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

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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

- Migratory: July – Oct.
- 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



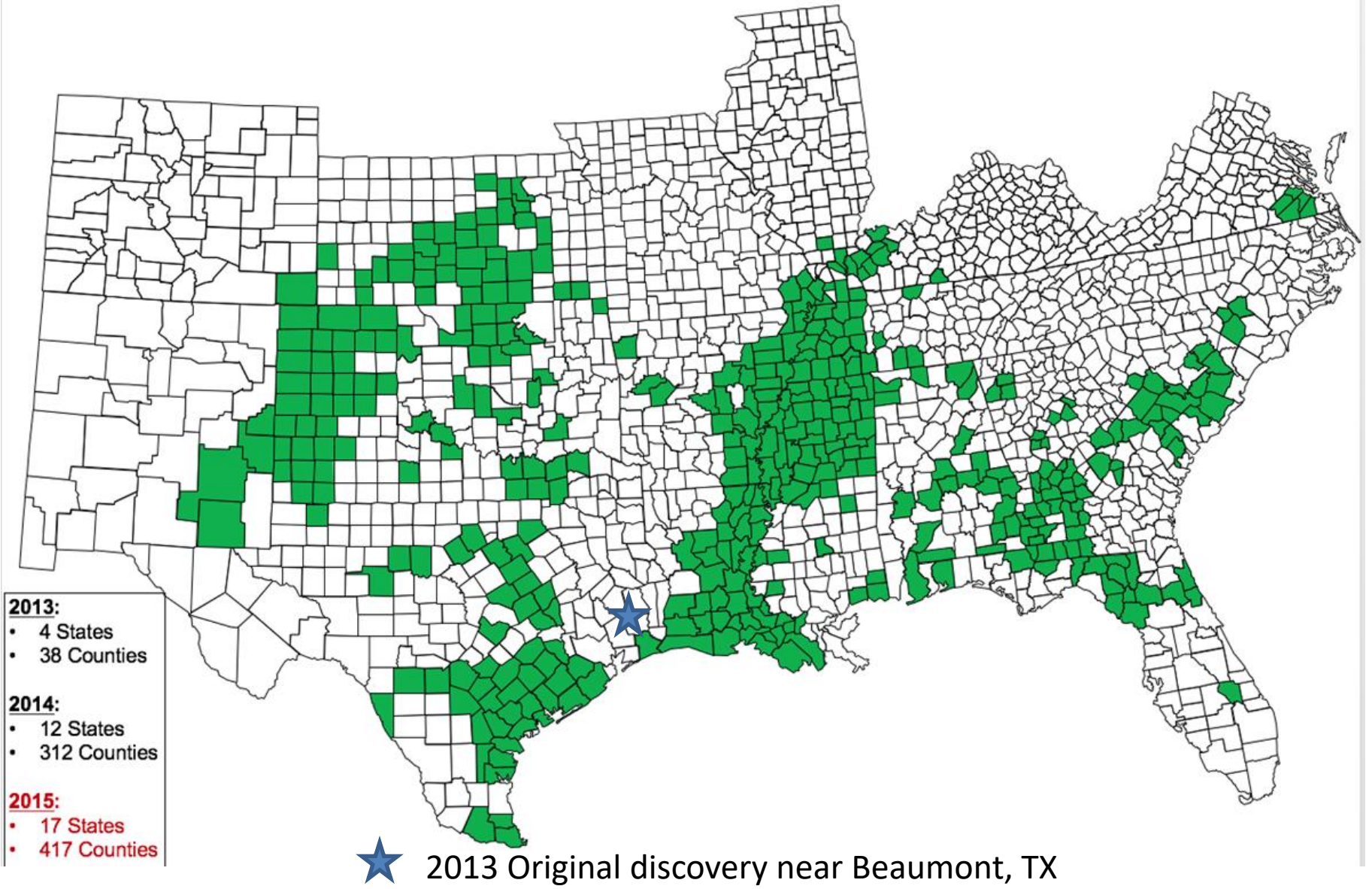
Yellow sugarcane aphid
Sugarcane aphid



- 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??

Photos: Pat Porter, Texas A&M Agrilife Extension

2015 Sugarcane Aphid, *Melanaphis sacchari*, Occurrence on Sorghum September 30, 2015



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)

Major Comp/Brands	Hybrid	Rank
Dekalb	DKS 3707	1
Pioneer	83P17	2
Sou. States	SS 540	3
Alta	AG1205	5
Alta	AG1203	4
Dyna-Gro	M60GB31 (GX13231)	6

Entries with reduced susceptibility or some tolerance, but Scouting and control still needed.

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

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

Timing of SCA Infestation

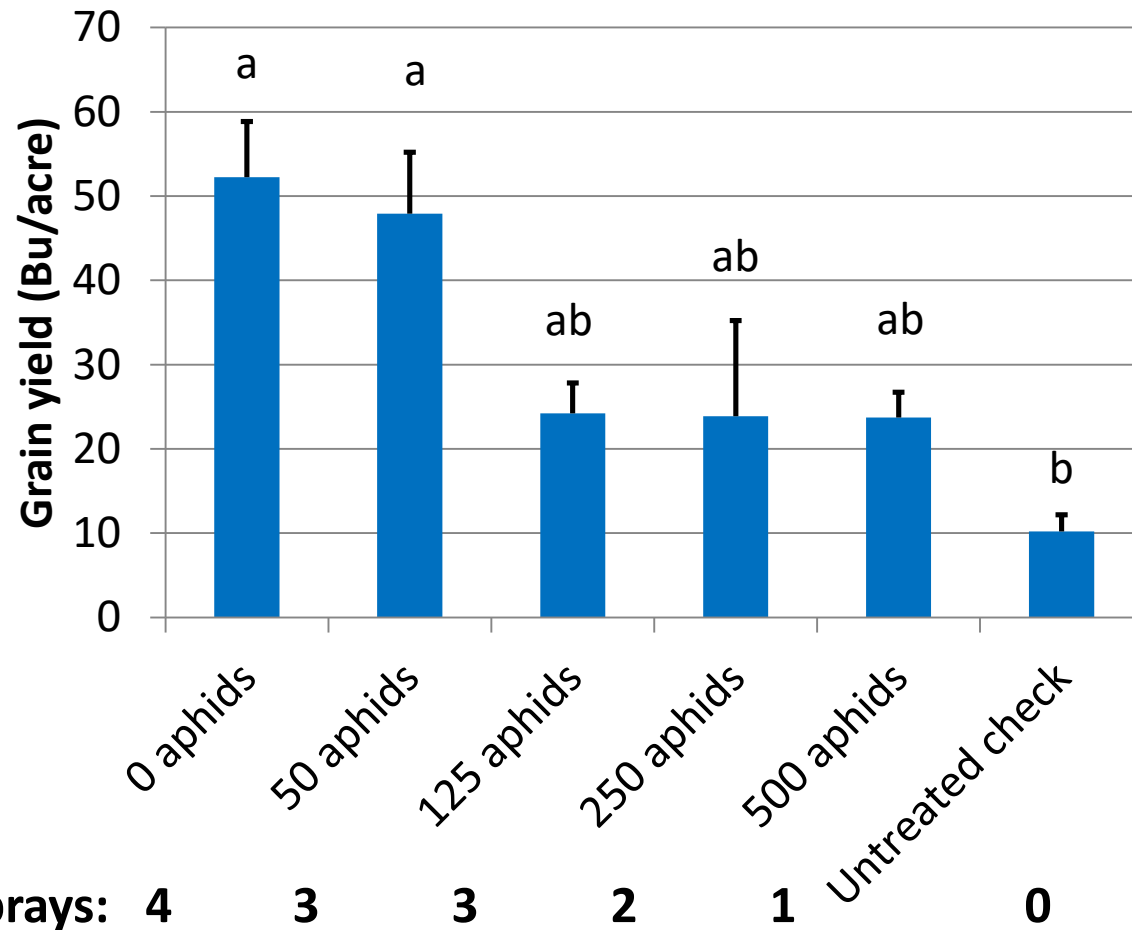
Crop stage at Infestation	Percent Yield Loss with no Control
Seedling / pre-boot	80 - 100%
Boot	50 - 80%
Heading	67%
Soft Dough	21%
Maturity	0%, Mechanical damage

Source: Mississippi State University

**Pre-Boot & Boot stage most
critical for damage;
Yield loss through dough stage**

Sugarcane Aphid **Threshold** Study, Sorghum Grain yield (\pm 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 ($\alpha=0.05$)



**Simple
Threshold**

**50 or More
Aphids on the
Leaves of 25%
of the Plants**

Crop stage at Infestation	Threshold (Mississippi State Univ.)
Seedling / pre-boot / Boot	20% of plants infested, localized areas of honeydew and established aphid colonies
Heading, Milk, Dough	30% of plants infested, localized heavy honeydew and established aphid colonies
Maturity	Aphid colonies on the flag leaf and in the head with heavy honeydew. Treat to prevent harvest problems

**Simple
Threshold**

**50 or More
Aphids on the
Leaves of 25%
of the Plants**



SCA Naturel Enemies

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



Image courtesy of James Woolley
Aphelinus sp. *varipes* group
(Aphelinidae)



Lady beetle larvae & adults
Left: *Scymnus* lady beetle

Hover fly
(syrphid)
larvae &
adult



Green lacewing

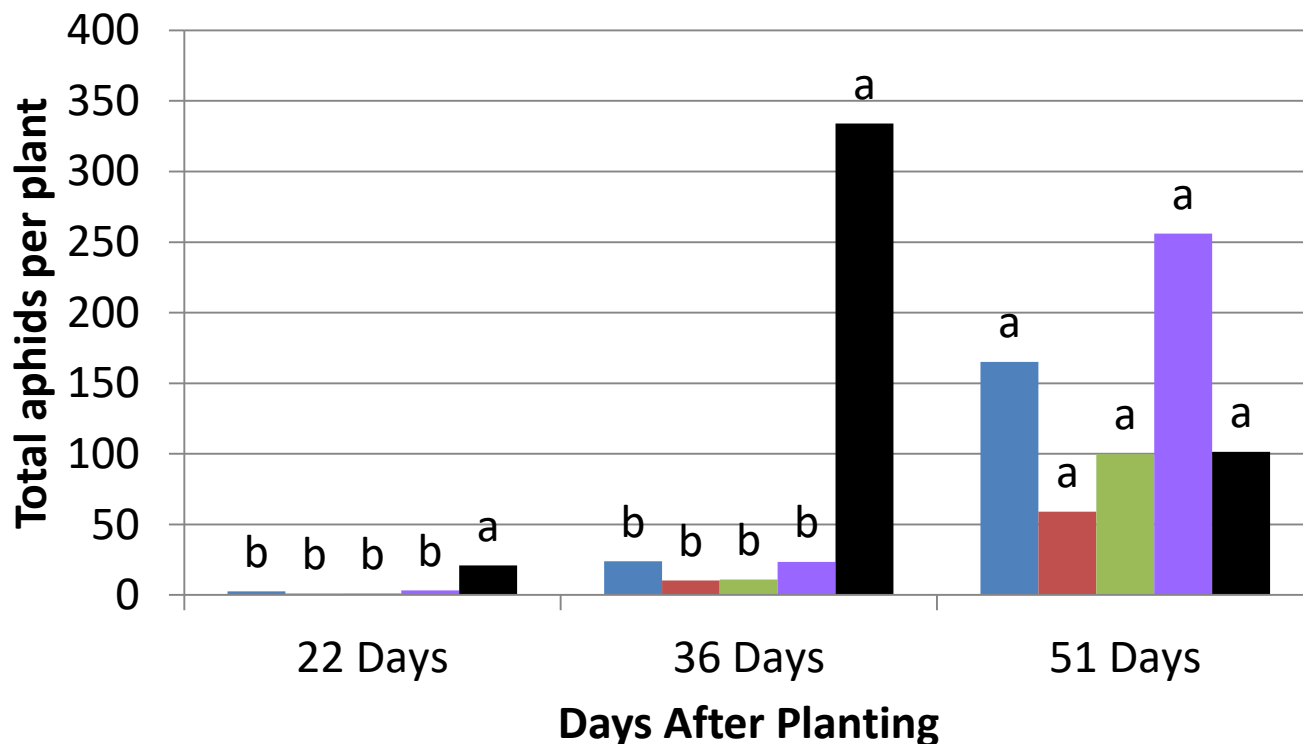


Insecticide Management



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

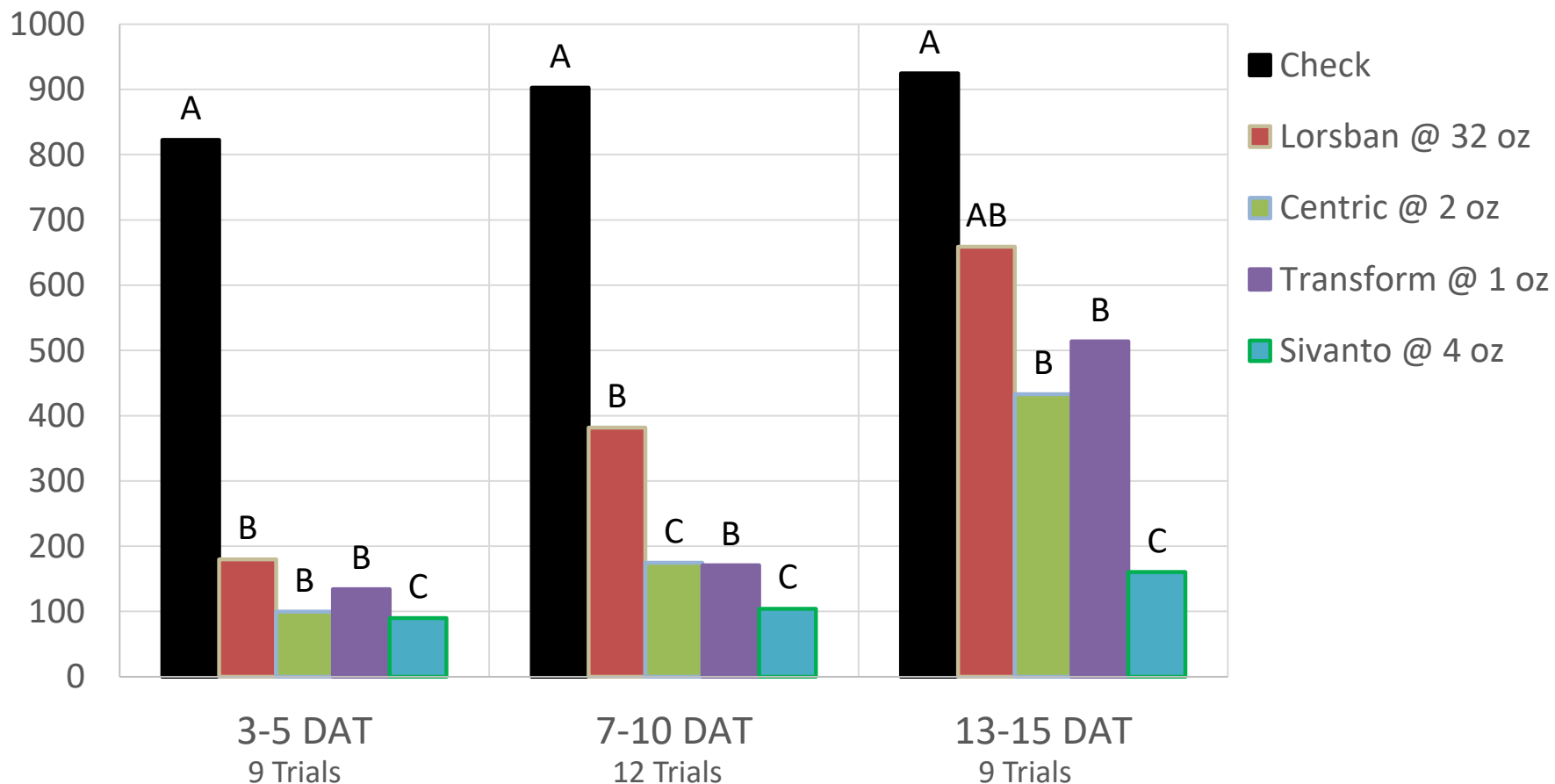
§Chromatin K73-J6 with Concept III, no fungicides

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



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

Major Comp/Brands	Hybrid	Rank
Dyna-Gro	705F (SGxS)	1
Alta Seeds	AS9302 (BMR Sudan)	2
Blade	CB 7290	3
Alta Seeds	AS6402 (S-Sudan)	4
Gayland Ward	Super Sugar (S-Sudan)	5

Pearl millets:	
Chromatin	Millex 32
Chromatin	Millex BMR

Silage - type sorghums

Major Comp/Brands	Hybrid	Rank
Sou. States	SS 2010BDF	1
Dyna-Gro	FullGraze BMR (Sudan)	2
Sou. States	SS 1515F	3
Alta Seeds	AF8301	4
Sor. Partners	NK300	5
Dyna-Gro	FullGraze (Sudan)	6
Alta Seeds	AF7401 (BMR-6)	7

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





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Grubs, May beetles & June beetles

Green June beetle



May beetles



Chafer beetles

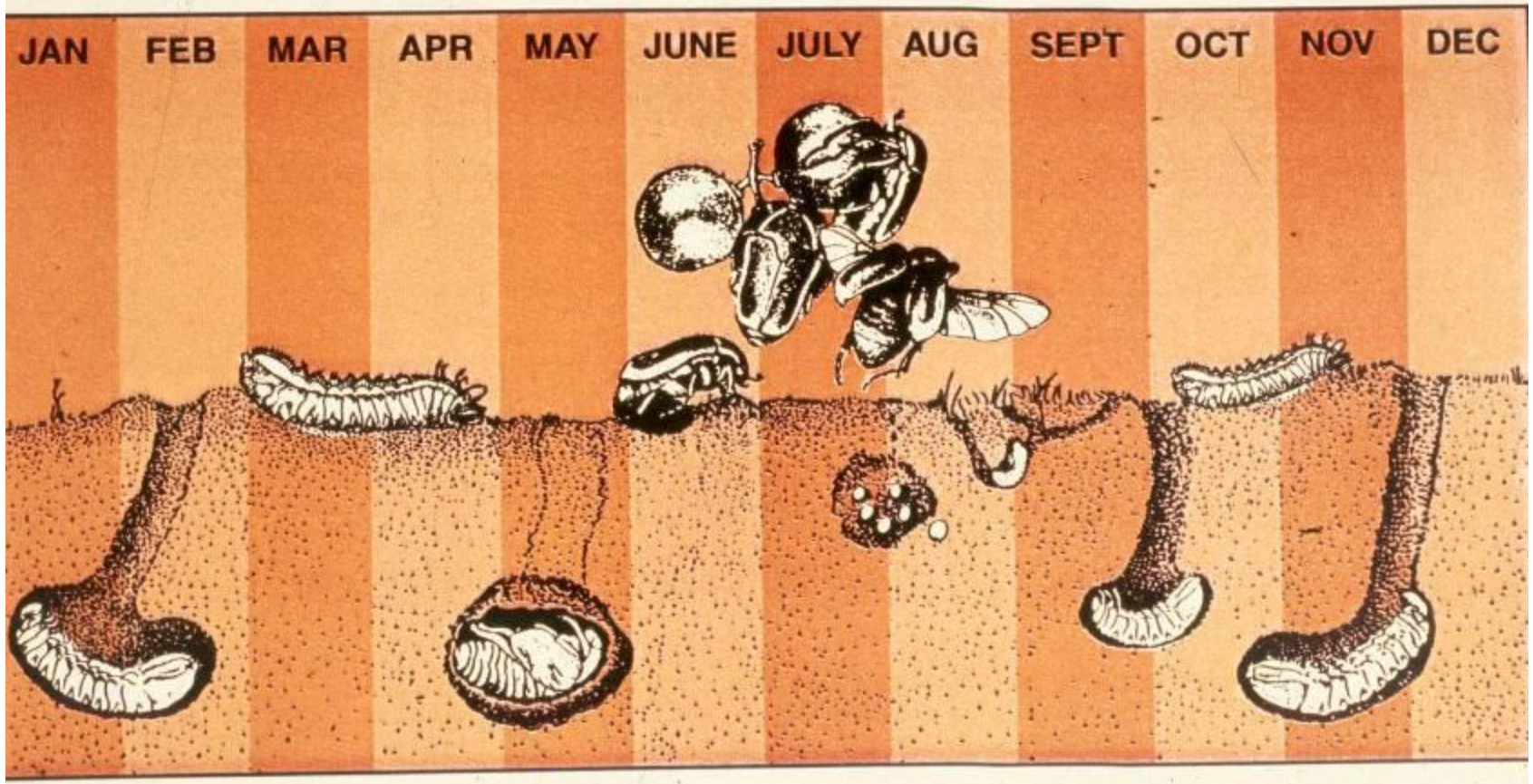


Japanese beetle





Life Cycle of the Green June Beetle





no litter

litter



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.