Insect Pest Management of Sorghum and Warm-season Forages, 2016

David Buntin
University of Georgia
Griffin Campus
gbuntin@uga.edu
770-412-4713
Sorghum Pests

- Lesser cornstalk borer
- Chinch bugs
- Fall armyworm in whorl
- Sorghum midge
- Headworms

Photos by Andrew Sawyer, John All, Wayne Gardner
Sugarcane Aphid (SCA) infestations on grain sorghum in Georgia in 2014
Top: Marion County, Center: Tifton GA, Bottom Randolph County, GA.
Silage chopper, East Texas
Lesser cornstalk borer prefers hot, dry condition, and conventional tillage.

Moths are attracted to smoke from burned areas to lay eggs.

Lorsban 15G in T-band
Seed treatments
  Cruiser 5FS
  Poncho 600
  Gaucho 600
Chinch bugs

- Forage sorghums, millets.
- Suck plant juices causing plants to be yellowed, stunted or death.
- Usually worse in dry conditions.
- Very difficult to control.
- Insecticides,
  - Seed treatments.
  - Chlorpyrifos (4E) (Lorsban, Nufos, etc)
  - Mustang Maxx (4 fl oz)
  - Karate Z (1.92 fl oz.)
  - Baythroid XL (2.8 fl oz.)
  - Use Max. label rate
- Coverage critical
Fall armyworm in sorghum whorl

- Threshold: 40% infested plants
- Control in whorl difficult
- Insecticides:
  - Prevathon (14 oz)
  - Belt (2-3 oz)
  - Blackhawk (small larvae)
- Ground application, cone nozzles, large droplet size, direct spray into whorl, 15+gpa.
Aphids on Sorghum

- Corn leaf aphid
- Greenbug
- Yellow sugarcane aphid
- Sugarcane aphid

Photos: Pat Porter, Texas A&M Agrilife Extension

- Sugarcane: Hawaii 1890’s, Florida 1970’s, LA-1990’s
- 2013 host shift to Sorghum east TX.
- All females! Live ave 28 days.
- Very high reproductive rate; doubling time: 1.5 days.
- Dry weather preferred.
- No Virus transmission??
2015 Sugarcane Aphid, *Melanaphis sacchari*, Occurrence on Sorghum
September 30, 2015

2013:  
- 4 States  
- 38 Counties

2014:  
- 12 States  
- 312 Counties

2015:  
- 17 States  
- 417 Counties

2013 Original discovery near Beaumont, TX
SCA Host Range

• Persistent Infestations: *Sorghum* spp.,
  – grain, forage, sweet sorghum,
  – Johnsongrass,
  – Sudangrass, Egyptian wheat
  – broom corn

• Non-persistent Hosts:
  – Corn
  – Sugarcane / Energycane
  – Crabgrass
  – Napiergrass
  – Pearl Millet, *Pennisetum glaucum* (Some varieties are host)

• Non-hosts:
  – Cool-season (C3) grasses
  – Wheat, Oats, barley, rye
  – Barnyardgrass
  – Switchgrass
Plant resistance / tolerance

Aphid counts: Number per 6 mid-canopy leaves
Plant injury rating (Burd et al. 1993):
  0 = no injury
  9 = Dead or nearly dead plants.
Grain Sorghum Hybrid Tolerance
Georgia States Variety Trial (Buntin)

<table>
<thead>
<tr>
<th>Major Comp/Brands</th>
<th>Hybrid</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dekalb</td>
<td>DKS 3707</td>
<td>1</td>
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<tr>
<td>Pioneer</td>
<td>83P17</td>
<td>2</td>
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<td>Sou. States</td>
<td>SS 540</td>
<td>3</td>
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<tr>
<td>Alta</td>
<td>AG1205</td>
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<tr>
<td>Alta</td>
<td>AG1203</td>
<td>4</td>
</tr>
<tr>
<td>Dyna-Gro</td>
<td>M60GB31 (GX13231)</td>
<td>6</td>
</tr>
</tbody>
</table>

United Sorghum Board results, Brent Bean, USB Checkoff, or LSU

<table>
<thead>
<tr>
<th>Major Comp/Brands</th>
<th>Hybrid</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alta Seeds</td>
<td>AG1201</td>
<td>Other</td>
</tr>
<tr>
<td>Alta Seeds</td>
<td>AG1301</td>
<td>Other</td>
</tr>
<tr>
<td>B&amp;H Genetics</td>
<td>BH 4100</td>
<td>Other</td>
</tr>
<tr>
<td>B&amp;H Genetics</td>
<td>BH 3000</td>
<td>Other</td>
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<tr>
<td>Dyna Gro</td>
<td>GX15561</td>
<td>LSU</td>
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<tr>
<td>Mycogen</td>
<td>627</td>
<td>Other</td>
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<tr>
<td>Mycogen</td>
<td>1G855</td>
<td>LSU</td>
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<tr>
<td>DeKalb</td>
<td>Pulsar</td>
<td>Other</td>
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<td>Pioneer</td>
<td>83P56</td>
<td>Other</td>
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<tr>
<td>Sorghum Partners</td>
<td>SP7715</td>
<td>LSU &amp; Other</td>
</tr>
<tr>
<td>Sorghum Partners</td>
<td>SPX17414</td>
<td>LSU &amp; Other</td>
</tr>
<tr>
<td>Sorghum Partners</td>
<td>SPX17514</td>
<td>LSU &amp; Other</td>
</tr>
<tr>
<td>Richardson</td>
<td>RS260E</td>
<td>LSU &amp; Other</td>
</tr>
<tr>
<td>Richardson</td>
<td>RS84353</td>
<td>LSU &amp; Other</td>
</tr>
<tr>
<td>Terral/Rev</td>
<td>9782</td>
<td>LSU</td>
</tr>
<tr>
<td>Warner Seeds</td>
<td>W-844-E</td>
<td>LSU &amp; Other</td>
</tr>
</tbody>
</table>

Entries with reduced susceptibility or some tolerance, but Scouting and control still needed.
## Timing of SCA Infestation

<table>
<thead>
<tr>
<th>Crop stage at Infestation</th>
<th>Percent Yield Loss with no Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seedling / pre-boot</td>
<td>80 - 100%</td>
</tr>
<tr>
<td>Boot</td>
<td>50 - 80%</td>
</tr>
<tr>
<td>Heading</td>
<td>67%</td>
</tr>
<tr>
<td>Soft Dough</td>
<td>21%</td>
</tr>
<tr>
<td>Maturity</td>
<td>0%, Mechanical damage</td>
</tr>
</tbody>
</table>

Source: Mississippi State University

Pre-Boot & Boot stage most critical for damage; Yield loss through dough stage
Sugarcane Aphid **Threshold** Study, Sorghum Grain yield (±SE), Georgia 2015
Target thresholds (No. aphid per leaf) using Transform @ 1 oz/acre at Pre-boot/boot stage

Yield Loss: 410 lbs / acre and 15% yield reduction for every 100 aphids/leaf.

Other locations: 6-13% yield loss per 100 aphids / leaf

Means with the same letter are not significantly different (α=0.05)
Simple Threshold

50 or More Aphids on the Leaves of 25% of the Plants
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<thead>
<tr>
<th>Crop stage at Infestation</th>
<th>Threshold (Mississippi State Univ.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seedling / pre-boot / Boot</td>
<td>20% of plants infested, localized areas of honeydew and established aphid colonies</td>
</tr>
<tr>
<td>Heading, Milk, Dough</td>
<td>30% of plants infested, localized heavy honeydew and established aphid colonies</td>
</tr>
<tr>
<td>Maturity</td>
<td>Aphid colonies on the flag leaf and in the head with heavy honeydew. Treat to prevent harvest problems</td>
</tr>
</tbody>
</table>

50 or More Aphids on the Leaves of 25% of the Plants
SCA Natural Enemies

Photos: Andrew Sawyer, UGA; J.P. Michaud, Kansas State Univ.

Lady beetle larvae & adults
Left: Scymnus lady beetle

Hover fly (syrphid) larvae & adult

Green lacewing
Insecticide Management
Sorghum§ Insecticide seed treatments and Sugarcane aphid numbers, Midville, GA - 2015

- Cruiser @ 7.6 oz
- Poncho 600 @ 6.4 oz
- NipsIt Inside @ 6.4 oz
- Gaucho 600 @ 6.4 oz
- Untreated

- All effective.
- Control ~24-40 days.
- More important on late-planted sorghum.
- Grazing PHI: Gaucho – 45 days, Poncho – none
- Cruiser – not listed

§Chromatin K73-J6 with Concept III, no fungicides

Buntin & J. All – University of Georgia
Standardized Foliar SCA Insecticide Efficacy 12 trials on Sorghum, 2015 in Southern U.S.

Average Number - Flag + Lower Leaves

United Sorghum Board Study: SC, GA, AL, MS, LA, AR, TN, TX, OK;
Summarized by S. Stewart, Univ. Tennessee
Foliar Insecticides for SCA

- **Sivanto Prime (200SL)**
  - Section 3 @ 7 - 10 oz, (21 d PHI);
  - Suppl. 2ee: for 4 - 7oz.
  - PHI: Grain - 21 days, Forage – 7 days
  - 4 – 7 applications per season (28 fl oz)
  - Chemigation pending.

- **Transform WG (50%)**
  - Section label vacated Dec 2015
  - **Section 18 Emergency use applied for 2016.**
  - 0.75 – 1.5 (1.0 – 1.5) oz/acre
  - PHI: Grain - 14 days; Grazing – 7 days
  - 2 or 3 applications per season (3 fl oz)

- **Chlorpyrifos** (Lorsban Adv, Nufos, etc).
  - 2 pt / acre
  - PHI: Grain & forage - 60 days (before flowering)
  - Efficacy, 7-10 days.
Insecticides for SCA

• Pyrethroids not effective, flare aphids.
• Not effective: Dimethoate, Lannate, malathion and chlorpyrifos @ 1pt; Dimethoate + chlorpyrifos @ 1 pt.
• Adjuvant little benefit for Sivanto & Transform
• Start with Sivanto follow with Transform.
  (Rotate chemistries).
• Transform for harvest infestations (14 d PHI)
• Coverage is critical.
  — Ground: 10+ gpa
  — Aerial: 5 gpa
• No chemigation for Sivanto, Transform.
• No labeled insecticides for sweet sorghum!
Management of Forage Sorghum?
Forage / Silage Hybrid Tolerance
Georgia States Variety Trial (Buntin)

Entries with reduced susceptibility or some tolerance but little resistance in silage/forage types

### Forage - type Sorghum

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<thead>
<tr>
<th>Major Comp/Brands</th>
<th>Hybrid</th>
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<tr>
<td>Dyna-Gro</td>
<td>705F (SGxS)</td>
<td>1</td>
</tr>
<tr>
<td>Alta Seeds</td>
<td>AS9302 (BMR Sudan)</td>
<td>2</td>
</tr>
<tr>
<td>Blade</td>
<td>CB 7290</td>
<td>3</td>
</tr>
<tr>
<td>Alta Seeds</td>
<td>AS6402 (S-Sudan)</td>
<td>4</td>
</tr>
<tr>
<td>Gayland Ward</td>
<td>Super Sugar (S-Sudan)</td>
<td>5</td>
</tr>
</tbody>
</table>

### Silage - type sorghums

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<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sou. States</td>
<td>SS 2010BDF</td>
<td>1</td>
</tr>
<tr>
<td>Dyna-Gro</td>
<td>FullGraze BMR (Sudan)</td>
<td>2</td>
</tr>
<tr>
<td>Sou. States</td>
<td>SS 1515F</td>
<td>3</td>
</tr>
<tr>
<td>Alta Seeds</td>
<td>AF8301</td>
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<tr>
<td>Sor. Partners</td>
<td>NK300</td>
<td>5</td>
</tr>
<tr>
<td>Dyna-Gro</td>
<td>FullGraze (Sudan)</td>
<td>6</td>
</tr>
<tr>
<td>Alta Seeds</td>
<td>AF7401 (BMR-6)</td>
<td>7</td>
</tr>
</tbody>
</table>

Pearl millets:
- Chromatin Millex 32
- Chromatin Millex BMR
Management of Forage Sorghum?

Good agronomic practices
Seed treatments
Sivanto @ 4 - 7 fl oz / acre by ground as late as possible
Aerial application may not be effective.
Graze or harvest silage when aphid buildup
Treat regrowth as needed
I thank
United Sorghum Board,
Southern States, Dow AgroSciences,
FMC/Cheminova, Bayer Crop Science,
Syngenta Crop Protection for support

David Buntin
Dept. of Entomology
University of Georgia; Griffin Campus
770-412-4713
gbuntin@uga.edu
Grubs, May beetles & June beetles

Green June beetle

May beetles

Chafer beetles

Japanese beetle
Life Cycle of the Green June Beetle
Chicken litter / cow manure / wet decaying hay attracts Green June beetles. Larvae damages roots, disrupt soil contact with roots.
Green June Beetle Control

• Insecticides:
  – **Sevin** (80S, 50WP, 4F) other brands of carbaryl @ highest rate
  – Do not graze or cut hay for **14 days** after application.
  – Pyrethroids?

• Coverage is important - mow or graze before applying insecticide.

• Boom sprayer with 25-30 gal. water per acre.

• Apply late in the day.

• Check field after a week to determine if a second application is needed.