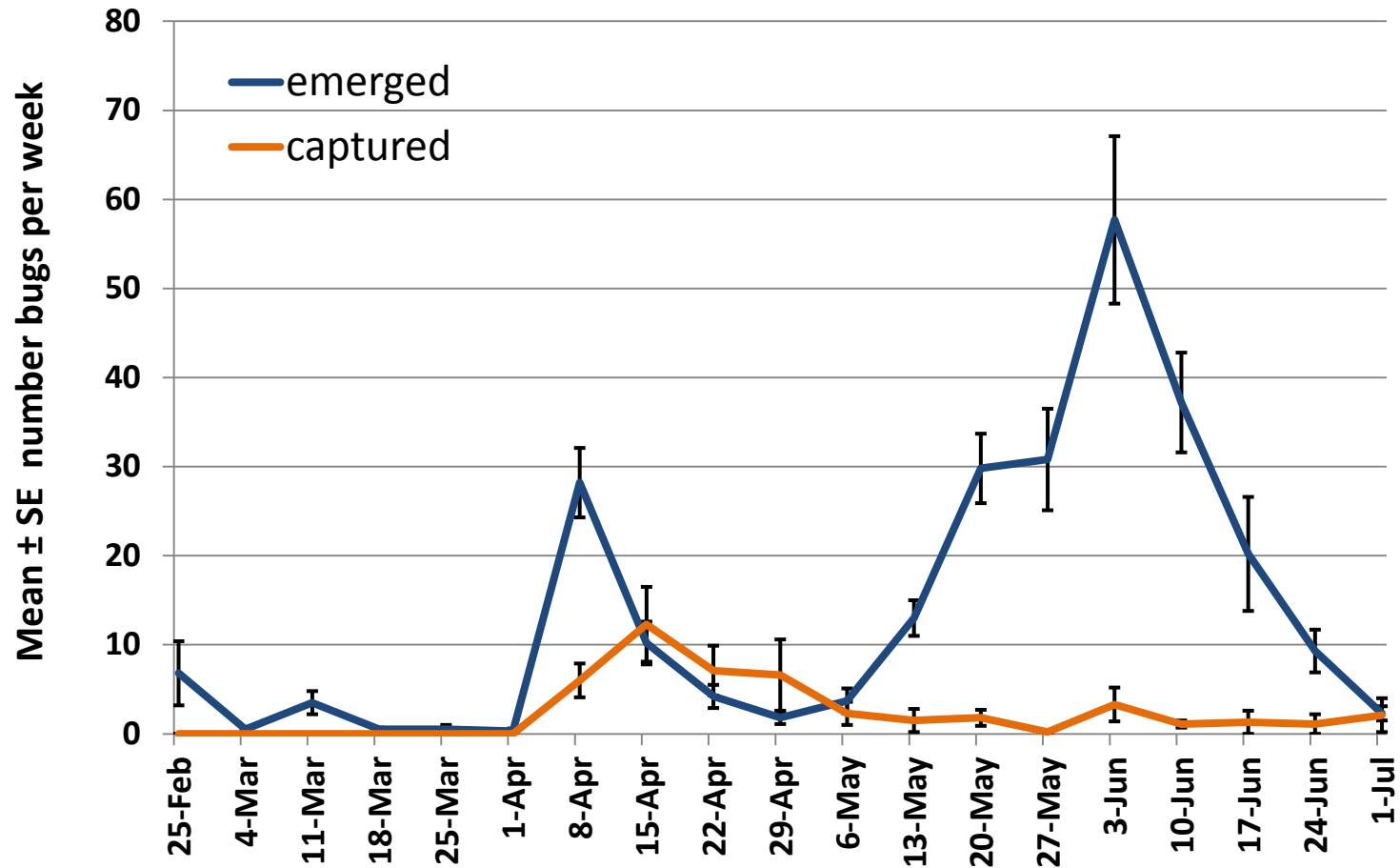


Emergence of BMSB from shelters in closed cages and captures in pyramid traps



97.6% of captures (n = 290) were in baited traps

Emergence of BMSB from shelters in closed cages and captures in pyramid traps



100% of captures were wild (unmarked) bugs

Conclusions, Questions, and Future Directions

1. BMSB emergence occurred over a ca. 3-month period, peaking between late May and early June
2. Importance of mean maximum weekly temperature
3. Onset of emergence and captures in pheromone-baited traps coincided
4. Traps did not reflect peak emergence
5. Where did all the marked bugs go? Do overwintering adult BMSB disperse from the emergence site?
6. Explore relationships between time of emergence, weight, and pronotum width by gender
7. Compare emergence patterns along a latitudinal transect
8. Conduct second year of same study



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