

Identifying and quantifying the damage of mirid bugs in raspberry (*Rubus idaeus*) crops in Tasmania.

By Emma Nightingale



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Importance

- Raspberry producers reporting 'unknown plant bug'
- Potentially causing fruit deformation
- Results in reduced yield
- Mirids thought to be potential culprit
- Confirmed by Dr. Mali Malipatil (DPI, Vic)



Miridae Background

- Sap feeding insects
- Large host range
- Shown to cause damage to buds, flowers and growing points through feeding

The Problem...

- No previous research
- Number of species unknown
- Impact on raspberries not proven



Research Questions

Who

What species are there?

When

When are they a problem?

What

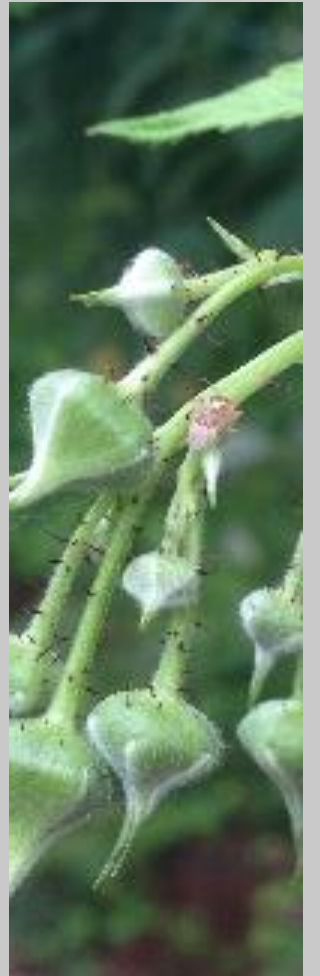
What impact does mirid feeding have on *Rubus* crops?

Where

Where are they coming from?

How

How can mirids potentially be controlled?



Sampling Methodology

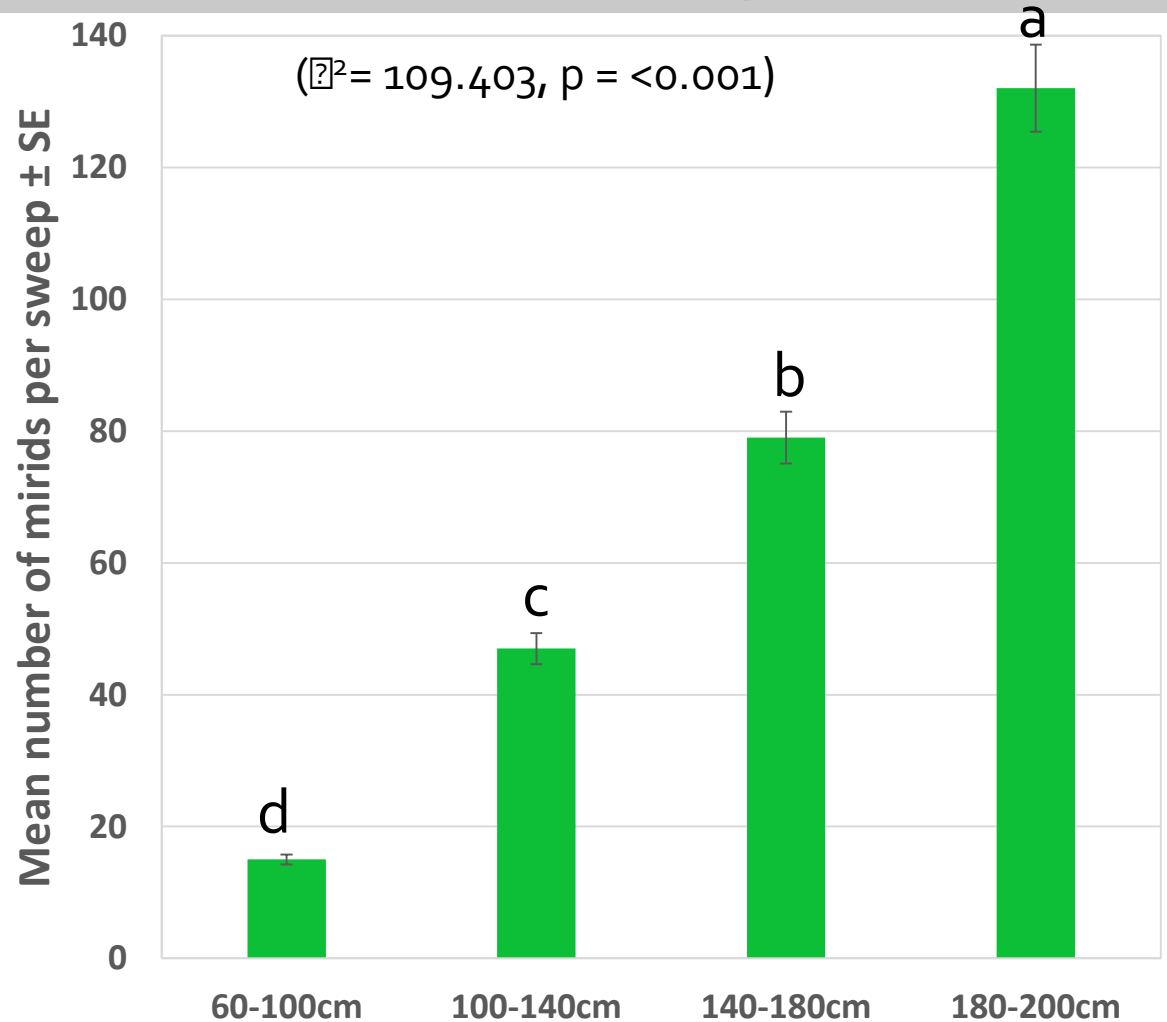
Best method for sampling mirids?

- Technique: Sweep net worked best to catch adults and juveniles
- Best time of day
- Best area in crop canopy

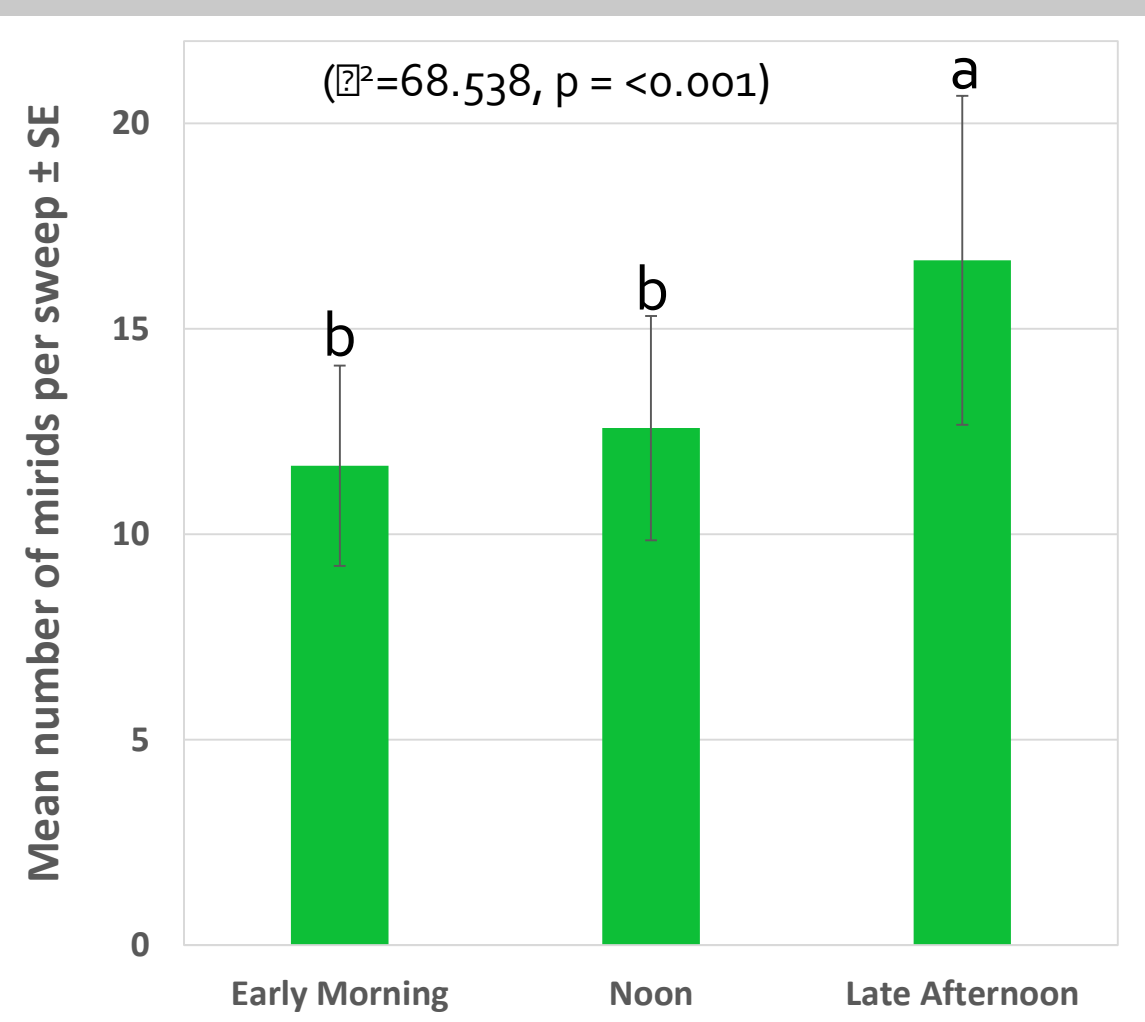


Sampling Methodology

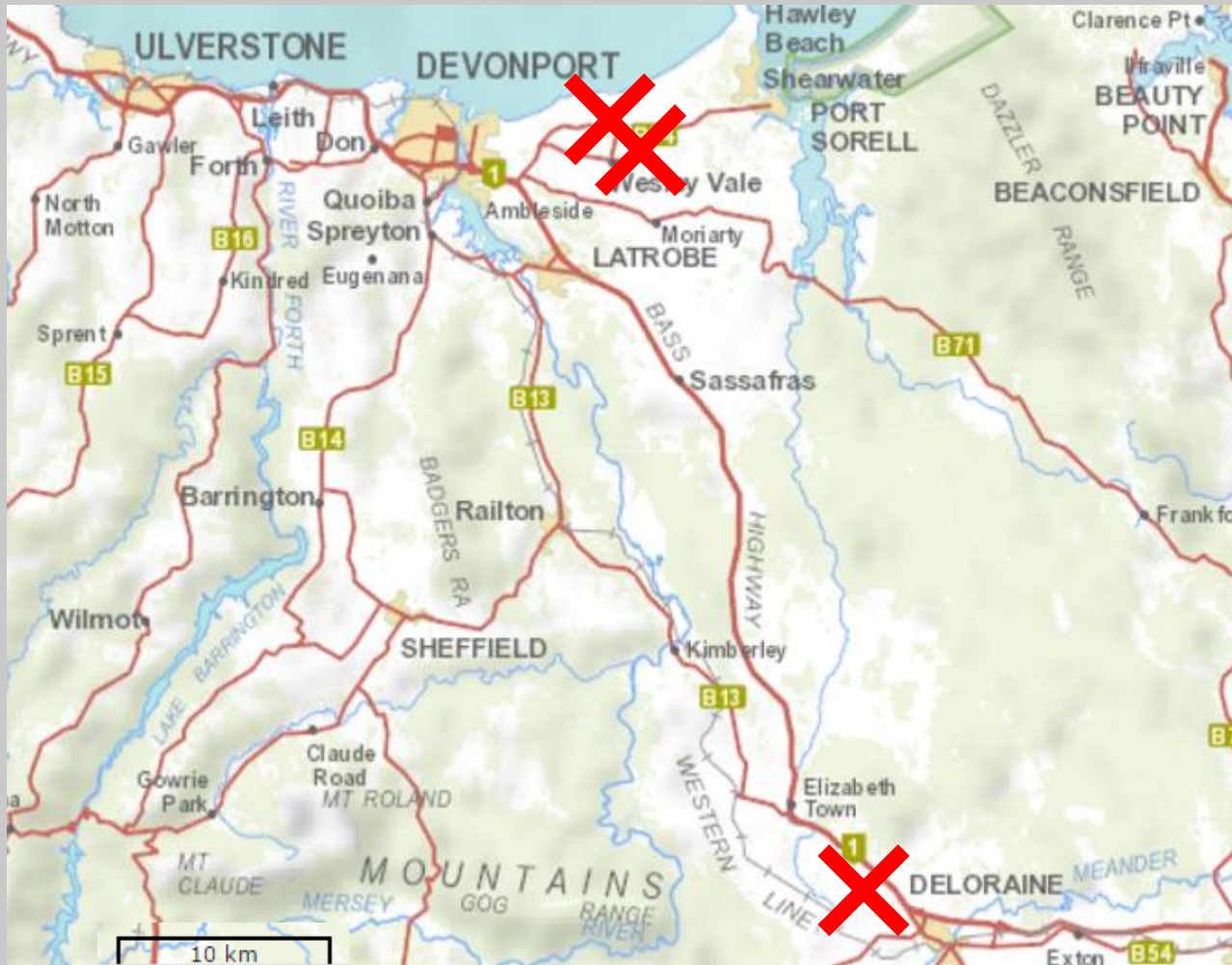
Canopy Height



Time of Day



Temporal Monitoring



- 3 sites
- Total 5 berry blocks
- 3 replicates in each block
- Sampling weekly
- 8th Dec.15 to 30th May.16
- Total mirids collected= 2,553

Species Identification

- Taxonomic identification undertaken by Dr. Mali Malipatill (Vic DPI)
- 3 main species between December and May

POTATO MIRID



(Closterotomus norvegicus)

**AUSTRALIAN
CROP MIRID**



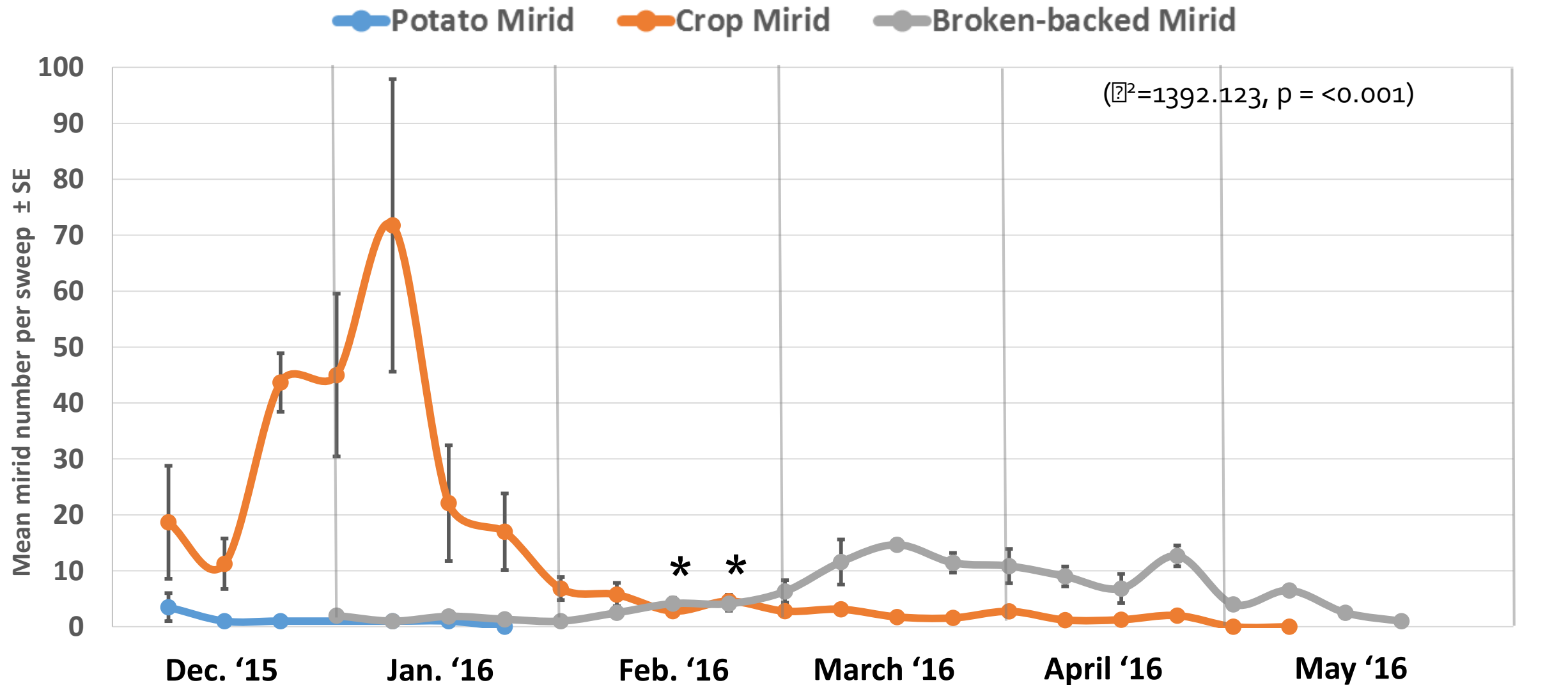
(Sidnia kinbergi)

**BROKEN-
BACKED MIRID**



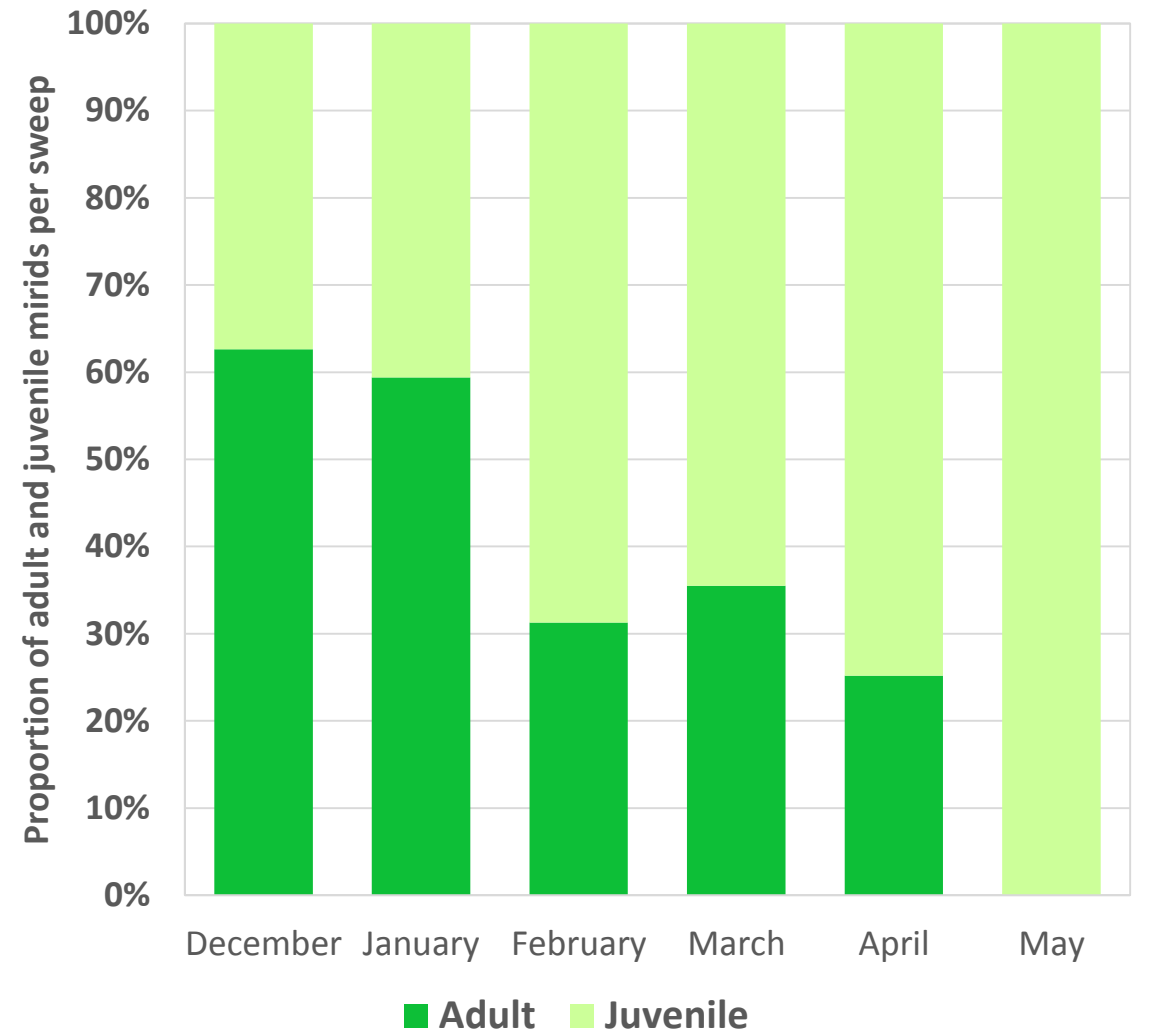
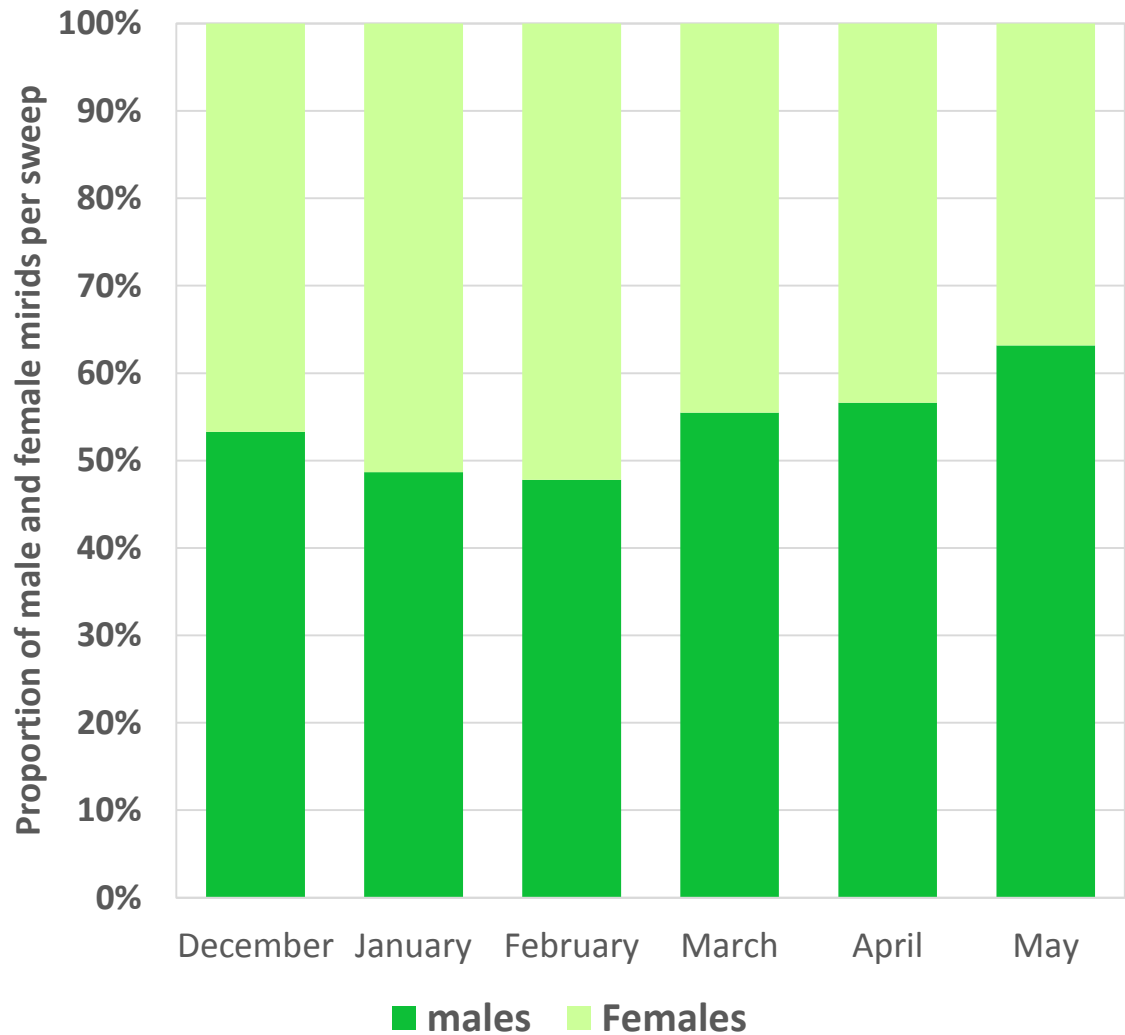
(Taylorilygus pallidulus)

Temporal Variation in Species



*= Not Significant

Temporal Monitoring



Impact of Mirid Feeding

Aim: To determine the impact mirid feeding had on fruit quality, by:

- Comparing the impact of adult and juvenile mirid feeding
- Comparing mirid feeding at three fruit development stages
- Assessed ripe berry weight and level of drupelet distortion

UNOPENED BUD

FLOWER

GREEN FRUIT



Drupelet Distortion



1 <10% distortion

2 10-25% distortion

3 26-50% distortion

4 >50% distortion

Impact of Mirid Feeding

Methods:

- Assessed impact of the Crop mirid as most prevalent at time of trial



- Closed buds selected

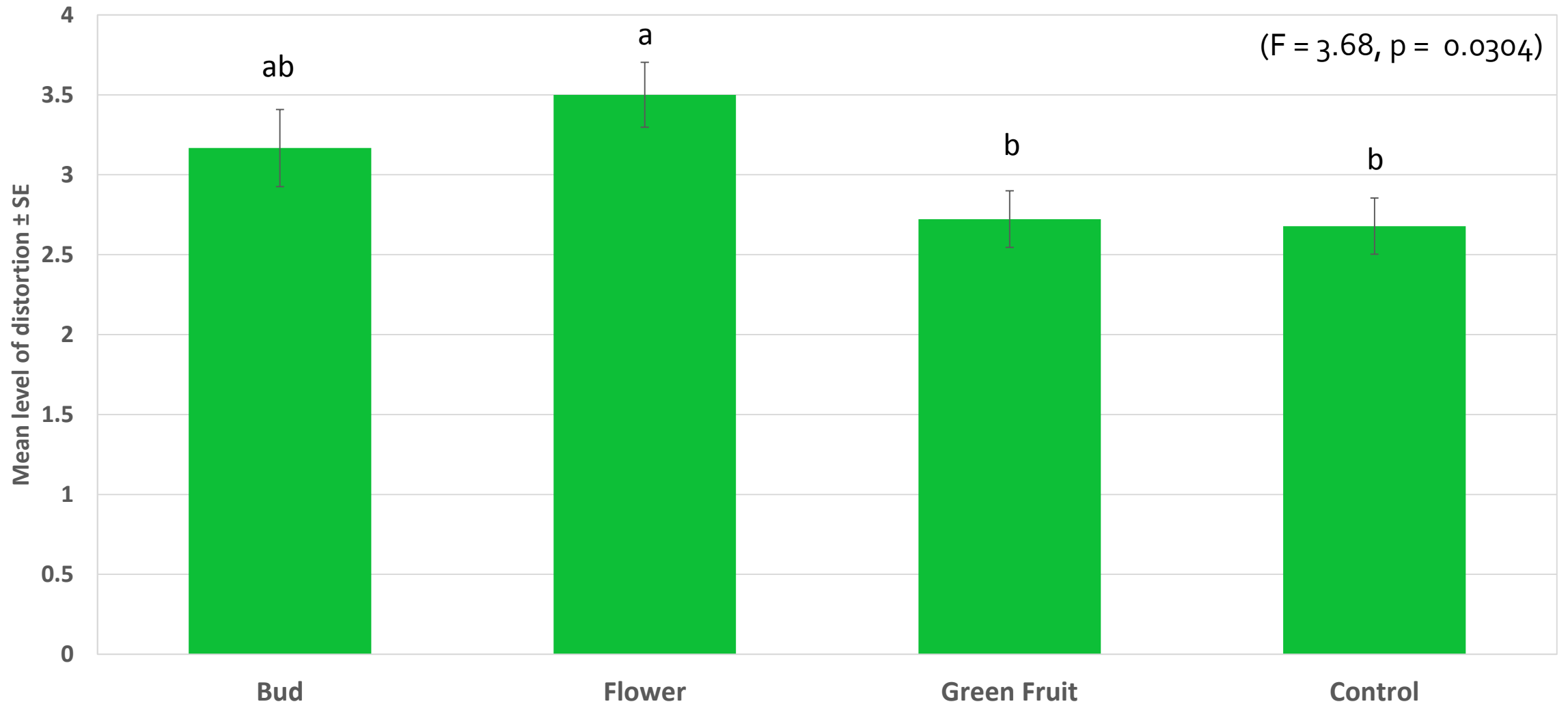
- Buds bagged
- Vials + mirids added for 48h.

- Flowers hand-pollinated

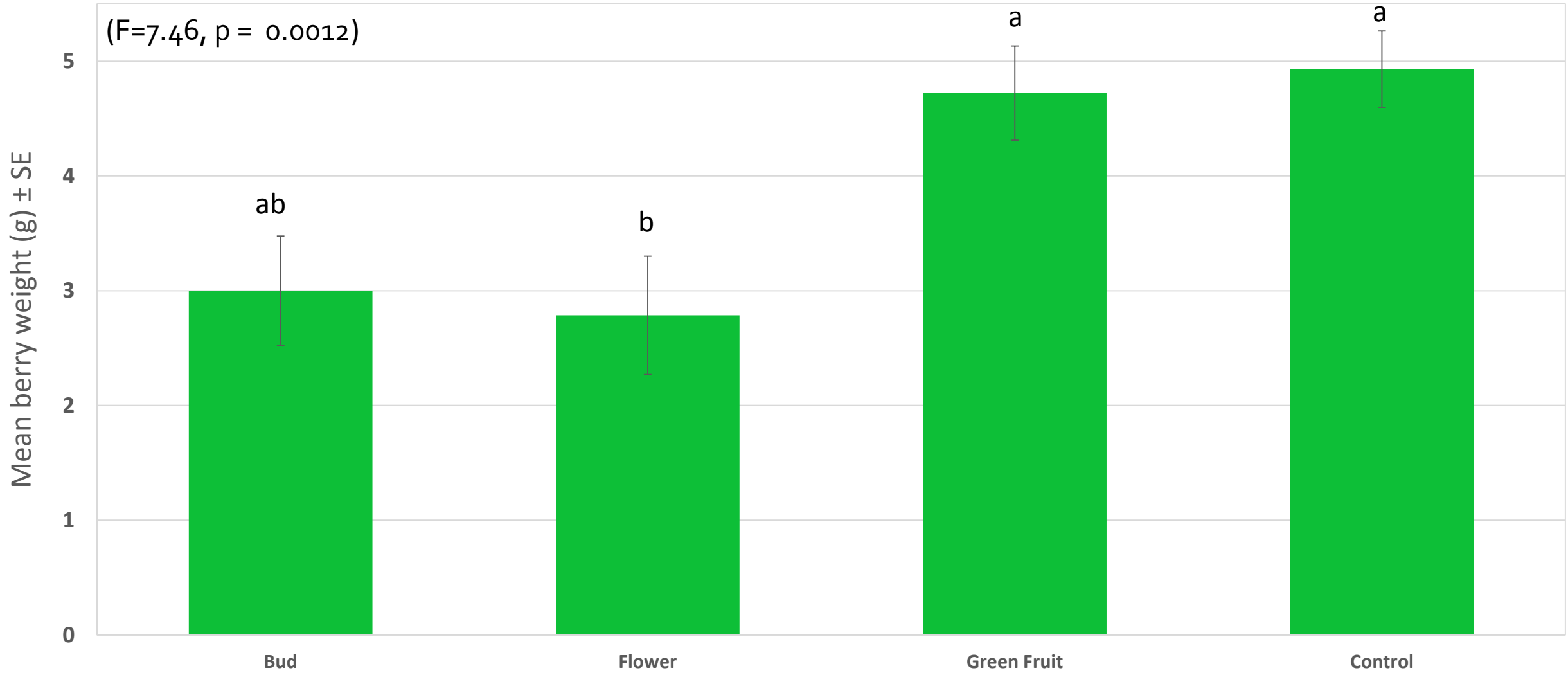
- Fruit remained bagged while developing

- Ripe fruit hand harvested

Impact on Berry Distortion



Impact on Berry Weight



Alternate Mirid Sources

Aim:

- To investigate whether weed, pasture or other crop species may be sources of mirids.

Methods:

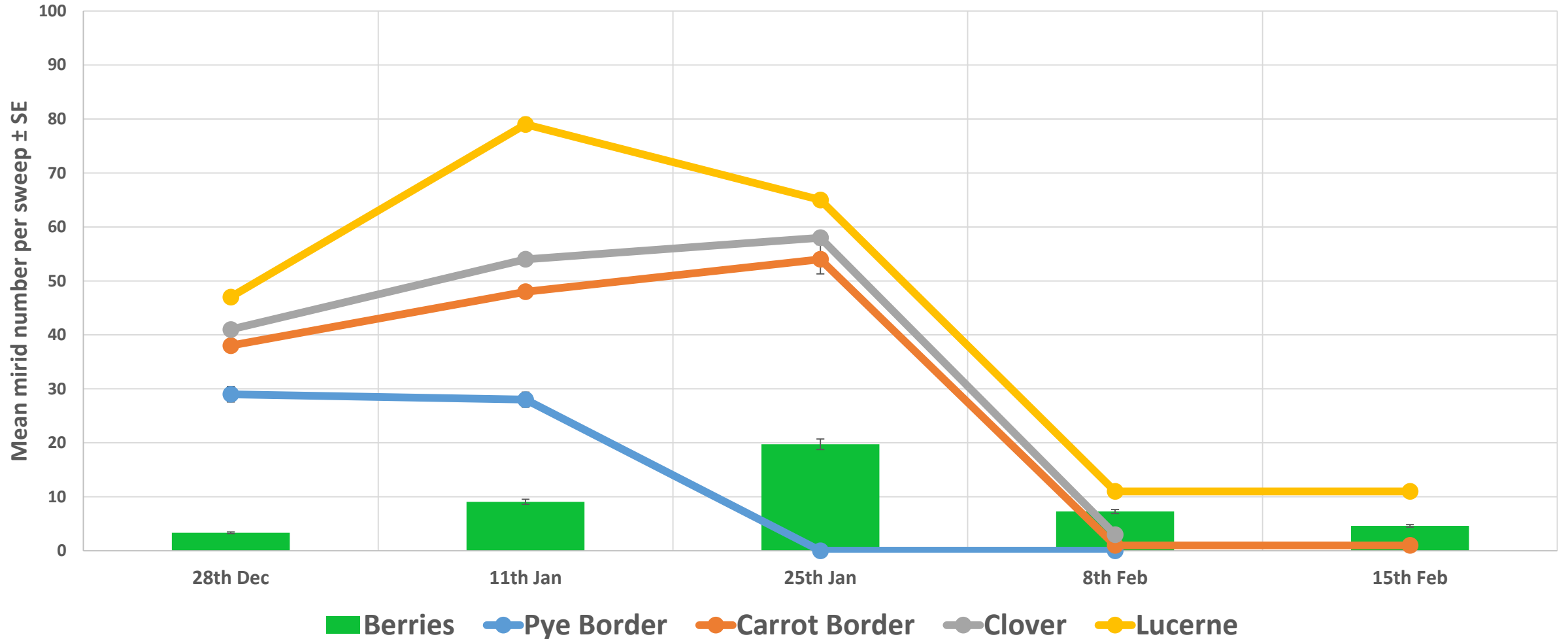
- 2-minute sweep, fortnightly between Dec.15 and Feb.16

Areas Monitored:

- Lucerne
- Pyrethrum crop border, containing thistle and grass spp.
- Carrot crop border, containing predominately Wild Radish
- Clover and grass



Alternate Mirid Sources



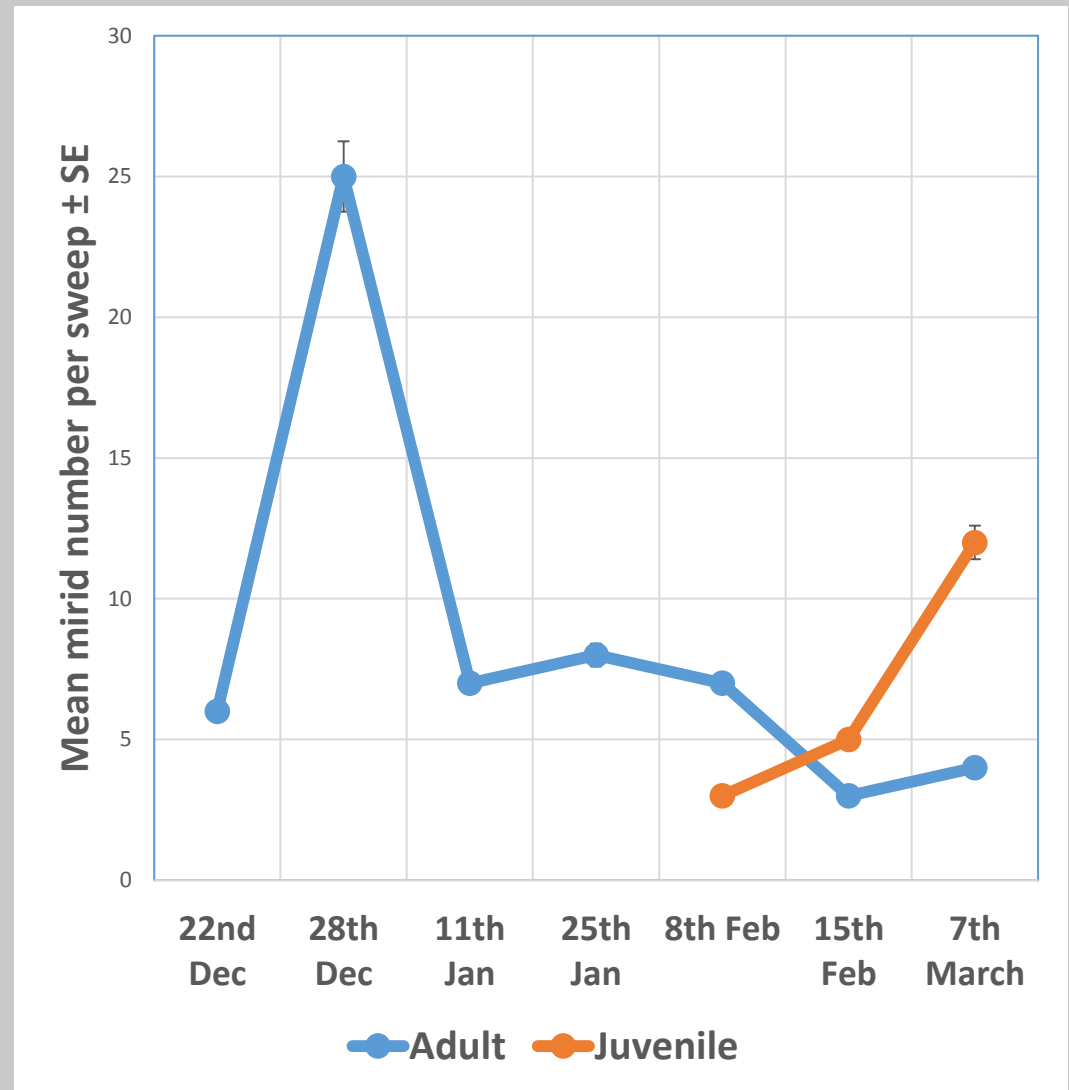
Potential Control Options

Lucerne

- Both adults and juveniles observed
- Abundance of flowering weeds
- Previously used as trap crop
- Potential control strategy

Weed Management

- Removal or control of weed species surrounding crops



Key Findings



- Sweep netting most efficient method for collection
- Predominately 3 mirid species identified
- Varied throughout the season
- Mirid feeding on flowers resulted in
 - Reduced berry weight (57%)
 - Increased fruit distorted (23%)
- No difference in feeding impact from adults to juveniles
- Weed, pasture and other crops all sources for mirids
- Lucerne = potential trap crop

Acknowledgements

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