UPDATE ON WINTER ALFALFA INSECTS AND THEIR CONTROL

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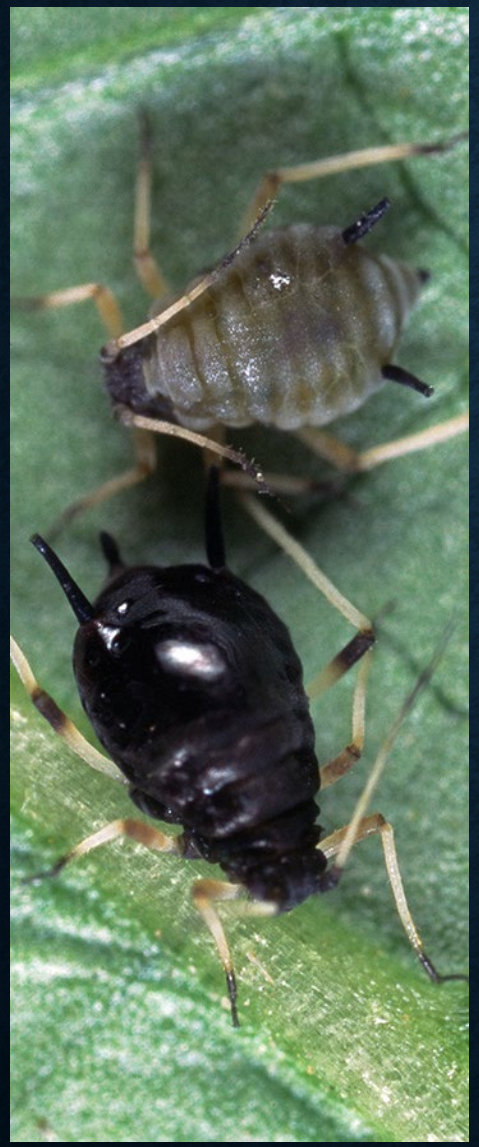
MAIN INSECT PESTS OF LOW DESERT WINTER ALFALFA



14 SPECIES OF APHIDS ARE LISTED BY BLACKMAN AND EASTOP AS THE WORLD'S MOST SERIOUS AGRICULTURAL PEST APHIDS

- *Aphis craccivora* – Cowpea Aphid
- *Aphis fabae* - Bean Aphid
- *Aphis gossypii* – Melon/Cotton Aphid
- *Aphis spireacola* – Spirea Aphid
- *Rhopalosiphum maidis* – Corn Leaf Aphid
- *Rhopalosiphum padi* – Bird Cherry-Oat Aphid
- *Schizaphis graminum* - Greenbug
- *Acyrthosiphon pisum* - Pea Aphid
- *Diuraphis noxia* – Russian Wheat Aphid
- *Lisaphis pseudobrassicae* – Turnip aphid
- *Macrosiphum euphorbiae* – Potato Aphid
- *Myzus persicae* – Green peach aphid
- *Sitobion avenae* - English Grain aphid
- *Therioaphis trifolii* – Spotted Alfalfa Aphid

FOUR (4) MOST COMMON ALFALFA APHID SPECIES

(LARGEST TO SMALLEST)

PEA APHID

Acyrthosiphon pisum

BLUE ALFALFA APHID

Acyrthosiphon kondoi

COWPEA APHID

Aphis craccivora

SPOTTED ALFALFA APHID

Therioaphis trifolii

FOUR (4) MOST COMMON ALFALFA APHID SPECIES

(THREE SPECIES INJECT TOXIN INTO PLANTS WHILE THEY FEED)

PEA APHID

Acyrthosiphon pisum

BLUE ALFALFA APHID

Acyrthosiphon kondoi

COWPEA APHID

Aphis craccivora

SPOTTED ALFALFA APHID

Therioaphis trifolii

LOW DESERT ALFALFA APHID SEASONALITY

Aphid Species	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Blue Alfalfa Aphid												
Pea Aphid												
Cowpea Aphid												
Spotted Alfalfa Aphid												

INSECTS AND SEEDLING ALFALFA

THREE INSECTS PRESENT AND DAMAGING SEEDLING ALFALFA IN THIS EXPERIMENT

- Western Flower Thrips

- Cowpea Aphids

Spotted Alfalfa Aphids

SPOTTED ALFALFA APHIDS WERE VERY NUMEROUS.

SOIL UNDERNEATH THE SMALL ALFALFA PLANTS HAD A SLIGHTLY DIFFERENT COLOR DUE TO THE HONEYDEW BEING DEPOSITED FROM THE SPOTTED ALFALFA APHID POPULATIONS, CONCERN SEEDLINGS POTENTIALLY BEING KILLED DUE TO THEIR FEEDING.

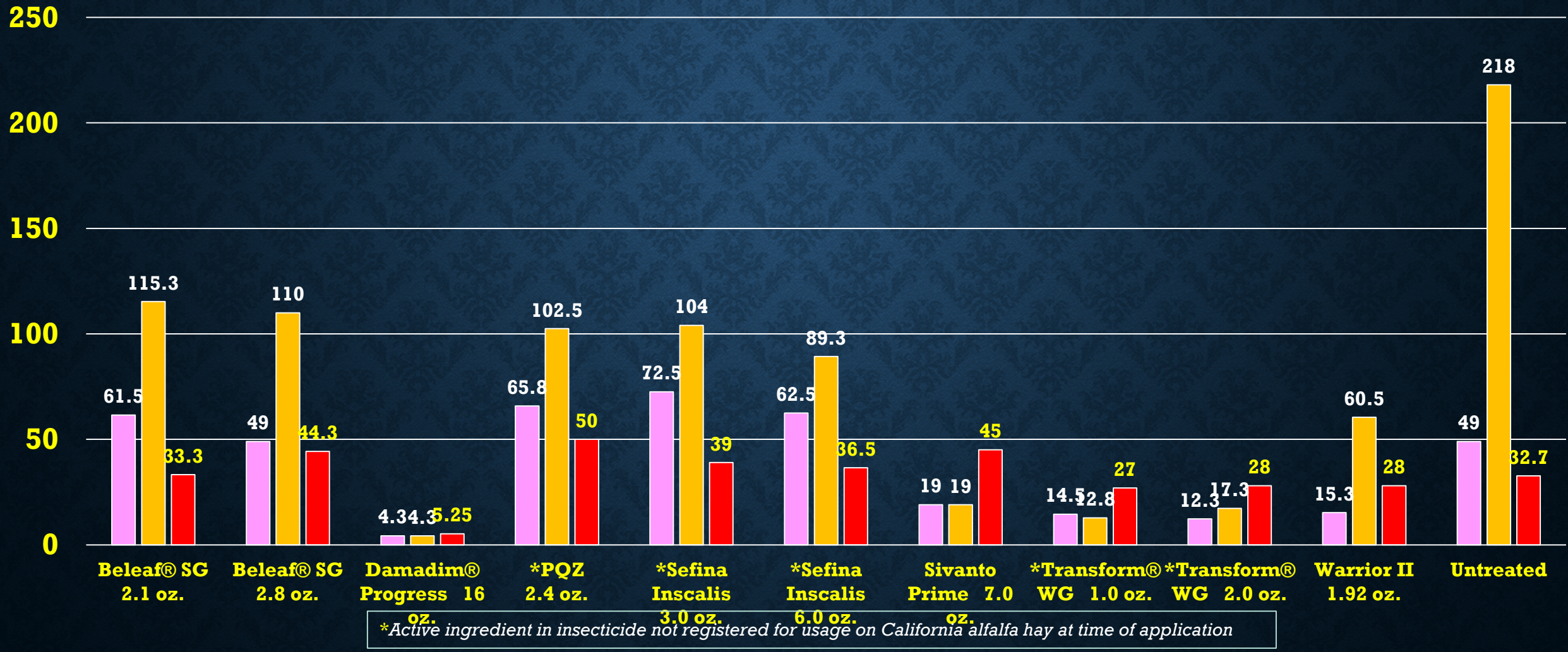
WESTERN FLOWER THRIPS FEEDING ON SEEDLING ALFALFA CAN RESULT MISSHAPEN LEAVES AND WHITISH AREAS ON LEAVES

WESTERN FLOWER THRIPS FEEDING ON SEEDLING ALFALFA CAN RESULT MISSHAPEN LEAVES AND WHITISH AREAS ON LEAVES

SAMPLING SEEDLING ALFALFA

AFTER BEATING THE SMALL ALFALFA STEMS TO DISLODGE INSECTS, THE INSECTS ON THE MANILA FOLDER WERE TRANSFERRED TO CONTAINERS FOR LATER COUNTING

MEAN NUMBER OF COWPEA APHIDS, SPOTTED ALFALFA APHIDS, AND WESTERN FLOWER THRIPS LARVAE PER 46 ROW INCHES OF SEEDLING ALFALFA AT 3 DAYS POST NOV. 14 TREATMENT, RIPLEY, CA, 2019



COWPEA APHIDS

COWPEA APHIDS

- Often feed near growing tips, and are usually more problematic in alfalfa that is in 2 (or more) year of stand. First major aphid pest in the fall/winter in these types of stands.

- **Immatures have a dull greyish appearance, while adults tend to be shiny and black/olive colored**

- **Legs have bands of color and black 'feet'**

- Inject a toxin as they feed

- High numbers of aphid can cause stunting and death of alfalfa stems

COWPEA APHIDS AND INITIAL DAMAGE

	Variety	Contact for Marketing Information	Winter Survival	Bacterial Wilt	Verticillium Wilt	Fusarium Wilt	Anthracnose Race 1	Phytophthora Root Rot	Aphanomyces Race 1 Root Rot	Aphanomyces Race 2 Root Rot	Spotted Alfalfa Aphid	Pea Aphid	Blue Alfalfa Aphid	Potato Leafhopper	Stem Nematode	Southern Root Knot Nematode	Northern Root Knot Nematode	Multifoliolate Expression (H-High/M-Mod/L-Low)	Continuous Grazing Tolerance (Y-Yes)	Standability Expression (R-Resistance)	Salt Tolerance (G-Germination/F-Forage)	R-RRA; X-HarvXtra; H-75-95% Hybrid
FD 2	**Foothold**	**BrettYoung**		**HR**	**HR**	**HR**	**HR**	**HR**	**HR**	**R**			**R**		**R**			**M**			**G**	
	Spredor 5	**Nexgrow Alfalfa**	**1**	**HR**	**HR**	**HR**	**HR**	**HR**	**HR**	**R**		**R**									**G**	
3 - DORMANT	**54VQ52**	**Pioneer**		**HR**	**HR**	**R**	**HR**	**HR**	**HR**	**HR**	**R**	**R**			**HR**							
	6305Q	**Nexgrow Alfalfa**	**1**	**HR**	**HR**	**HR**	**HR**	**HR**	**HR**		**HR**				**R**			**H**				
	Graze N Hay 3.10RR	**Croplan**	**2**	**HR**	**HR**	**HR**	**HR**	**HR**	**HR**		**R**											**R**
	Hi-Gest 360	**Alforex Seeds**	**1**	**HR**	**HR**	**HR**	**HR**	**HR**	**HR**	**HR**	**R**	**MR**	**R**		**R**		**R**	**M**			**G**	
	HVX Tundra II	**Croplan**	**1**	**HR**	**HR**	**HR**	**HR**	**HR**	**HR**	**R**		**R**			**R**			**H**			**G**	**RX**
	LegenDairy AA	**Croplan**	**1**	**HR**	**HR**	**HR**	**HR**	**HR**	**HR**	**HR**	**R**	**HR**			**R**			**H**			**G**	
	Octane	**BrettYoung**		**HR**	**HR**	**HR**	**HR**	**HR**	**HR**	**HR**			**R**		**HR**			**L**				

TWO SPECIES OF PARASITIC WASPS OFTEN CAN KEEP COWPEA APHIDS UNDER CONTROL IN LOW DESERT ALFALFA

Lysiphlebus

Diaeretiella

CHLORPYRIFOS USED TO BE USED AT ABOUT 4 OZ./ACRE *(HALF OF LOWEST LABELED RATE)*

THIS RESULTED IN REDUCTION OF COWPEA APHIDS AND DID NOT KILL MOST BENEFICIAL WASPS, ALLOWING THE WASPS TO ‘CLEAN UP’ THE COWPEA APHIDS

CHLORPYRIFOS NO LONGER AVAILABLE FOR USAGE IN ALFALFA

RESEARCH CONDUCTED DURING THE SPRING OF 2022 HAS MADE THE DISCOVERY OF AT LEAST ONE SPECIES OF HYPERPARASITOID WASP THAT IS PRESENT IN THE PALO VERDE VALLEY

(A WASP THAT PARASITIZES AND KILLS WASPS THAT FEED AND KILL COWPEA APHIDS, THOUGHT TO BE A SPECIES OF *ALLOXYSTA*)

ALFALFA WEEVILS

SWEEPING METHODOLOGY COMPARISONS

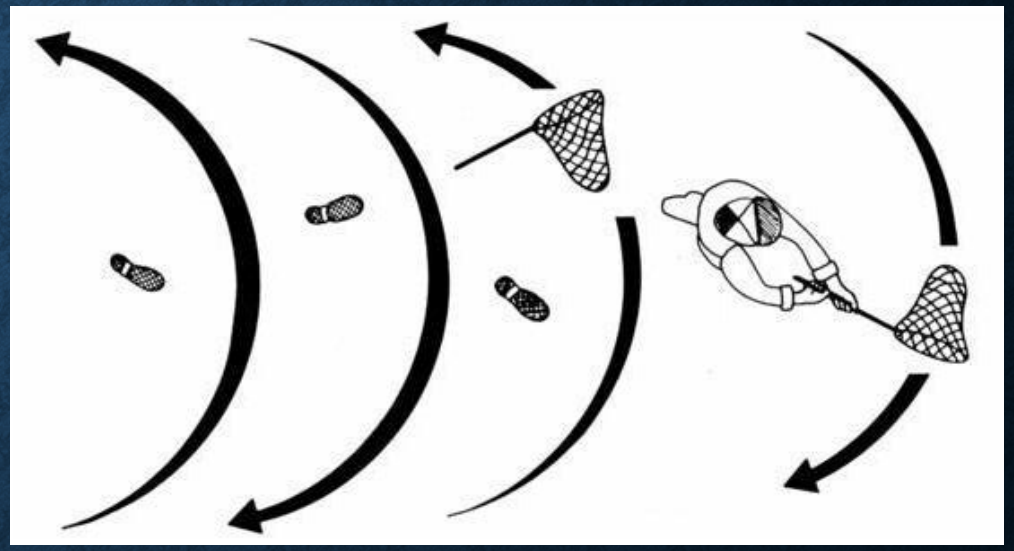
ALFALFA WEEVIL THRESHOLDS

- UC economic threshold has been 20 larvae/ 180 degree sweep.
- This was established using solid seeded (flat planted) alfalfa.
- Hard to do a 180 sweep on bedded alfalfa and have same amount of area sampled as in solid planted alfalfa!

ALFALFA WEEVIL THRESHOLDS

- 

How does a pendulum/figure 8 sweep compare to a 180 degree sweep?



- Our research shows that the relationship is roughly 3.8:1, thus ~5 weevils per pendulum sweep can be used as a threshold. These deeper sweeps (rather than just stem tips) are more likely to also collect smaller larvae which are easier to kill than larger larvae.

BIOLOGY – EARLY FROST/FREEZE VS. LONG STAGGERED EMERGENCE/OVIPOSITION

- The past two winters have not had a hard freeze early in the fall.
- This did not bring the alfalfa weevils out of estivation in mass.
- The lack of a freeze has resulted in a trickle of weevils and oviposition over a long period of time, with peaks noted in February and then again in March, vs. a single higher peak in years with a freeze

THROUGH DECEMBER 2017

ALL ALFALFA WEEVILS

DOCUMENTED WITH PYRETHROID

INSECTICIDE RESISTANCE HAD BEEN

"WESTERN STRAIN"

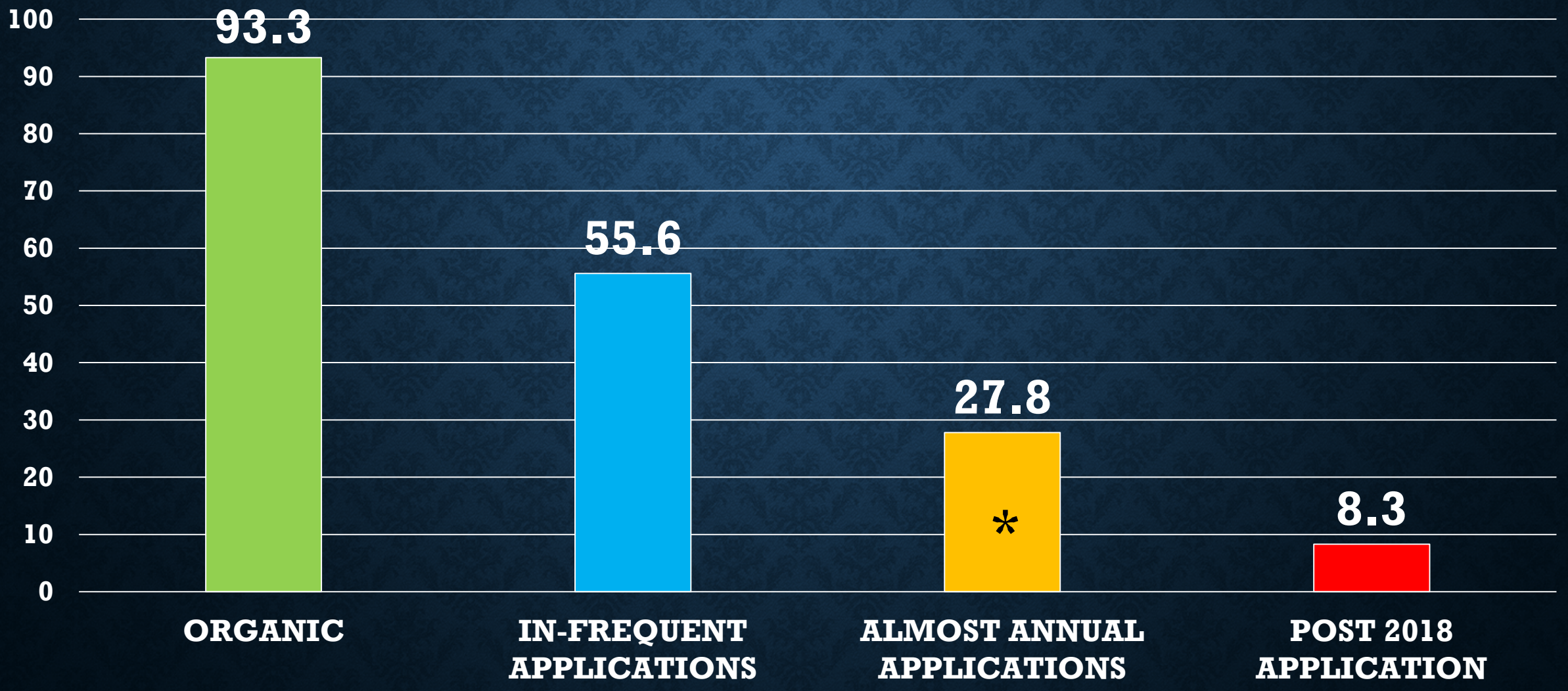
ALFALFA WEEVILS.

BLYTHE, CALIFORNIA
FEBRUARY 2018

- FIELD FAILURE IN CONTROLLING ALFALFA WEEVILS WITH LAMBDA-CYHALOTHRIN

- LABORATORY BIOASSAYS SHOWED HIGH LEVELS OF INSECTICIDE RESISTANCE

2018 LABORATORY BIOASSAY COMPARISONS FOR PALO VERDE VALLEY ALFALFA WEEVIL LARVAE CONTROL BY 1.92 OZ./ACRE OF WARRIOR II



WHY ISN'T FIELD EFFICACY CONTROL DATA THE SAME AS THE LABORATORY BIOSASSY?

- Laboratory bioassay used only large larvae that had survived several days of travel prior to testing (the weak didn't survive?).

- Field testing involved all larval stages, and smaller larvae are often more susceptible to insecticides.

TRIAL RESULTS AND EFFICACY COMPARISONS

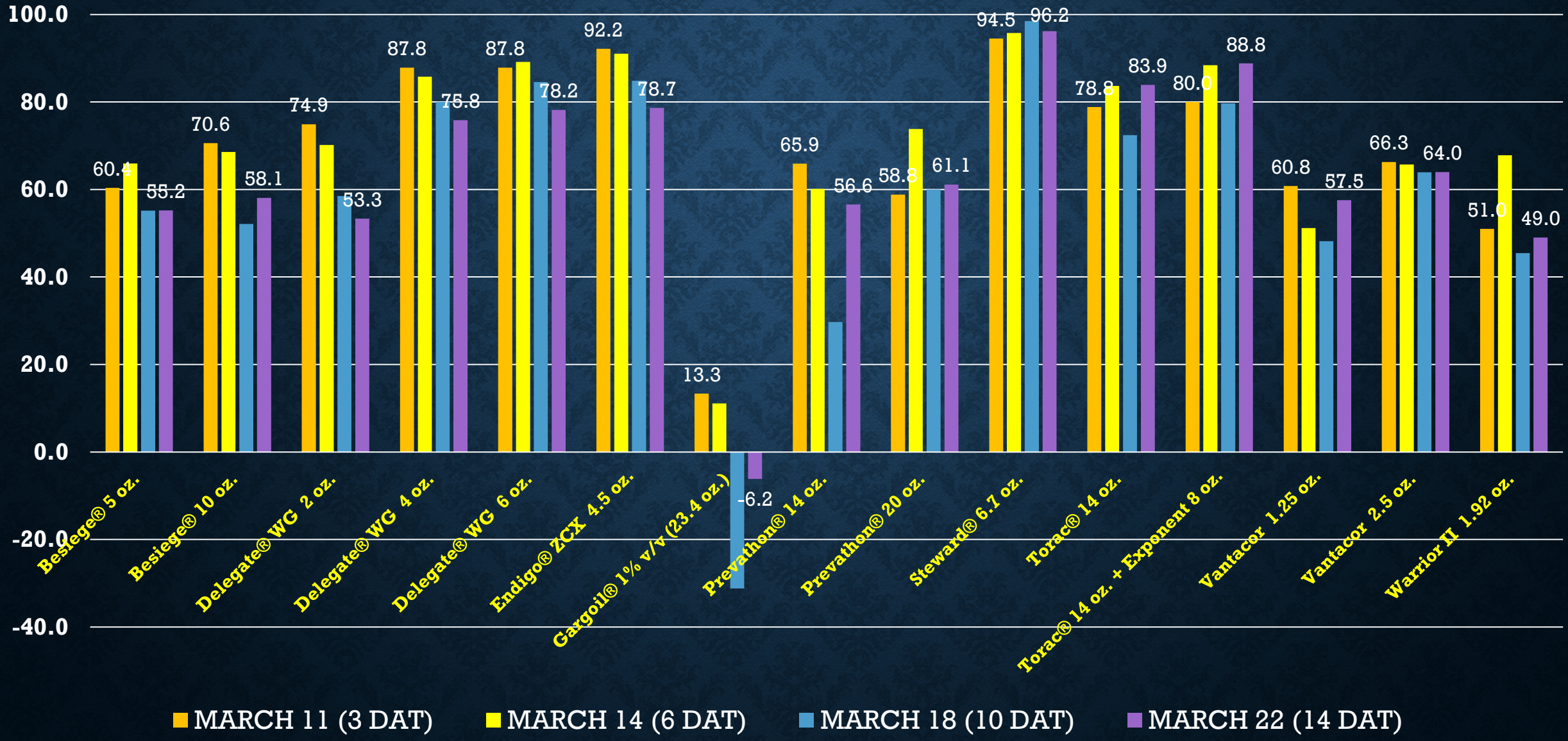
- Field trials conducted in each year from 2018-2022
- Some years only a few products/rates tested, but last 2 years there have been over 10 insecticides included in the trials and compared with untreated alfalfa
- Four replications, usually conducted on alfalfa more than 1 year in stand
- Pendulum sweep sampling
- Data on alfalfa weevil numbers also collected from aphid insecticide trials.

2018 FIELD TRIAL DATA – BLYTHE

MEAN PERCENT ALFALFA WEEVIL LARVAE CONTROL AT 4 & 9 DAYS POST FEBRUARY 24 TREATMENT

	Malathion 8 - 12 oz.	Lorsban 4E - 8 oz.	Lorsban 4E - 32 oz.	Warrior II 1.92 oz.	HM-1508A 2.8 oz.	Steward 4 oz.	Steward 6 oz.
	61.6	43.3	53	64.3	58.2	82.9	85.4
	57.3	25.9	56.3	72.5	73.6	95.5	96.1

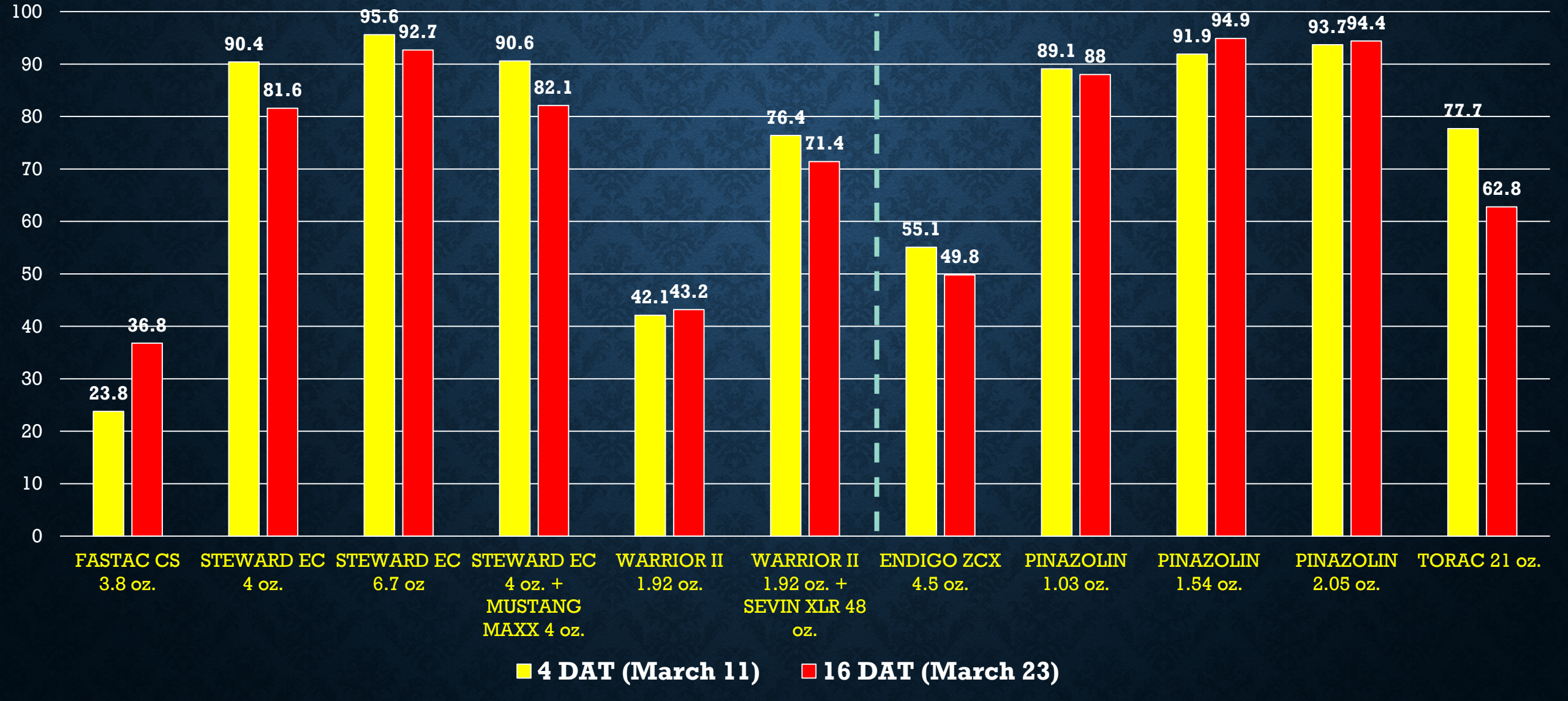
MEAN NUMBER OF ALFALFA WEEVILS/10 SWEEPS AFTER INSECTICIDE APPLICATION ON MARCH 8, 2021, BLYTHE, CA



2022 TRIAL

EFFICACY COMPARISONS OF ESTABLISHED AND NEW POTENTIAL INSECTICIDE PRODUCTS

PERCENT CONTROL OF ALFALFA WEEVIL LARVAE
2022 RESULTS – BLYTHE, CALIFORNIA



BLUE ALFALFA APHIDS

BLUE ALFALFA APHID VS. PEA APHID

Blue Alfalfa Aphid

Acyrthosiphon kondoi

Pea Aphid

Acyrthosiphon pisum

WHY DOES THE BLUE ALFALFA APHID POSE A THREAT TO ALFALFA PRODUCTION?

- Unlike the pea aphid, the blue alfalfa aphis injects a toxin while it feeds. Crop loss can occur with larger plants and/or severe injury/death of small plants with small numbers of aphids

DAMAGE FROM APHID FEEDING, 2019

MIS-SHAPEN STEMS, YELLOWED/DESICATED LEAVES, CAST APHID SKINS, AND BLACK MOLD ON LEAVES ASSOCIATED WITH ‘HONEYDEW’

SINCE 1978 A MAJOR EFFECTIVE

INTEGRATED PEST MANAGEMENT TOOL

FOR BLUE ALFALFA APHIDS

HAS BEEN THE USAGE OF

HIGHLY RESISTANT (OVER 50% RESISTANCE)

ALFALFA VARIETIES

ALFALFA VARIETY RESISTANCE LEVELS

Resistance Level		% Resistant Plants	% Susceptible Plants
S	Susceptible	0-5	95-100
LS	Low Resistance	6-14	84-96
MR	Moderate Resistance	15-30	70-85
R	Resistance	31-50	50-69
HR	High Resistance	51+	0-49

BLUE ALFALFA APHID
TIME LINE OF IMPORTANT EVENTS

- 1991 - First report of a new blue alfalfa biotype in US, noted as BAOK90 (Oklahoma).

- 1998 – Three to seven (3-7) phenotypes identified in Australia. Clones differed in life history traits that included survival, fecundity, growth rates and percentage of winged aphids.

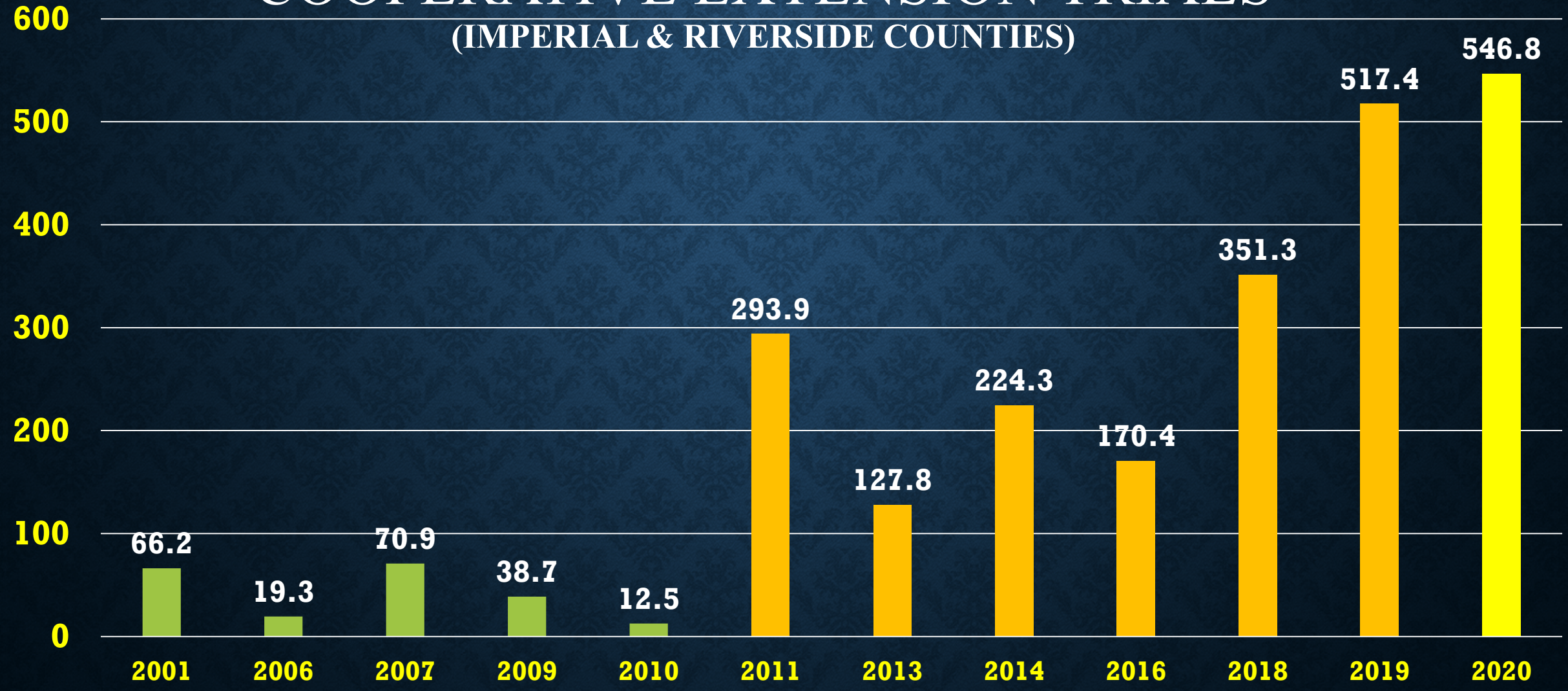
BLUE ALFALFA APHID
TIME LINE OF IMPORTANT EVENTS

- 2001 – Variation in growth rates of various BAA aphids (Australia)

- 2009 – South Australia – Blue alfalfa aphids collected from certain locations had much greater virulence on all previously resistant alfalfa varieties, producing high rates of plant mortality.

BLUE ALFALFA APHIDS – MEAN PEAK NUMBER/ SWEEP IN UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION TRIALS

(IMPERIAL & RIVERSIDE COUNTIES)



WINGED APHIDS OCCUR WHEN THERE IS OVER-CROWDING AND/OR PLANTS ARE UNDER STRESS

HIGH NUMBERS OF BLUE ALFALFA APHIDS MIGRATE INTO PALO VERDE VALLEY OF CALIFORNIA IN FEBRUARY-MARCH

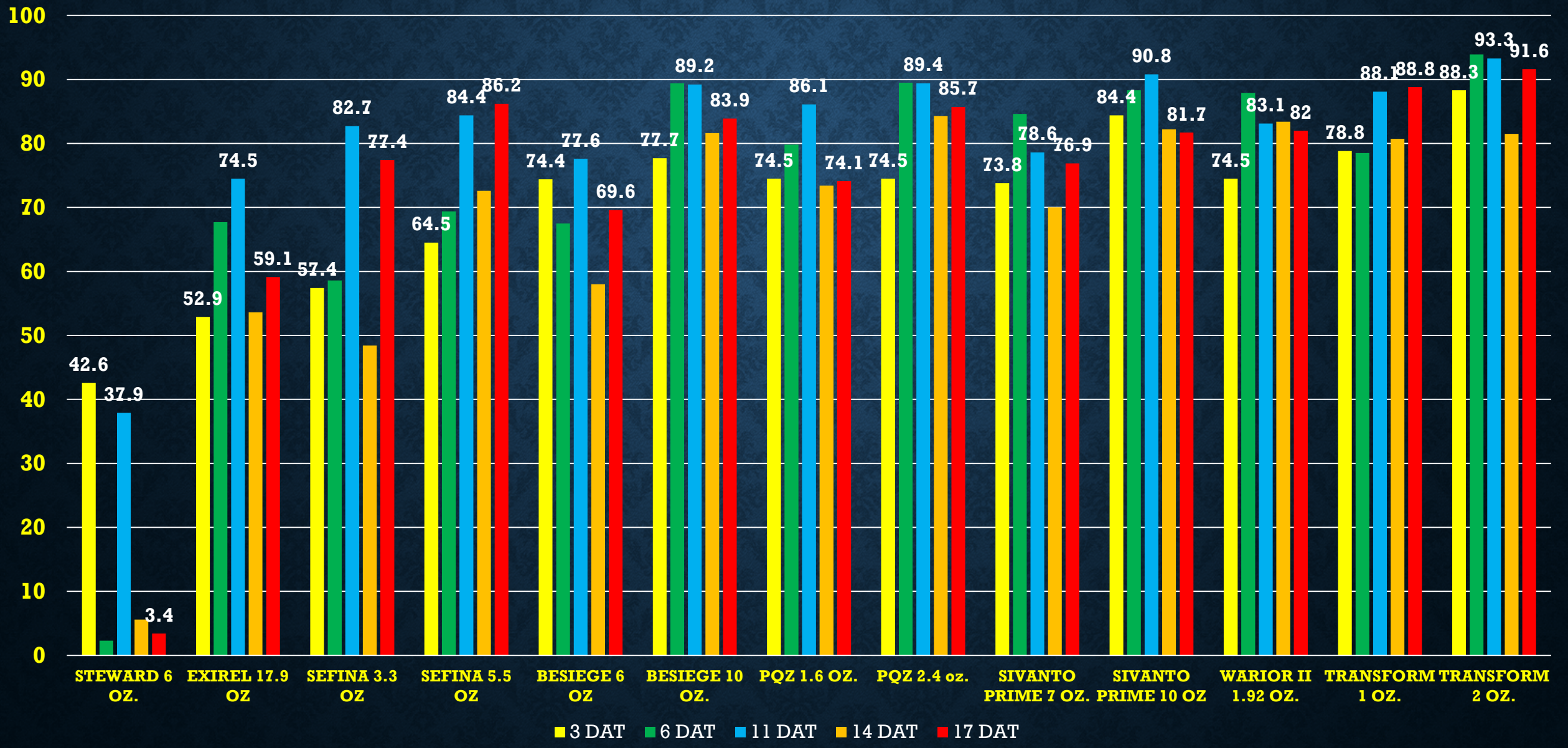
Numbers of blue alfalfa aphids in collected in a water trap indicated about 275 aphids/ square foot in a 2 day period March 13-15, 2020

DIFFERENCE AND DAMAGE DUE TO HEAVY MIGRATING POPULATION OF BLUE ALFALFA APHID FEEDING ON ALFALFA IN 7 DAYS.

DO WINGED APHIDS CAUSE GREATER YIELD LOSS DUE TO LARGER SIZE OF APHIDS AND INCREASED TOXINS FROM FROM FEEDING BY LARGER APHIDS?

BLUE ALFALFA APHIDS ON ALFALFA

PERCENT CONTROL OF BLUE ALFALFA APHIDS INSECTICIDE AFTER INSECTICIDE APPLICATION ON MARCH 5, 2019, BLYTHE, CA



ALFALFA COLOR AND HEIGHTS AS AFFECTED BY BLUE ALFALFA APHID FEEDING.

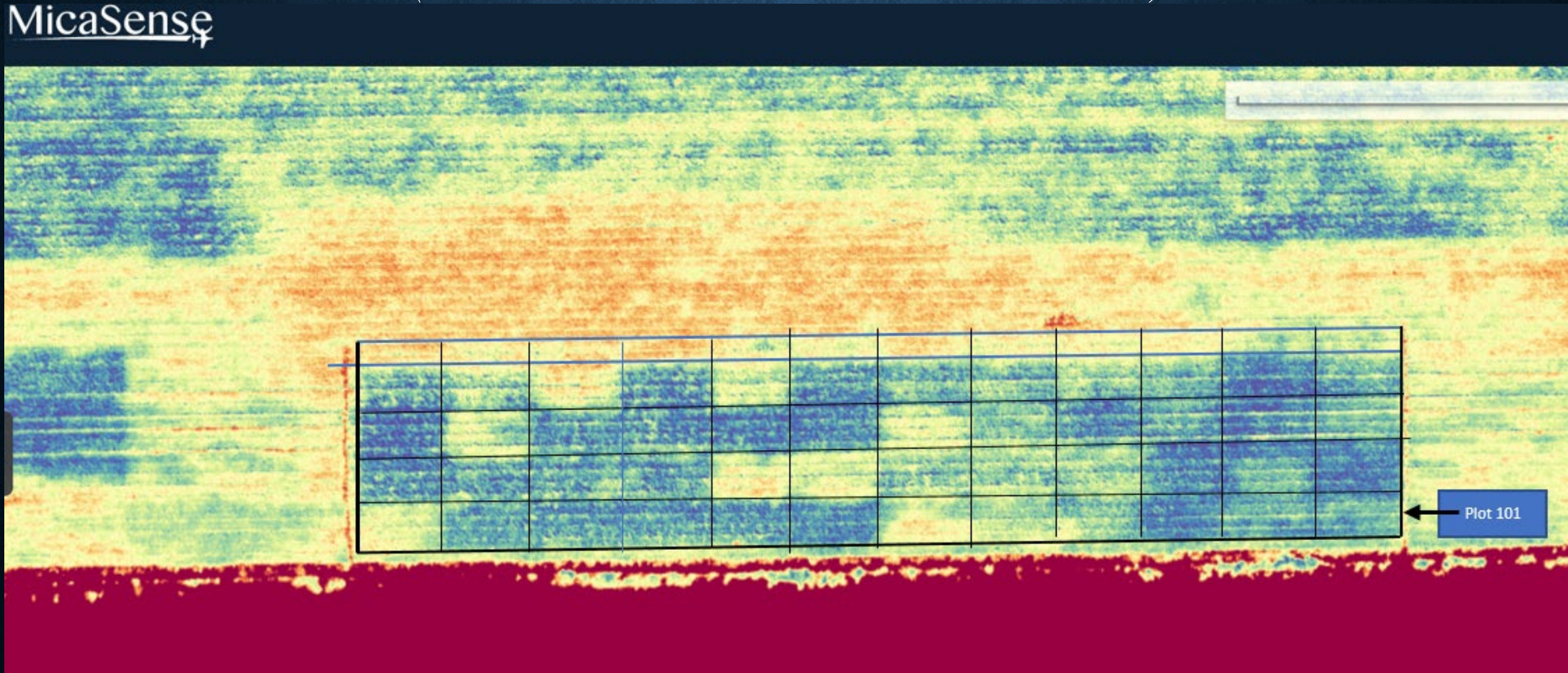
TALLER, LIGHTER GREEN COLOR ARE PLOTS WITH EFFECTIVE APHID CONTROL.

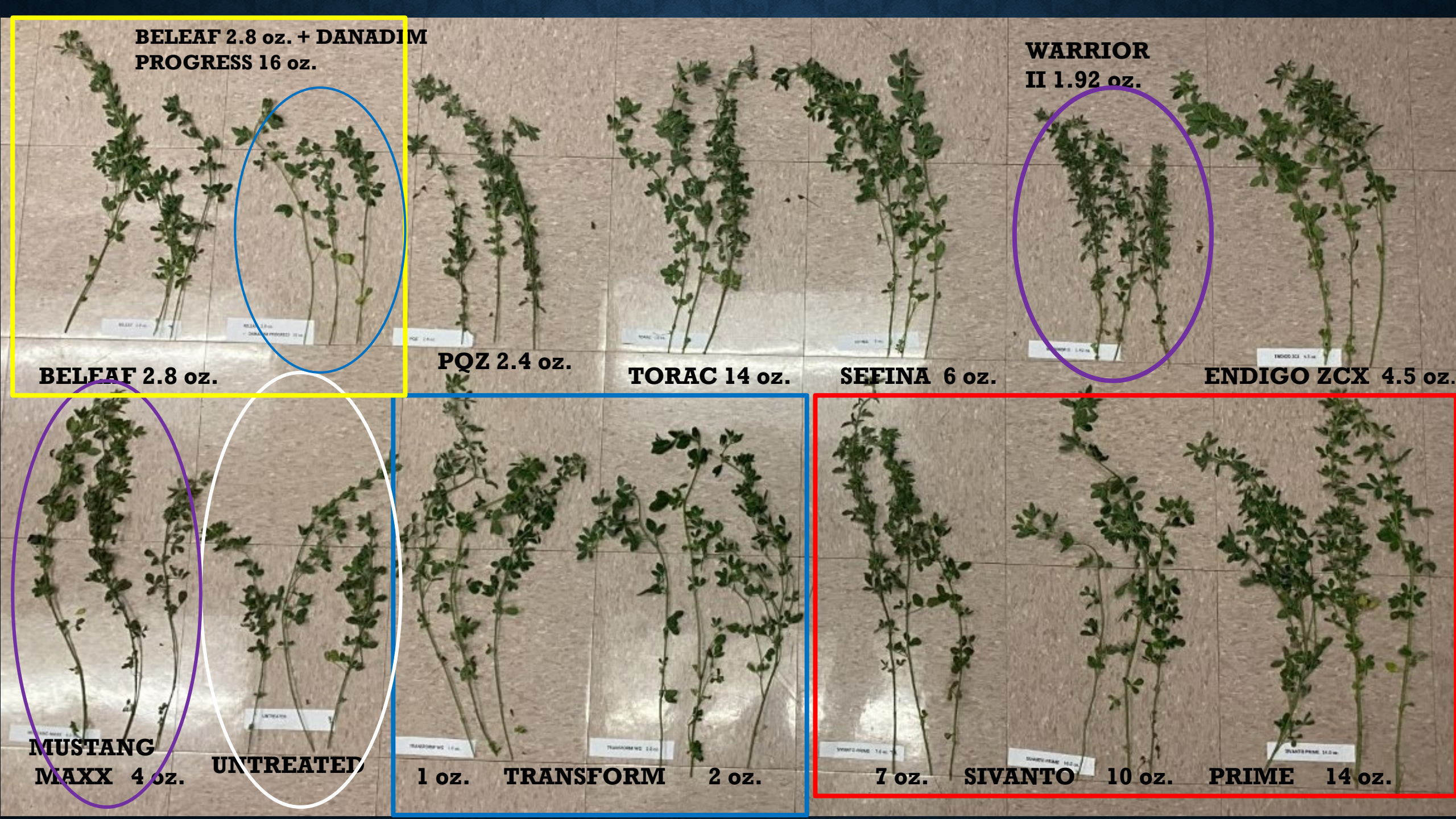
SEVEN SPOTTED LADY BEETLE

- Feeds on alfalfa weevil larvae as well as aphids
- Much larger in size than the convergent lady beetle, or other lady beetles encountered in local alfalfa. Larger = eats more aphids!

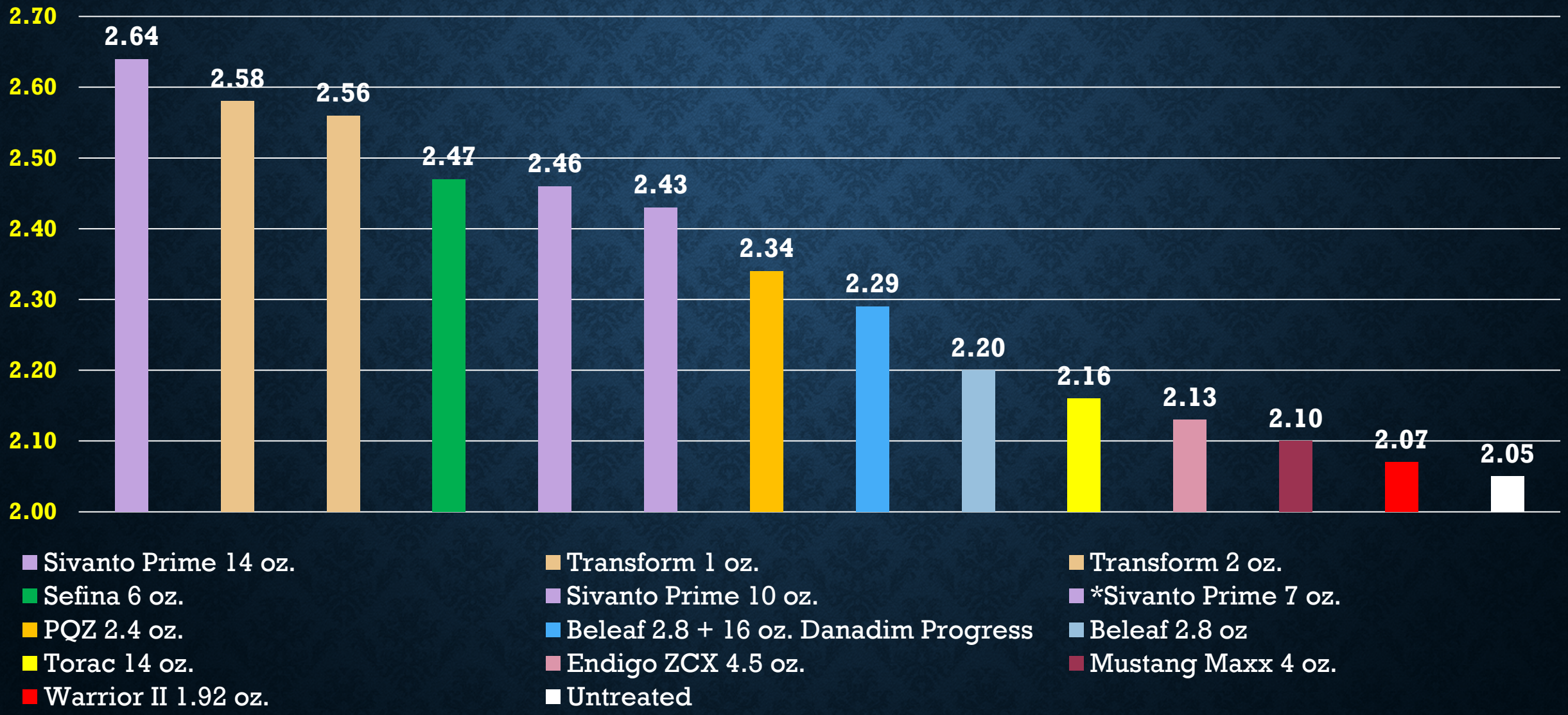
- **What are results of interactions insecticides and efficacy on aphids when ladybeetles are present in 2021 field trial?**

DRONE IMAGERY OF PLOTS AT 23 DAYS POST MARCH 29, 2021, TREATMENT SHOWING DIFFERENCES IN STRESS OF ALFALFA.
DARK BLUE = LESS STRESS/BETTER BLUE ALFALFA APHID CONTROL
(LADYBEETLES PRESENT IN THIS STUDY)

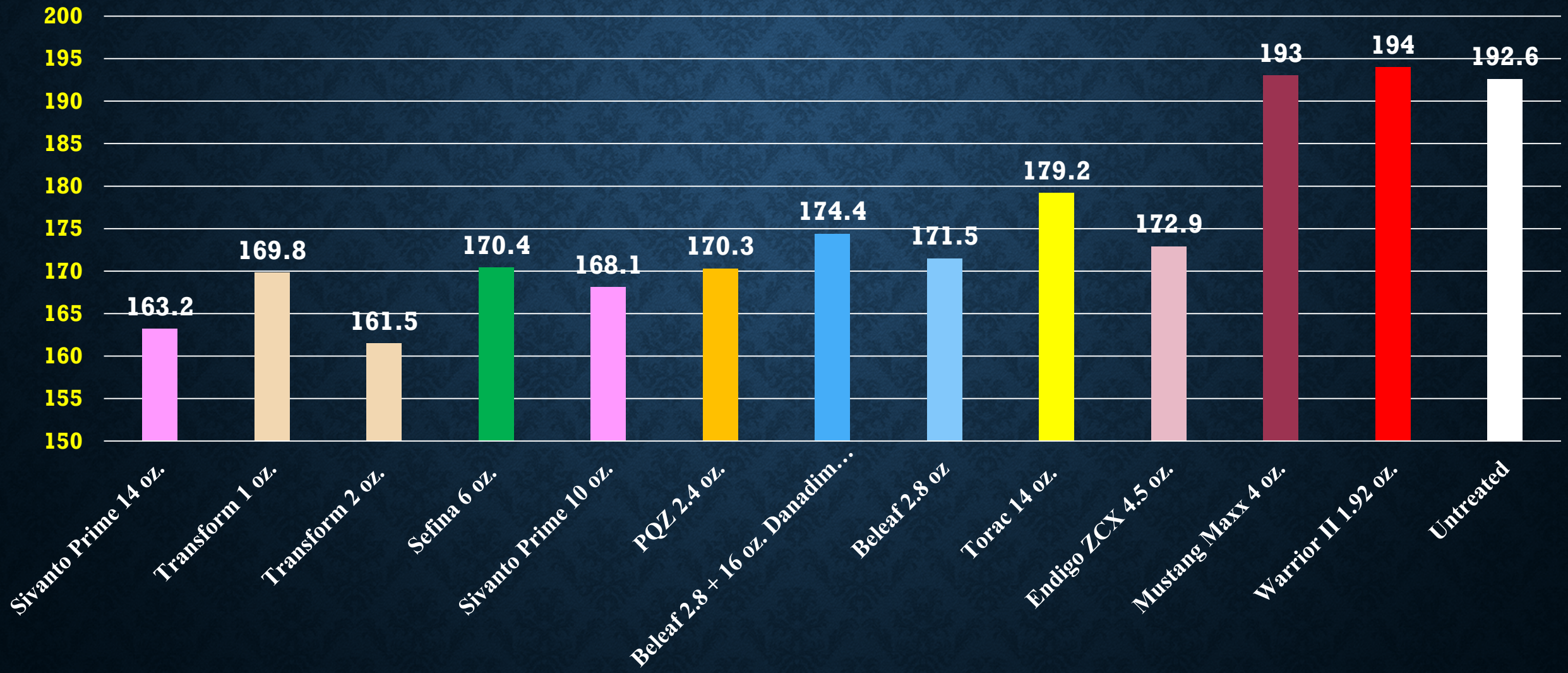



BELEAF 2.8 oz. + DANADIM
PROGRESS 16 oz.
BELEAF 2.8 oz.
PQZ 2.4 oz.
TORAC 14 oz.
SEFINA 6 oz.
WARRIOR
II 1.92 oz.
ENDIGO ZCX 4.5 oz.
MUSTANG
MAXX 4 oz.
UNTREATED
1 oz.
TRANSFORM 2 oz.
7 oz.
SIVANTO 10 oz.
PRIME 14 oz.

YIELDS *(TONS/ACRE)* OF NEWLY ESTABLISHED ALFALFA AS AFFECTED BY INTERACTIONS OF BLUE ALFALFA APHIDS, INSECTICIDES & LADYBEETLES, FOLLOWING APPLICATION ON MARCH 29 *(12.25" TALL)* & APRIL 27, 2021 HARVEST



YIELDS AND QUALITY OF NEWLY ESTABLISHED ALFALFA AS AFFECTED BY INTERACTIONS OF BLUE ALFALFA APHIDS, INSECTICIDES & LADYBEETLES



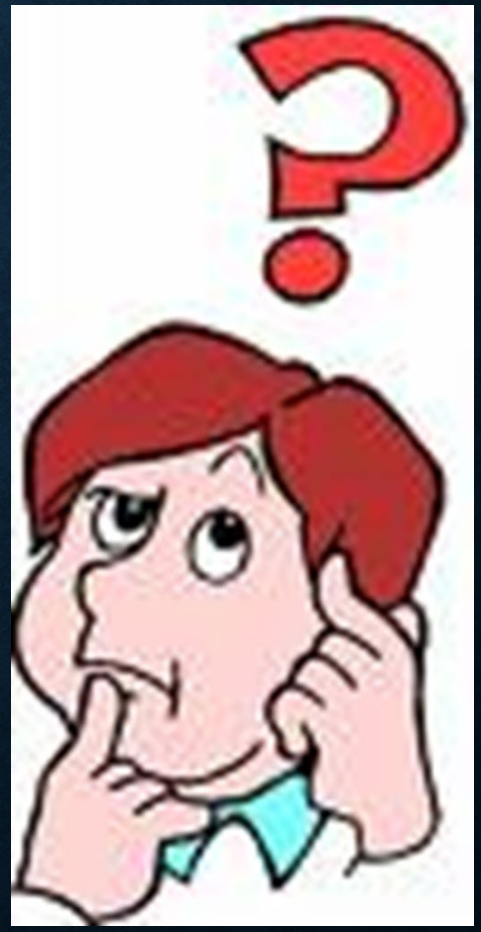
TWO-SPOTTED SPIDER MITES AND ESTABLISHED ALFALFA HAY

WHAT ARE THE EFFECTS/RELATIONSHIP OF WEEVIL/APHID INSECTICIDE TREATMENTS ON SPIDER MITE POPULATIONS IN ESTABLISHED ALFALFA?

I HAVE HEARD COMMENTS THAT SIVANTO AND TRANSFORM FLARE SPIDER MITES

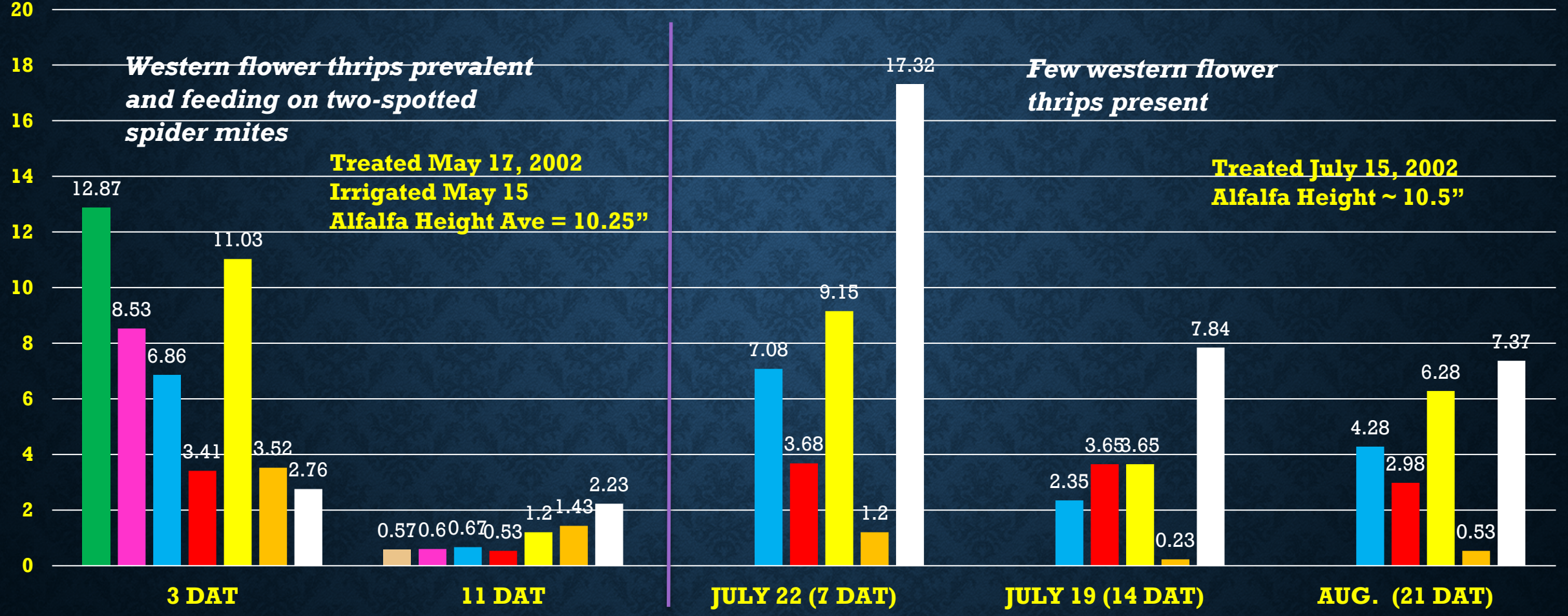
- Is this a true statement, or just a random observation?

- Lets take a look at our alfalfa insecticide aphid and weevil data from the last 3 years from established alfalfa.

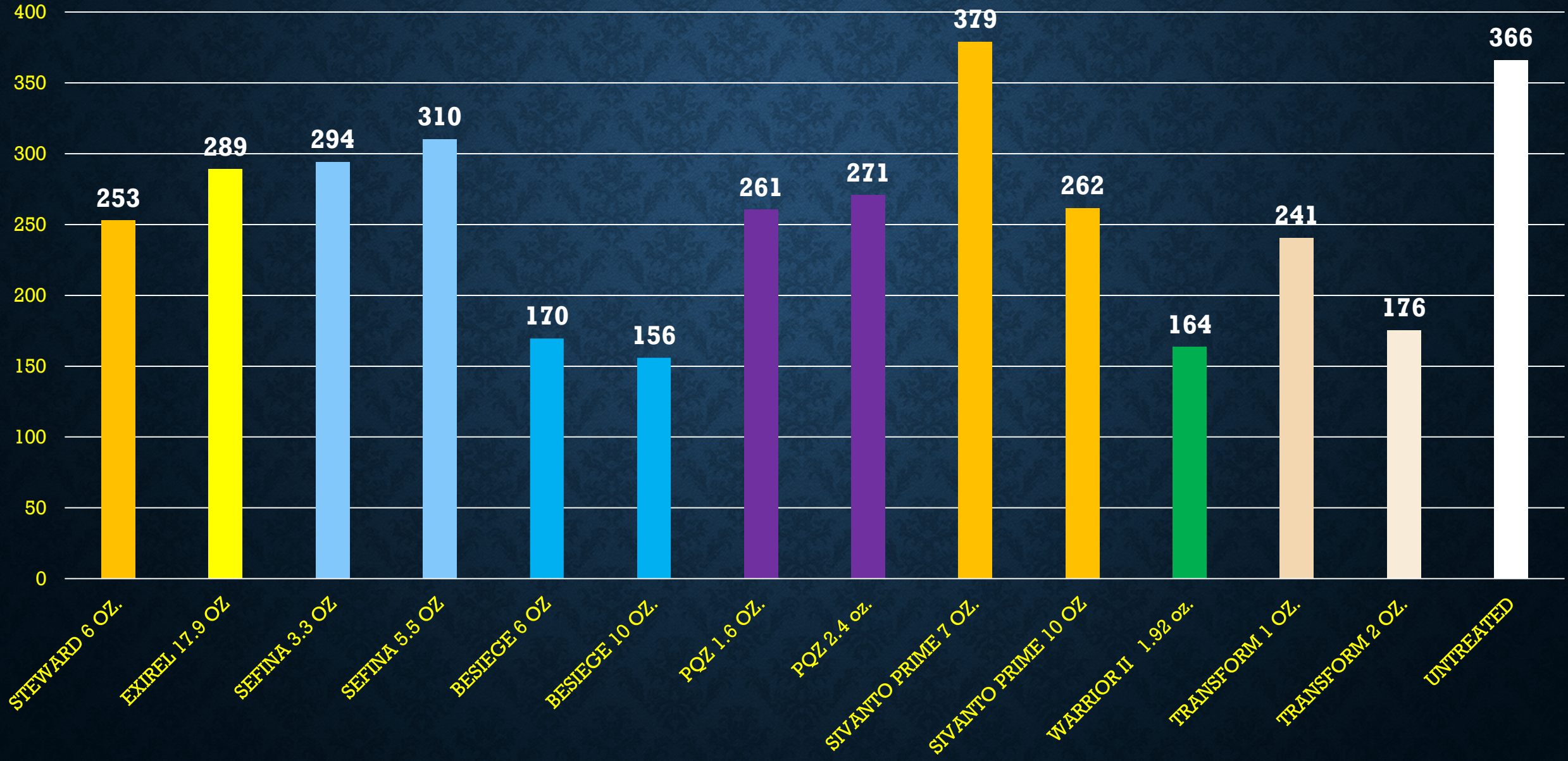


WHAT ARE THE EFFECTS OF INSECTICIDES APPLIED FOR ALFALFA WEEVIL AND/OR APHID CONTROL ON SPIDER MITES?

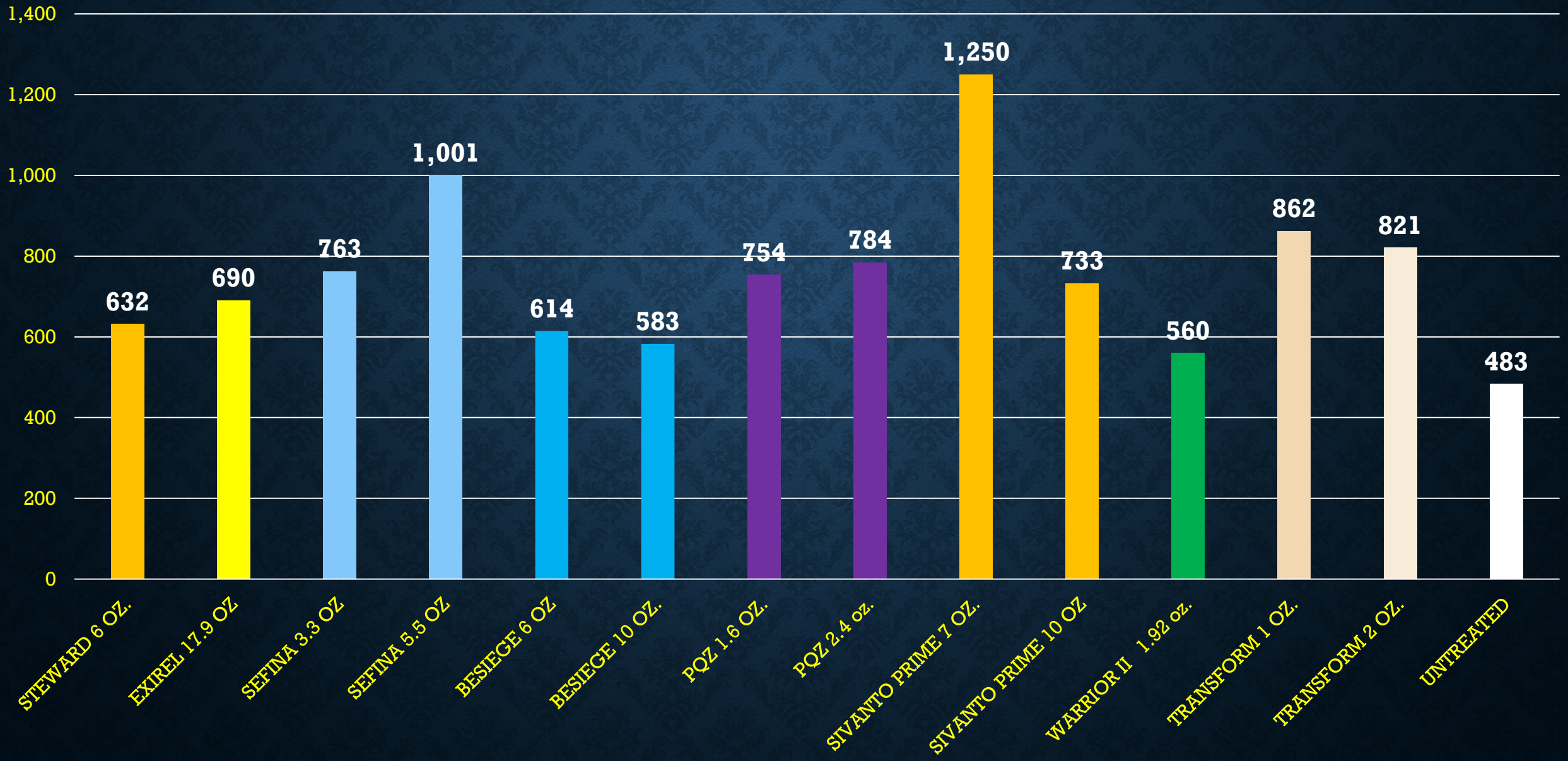
INTERACTIONS OF REGISTERED ALFALFA HAY MITICIDES AND WESTERN FLOWER THRIPS ON TWO SPOTTED SPIDER MITE MOTILES PER ALFALFA STEM, BLYTHE, CA



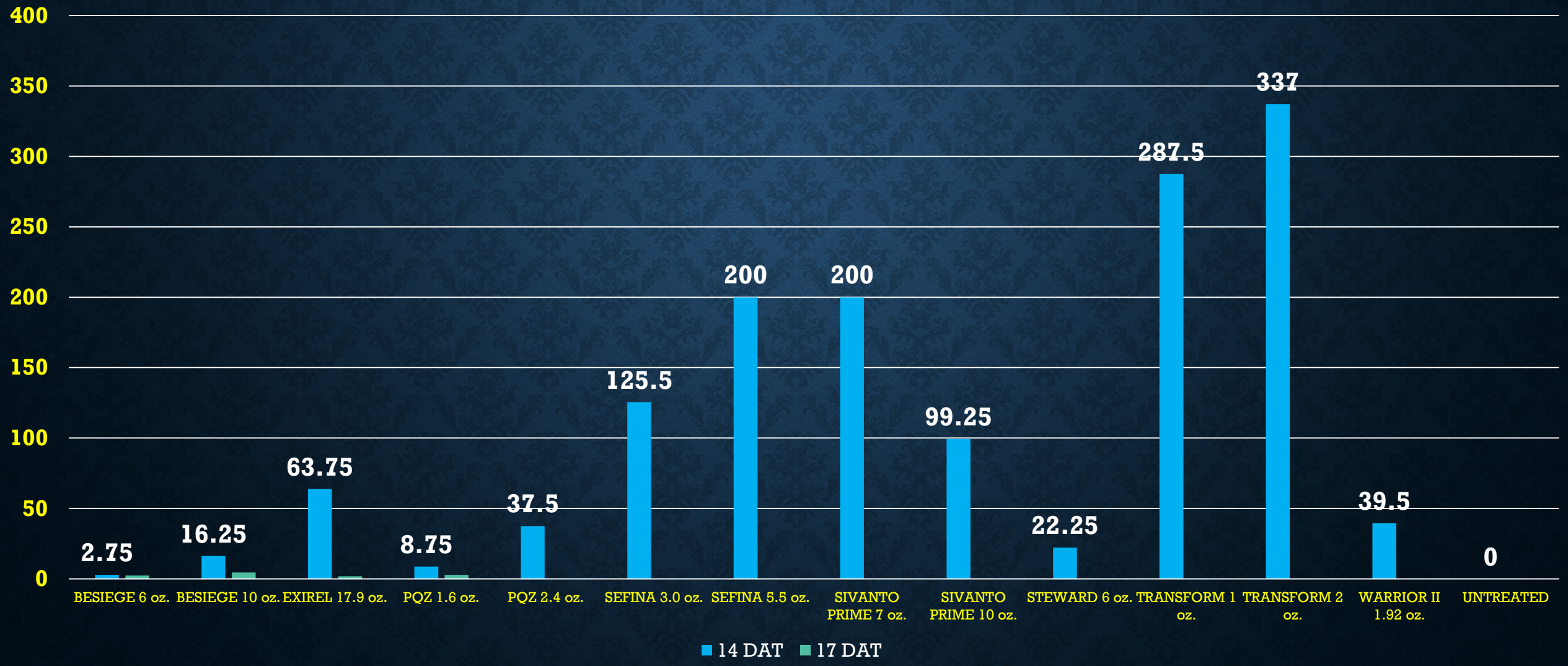
WESTERN FLOWER THRIPS/10 SWEEPS AT 3 DAYS POST INSECTICIDE APPLICATION TO ALFALFA, MARCH 5, 2019, BLYTHE, CALIFORNIA



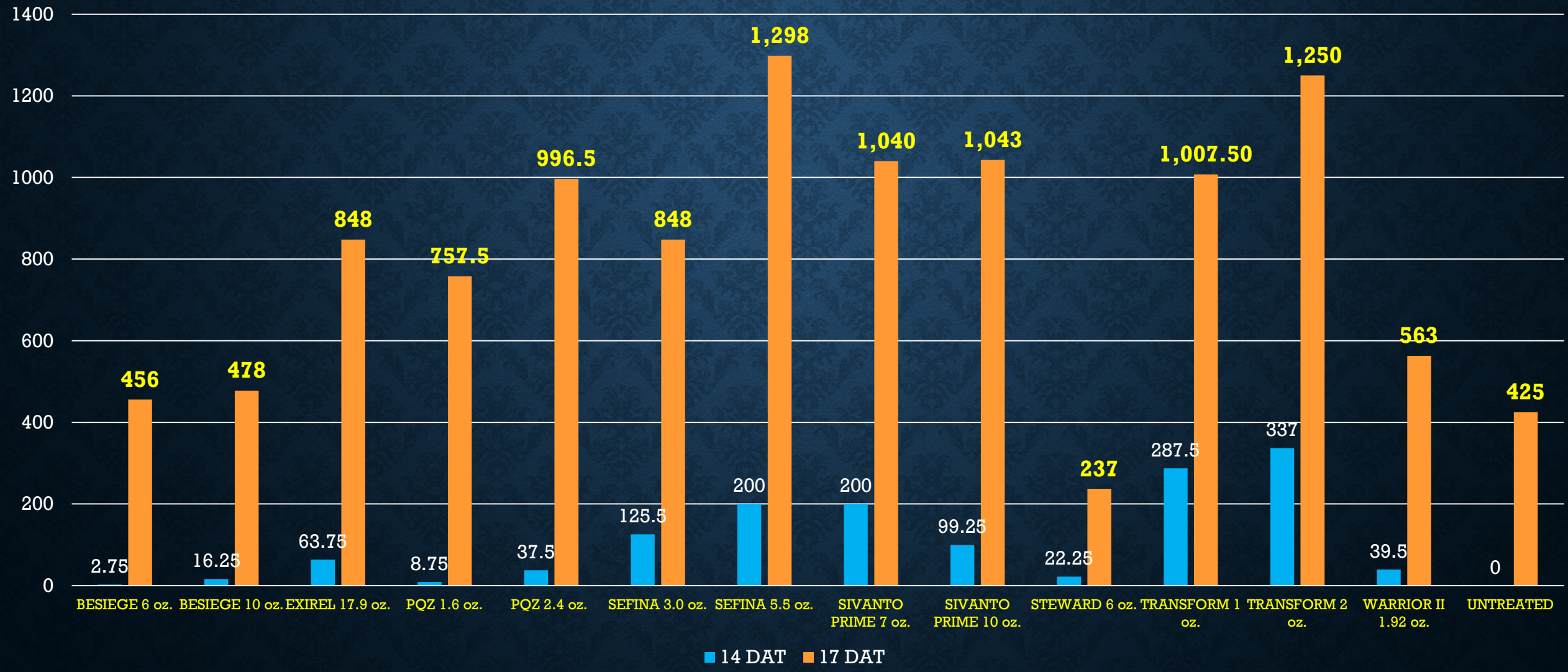
TWO-SPOTTED SPIDER MITES/10 SWEEPS AT 3 DAYS POST INSECTICIDE APPLICATION TO ALFALFA, MARCH 5, 2019, BLYTHE, CA



MEAN NUMBER OF TWO SPOTTED SPIDER MITES PER 10 SWEEPS AT 14 DAYS POST MARCH 5, 2019, INSECTICIDE APPLICATION, BLYTHE, CA *(ESTABLISHED HAY FIELD)*



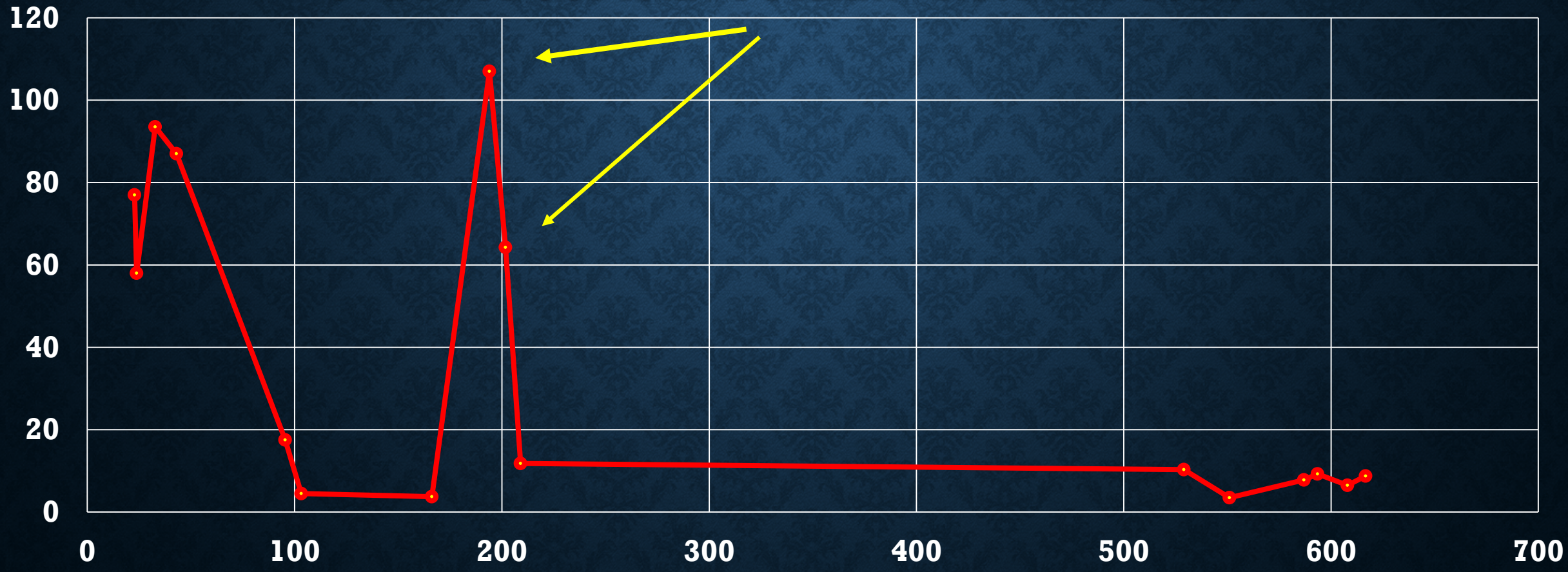
MEAN NUMBER OF TWO SPOTTED SPIDER MITES FOLLOWING INSECTICIDE APPLICATION ON MARCH 5, 2019, BLYTHE, CA



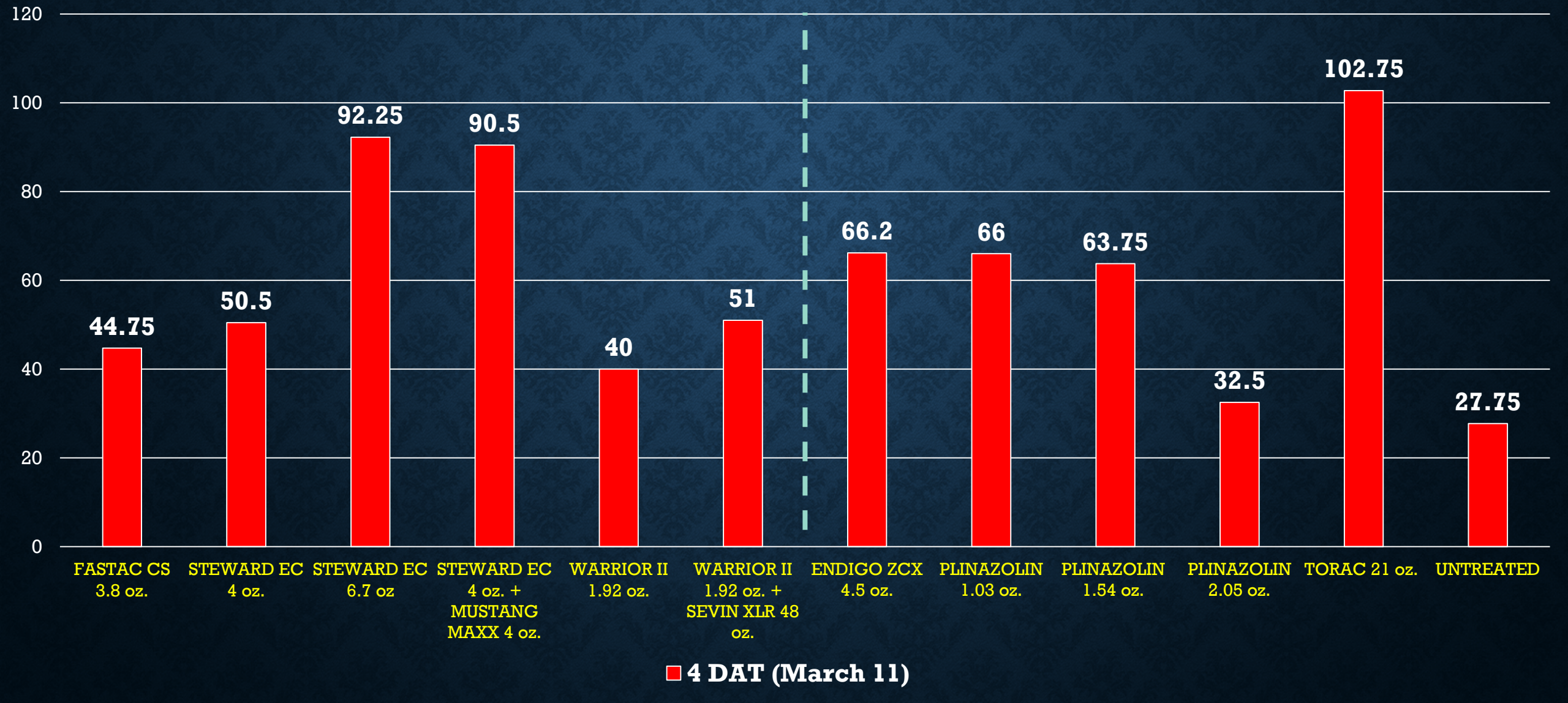
WHAT IS HAPPENING HERE?

RELATIONSHIP BETWEEN TWO-SPOTTED SPIDER MITES AND WESTERN FLOWER THRIPS ADULTS *(NUMBERS PER 10 SWEEPS)* AT 4 DAYS POST TREATMENT, 2021

ONE PRODUCT IS AN OUTLIER – HORMOLYGOSIS?



MEAN NUMBER OF TWO-SPOTTED SPIDER MITES/10 SWEEPS AFTER INSECTICIDE APPLICATION ON MARCH 7, 2022, BLYTHE, CA



ESTABLISHED ALFALFA

MULTIPLE PESTS AND INSECTICIDE APPLICATIONS AT DIFFERENT STAGES OF REGROWTH

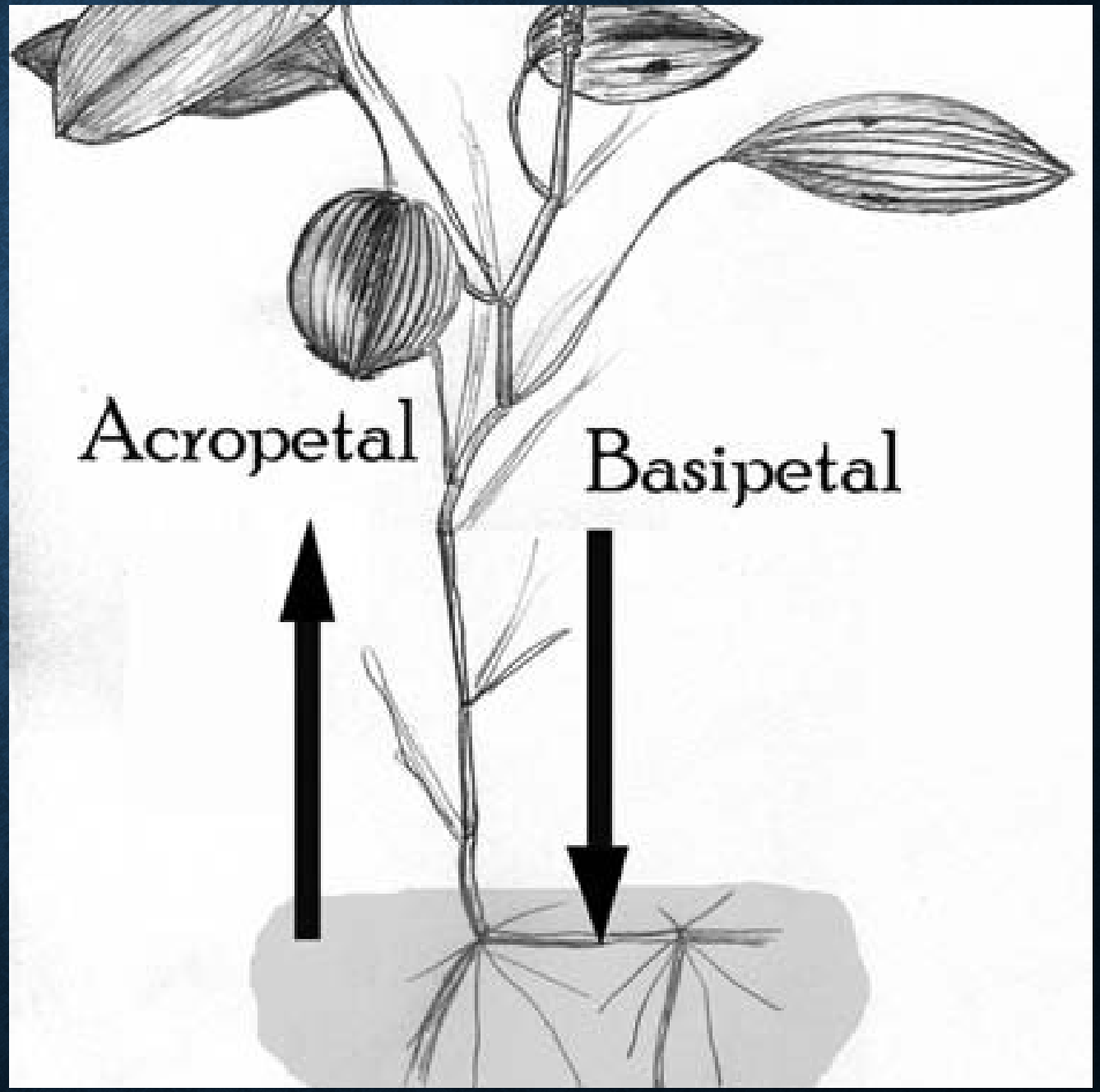
RESULTS FROM 2022 TRIALS

MANY OF THE SYSTEMIC INSECTICIDES USED IN ALFALFA TODAY ARE NOT FULLY SYSTEMIC, BUT ARE ACROPETALLY SYSTEMIC

THIS MEANS THAT THEY ONLY PROTECT THE INTERCEPTED FOLIAGE WHEN SPRAYED, AND THE NEW GROWTH AFTER THAT.

FOLIAGE UNDERNEATH THE DIRECT CONTACT AREA WILL NOT BE PROTECTED AND APHIDS WILL CONTINUE TO FEED.

BETTER INSECT CONTROL USUALLY NOTED AT 10 DAYS THAN AT 3 DAYS POST TREATMENT



TRIAL BACKGROUND – APPLICATIONS AT VARIOUS REGROWTH HEIGHTS

- THINGS NEEDING TO BE DOCUMENTED:

- 1). WHAT IS THE INTERACTION OF PLANT HEIGHT AND INSECTICIDE ON EFFICACY OF ACROPETALLY SYSTEMIC INSECTICIDES FOR APHID CONTROL?

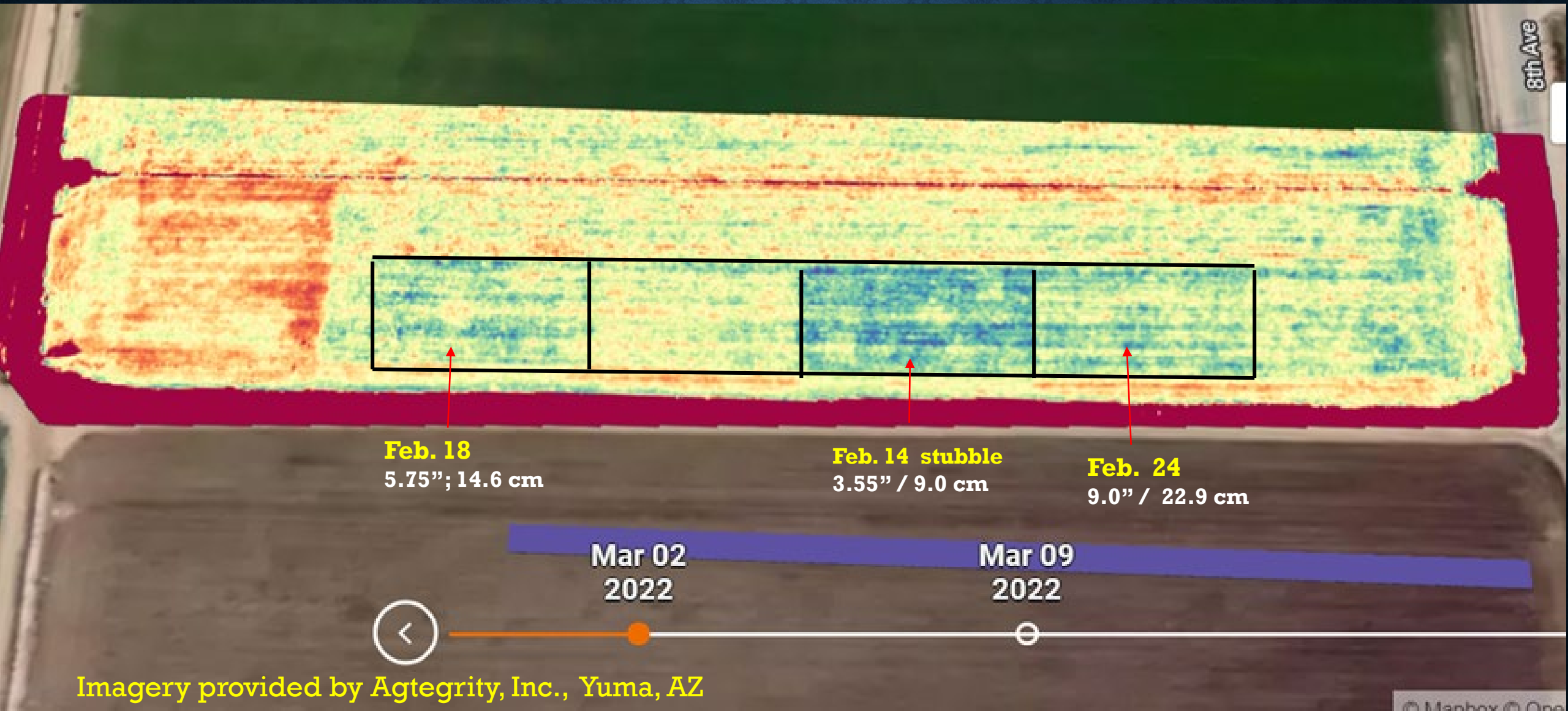
- 2) HOW DOES THIS DIFFERENCE IN PLANT GROWTH AFFECT LONGEVITY OF INSECTICIDE ACTIVITY? *(i.e. DOES ENOUGH PRODUCT GET ON ALFALFA STUBBLE TO EVEN BE EFFECTIVE, AND IF SO, DOES IT LAST VERY LONG WHEN MOST PRODUCT GETS ON THE GROUND? DO WE NEED TO WAIT UNTIL MORE GROWTH FOR BETTER CONTROL)?*

WHAT IS EFFECT ON APHIDS AND RESULTING ALFLAFA GROWTH WHEN APHID INFESTED ALFALFA IS TREATED AT DIFFERENT HEIGHTS?

- WINTER 2022 TRIAL

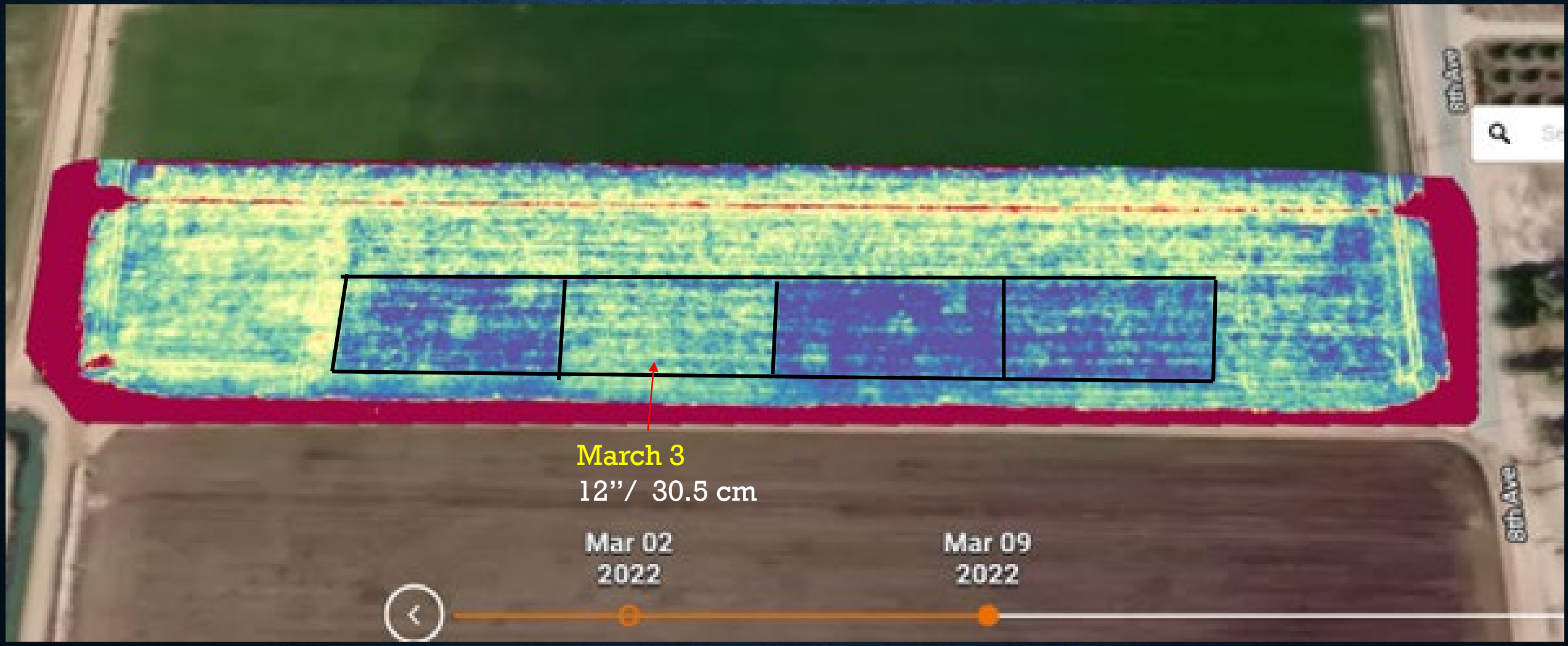
- *ESTABLISHED ALFALFA INFESTED WITH COWPEA APHIDS AND BLUE ALFALFA APHIDS TREATED AT 4 DIFFERENT HEIGHTS*
  - 3.55” (9.0 cm) (Stubble treatment)
  - 5.75” (14.6 cm)
  - 9.0” (22.9 cm)
  - 12.0 “ (30.5 cm)

NDRE IMAGE OF ALFALFA ON MARCH 2, 2022



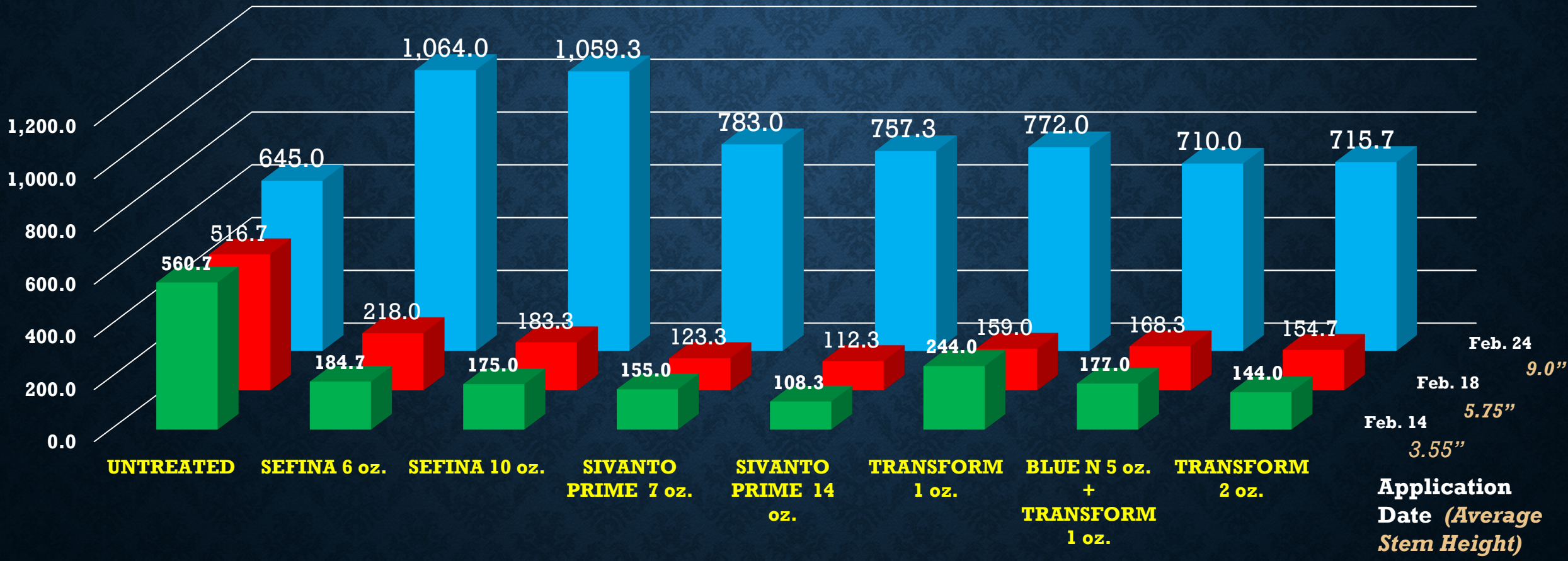
Imagery provided by Agtegrity, Inc., Yuma, AZ

NDRE IMAGE OF ALFALFA ON MARCH 9, 2022

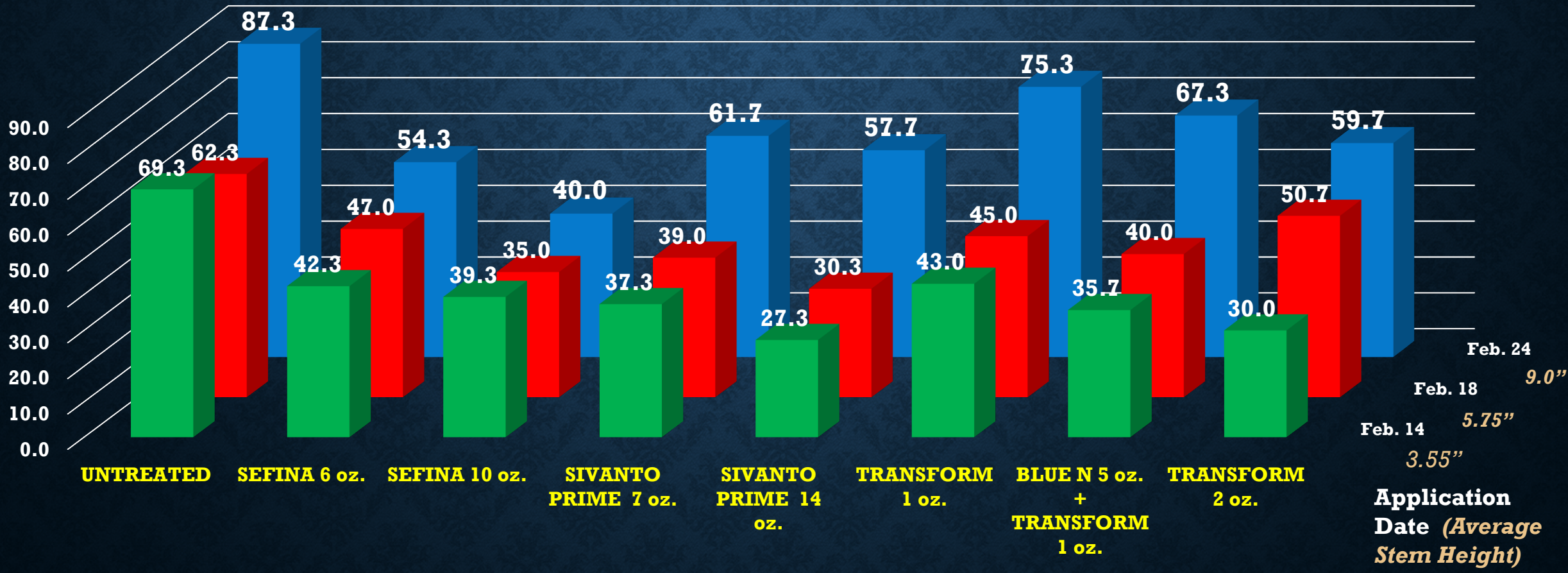


Imagery provided by Agtegrity, Inc., Yuma, AZ

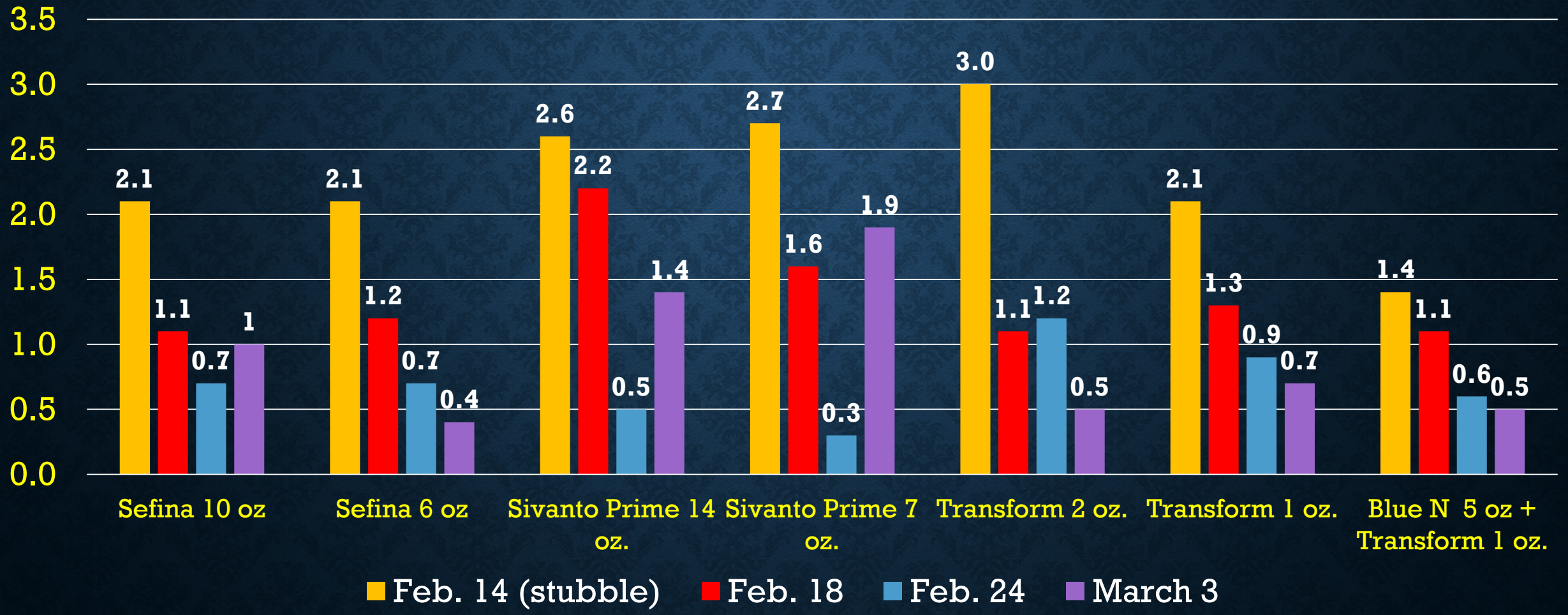
MEAN NUMBER OF COWPEA APHIDS/10 SWEEPS OF ESTABLISHED ALFALFA ON MARCH 3, 2022, BLYTHE, CA



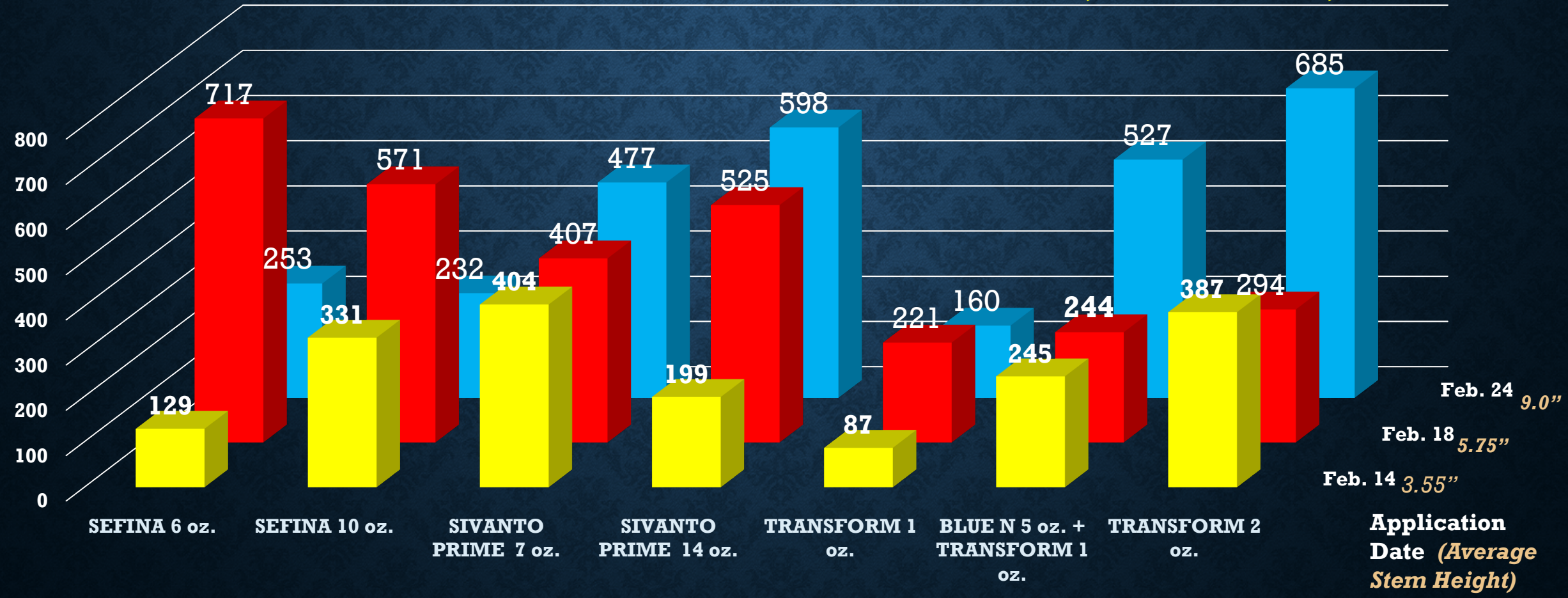
MEAN NUMBER OF COWPEA APHID PARASITIC WASPS/10 PENDULUM SWEEPS OF ESTABLISHED ALFALFA ON MARCH 3, 2022, BLYTHE, CA



STEM HEIGHT DIFFERENCES *(INCHES)* FROM INSECTICIDE TREATMENTS - NEW STAND ALFALFA - MARCH 12, 2022, BLYTHE, CA



MEAN 2022 YIELDS ON MARCH 28-30 OF ESTABLISHED ALFALFA INFECSTED WITH BLUE ALFALFA APHIDS AND COWPEA APHIDS AS AFFECTED BY INSECTICIDES APPLIED AT DIFFERING DATES/STEM HEIGHTS, BLYTHE, CA



ALFALFA WEEVILS

PRELIMINARY THOUGHTS ON APPLICATION TO ALFALFA STUBBLE

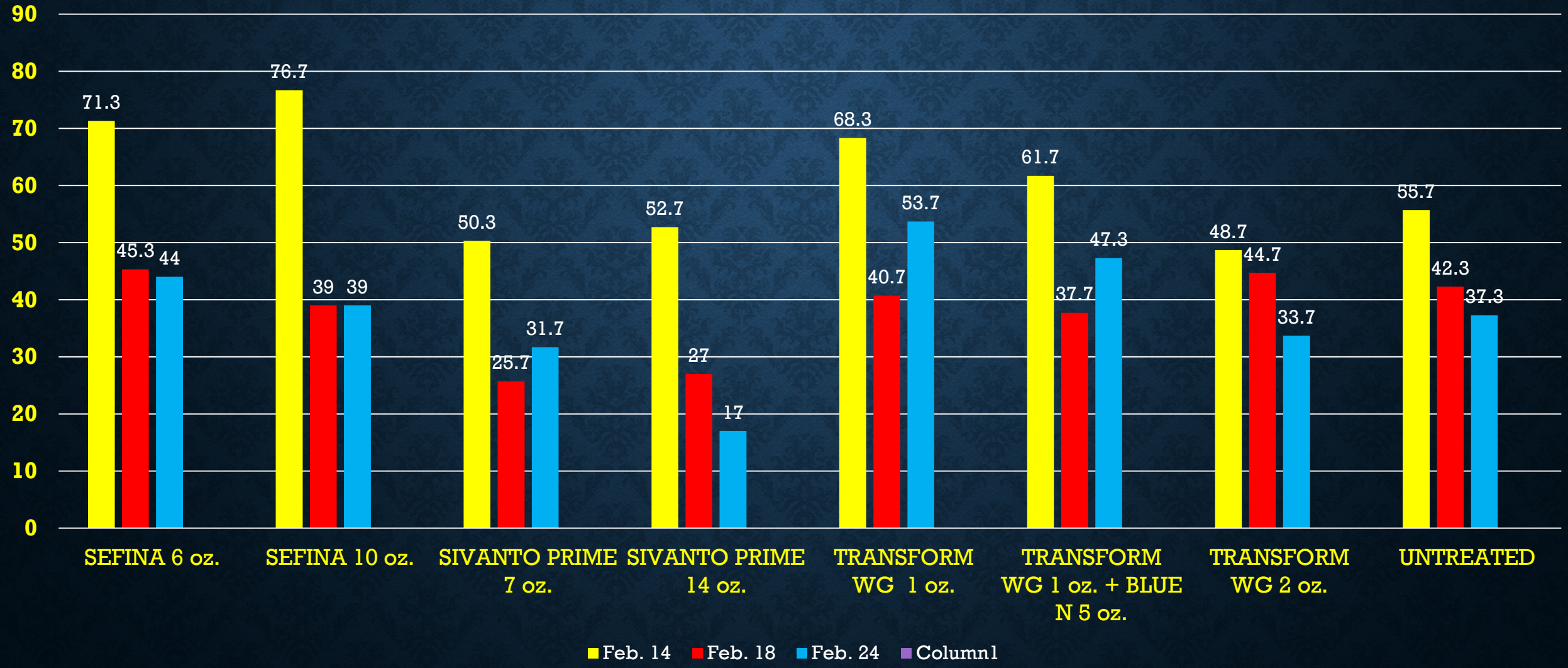
- It does appear promising. Most treatments resulted in fewer aphids, and yields were somewhat increased.

- These trials were conducted on established alfalfa that had both cowpea aphids and blue alfalfa aphids. Established alfalfa grows back faster, and new alfalfa is not expected to have as many cowpea aphids in later winter

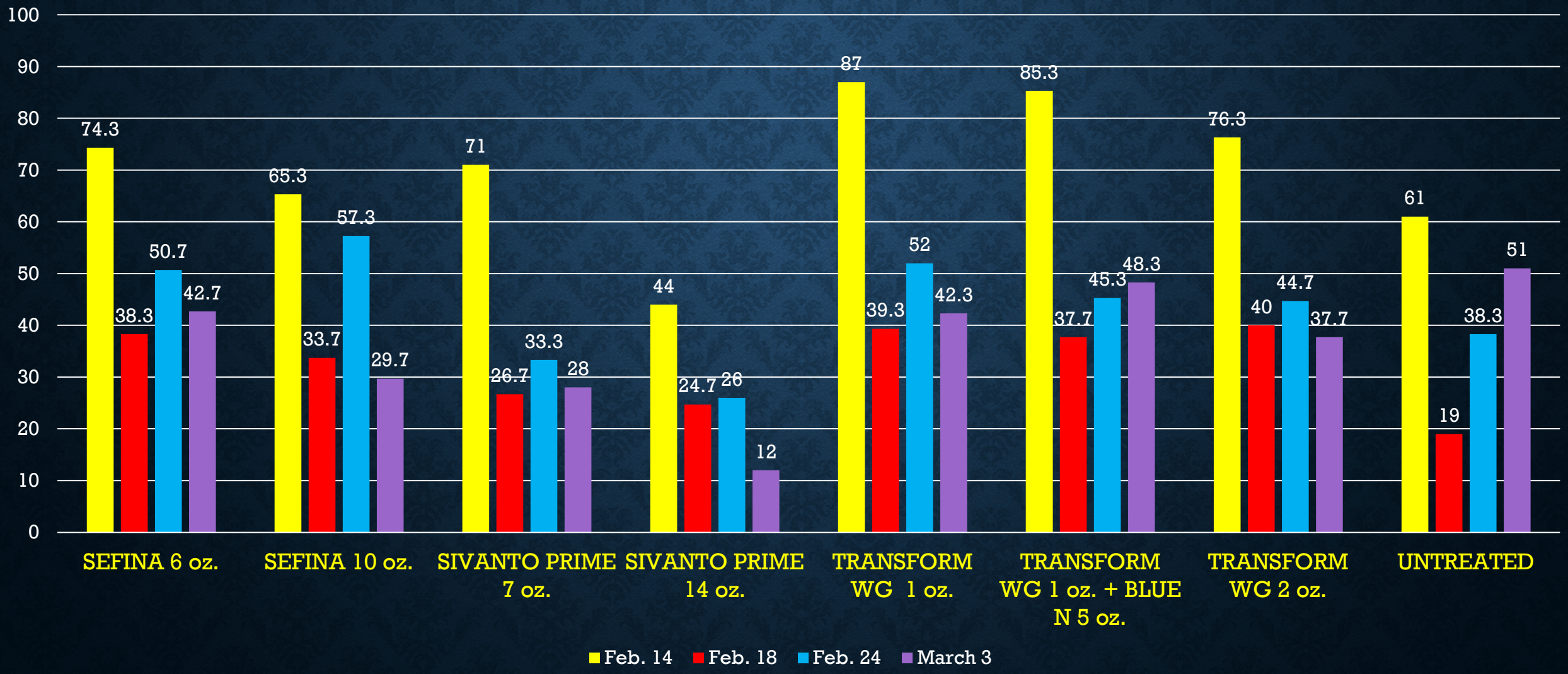
- Results and economics/efficacy will probably be different for first year hay than 2nd- - 3rd year hay.

- More research will be conducted in 2023. Alfalfa weevils were also present in 2022.

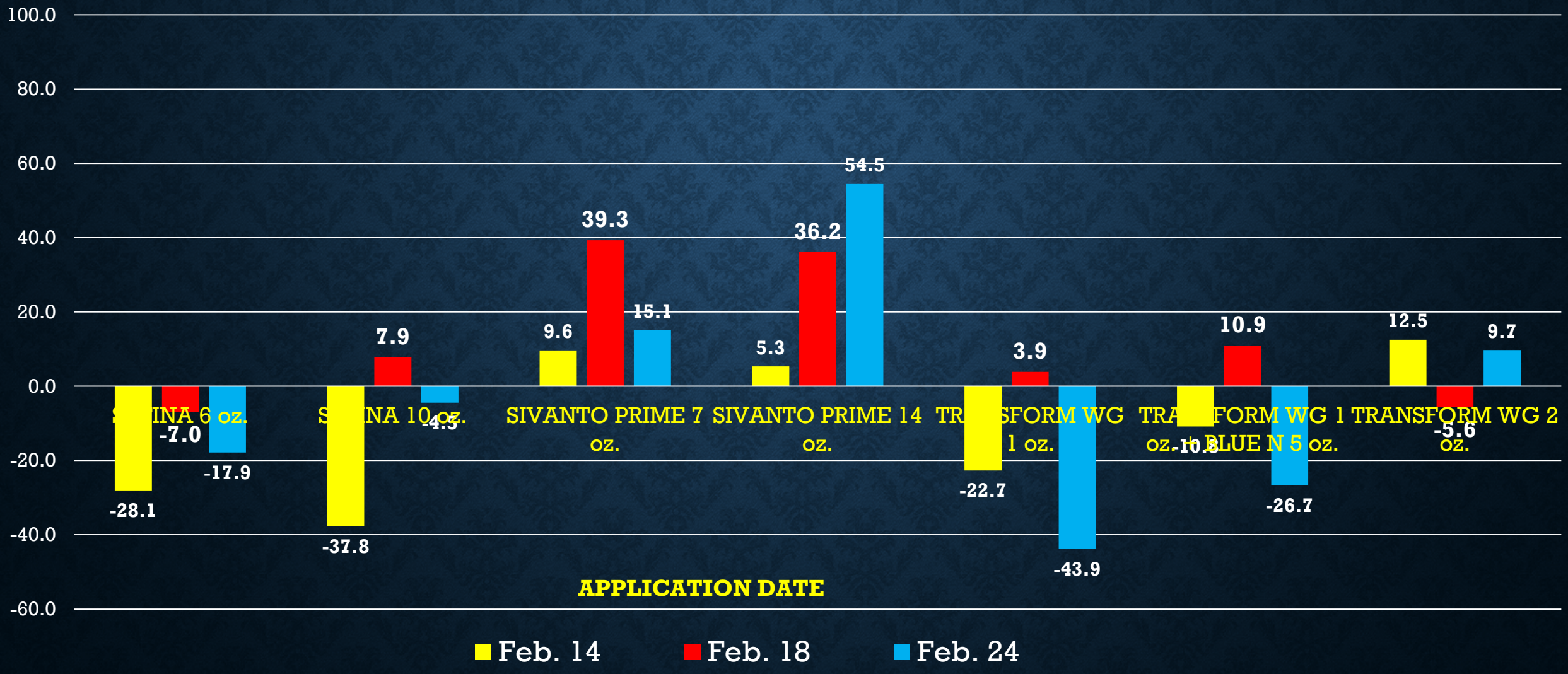
MEAN NUMBER OF ALFALFA WEEVIL LARVAE/10 SWEEPS ON MARCH 3 AS AFFECTED BY INSECTICIDES APPLIED AT DIFFERING DATES/STEM HEIGHTS, BLYTHE, CA



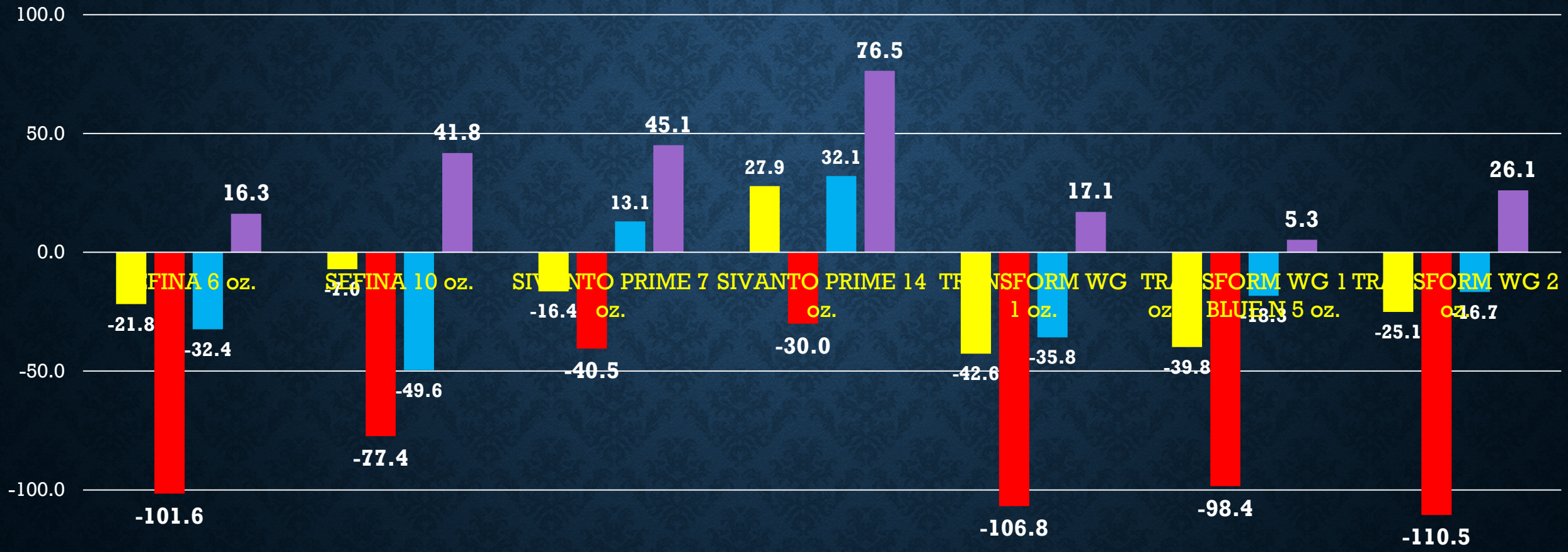
MEAN NUMBER OF ALFALFA WEEVIL LARVAE/10 SWEEPS ON MARCH 9 AS AFFECTED BY INSECTICIDES APPLIED AT DIFFERING DATES/STEM HEIGHTS, BLYTHE, CA



PERCENT REDUCTION OF ALFALFA WEEVIL LARVAE/10 SWEEPS ON MARCH 3 AS AFFECTED BY INSECTICIDES APPLIED AT DIFFERING DATES/STEM HEIGHTS, BLYTHE, CA



PERCENT REDUCTION OF ALFALFA WEEVIL LARVAE/10 SWEEPS ON MARCH 9 AS AFFECTED BY INSECTICIDES APPLIED AT DIFFERING DATES/STEM HEIGHTS, BLYTHE, CA



2022 ALFALFA INSECT COUNTERS

ANISSA SORIA

SARAH UNZON GONZALEZ

NEW CATERPILLAR IN LOCAL ALFALFA

- Looper caterpillar first reported about 5 weeks ago
- Widespread throughout the Palo Verde Valley in alfalfa fields
- Reports of this insect from alfalfa in Butler Valley, Vicksburg and Cibola areas of western Arizona
- Although not yet verified, highly confident that these are caterpillars of the dot lined angle moth. Caterpillars have different looks at different growth stages, and can reach almost 1 inch in length
- These findings are significant, as this appears to represent a new host for this caterpillar species *(and yes, they can complete their development on alfalfa).*

YOUNG LOOPERS HAVE GREEN HEADS, AND MULTIPLE PALE WHITE STRIPES FROM HEAD TO END OF ABDOMEN.

THEY ALSO HAVE ONLY 2 PAIRS OF PROLEGS
(CABBAGE AND ALFALFA LOOPERS HAVE 3 PAIRS)

LOOPERS CAN REACH 22 CM (0.9 INCHES) IN LENGTH

LATER INSTARS OF THE CATERPILLARS HAVE DOTS AND SOMETIMES ADDITIONAL BROWNISH MARKINGS ON THEIR SIDES

LATER INSTARS OF THE CATERPILLARS HAVE DOTS AND SOMETIMES ADDITIONAL BROWNISH MARKINGS ON THEIR SIDES

LAST INSTARS ARE NOT GREEN BUT HAVE A BEIGE/WHITE STRIPE ON THE LOWER SIDES. HEADS STILL HAVE SOME GREEN IN COLORATION

ADULT MOTHS ARE VARIABLE IN COLOR AND SOMEWHAT IN MARKINGS. NOTE THE DARK WING EDGES AND THE POINTED ANGLE OF THE MIDDLE HIND WINGS

- Species Page at BugGuide.Net

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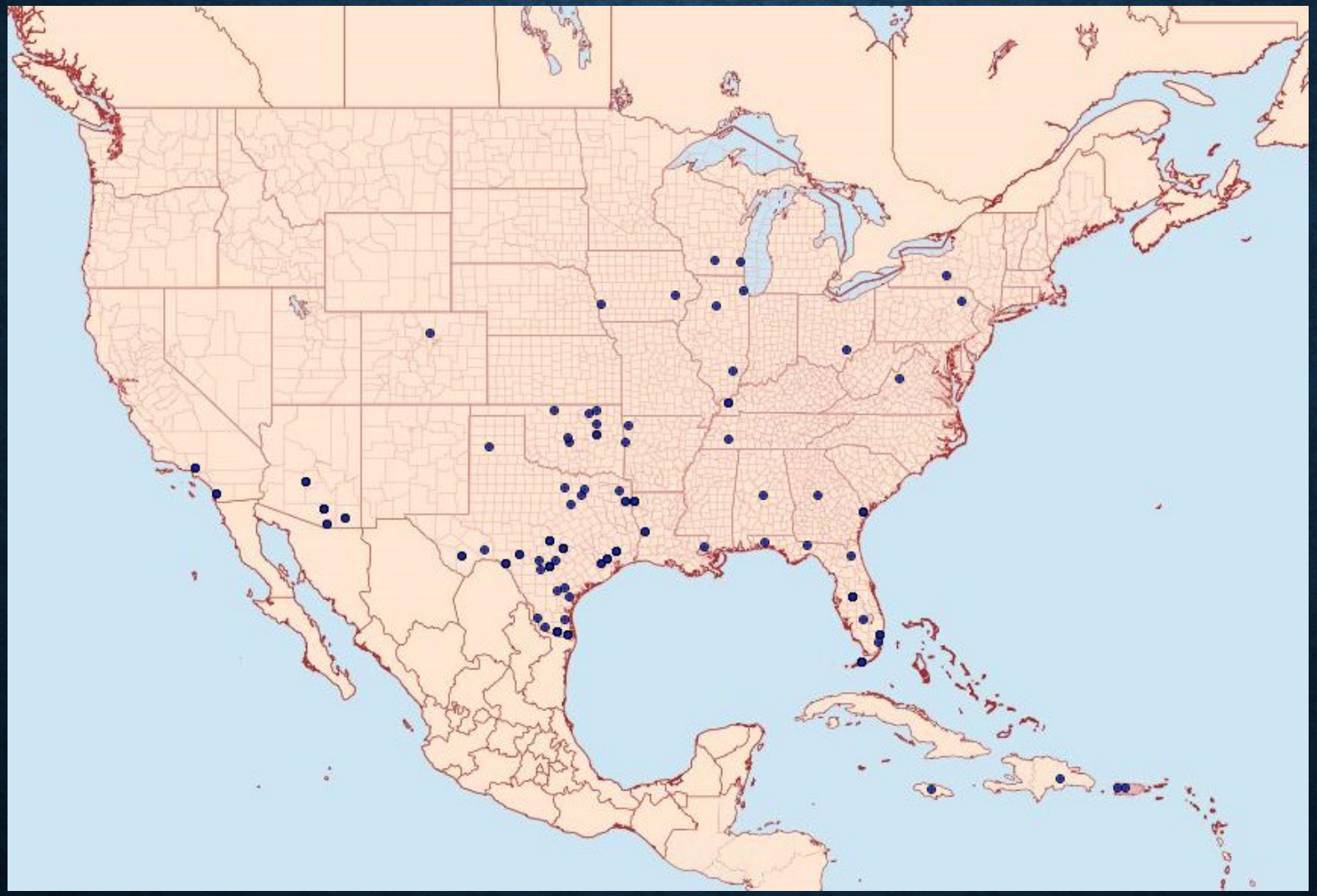
♀ – © CNC - Jocelyn Gill

♂ – © CNC - Jocelyn Gill

Mississippi State University *http://mothphotographersgroup.msstate.edu/large_map.php?hodges=6332*

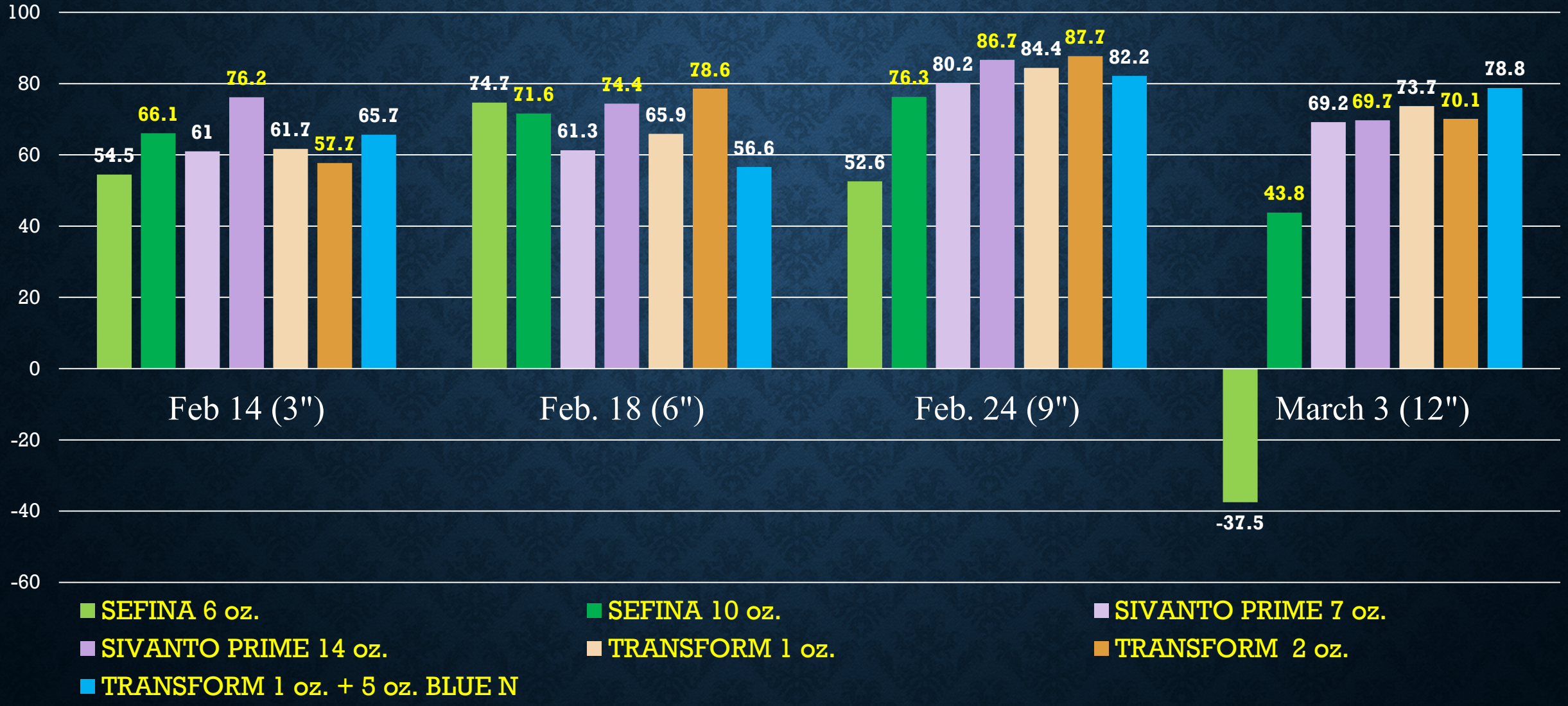
ADULT DOT LINED ANGLE MOTH
(PREVIOUSLY KNOWN U.S. GEOGRAPHIC DISTRIBUTION)



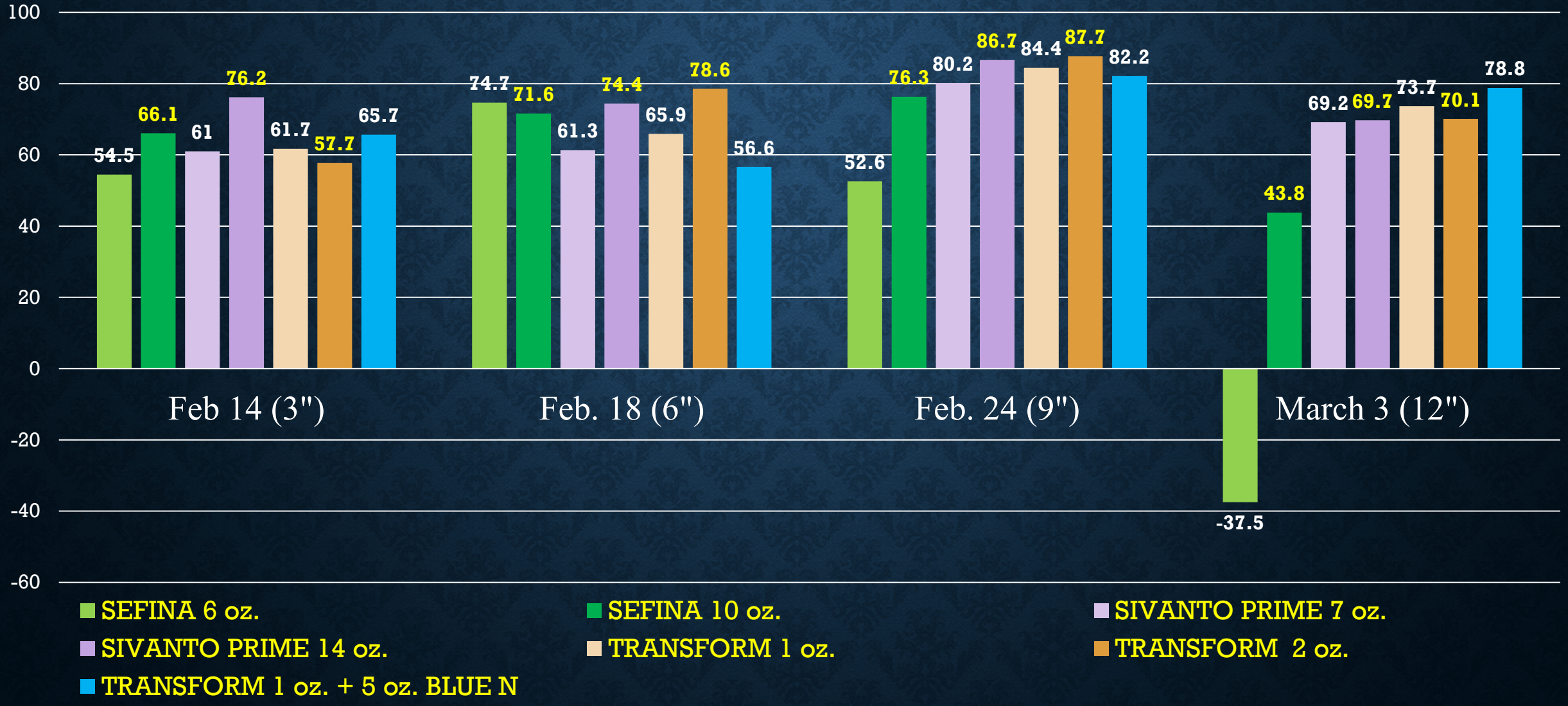
Moth distribution map from Mississippi State University
http://mothphotographersgroup.msstate.edu/large_map.php?hodges=6332

QUESTIONS?

PERCENT OF COWPEA APHIDS RELATIVE TO UNTREATED ALFALFA ON MARCH 9, 2022, FOLLOWING APPLICATIONS AT DIFFERENT DATES/ALFALFA STEM HEIGHTS OF ESTABLISHED ALFALFA



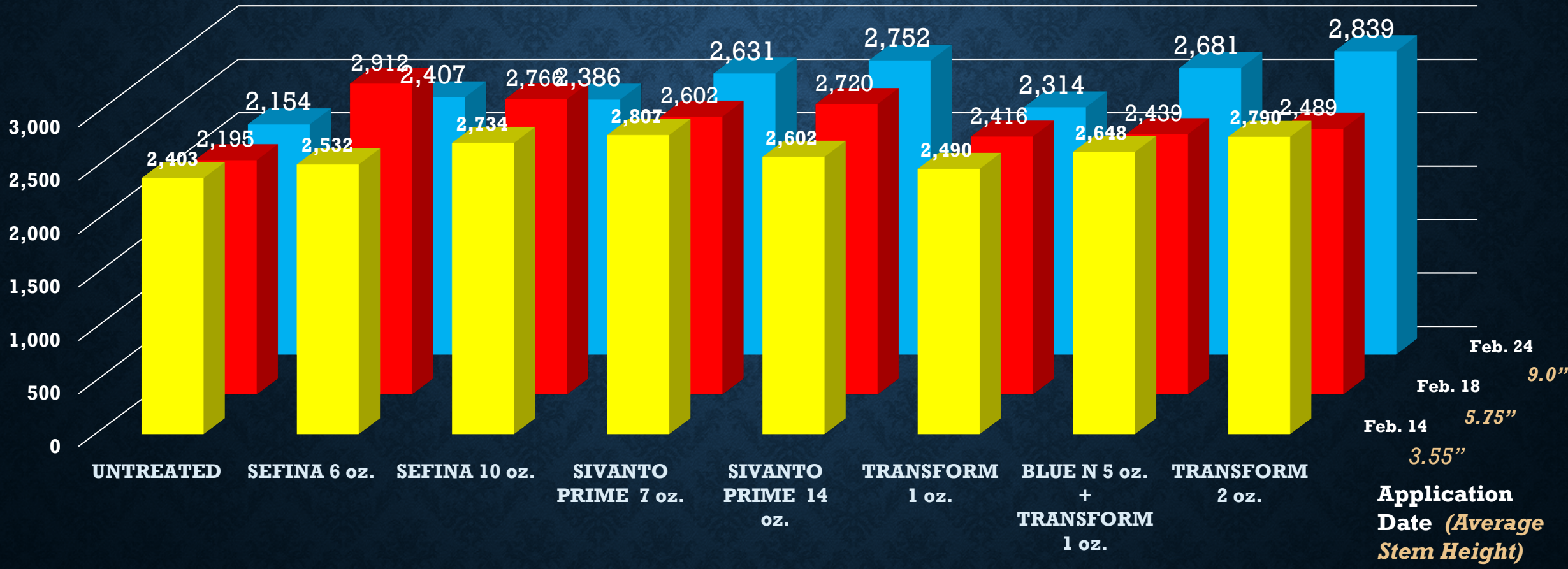
PERCENT OF COWPEA APHIDS RELATIVE TO UNTREATED ALFALFA ON MARCH 9, 2022, FOLLOWING APPLICATIONS AT DIFFERENT DATES/ALFALFA STEM HEIGHTS OF ESTABLISHED ALFALFA



OUTLINE

- Blue Alfalfa Aphid control in 1st year hay –
- Crop Responses (2021 internode lengths data)
- Comparison of BAA control in new vs. established hay (2022 data)
- Interactions with plant heights? (2022)
- What do we know about cowpea aphids and resulting interactions when multiple aphids are present? (2022 data, including wasps and ratios with CPA)
- Other Transform alfalfa data/Alfalfa (leafhoppers, whiteflies, seedling alfalfa)
- ,tef from 2021?
- Methylobacterium symbioticum data (alfalfa, teff seed, garlic, bermudagrass seed)

MEAN 2022 YIELDS OF ESTABLISHED ALFALFA AS AFFECTED BY INSECTICIDES APPLIED AT DIFFERING DATES/STEM HEIGHTS, BLYTHE, CA



TREATMENT and RATE/ACRE