

Bloom Period Management of Lygus Bug in Alfalfa Seed: Beleaf Rate by MSO Trial



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Beleaf rate by MSO trial

Managed largely with insecticides

- A number of insecticides labeled for lygus control
 - Broad spectrum OP's, carbamates, pyrethroids
 - Several lower-risk insecticides available
- Usefulness of available compounds limited by
 - Efficacy and resistance management issues
 - Toxicity to beneficial insects
 - Natural enemies, but especially pollinators:
ID-alfalfa leafcutting bee (ALCB)
- Need for effective, bee-safe insecticides during bloom

Beleaf rate by MSO trial

❖ Beleaf 50SG (flonicamid, FMC Corp)

- **Insecticide class:** pyridinecarboxamide
- **IRAC resistance group:** 9C
- **Mode of action:** nerve poison. Blocks pre-synaptic potassium channels resulting in uncontrolled acetylcholine release at synapse: **inhibits/ reduces feeding**
- **Route:** contact, ingestion
- **Systemic in plant:** systemic, translaminar
- **Insect stages affected:** adult and immature insects
- **Activity spectrum:** sucking insects only: aphids, **plant bugs**, white flies, etc.

Beleaf rate by MSO trial

❖ Beleaf 50SG

- Available for lygus control in alfalfa seed since 2007
- Good to excellent lygus control
- Pollinator safe (can be applied over bees!)
- Reasonably safe to natural enemies



Beleaf rate by MSO trial

❖ Beleaf 50SG

- **Appears slow acting**
 - Insects stop feeding within an hour of contact/ ingestion
 - Starve or desiccate over several days
 - Larger instars and adults likely to die more slowly
 - Activity spectrum: sucking insects only (aphids, plant bugs)
- **Growers interested in:**
 - Higher application rate (4.2 oz. / acre vs. 2.8 oz. / acre)
 - **High rate labeled in some vegetable crops**
 - NIS efficacy

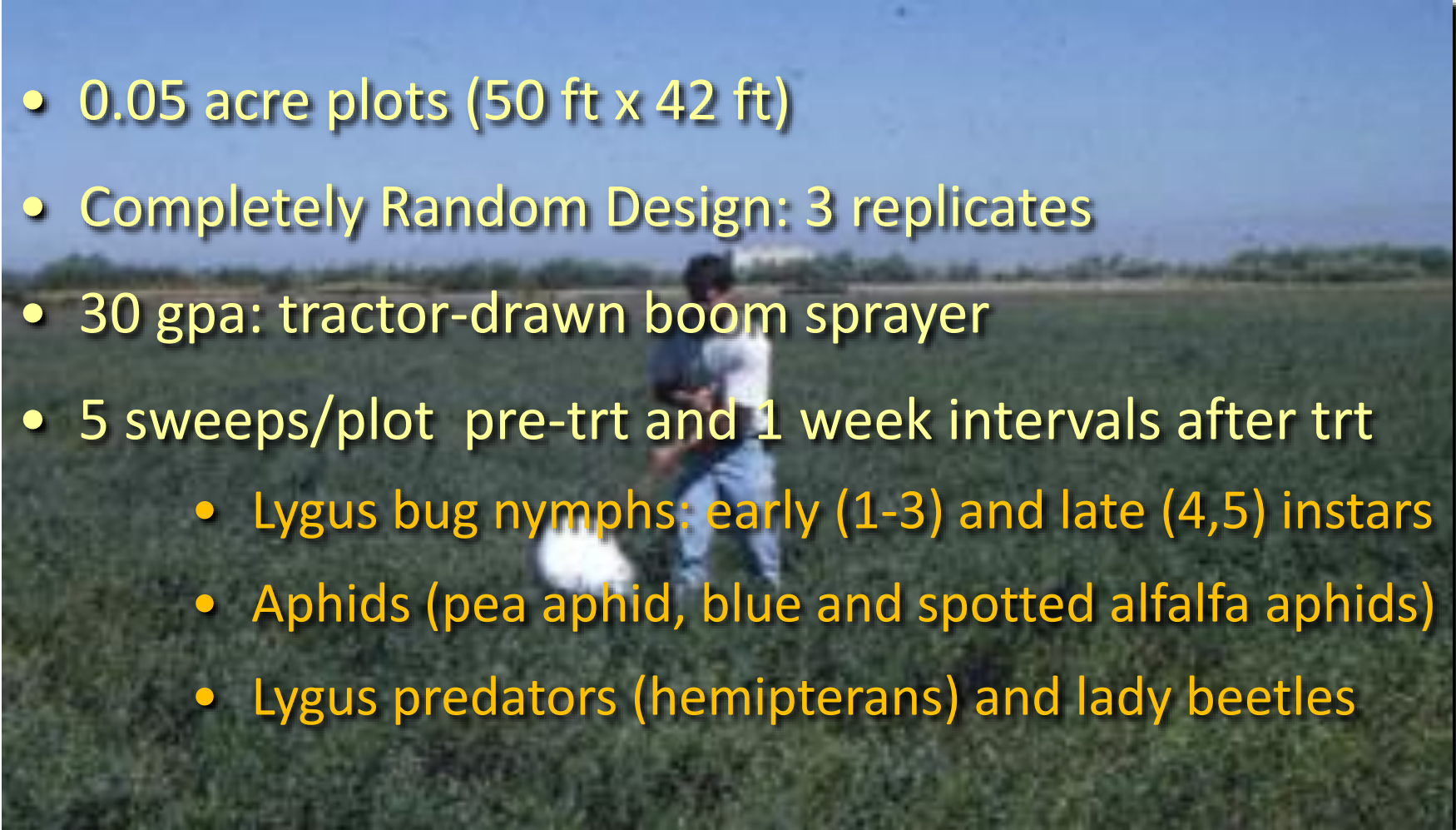
Beleaf rate by MSO trial

Treatment table

No.	Treatment	Beleaf (oz/acre)	MSO
1	BeLeaf	2.8	None
2	BeLeaf	4.2	None
3	Beleaf	2.8	2%
4	Beleaf	4.2	2%
5	UTC	n/a	n/a


Beleaf (flonicamid) rate by MSO trial

Pesticide trial methods

- 0.05 acre plots (50 ft x 42 ft)
 - Completely Random Design: 3 replicates
 - 30 gpa: tractor-drawn boom sprayer
 - 5 sweeps/plot pre-trt and 1 week intervals after trt
 - Lygus bug nymphs: early (1-3) and late (4,5) instars
 - Aphids (pea aphid, blue and spotted alfalfa aphids)
 - Lygus predators (hemipterans) and lady beetles
- 
- A photograph of a person in a field, likely conducting a trial. The person is wearing a light-colored shirt and dark pants, and is holding a white bag. The field is green and appears to be a crop field. The background shows a clear blue sky and some distant trees.

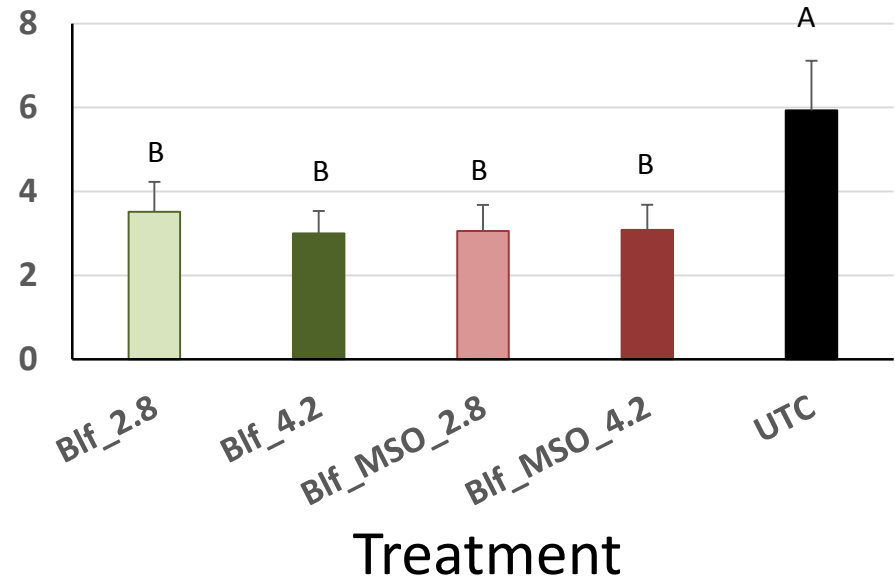
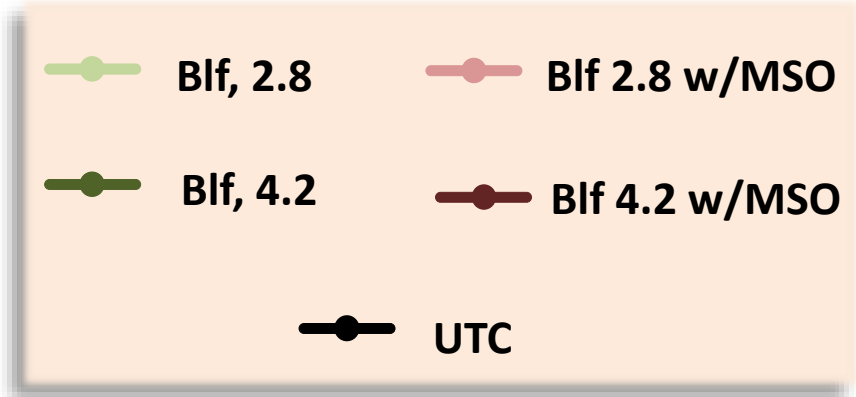
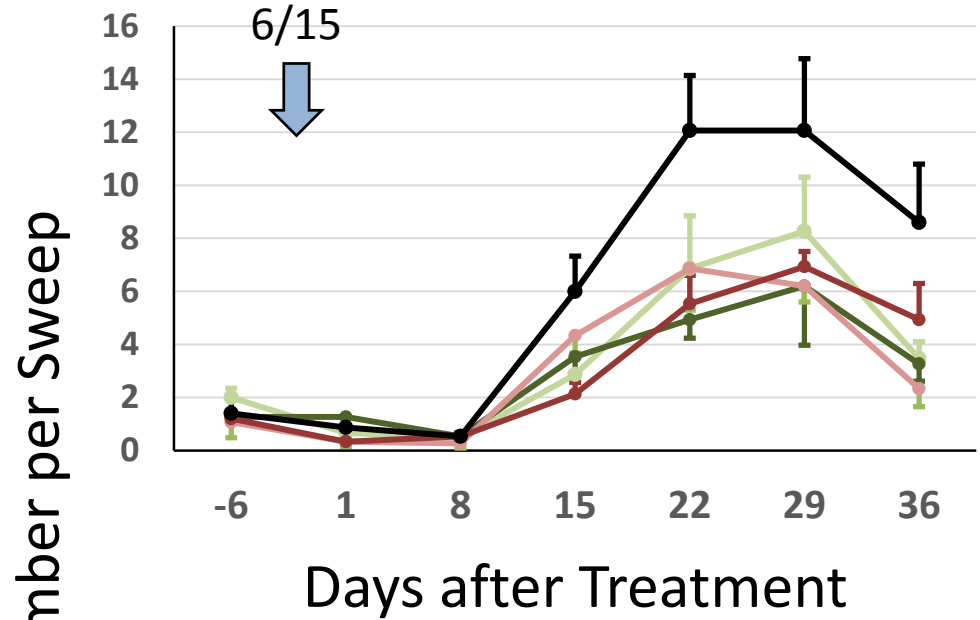
Beleaf (flonicamid) rate by MSO trial

Pesticide trial methods

- Analyzed by ANOVA:
 - Completely Random Design: 3 replicates
 - Separate treatment means by LSD
 - Compare specific 'trt pairs' using contrast statements
 - Means from treated plot vs. untreated plots
 - Means from MSO vs. non-MSO treated plots
 - Means from plots treated with high vs low rates of Beleaf
- 
- A photograph of a person in a white shirt and blue jeans working in a field, likely conducting a pesticide trial. The person is standing in a field of green crops, possibly soybeans, and appears to be handling a white container or bag. The background shows a clear blue sky and a distant horizon line.

2015 Beleaf rate by MSO grower trial

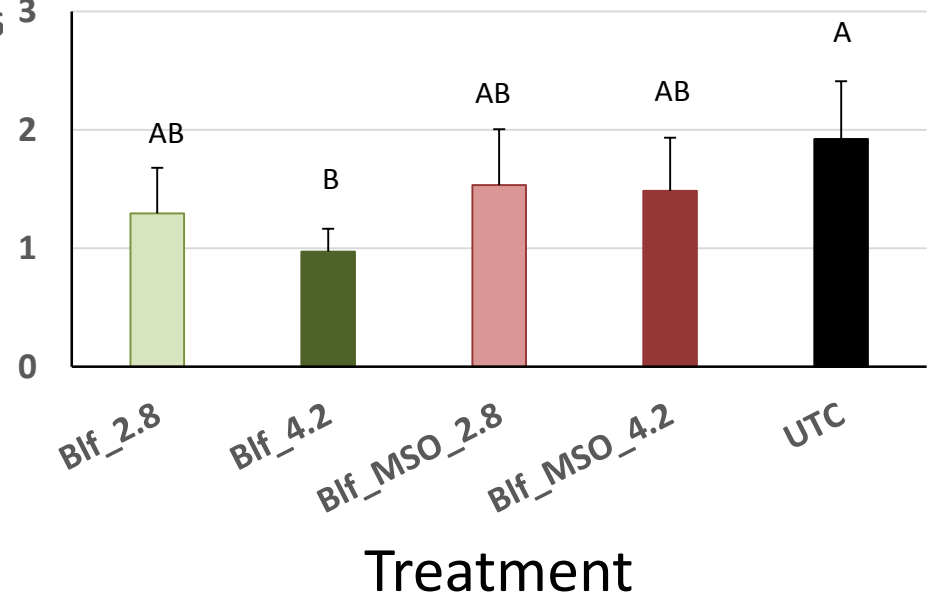
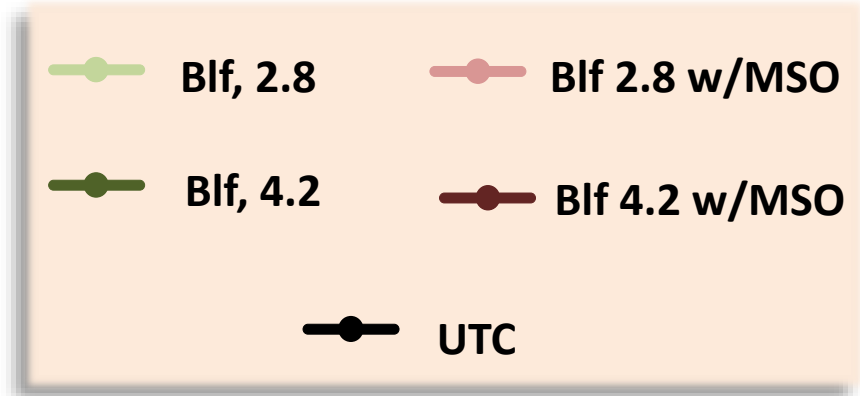
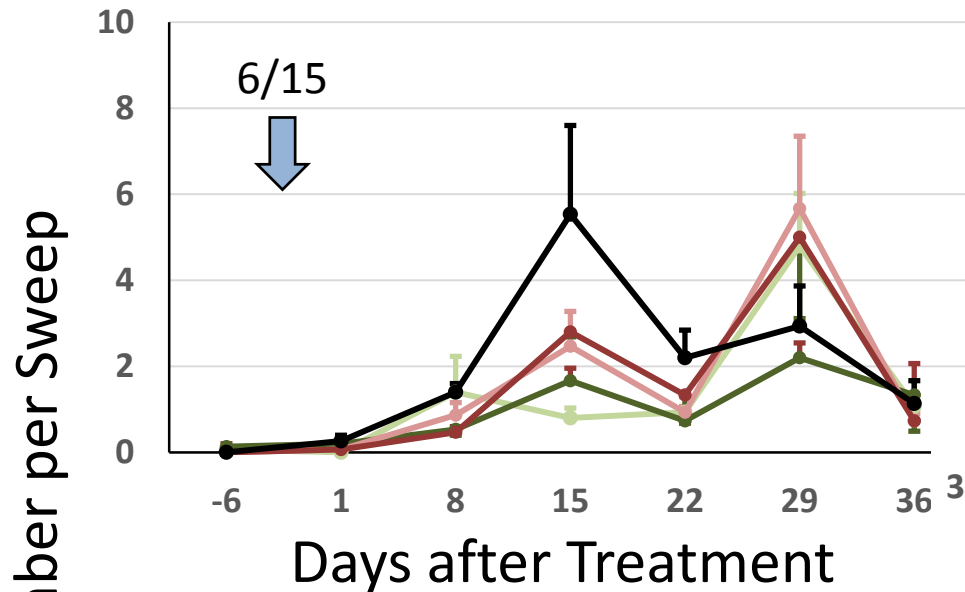
Mean number of *Lygus adults* on each sample day and over all sample days on treated and untreated plots



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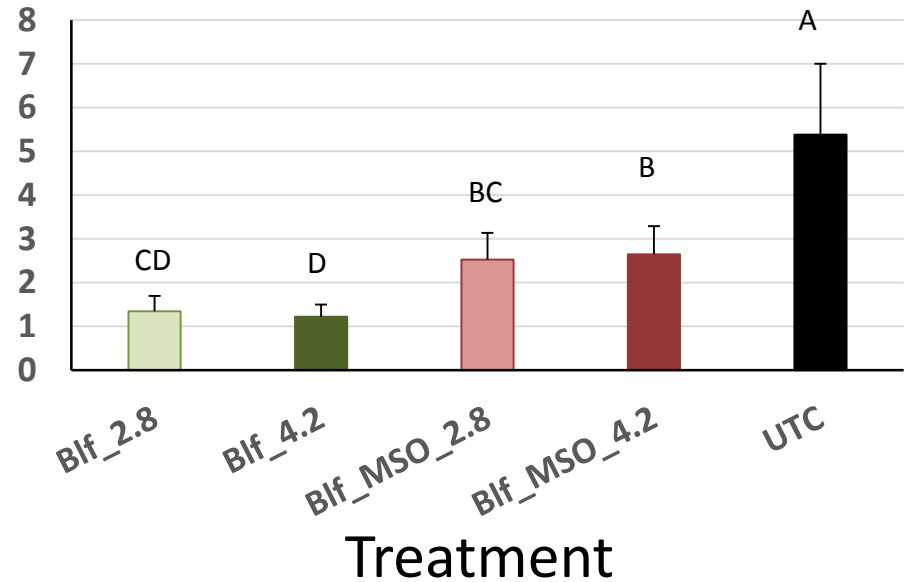
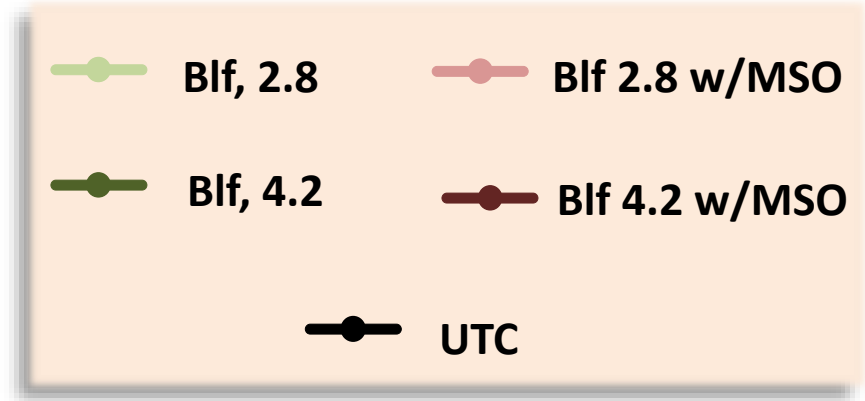
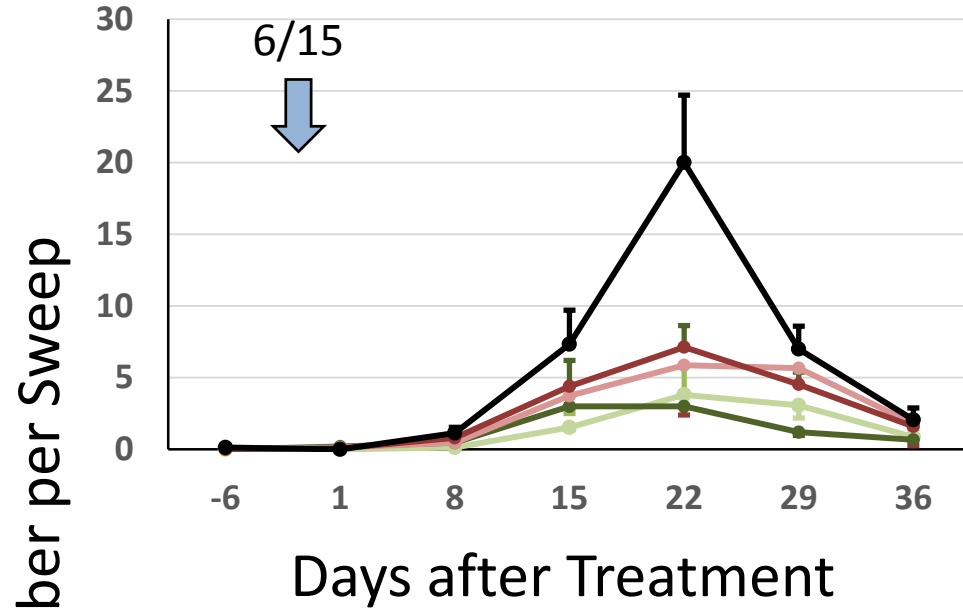
2015 Beleaf rate by MSO grower trial

Mean number of **small Lygus nymphs** on each sample day and over all sample days on treated and untreated plots



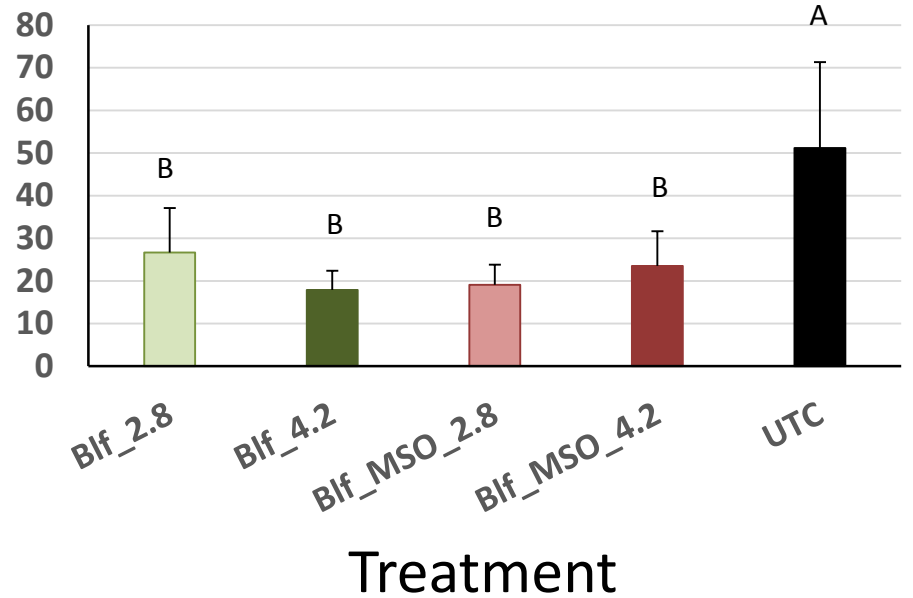
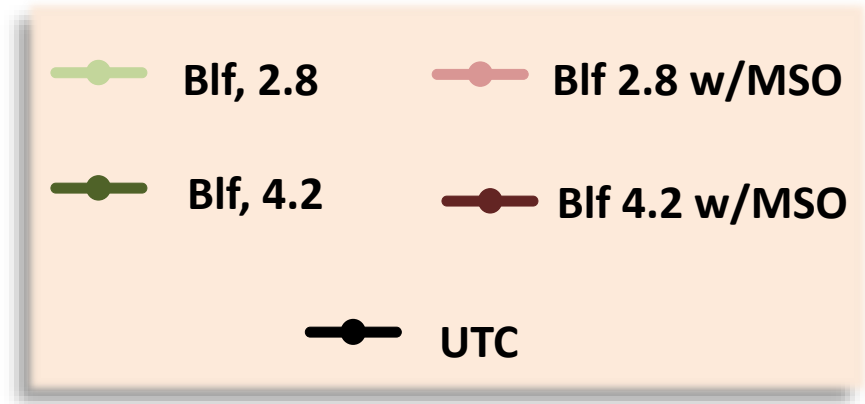
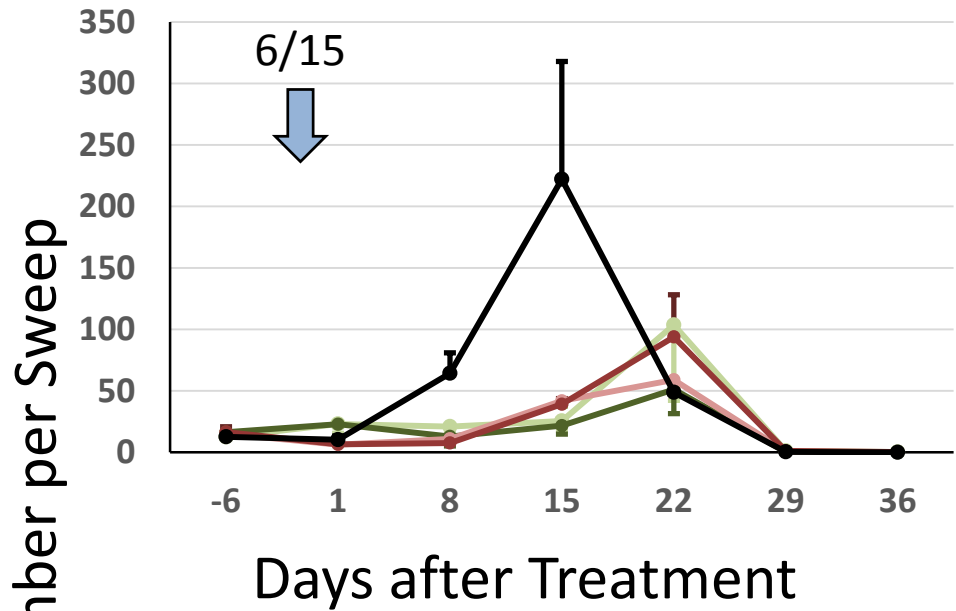
2015 Beleaf rate by MSO grower trial

Mean number of **large *Lygus* nymphs** on each sample day and over all sample days on treated and untreated plots



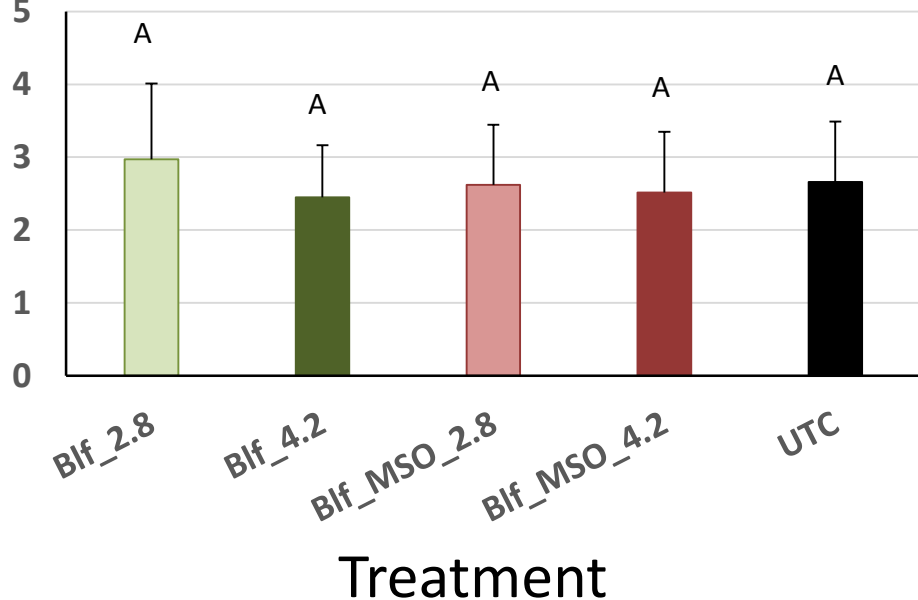
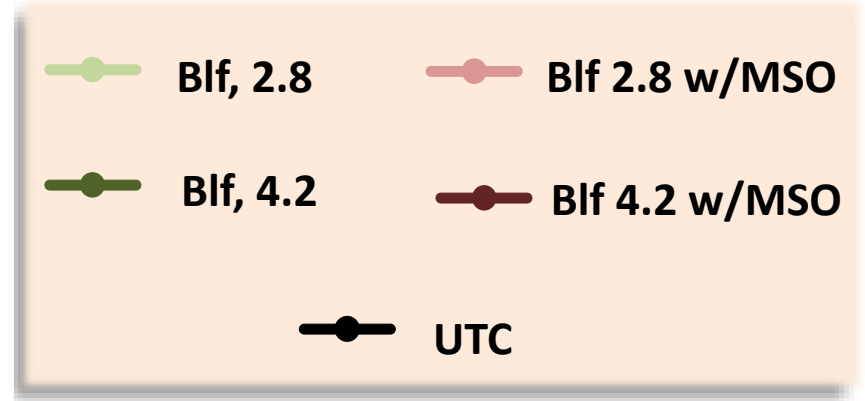
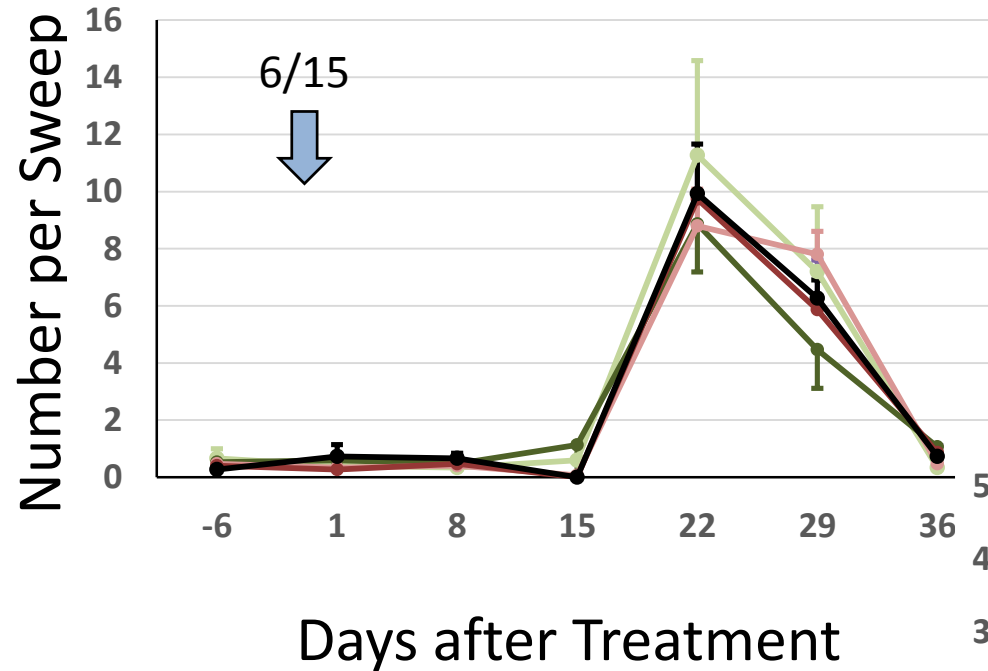
2015 Beleaf rate by MSO grower trial

Mean number of **pea and blue alfalfa aphids** on each day and over all sample days on treated and untreated plots



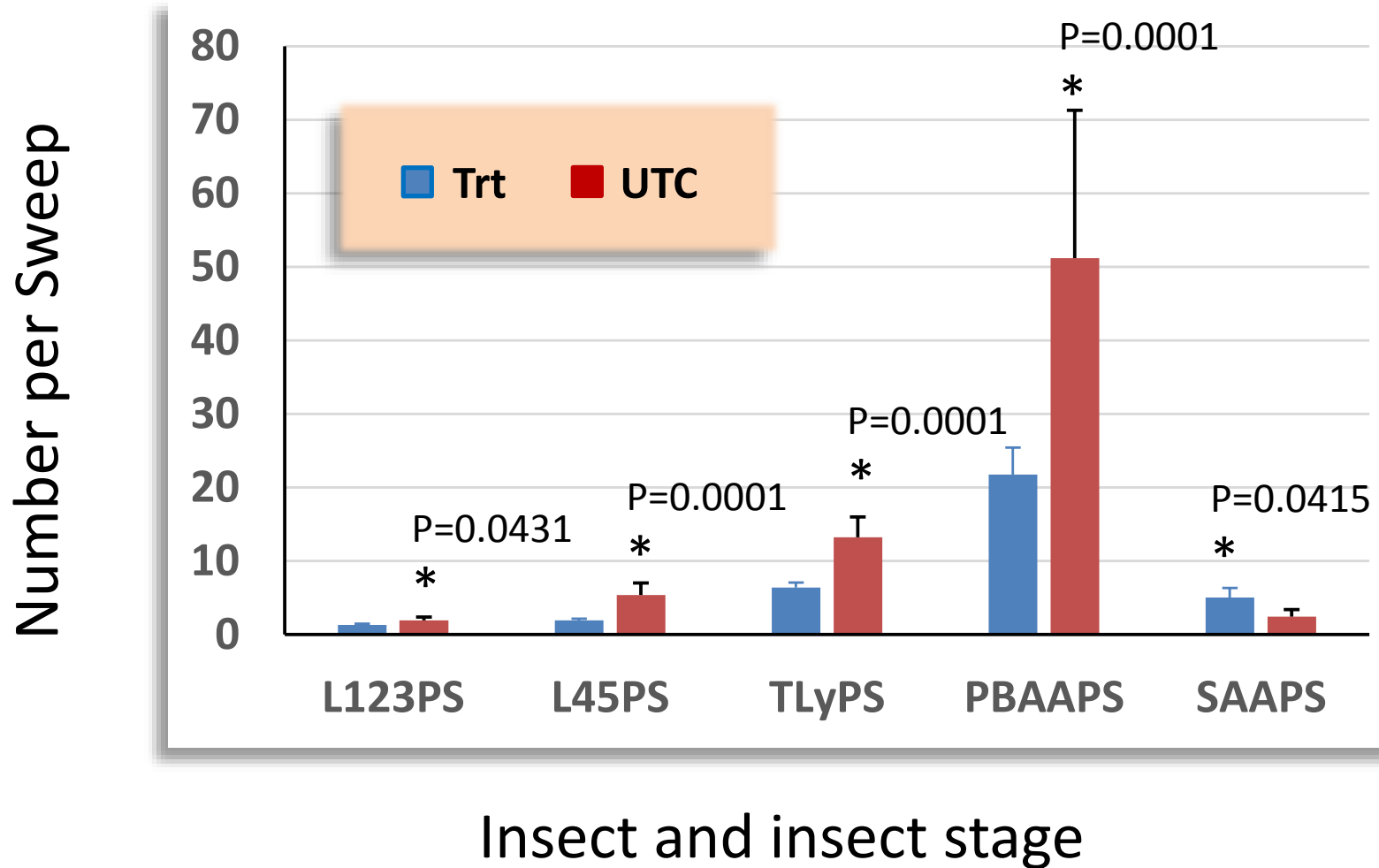
2015 Beleaf rate by MSO grower trial

Mean number of **spotted alfalfa aphids** on each day and over all sample days on treated and untreated plots



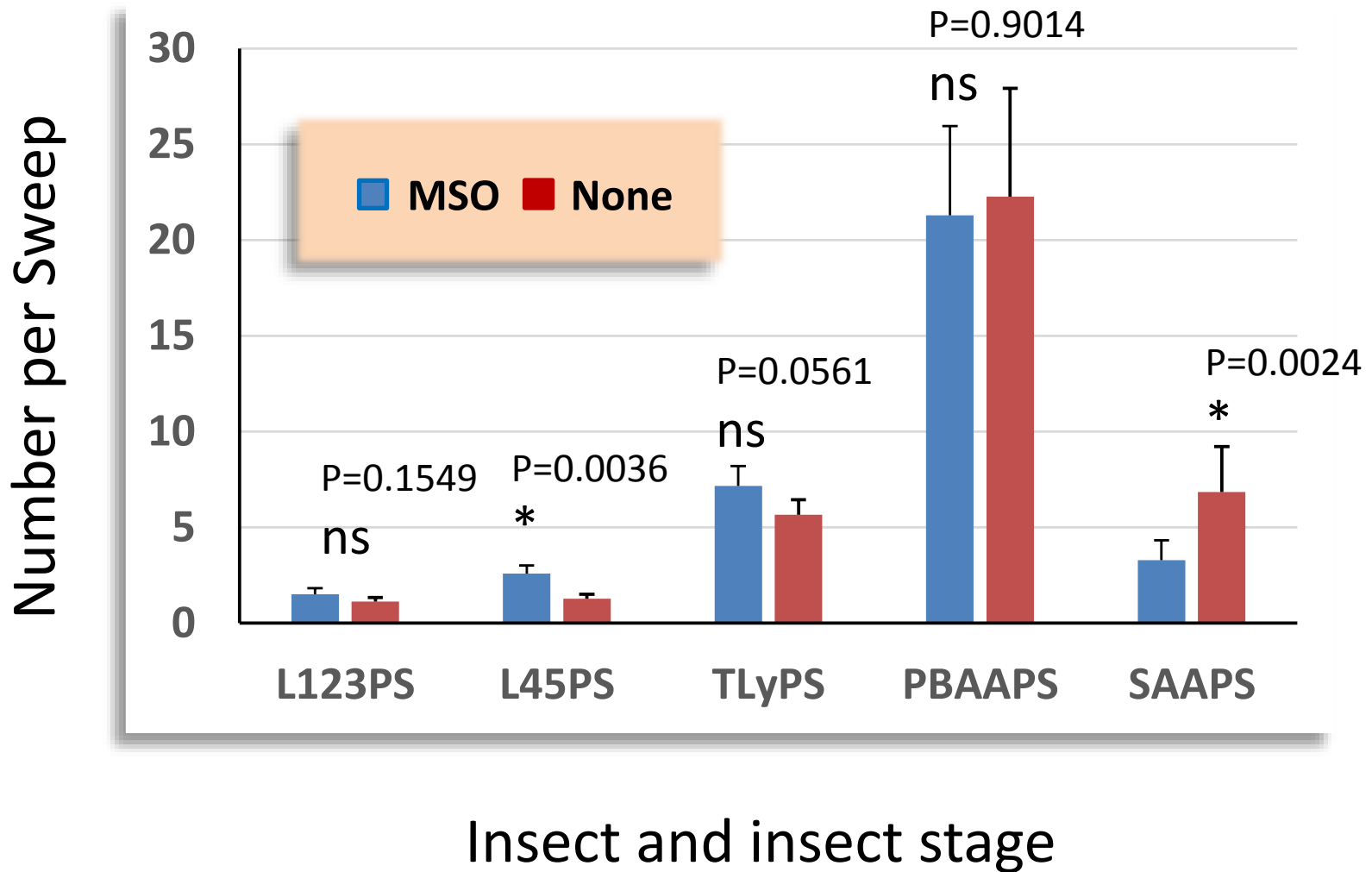
Beleaf (flonicamid) rate by MSO trial

Comparison of insect numbers on plots **treated** (pooled over all treatments) vs. **untreated plots**



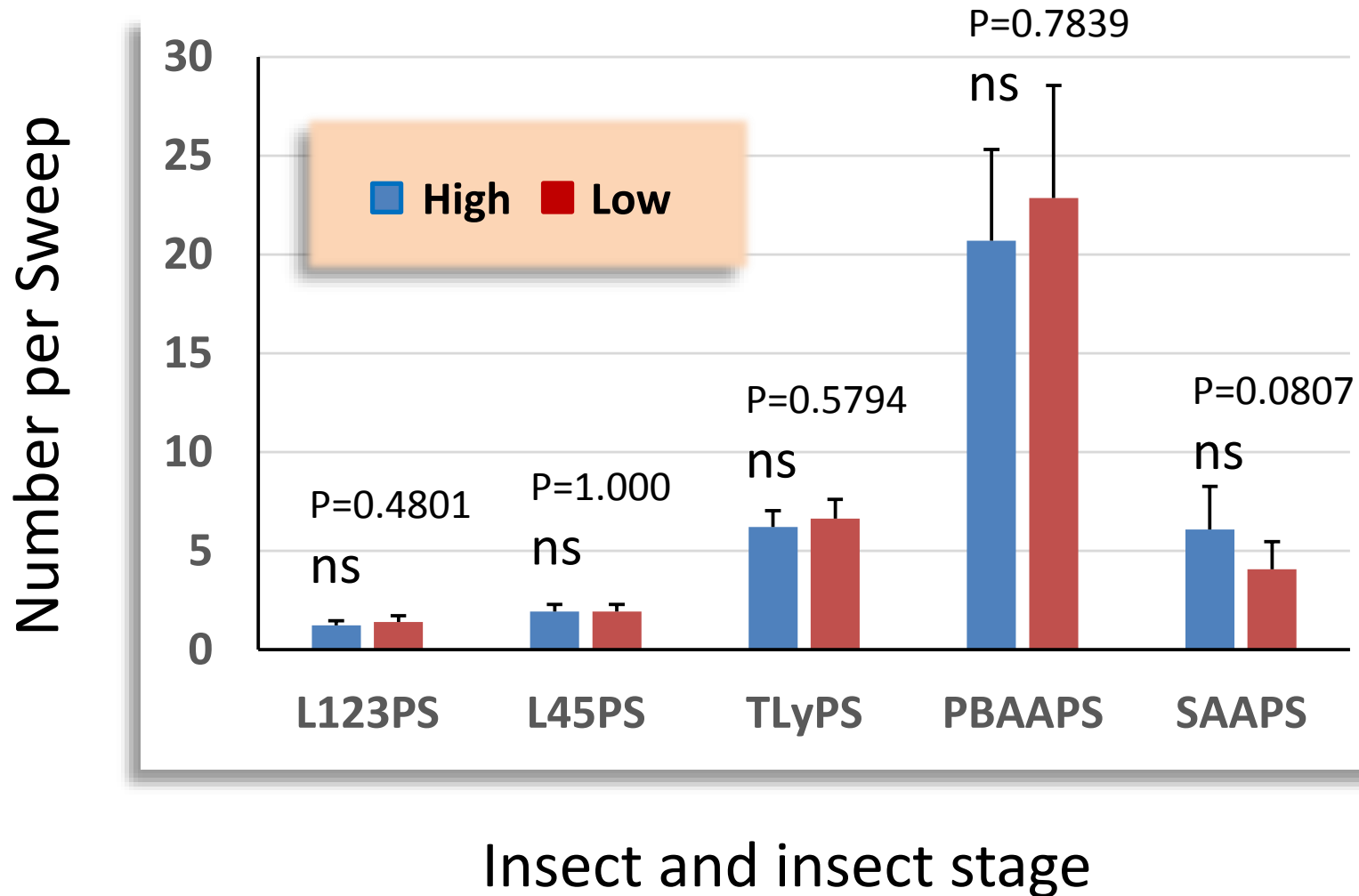
Beleaf (flonicamid) rate by MSO trial

Comparison of insect numbers on Beleaf-treated plots with 2% MSO and without MSO



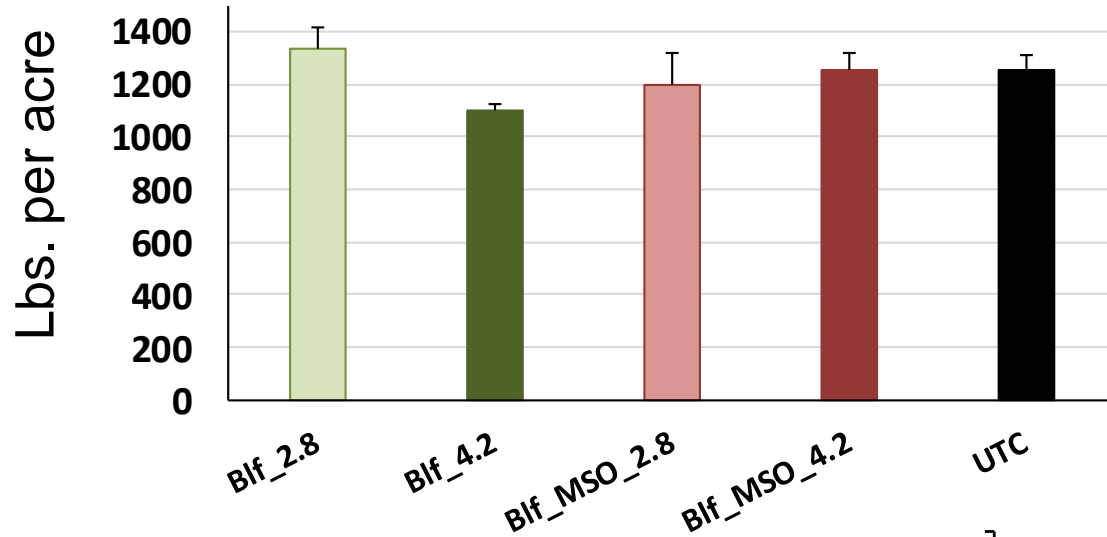
Beleaf (flonicamid) rate by MSO trial

Comparison of insect numbers on plots treated with Beleaf at the **high** (4.2 oz./ acre) and **low** (2.8 oz./ acre) rate



Bloom-Period Insecticide Trial 1

Mean lb per acre field yield from treated and untreated plots



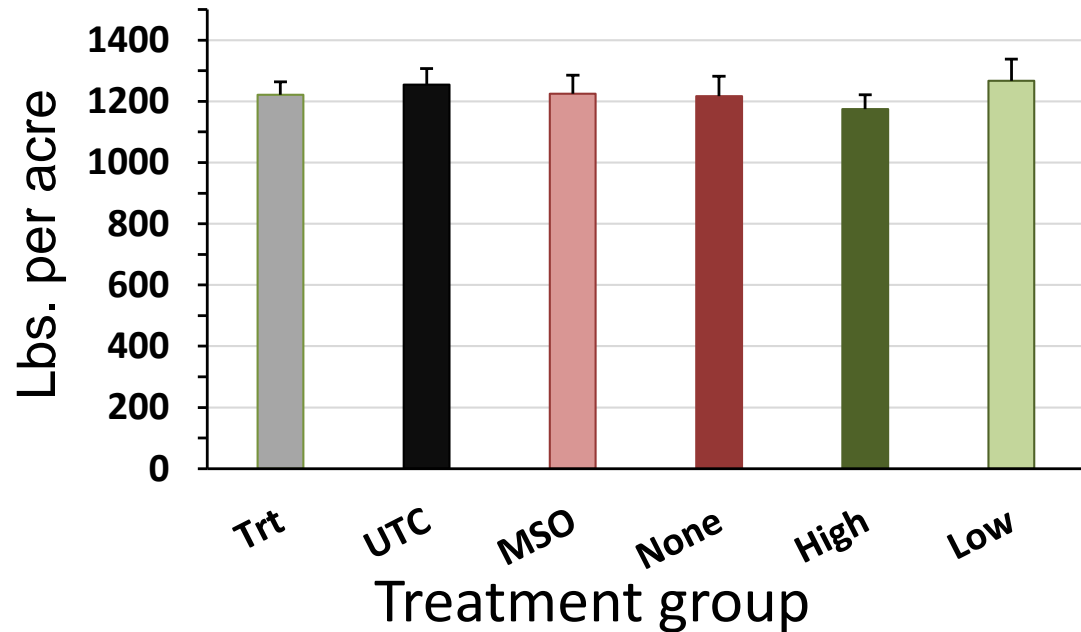
NS trt effect: P=0.3010

Treatment

NS contrast: Trt vs. UTC P=0.3010

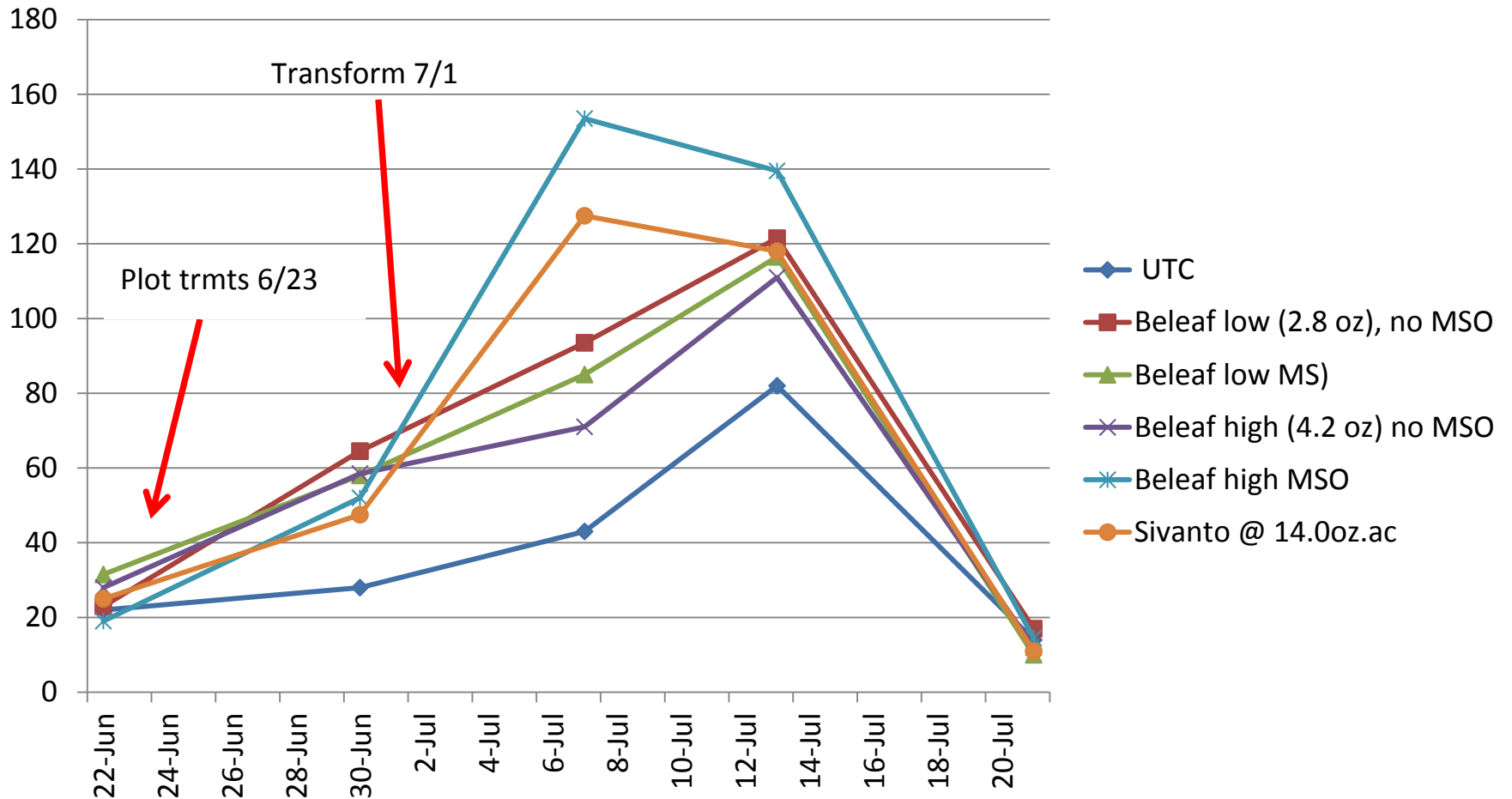
NS contrast: MSO vs. none

NS contrast: High vs. low Beleaf



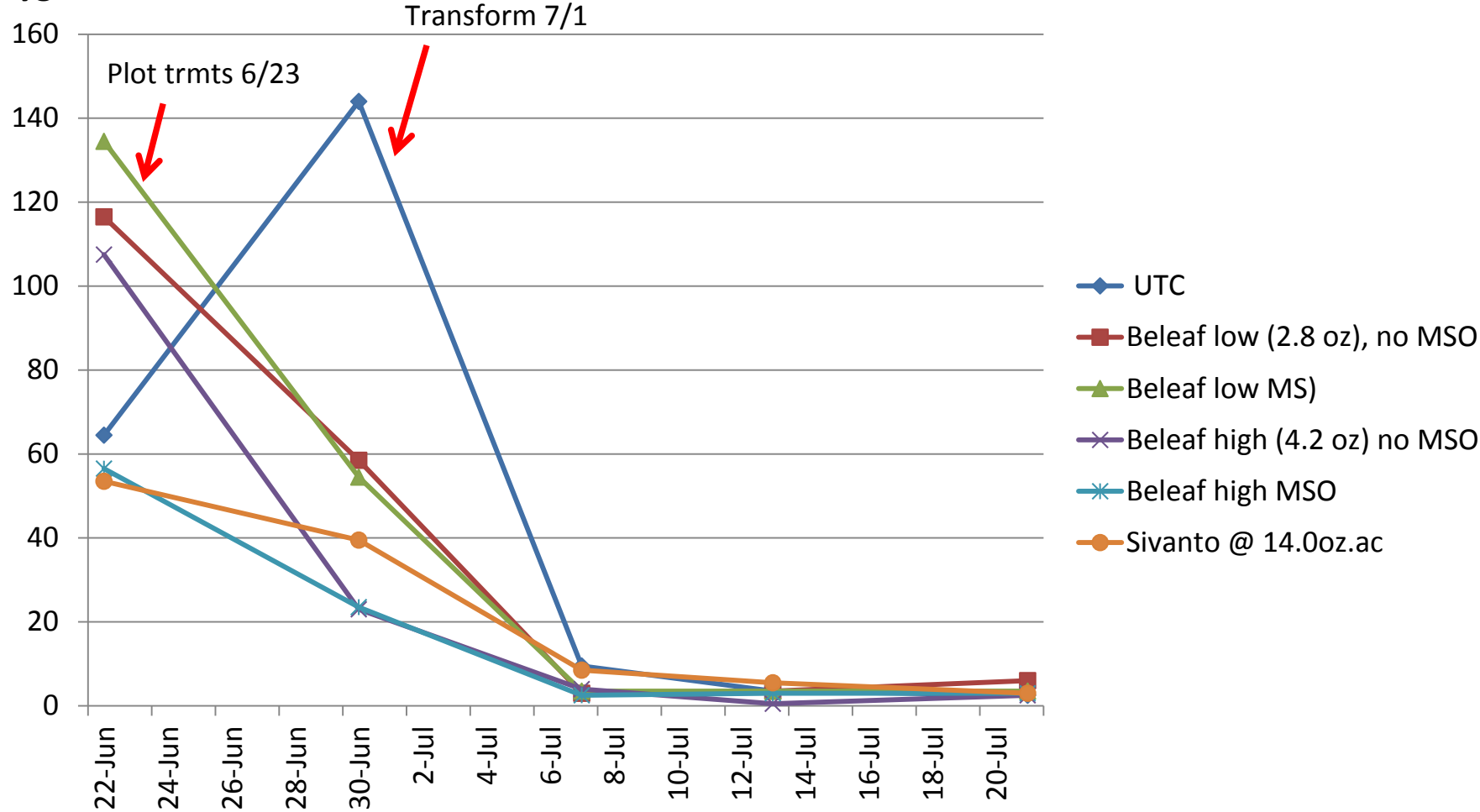
Grower Trial:

Lygus Adults



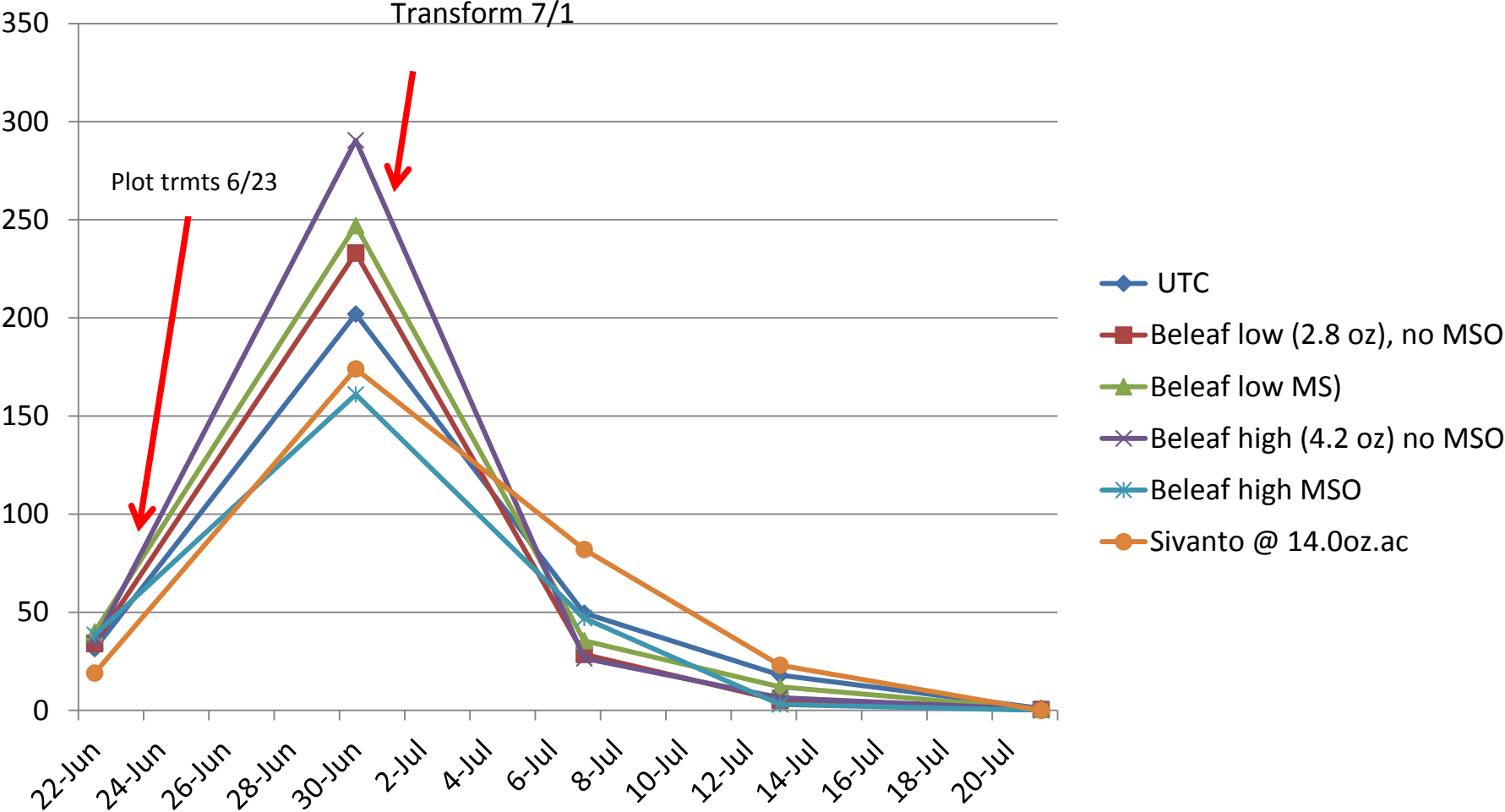
Grower Trial:

Lygus instars 1-3



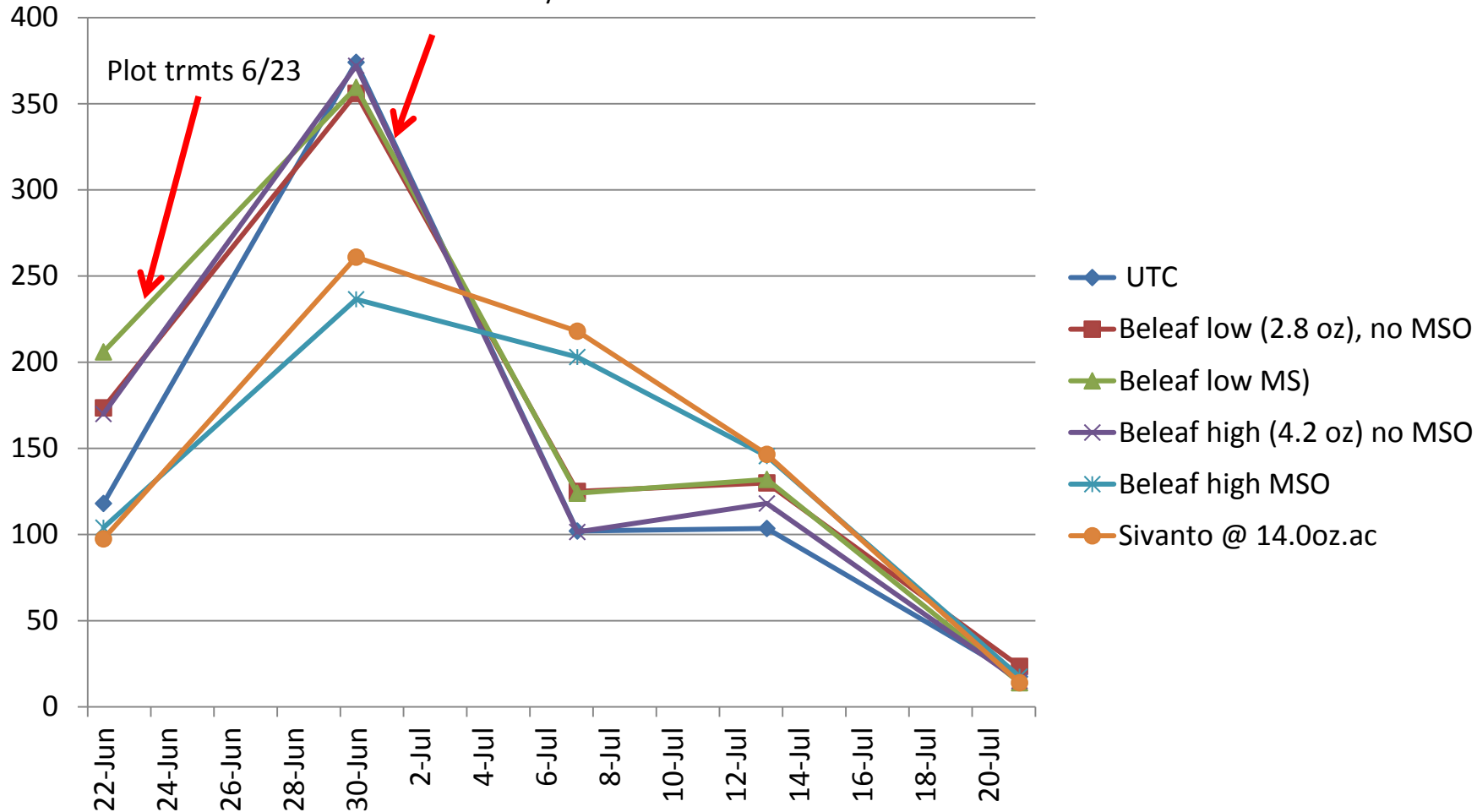
Grower Trial:

Lygus instars 4-5



Grower Trial:

Total lygus



Conclusions

Impact of Beleaf on lygus and aphid numbers

- Use of Beleaf lowered lygus and aphid numbers

Impact of Beleaf rate on lygus and aphid numbers

- There was no impact of Beleaf rate: the low (2.8 oz./a) performed as well as the high (4.2 oz./a) rate

Impact of MSO lygus and aphids

- MSO had no impact on lygus or pea and blue alfalfa aphid nos., but did lower spotted alfalfa aphid numbers

Thanks to:

- **WASGA/USDA-ARS Logan Bee lab**
For financial support
- **ID Grower/cooperators**
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- **FMC Corporation (Kirk Sager)**
For material support and assistance organizing the trial
- **Noemi Fernandez, Paul Blanscet, Sasha Adams, and Sheila Keith**
For their help conducting this work



