

*Sunflower Moth Control
Using Chlorantraniliprole
(Dupont or Besiege) vs.
Common Insecticides—
Final Report*

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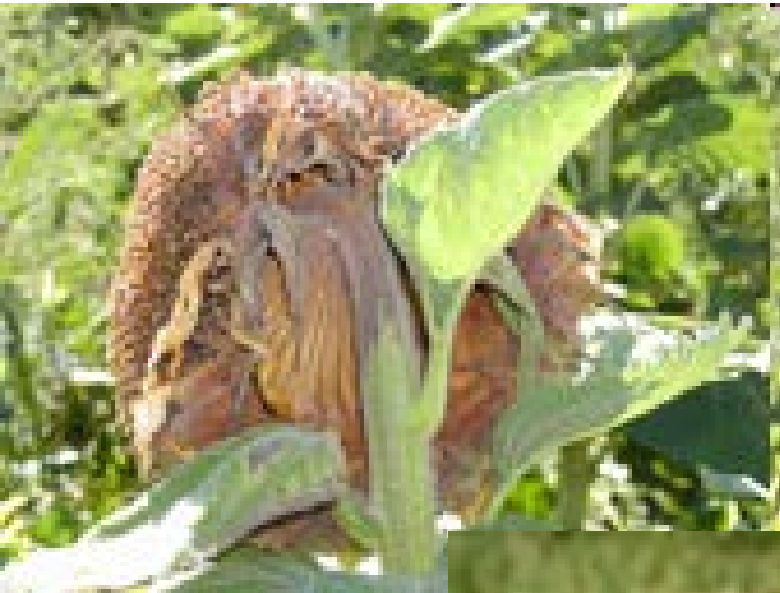


Sunflower (Head) Moth

- ⌘ Threat for 7-10 days (if uniform stand) beginning with initial bloom when pollen becomes available
 - ☒ Second spray when needed 5-7 days later (but not for low yields in dryland)
- ⌘ Don't get caught!—Hybrids bloom fast, from 5% to 75% bloom in 2-3 days if warm
 - ☒ Don't wait until 2-5% bloom to contact your applicator; get on the spray schedule
- ⌘ Uncontrolled larvae eventually burrow into head destroying seed—increasing susceptibility to *Rhizopus* head rot



Ultimately *Rhizopus* Headrot



“Styrofoam Bricks!”

Example of SFM Larval Abundance (no spraying, Texas sites)

| | Mean Number of SFM Larvae/6 Heads | | | |
|-------------------------|-----------------------------------|-----------|-----------|------------|
| Days After 1st Bloom | Bushland1 | Bushland2 | Lubbock1 | Lubbock2 |
| 3 | 0 | 2 | 1 | 0 |
| 6 | 3 | 0 | 3 | 9 |
| 9 | 7 | 27 | 2 | 77 |
| 12 | 38 | 15 | 4 | 220 |
| 15 | 34 | 28 | 3 | 263 |
| 18 | 28 | 18 | 3 | 312 |
| 21 | 13 | 24 | 7 | 215 |
| 24 | 8 | 23 | 47 | 142 |
| 27 | 4 | 12 | 71 | 77 |
| 30 | --- | 12 | 75 | --- |
| 33 | --- | 13 | --- | --- |

Sunflower Moth Spraying


⌘ Current "By the Book" (Texas AgriLife Extension's sunflower insect guide)

- ☒ Spray at 15-25% bloom 'when moths are in the field', count any head as blooming when any of the ray flowers are opening and disk flowers are exposed.
- ☒ Based on pyrethroids
- ☒ No statement on how many moths—threshold is presence, not number
- ☒ Downside: Still no room for error; moths still have 1-2 days to freely lay eggs on many heads
- ☒ Result: Still have potential damage if late

New Insecticide, New Approach—Prevathon, 2013 I.

- ⌘ Active ingredient, **chlorantraniliprole** (Rynaxypyr), from Dupont
- ⌘ “Softer” chemical; does not affect honeybees and other beneficials—thus target is larvae, not moths (concern: this allows the egg lay)
- ⌘ Also **Besiege**, from Syngenta, a mix of chlorantraniliprole and pyrethroid
 - ☒ Chlorantraniliprole: 14 oz./A rate of Prevathon = 7.6 oz/A for Besiege (7.6 oz./A includes 1.54 oz/A of Warrior II/λ-cyhalothrin; labeled range for sunflower, 1.28-1.92 oz./A)

New Insecticide, New Approach—Prevathon, 2013 II.



- ⌘ “**Translaminar**” movement of insecticide to feeding larvae
 - ☒ Little to no activity on adults so scouting after your first spray doesn't mean much
 - ☒ This mechanism of movement has not been documented independently
- ⌘ Up to 14-day spray interval?

Prevathon Label & Sunflower



- ⌘ Sunflower Moth & Banded Sunflower Moth: “Apply when moth populations reach local established treatment thresholds and **as blooms begin to open** (R5.0-R5.1) to prevent crop damage.

Sunflower Bloom Stages

This head is considered blooming



Early R-4

Late R-4

R-5.1
(10% of disk
flowers in bloom)

R-5.2
(20% of disk
flowers in bloom)

Besiege Label & Sunflower



- ⌘ Apply before pests reach damaging levels. Scout and treat again if populations rebuild to potentially damaging levels.

Objectives & Locations

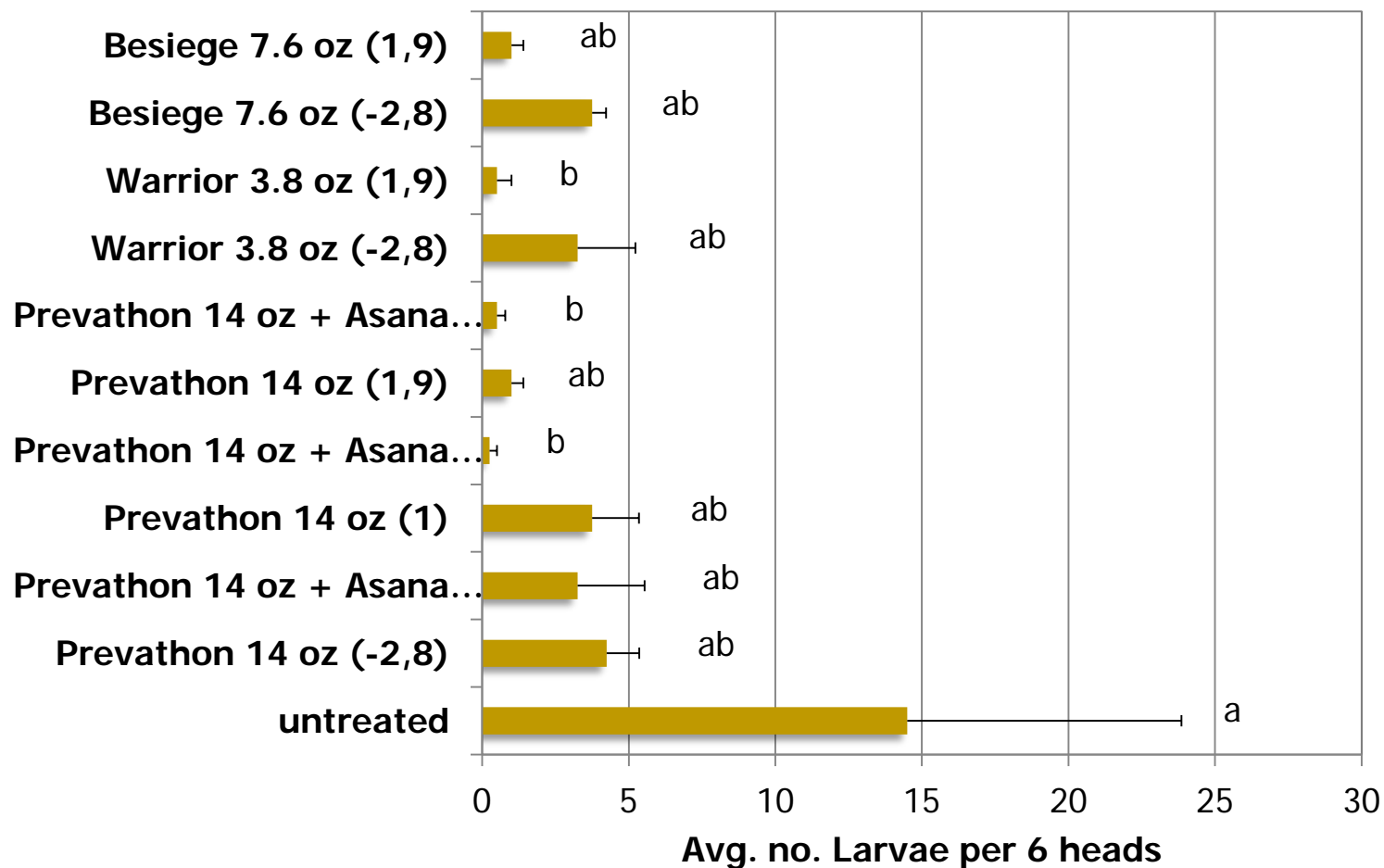


- ⌘ Examine timing of Prevathon, Besiege, Belt, Warrior II applications, including pre-bloom
- ⌘ Examine early spray only vs. two-spray program
- ⌘ Lower Rio Grande Valley, Lubbock, Amarillo, Texas & Goodland, Kansas
- ⌘ 10 gal/A carrier volume with backpack; 4 reps, RCBD
- ⌘ Larval counts, yield, *Rhizopus* infection

| NSA Trials | Rate | Rate | Target First | Target Second |
|------------------------|---------------------|---------------------|-----------------------------|-----------------------------------|
| Brand | First | Second | Application | Appl. Days |
| <u>Chemical</u> | <u>Spray</u> | <u>Spray</u> | <u>Growth Stage†</u> | <u>after R5.1-5.2</u> |
| Control | 0 | 0 | .--- | .--- |
| Prevathon | 14 | 14 | 2 days before R5.0 | 4 (8 days after initial spray) |
| Prevathon | 14 | 0 | R5.1-5.2 | None |
| Prevathon | 14 | 14 | R5.1-5.2 | 8 |
| Besiege | 7.6 | 7.6 | 2 days before R5.0 | 4 (8 days after initial spray) |
| Besiege | 7.6 | 0 | R5.1-5.2 | None |
| Besiege | 7.6 | 7.6 | R5.1-5.2 | 8 |
| Belt | 3.0 | 0 | R5.1-5.2 | None |
| Belt | 3.0 | 3.0 | R5.1-5.2 | 8 |
| Warrior II | 1.92 | 0 | R5.1-5.2 | None |
| Warrior II | 1.92 | 1.92 | R5.1-5.2 | 8 |

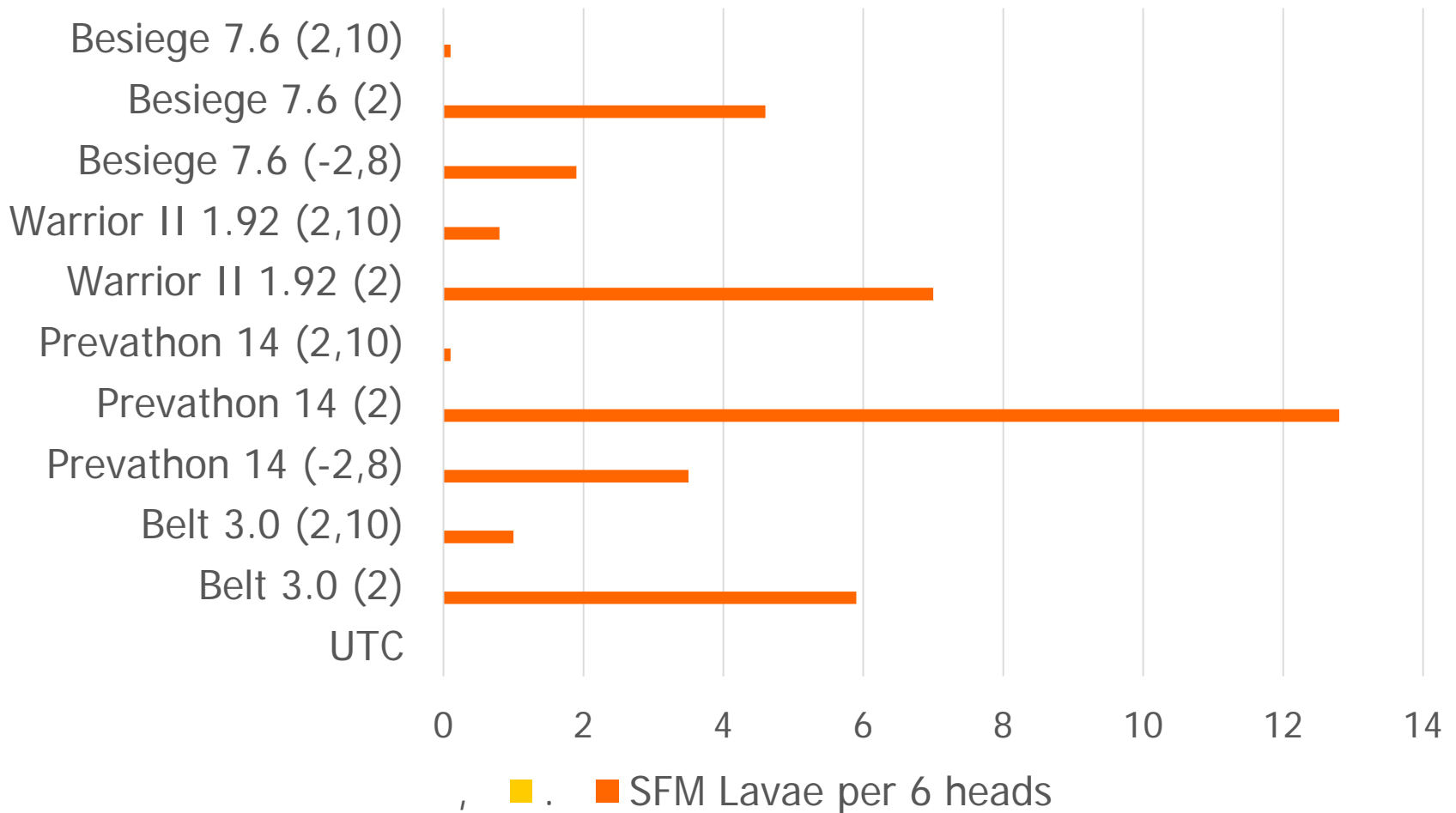
Sunfl Moth Larvae: Lubbock—2015

1% bloom August 15th,
Sampled August 31, 7 Days after last application



SFM Larvae, Lubbock 2017

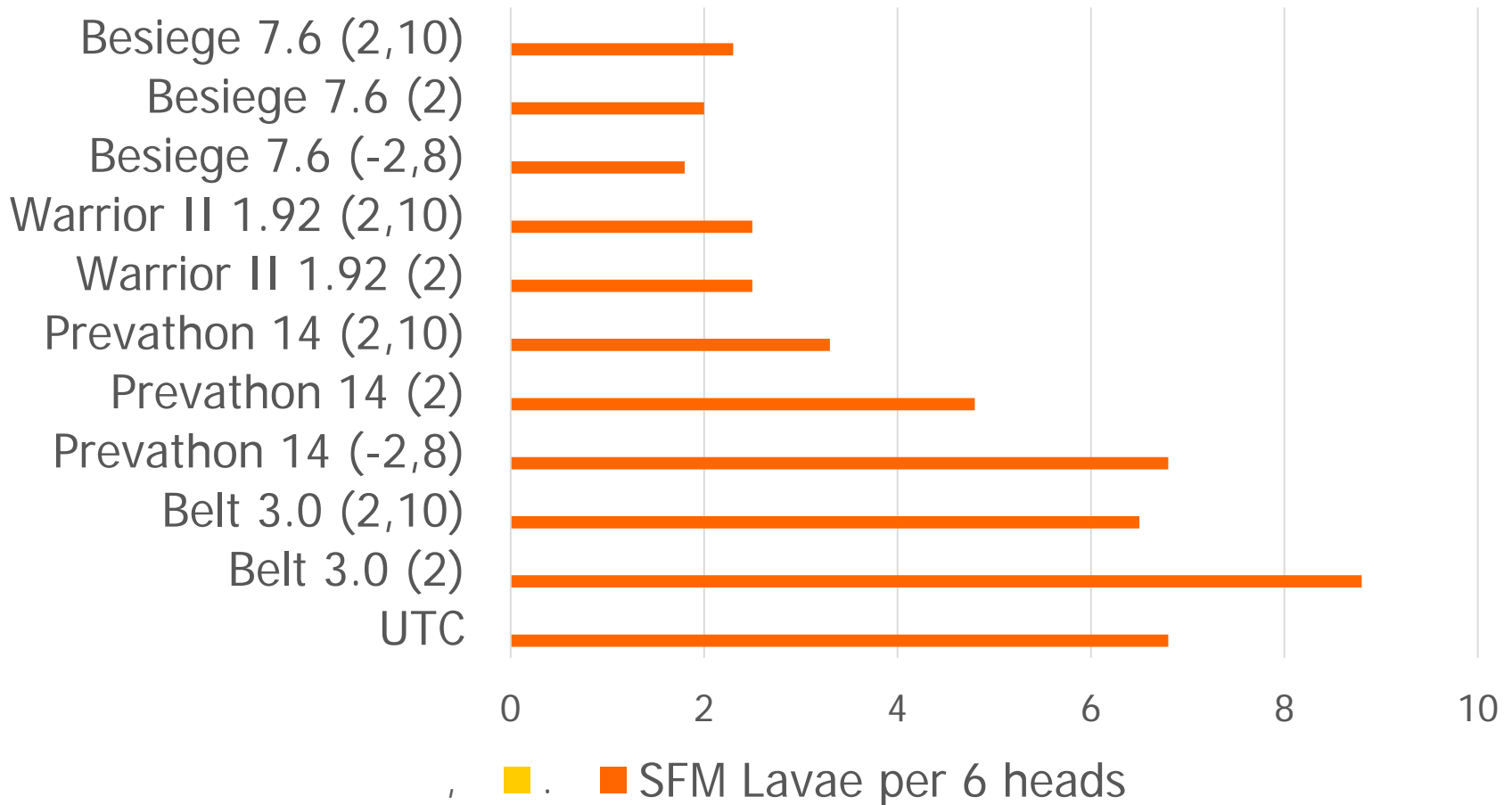
Chemical/Rate (oz./A)/Timing rel to bloom



LSD = 4.5

SFM Larvae, Goodland 2016

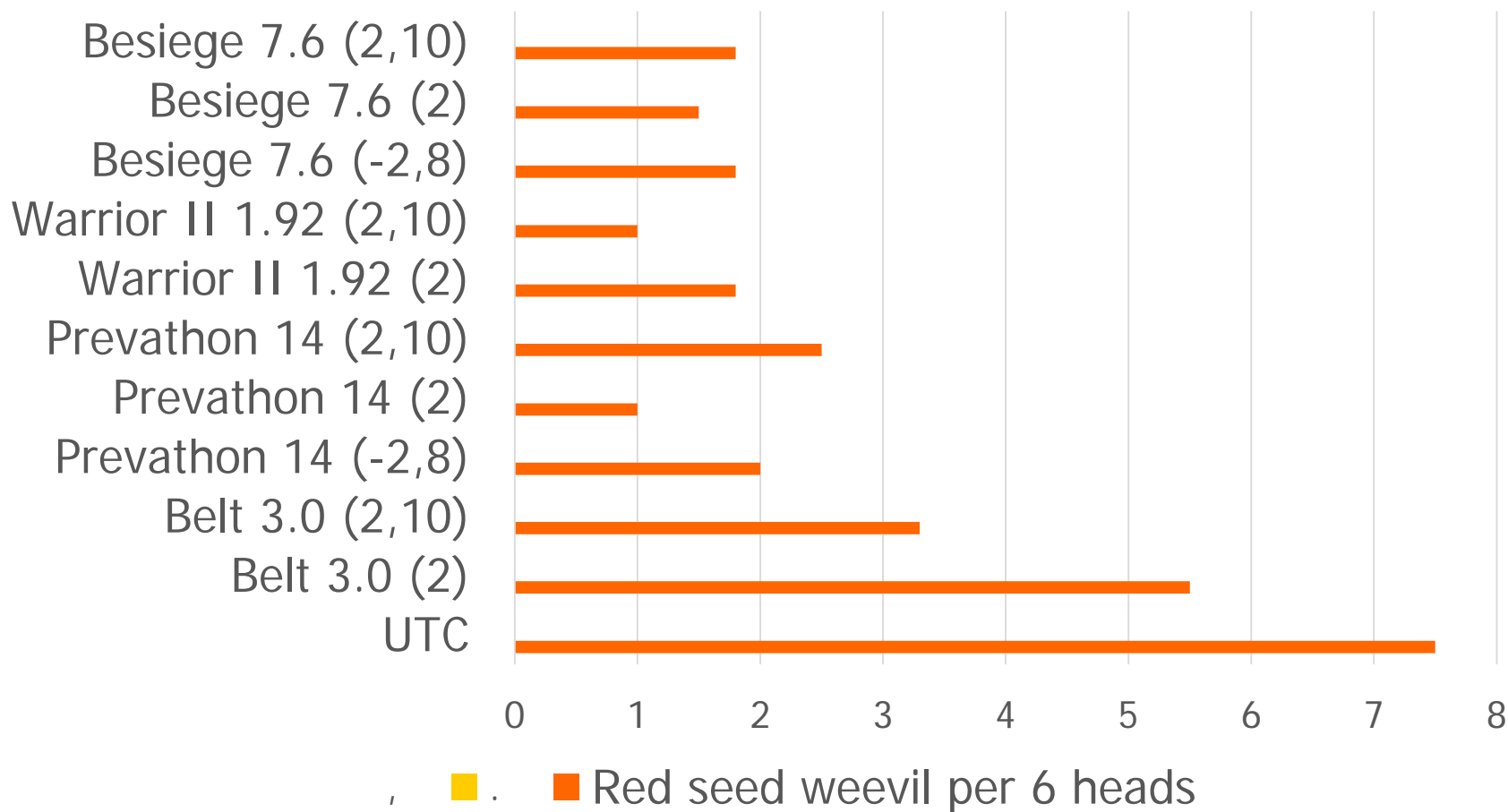
Chemical/Rate (oz./A)/Timing rel to bloom



LSD = 5.1

Red Seed Weevil, Goodland 2016

Chemical/Rate (oz./A)/Timing rel to bloom



LSD = 4.3

Yields?



- ⌘ In no trial were yields statistically different due to insecticide treatment (UTC was usually lower though)

Labels & Spray Volume



- ⌘ Prevalon: 2.0 gal/A minimum aerial & 10 gal/A ground rig
- ⌘ Besiege: **5.0 minimum** & 10 (no ultra low volume aerial applications)
- ⌘ Warrior II: 2.0 minimum & unstated
- ⌘ Belt: 2.0 minimum/**5.0 recommended** & 10 (no ULV)

Ongoing Advice to Farmers



⌘ For sunflower moth control, which chemical you use may be your third most important consideration

⌘ Timing is first!

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⌘ **What is second?** COVERAGE! Recommended carrier volumes:

⌘ 10 gal/A with ground rig

⌘ At least 3 gal/A by air (preferably 4-5 gal/A)

Summary



- ⌘ Regardless of the insecticide (OP, pyrethroid, or diamide) used application timing is critical for effective SFM control.
- ⌘ Base applications on moth/egg laying activity.
- ⌘ Two applications are generally warranted.
- ⌘ OP and pyrethroid insecticides provides activity against both moths and larvae.
- ⌘ Diamide applications (Prevathon, Besiege, Belt) should be applied based on when sunflowers are blooming (not pre-bloom).