TEXAS A&M GRILIFE EXTENSION

COTTON & GRAIN IPN 2023

Danielle Sekula – Extension Agent, IPM Texas A&M AgriLife, Weslaco

Texas Boll Weevil Eradication Foundation, Inc.

Total Bollweevil for the year: 2022- 4094 bollweevils 2021- 3196 bollweevils 2020- 40,197 bollweevils

Lower Rio Grande Valley (LRGV)

| Date | Category | Description | Total |
|------------|---|------------------------------|------------|
| 11/21/2022 | COTTON ACREAGE: | 2022 Acreage Planted | 182,213.20 |
| | TRAPPING INFORMATION (Report Week): | Total Traps Inspected | 2,249 |
| | | Total Weevils Captured | 0 |
| | | Weevil Per Trap Average | 0 |
| | TRAPPING INFORMATION (YTD): | YTD Traps Inspected | 1,923,531 |
| | | YTD Weevils Captured | 4037 |
| | | YTD Weevils Per Trap Average | 0.0021 |
| | TREATMENT INFORMATION (Report Week): | Number of Acres Treated | 0.00 |
| | TREATMENT INFORMATION (YTD): | YTD Acres Treated | 455,281.49 |

| Year | 2018 | 2019 | 2020 | 2021 | 2022 YTD |
|------------------------------|--------|--------|---------|---------|----------|
| Season Long per Trap Average | .04999 | .02503 | . 02227 | . 00162 | .0021 |

| LRGV Ca | ptures | |
|---------|---------|--|
| 2021 | 3,196 | |
| 2020 | 40,179 | |
| 2019 | 45,883 | |
| 2018 | 96,346 | |
| 2017 | 34,544 | |
| 2016 | 174,640 | |
| 2015 | 147,746 | |
| 2014 | 44,969 | |
| 2013 | 63,593 | |
| | 2 WTMA | a ETMA 2 Lower Rie Grande Valley |







Boll weevil pupae



Cotton Boll weevil Stages



Boll weevil larvae

Use of Pheromone traps & Malathion sprays for control

- Texas Boll Weevil Eradication Program employees place yellow-green, cone-shaped pheromone traps around the perimeters of all cotton fields.
- The pheromone attractant (lure) is a man-made copy for the natural aggregation and sex attractant used by weevils to communicate to each other where weevils are gathering to feed and reproduce.
- The pheromone-baited traps are very effective in determining the presence of boll weevils in cotton fields.
- Because the traps contain an insecticide strips, they function as a control method as well.





Regrowth ... is it green/alive? Or is it brown/dead?

| | Treatment | Mean # cotton stalks with Regrowth (any green growth) | | | | owth) | | |
|---|--|---|--------|--------|--------|--------|---------|----------------|
| | | 26-Sep | 4-Oct | 11-Oct | 17-Oct | 25-Oct | 4-Nov | |
| | | Precounts | 7 DAT | 14 DAT | 21 DAT | 28 DAT | 38 DAT | Prices for trt |
| 1 | Duplosan @ 32 fl oz/a + COC @ 1% | 106.50 | 92.75 | 64.25 | 28.00 | 17.50 | 13 c | \$12.96 |
| 2 | Duplosan @ 24 fl oz/a + Reviton @ 1 fl oz/a + MSO @ 1% | 104.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 c | \$15.50 |
| 3 | Duplosan @ 24 fl oz/a + Freefall @ 3.2 fl oz/a + COC @ 1% | 112.00 | 69.25 | 31.00 | 13.50 | 8.50 | 5 c | \$13.50 |
| 4 | Engenia @ 25.6 fl oz/a + COC @ 1% | 105.00 | 89.00 | 86.50 | 87.00 | 87.00 | 61.75 b | \$20.64 |
| 5 | Engenia @ 19.2 fl oz/a + Reviton @ 1 fl oz/a + MOS @ 1% | 104.75 | 6.75 | 5.00 | 3.00 | 3.75 | 1.75 c | \$21.26 |
| 6 | Engenia @ 19.2 fl oz/a + Freefall @ 3,2 fl oz/a + COC @ 1% | 102.25 | 94.25 | 86.25 | 89.50 | 88.00 | 93.25 a | \$19.26 |
| 7 | Duplosan @ 24 fl oz/a + Freefall @ 3.2 fl oz/a + COC @ 1% fb Duplosan @ 24 fl oz/a + COC @ 1% | 108.75 | 59.00 | 8.75 | 0.75 | 0.00 | 0 c | \$23.26 |
| 8 | Engenia @ 19.2 fl oz/a + Freefall @ 3.2 fl oz/a + COC @ 1% fb Engenia @ 19.2 fl oz/a + COC @ 1% | 114.50 | 104.75 | 98.50 | 87.50 | 74.25 | 63 b | \$34.78 |
| 9 | Nontreated Control | 108.50 | 108.50 | 108.50 | 108.50 | 108.50 | 108.5 a | \$32.50 |
| | * fb = second spray treatment sprayed on Oct 6, 9 days after first treatment was done | | | | | | | |





Figure 1: Cotton stalks with regrowth after 2 weeks & close-up of regrowth with pin head squares on shredded stalk



Figure 3: Adult boll weevil with damage on a square , photo credit : htthttps://www.aces.edu/blog/topics/cropproduction/history-of-insect-pestmanagement-in-alabama-cotton/



Figure 2: Cotton boll weevil feeding on cotton, photo credit: http://entoweb.okstate.edu/ddd/i nsects/bollweevil.htm



Hostable ... does it have a viable pinhead square?

| | Treatment | Mean # cotton stalks with Hostable pinhead squares | | | | | | | |
|---|--|--|--------|--------|--------|--------|---------|---|----------------|
| | | 26-Sep | 4-Oct | 11-Oct | 17-Oct | 25-Oct | 4-Nov | | |
| | | Precounts | 7 DAT | 14 DAT | 21 DAT | 28 DAT | 38 DAT | | Prices for trt |
| 1 | Duplosan @ 32 fl oz/a + COC @ 1% | 106.50 | 6.25 | 4.00 | 7.50 | 8.25 | 9.25 c | | \$12.96 |
| 2 | Duplosan @ 24 fl oz/a + Reviton @ 1 fl oz/a + MSO @ 1% | 104.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 c |] | \$15.50 |
| 3 | Duplosan @ 24 fl oz/a + Freefall @ 3.2 fl oz/a + COC @ 1% | 112.00 | 0.25 | 0.25 | 1.75 | 2.25 | 3.75 c | | \$13.50 |
| 4 | Engenia @ 25.6 fl oz/a + COC @ 1% | 105.00 | 3.50 | 26.00 | 68.75 | 87.00 | 61.75 b | | \$20.64 |
| 5 | Engenia @ 19.2 fl oz/a + Reviton @ 1 fl oz/a + MOS @ 1% | 104.75 | 1.25 | 1.00 | 2.00 | 3.00 | 1.75 c | | \$21.26 |
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| 8 | Engenia @ 19.2 fl oz/a + Freefall @ 3.2 fl oz/a + COC @ 1% fb Engenia @ 19.2 fl oz/a + COC @ 1% | 114.50 | 0.25 | 0.00 | 0.00 | 0.00 | 0.5 c | | \$34.78 |
| 9 | Nontreated Control | 108.50 | 108.50 | 108.50 | 108.50 | 108.50 | 108.5 a | | \$32.50 |
| | * fb = second spray treatment sprayed on Oct 6, 9 days after first treatment was done | | | | | | | | |



Trt 2: Duplosan @ 24 fl oz/a + Reviton @ 1 fl oz/a + MSO @ 1%





Predators in Cotton & Grain sorghum you should be familiar with









LACEWINGS



COCCINELLIDS ARE THE MOST IMPORTANT BIOCONTROL AGENTS OF PSYLLID IN TX, AND OF MANY OTHER PESTS IN THE RGV



Larva can eat 400 aphids, adults eat up to 5,000 aphids Female can lay 1500 eggs in 100 day lifetime

Predators feeding on Aphids

Lady bug : Harmonia axyridis (larva on left and adult on the right)



Lady bug : Scymnus (larva on the left and adult on the right)





Lady bug: Pseudoscymnus (adult on the left and larva on the right)





SORGHUM PLANT GROWTH STAGES





TOPICS

Sorghum

- Fall armyworm
- Rice Stink Bug
- Sugarcane Aphids
- Sorghum Midge



Sugarcane aphid (Melanaphis sacchari)











Sugarcane aphid (*Melanaphis sacchari*) : Biology GRILIFE EXTENSION

What is the Sugarcane aphid (SCA)?

The SCA is a soft body insect that sucks sap plant juices and produces a large amount of honey dew. It was first detected in the LRGV in the fall of 2013 and since then has become grain sorghum's number one pest throughout the U.S. and Mexico. The SCA can produce large amounts of honey dew as it feeds causing great loss in sorghum yields killing whole plants. The SCA during the LRGV growing season can reach soaring infestations of 1,000 aphids per leaf if undetected and left untreated.





SUGARCANE APHID



- Low pressure in 2021
- Largely kept in check by natural enemies
- Many varieties have tolerance
- Populations can "explode" rapidly so it is important to scout regularly and treat when thresholds are reached.
- Keep PHI in mind



Table 11. Action thresholds based on sorghum growth stages (Source: revised from thresholds created by Louisiana State University)

| Growth stage | Action threshold |
|----------------|---|
| Preboot | 20% of plants infested with 50 or more aphids |
| Boot | 20% of plants infested with 50 or more aphids |
| Flowering-milk | 30% of plants infested with 50 or more aphids |
| Soft dough | 30% of plants infested with established aphid colonies and localized areas1 with heavy honeydew |
| Dough | 30% of plants infested with established aphid colonies and localized areas ¹ with heavy honeydew |
| Black layer | Heavy honeydew and established aphid colonies. Treat only to prevent harvest problems. Observe preharvest intervals for insecticides. |

1: A single plant or group of adjacent plants with sugarcane aphid colonies

Sugarcane aphid trial 2019

| <u>3 day</u> | | | | <u>14 day</u> | | | |
|--------------|---|---|---------------|----------------|---|---|---------------|
| | | | Least Sq Mean | | | | Least Sq Mean |
| Control | A | | 179.4 | Control | A | | 232.05 |
| Sefina 3oz | | В | 5.425 | Sefina 3oz | | В | 5.25 |
| Sefina 5.5oz | | В | 4.5 | Transform loz | | В | 4.775 |
| Sivanto | | В | 2.15 | Sefina 5.5 oz | | В | 4.075 |
| Transform | | | | Sivanto 4oz | | В | 0.55 |
| loz | | В | 2.025 | | | | |
| | | | | <u>21 day</u> | | | |
| <u>7 day</u> | | | | | | | Least Sq Mean |
| | | | Least Sq Mean | Control | A | | 0.8 |
| Control | A | | 190.25 | Sefina 5.5oz | A | В | 0.55 |
| Sefina 3oz | | В | 2.975 | Transform 1 oz | A | В | 0.3 |
| Sivanto | | В | 2.45 | Sivanto 4 oz | A | В | 0.2 |
| Transform | | | | Sefina 3 oz | | В | 0.025 |
| loz | | В | 2.3 | | | | |
| Sefina 5.5oz | | В | 2 | | | | |

precount = 200 SCA/leaf

Coursesy of Danielle Sekula



SCA - NATURAL ENEMIES







Sorghum Midge

- Overwinter in the aborted sorghum seeds or in Johnsongrass
- Adults emerge in the spring in search for flowering host plants (johnsongrass)
- When sorghum blooms female will lay ≈ 50 light yellow eggs in the flowering spikelets.
- Larvae emerge in 2-3 days and feed on the undeveloped kernel
- Generation every 14-16 days





Sorghum Midge Damage

- 1-day adult life span means daily monitoring 10 a.m. to 2 p.m.
- Inspect flowering grain heads that have yellow flowers
 - Inspect flowers
 - Bag
 - Bucket
- Start in field margins, esp. down wind from potential sources
- If midge numbers exceed 1 per head, sample throughout field, consider control.



Photo by Greg Cronholm



CULTURAL CONTROL – SORGHUM MIDGE



Figure 22. Estimated latest sorghum flowering dates most likely to escape significant damage by sorghum midge

From Managing Insect and Mite Pests of Texas Sorghum, NTO-085

- Early planting midge populations increase as season progresses
- Uniform heading and flowering
- Eliminate johnsongrass
- Disk / deep plow previous crop = destroy overwintering midges









2021 Sorghum Midge/Rice Stink Bug Insecticide Efficacy Trial – Hidalgo County, TX Holly Davis–Texas AgriLife Research & Extension Center Weslaco, TX



Treatment Date: 24 June 2021

| Treatment | Avg. # of adult midge/ 10 panicles Pretreatme nt (23 June) | Avg. # of adult midge/ 10 panicles 2 DAT (26 June) | Avg. # of rice stink bug/ 10 panicles Pretreatme nt (23 June) | Avg. # of rice stink bug/ 10 panicles 2 DAT (26 June) |
|--------------------------|---|---|--|--|
| Untreated Control | 4.6 | 3.6a | 0.8 | 0.8a |
| Mustang Maxx @ 2.0 | 4.3 | | 0.8 | |
| oz/a | | 0.4b | | 0.5ab |
| Baythroid XL @ 1.3 oz/a | 6.4 | l.lb | 0.3 | 0.2bc |
| Beseige @ 5.5 oz/a | 7.8 | 1.3b | 0.3 | 0.1c |
| Dimethoate 4EC @ 1.5 | 7.8 | | 0.4 | |
| oz/a* | | na | | na |
| Asana XL @ 4.0 oz/a | 11.4 | 1.1b | 0.7 | 0.3bc |

*Dimethoate was old and gave little efficacy. I did not feel confident it reflected the efficacy of the active ingredient, thus data was not included.

Means within a column followed by the same letter are not significantly different (*P*>0.05; PROC ANOVA; Mean comparison by LSD [SAS 9.4]). Reference to specific products is provided for informational purposes. Experiments with pesticides on non-labeled crops or pests is part of the insecticide registration process, it does not imply endorsement or recommendation of non-labeled uses of pesticides by Texas A&M University. **All pesticide use must be consistent with current labels.**



RICE STINK BUG

- Piercing-sucking mouthparts feed on developing grain kernels
- Can reduce grain weight, size and impact seed germination. May allow fungi to enter
- Sample by shaking grain heads into a 5-gallon white bucket
- <u>https://extensionentomology.tamu</u> .edu/sorghum-rice-stink-bugcalculator/



Figure 8: Rice stinkbug adult



Figure 6: Rice stinkbugs just hatched



Figure 7: Rice stinkbug nymph





Rice Stinkbug life stages...



Economic threshold for rice stinkbugs if you figure you have a sorghum field with seeding rate of 65,000 heads/acre is about 0.47/head economic threshold to control, we are finding and averaging at least one per head! So please check your softdough sorghum fields for Rice stinkbugs and treat accordingly as well.





HEADWORMS





- May be fall armyworm or corn earworm
- vulnerable from bloom to milk stage
- Check sorghum when it begins to head.
- 1-2 worms per head can justify control.
- Generally consider 5% loss per worm per head.
- <u>https://extensionentomology.ta</u> <u>mu.edu/sorghum-headworm-</u> <u>calculator/</u>



HEADWORMS

- Location on head makes easy to get insecticides to them
- Pyrethroids are not recommended for FAW over ¹/₄ inch (2nd instar)
- Broad-spectrum insecticides have the potential to flair SCA













FALL ARMYWORM (FAW)

- Eggs laid in masses and tiny (1/8 inch) larvae feed for 2 – 3 weeks reaching 1 to 1 ¹/₂ inches in length... they are eating machines
- Mature larvae tunnel about an inch into the soil and pupate
- Moth emerges in about 10 days and the cycle begins again.
- Outbreaks are often "triggered" by rain which favors egg and larval survival





FALL ARMYWORM- TWO STRAINS



- "Rice strain" -Rice, bermudagrass and other pasture grasses
- "Corn strain" Corn, sorghum and cotton



FALL ARMYWORM

Larvae

- May be green brown or black with white to yellowish lines running down body
- Have a distinct white line between the eyes forming an inverted "Y"
- Four black spots form a square on last segments

Adult

- Moth has a wingspan of about 1 $^{1\!/_{2}}$ inches
- Front wings are dark with patterns while hind wings are solid cream









RAGWORMS / WHORL WORMS

- May be fall armyworm or corn earworm
- Larvae feed within whorl and as leaves emerge damage becomes is very showy
- By the time damage is noticed, feeding is often complete



- Control can be difficult because larvae are protected within whorl
- Late planted sorghum more likely to be infested





MANAGING WHORL WORMS

Typically don't recommend:

- Forage loss insignificant
- Exception: Larval feeding reduces leaf area by more than 30%, especially if other stressors are present.
- Once larvae are 1-1/14 inch long, feeding will be complete in 3-4 days and treatment provides little yield benefit.
- Must have high volumes of spray applied by ground, directed at whorl







FAW IN PASTURE

Early detection is IMPORTANT

 Once larvae reach ³/₄ inch long feeding pressure becomes most intense (final 2-3 days of feeding = 80% of total foliage consumed)

 Insecticides are most efficacious on smaller worms!



SAMPLING - PASTURE

- Monitor weedy grasses in ditches that can be source of worms that move into crop
- Scout early morning and late evening during cooler parts of day or in cloudy weather
- Spend sunny, hot hours low in grass canopy and even just under loose soil/other debris

Scouting methods:

- Run hands through 1-2 sq. foot area = knock larvae onto soil surface
- Sweep net



| Active ingredient | Insecticide | Pre-grazing interval (days) | Pre-harvest interval for hay (days) | Remarks |
|---|--|-----------------------------------|---|---|
| beta-cyfluthrin | Baythroid | 0 | 0 | Restricted use |
| carbaryl | Sevin 4F, Carbaryl 4L | 14 | 14 | General use |
| chlorantraniliprole | Prevathon, Coragen | 0 | 0 | General use |
| chlorantraniliprole + lambda-cyhalothrin | Besiege | 0 | 7 | Restricted use |
| cyfluthrin | Tombstone | 0 | 0 | Restricted use |
| diflubenzuron | Dimilin 2L | None listed | 1 | Restricted use; apply at egg hatch and when larvae are less than ½ inch long |
| gamma-cyhalothrin | Declare | 0 | 7 | Restricted use |
| lambda-cyhalothrin | Warrior II, Karate, Lambda-cy, generics | 0 | 7 for hay, 0 for forage | Restricted use |
| malathion | Malathion 57EC | 0 | 0 | General use |
| methoxyfenozide | Intrepid | 0 | 7 | General use |
| spinosad | Tracer, Blackhawk | Allow spray to dry | 3 | General use; target small larvae or egg hatch |
| zeta-cypermethrin | Mustang Maxx | Allow spray to dry | 0 | Restricted use |

Table 1. Insecticides labeled for fall armyworm and true armyworm in pasture, grasses, and hay. Follow label directions.

Thresholds:

Varies with crop's value and growth stage

Seedlings tolerate less feeding (fewer worms) than older plants Consider treatment more than 2-3 armyworms $\frac{1}{2}$ inch or longer per square foot



MEALYBUGS







Figure 4: Close up shots of mealybugs (above & below) on Bermuda grass blade





Figure 5: Black sooty mold in Bermuda grass circled in red that is being fed on by mealybugs



• If you do custom bale harvesting, pressure wash your machinery before you take it back to your fields and visa versa

https://agrilife.org/texaslocalproduce-2/files/2018/07/Magaging-Insect-and-Mite-Pest-of-Texas-Forage-Crops.pdf

https://lubbock.tamu.edu/files/2017/08/Managing-Insect-Pests-of-Texas-Forage-Crops-ENTO-064-2017.pdf





SFSAME



SESAME GROWTH STAGES





Sesame leafroller, Antigastra catalaunalis

- Not native, but well-established in the LRGV
 - Has been a significant pest for years in India, China, Japan, etc.
- Larval populations were significant in 2020





Identification & Biology

- Larvae Tiny when they hatch (0.1cm long) and are feeding machines for the next 10-12 days
- Go thru 5 instars (molts) and reach 1 1 ¹/₂ cm at maturity
- Yellow-green to green in color with black spots and a black head capsule
- Well hidden in webbing or along stem in capsule







- Larvae feed on tender foliage, capsules, and shoots
- Web together leaves and feed in protected "housing"
- Pupate in this webbing or may drop to the ground





- Multiple generations/year
- Up to 14 generations recorded in India

















Management - IPM

Cultural

- Earlier planted sesame will likely have lower leafroller pressure
- CONTROL WEEDS! Has multiple hosts including Amaranthus spp.

Chemical

- Keep in mind they are protected in webbing so plenty of carrier will be needed
- Limited products labelled





2020 Sesame Leafroller Insecticide Efficacy Trial -

Hidalgo County, TX

Holly Davis – Extension Specialist, Entomology - Weslaco Research & Extension Center Webb Wallace – RGV Ag Science Inc.

| | | | Mean #larvae + | Mean # larvae/ 10 | Mean #pupae/ 10 | Mean #larvae + | | |
|----------------------------|------------------------|------------------------|--------------------|-------------------|-------------------|--------------------|--|--|
| | Mean #larvae/10 | Mean # pupae/ 10 | pupae/10 plants 15 | plants 19 June (7 | plants 19 June (7 | pupae/10 plants 19 | | |
| | plants 15 June (3 DAT) | plants 15 June (3 DAT) | June (3 DAT) | DAT) | DAT) | June (7 DAT) | | |
| Treatment | | | | | | | | |
| Untreated | 6.5a | 1.8a | 8.3a | 4.0a | 1.5ab | 5.5a | | |
| Mustang Maxx @ 4.0 oz/acre | 2.5b | 1.0ab | 3.5b | 1.8b | 1.8a | 3.5a | | |
| Prevathon @ 8.0 oz/acre | 0.5c | 0.8ab | 1.3c | 0.3b | 0.5bc | 0.8b | | |
| Prevathon @ 12.0 oz/acre | 0.3c | 0.5b | 0.8c | 0.3b | 0.5bc | 0.8b | | |
| Blackhawk @ 1.1 oz/a** | 0.0c | 0.5b | 0.5c | 0.3b | 0.0c | 0.3b | | |
| Blackhawk @ 2.2 oz/a** | 0.0c | 0.3b | 0.3c | 0.0b | 0.3c | 0.3b | | |

Treatment Date: 12 June 2020

** Please note that Blackhawk is not currently registered for use on sesame. All pesticides must be used in a manner consistent with current labels.

Means within a column (treatment date) followed by the same letter are not significantly different (*P*>0.05; PROC ANOVA; Mean comparison by LSD [SAS 9.4]). Reference to specific products is provided for informational purposes. Experiments with pesticides on non-labeled crops or pests is part of the insecticide registration process, it does not imply endorsement or recommendation of non-labeled uses of pesticides by Texas A&M University. All pesticide use must be consistent with current labels.

Nesidiocoris tenuis in sesame







Beneficial Predator and Potential Pest

Feed on whiteflies in sesame and tomato but can also complete life cycle on plant alone



Photos by Danielle Sekula

Nesidiocoris tenuis in sesame



Several mirid adults and nymphs feeding on sesame

- Feeding concentrated on tender growing point.
- Stunt plant growth, necrotic damage, injury/aborti on of pods.
- Do not currently have thresholds



Photos by Danielle Sekula



Thank You!

Questions?

Danielle Sekula Extension Agent-IPM

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https://southtexas.tamu.edu/programs-and-services/ipm/



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