



2015 CQIQ Meeting,  
Midwest City, OK

# Results of OSU's Sugarcane Aphid Management Projects, 2015

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# Presentation

- The pest and its spread throughout Oklahoma
- Identification
- Biology
- Nature of Damage
- Our research programs 2014-2015

# Sugarcane Aphid History in US

- Name: *Melanaphis sacchari* (Zehntner)
- Aliases:
  - Sugarcane aphid
  - White sugarcane aphid
  - Cane aphid
  - Green sugarcane aphid
  - Sorghum aphid



Photo Courtesy of Dr. Pat Porter,  
Texas A&M Agrilife, Lubbock

# Sugarcane Aphid History in US

- A known pest of sorghum and sugarcane in growing regions of Africa, Asia, Australia, and parts of Central and South America (Singh et. al 2004).



Photo Courtesy of Dr. Pat Porter,  
Texas A&M Agrilife, Lubbock

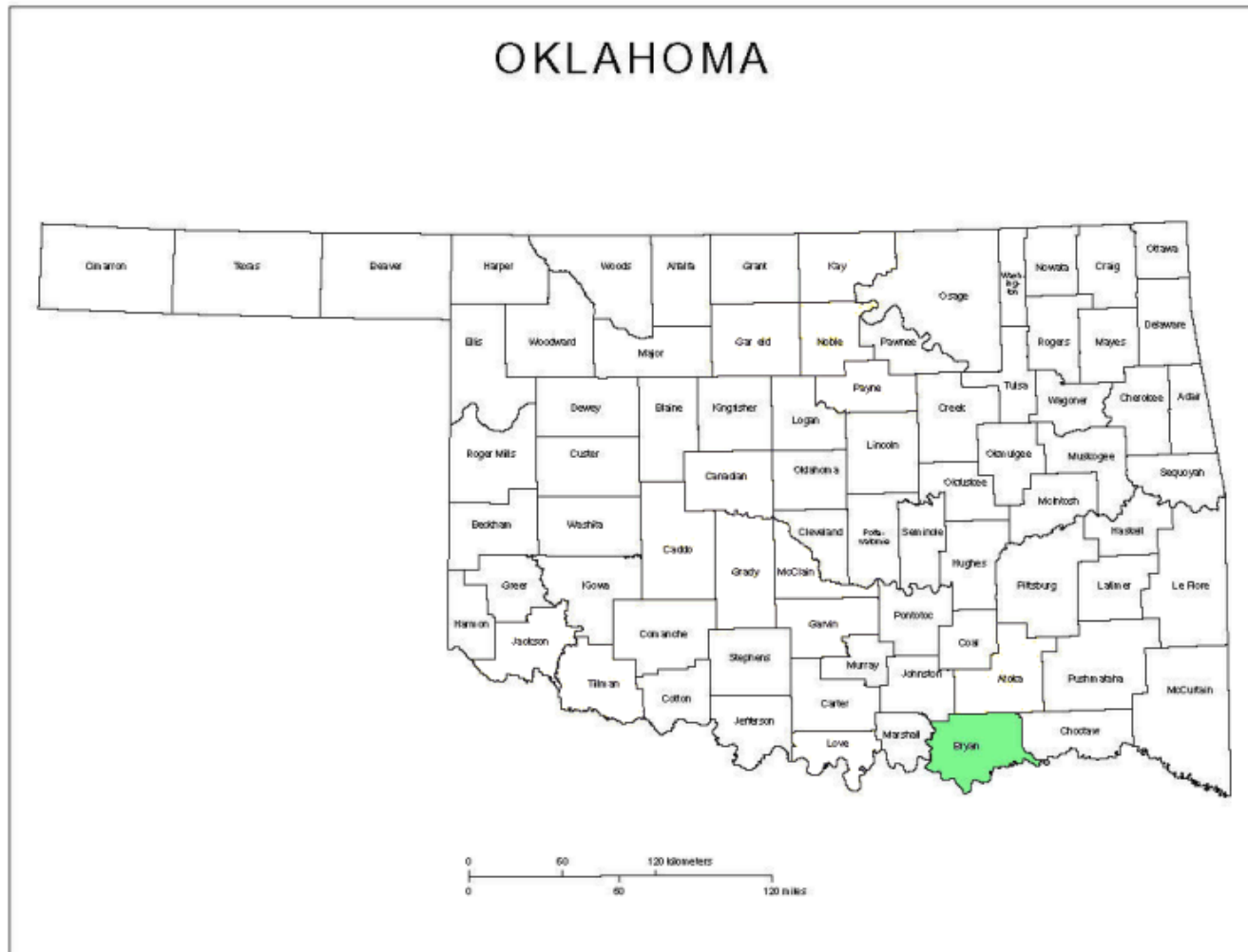
# Sugarcane Aphid Identification

- In the U.S., this aphid has been known as a pest in sugarcane in Florida (1977), Louisiana (1999), and more recently in Texas.
- In 2013, this aphid seemed to “shift” from sugarcane to sorghum in the U.S., although in other parts of the world, it was more known as a pest of sorghum.

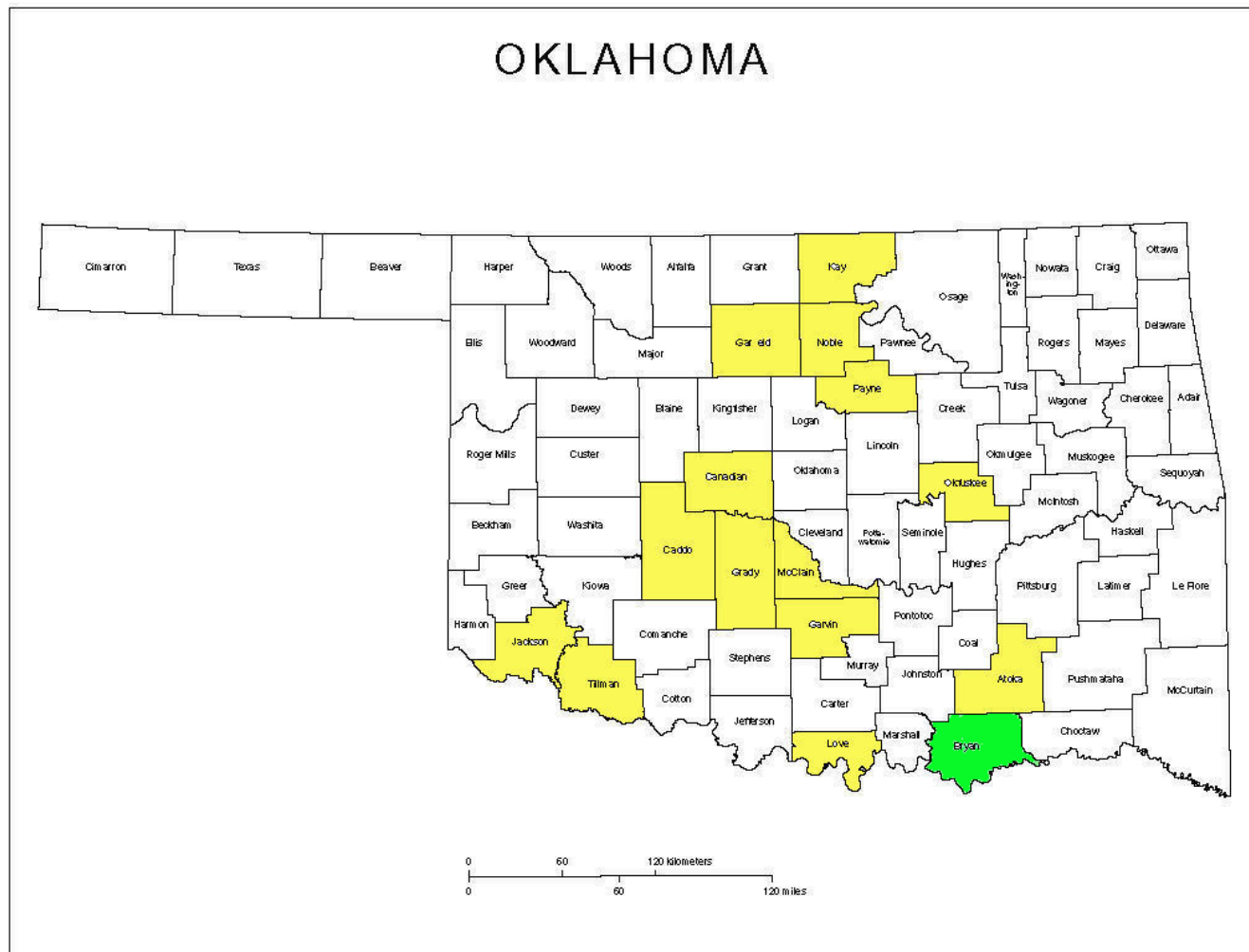


Photo Courtesy of Dr. Pat Porter,  
Texas A&M Agrilife, Lubbock

# Presence of Sugarcane Aphid in OK, 2013



# Presence of Sugarcane Aphid in OK, 2014







# Sugarcane Aphid Identification

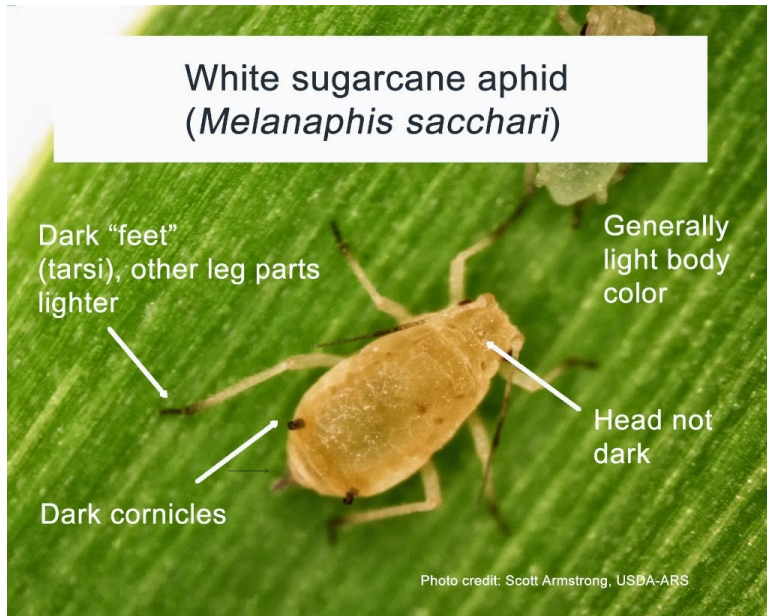
- Several aphid pests of sorghum are commonly found and without some magnification, could be confused with each other.
- One of them is known as the “yellow sugarcane aphid” which makes it even more confusing.
- Both “sugarcane aphids” are “yellow” but there are several features that make them easy to tell apart.
- Lets go through them and distinguish them from each other.



Photo Courtesy of Dr. Pat Porter,  
Texas A&M Agrilife, Lubbock

# Sugarcane aphid

## Identifying Characters



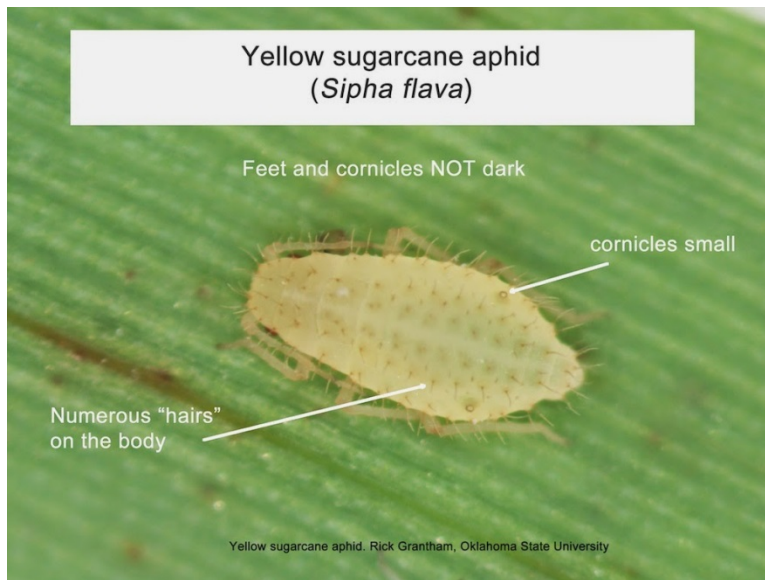
## "Typical Infestation"



Descriptions prepared by Ed Bynum and Patrick Porter, Texas Agrilife Extension.

# Yellow sugarcane aphid.

## Identifying Characters



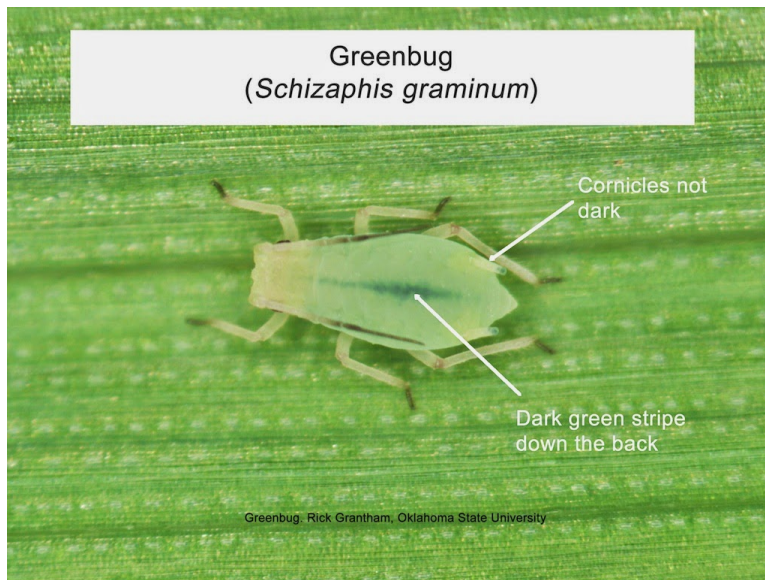
## "Typical Infestation"



Descriptions prepared by Ed Bynum and Patrick Porter, Texas Agrilife Extension.

# Greenbug

## Identifying Characters



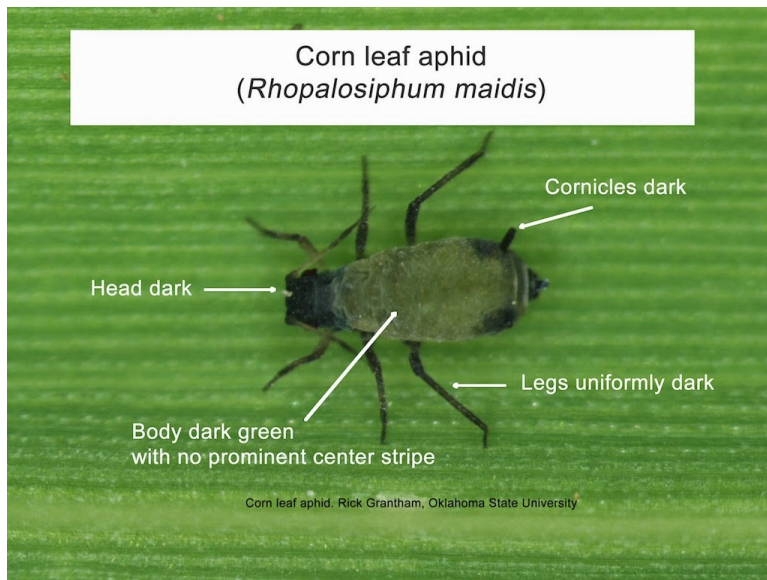
## “Typical Infestation”



Descriptions prepared by Ed Bynum and Patrick Porter, Texas Agrilife Extension.

# Corn leaf aphid

## Identifying Characters



Descriptions prepared by Ed Bynum and Patrick Porter, Texas Agrilife Extension.

## “Typical Infestation”



# Sugarcane Aphid Biology

- Like most aphids, they reproduce asexually via parthenogenesis (live birth, all female).
- 4 nymphal stadia
- Birth to adult in 5 to 12 days
- One female produces 68 young on average.



Photo Courtesy of Dr. Pat Porter,  
Texas A&M Agrilife, Lubbock

# Sugarcane Aphid Biology

- Reported Hosts:

- Sorghum
- Johnsongrass
- Sudangrass
- *Miscanthus sinensis*  
(Japanese silvergrass)
- Sugarcane
- Bermudagrass
- Rice
- Barnyard grass
- Hairy crabgrass
- *Setaria* millet



# Sugarcane Aphid Biology

- Overwinters on ratoon sorghum and johnsongrass
- Probably does not overwinter in Oklahoma, but johnsongrass could serve as a continuous source of aphid populations during the growing season.





# Sugarcane Aphid: Natural Enemies



# Sugarcane Aphid: Nature of Damage

- Research in S Africa:
  - Typically infests sorghum soon after plant emergence, but significant population increases often occur after panicle emergence
  - These increases seem to occur in response to changes in the plant's physiology especially as the panicle emerges.



Photo Courtesy of Dr. Pat Porter,  
Texas A&M Agrilife, Lubbock

# Sugarcane Aphid: Nature of Damage

- Aphids establish and feed on abaxial surface of the basal leaves.
- They produce substantial amounts of honeydew, which is a source of sooty mold on the leaves



# Sugarcane Aphid: Nature of Damage

- Infestations eventually kill leaves



# Sugarcane Aphid: Nature of Damage

- Damage to sorghum:
  - Reduces yield
  - Lowers grain quality
  - Lowers forage quality
  - May weaken plants so they are more susceptible to diseases
  - Interferes with harvest operations.



# Sugarcane Aphid: Research Projects at OSU

- Hybrid resistance evaluations
- Date-of-planting evaluations
- Insecticide evaluations
- Application timing evaluations
- Sampling schemes
- Economic threshold evaluations

# Sugarcane Aphid: Variety Trial, 2015, Lane OK

- Host resistance will play a crucial role for effectively managing this aphid.
- Objectives:
  - Screen germplasm for incorporating resistance into commercial lines (USDA).
  - Screen commercial lines for resistance.
  - Evaluate population dynamics on resistant sorghums, and compare effectiveness of natural enemies on resistant and susceptible lines.

# Sugarcane Aphid: Variety Trial, 2015, Lane OK

Variety	Aphids 7 Days	Aphids 14 Days	Yield/bu/A
KS 585 (S)	1138	373	29.8
TAMU TX 430 (S)	1098	425	31.8 (2)
TAMU TX 2783 (R)	12	8	43.6 (13.8)
SP 7715	1	2	40.2 (10.4)
GX 15371	5	7	38.9 (9.1)
SP 6929	26	69	38.7 (8.9)
SPX 17613	1	1	38.4 (8.6)



# Sugarcane Aphid: Date of Planting

- This year, we will combine Date of Planting with thresholds (will show data later in talk).
- This will be a crucial area for our future research with sampling/resistance and yield

# Sugarcane Aphid: Insecticide Efficacy Trials, 2014, 2015, Lane OK

- Need to determine effective insecticides for control of outbreaks.

# Sugarcane Aphid: Insecticide Trial, 2014, Lane OK

Chemical	Rate lb ai/A	% Control 14 DAT*	Yield/bu/A
Transform WG	0.0235	95.9	104.03 (+ 26)
Transform WG	0.031	87.1	99.42 (+21)
Transform WG	0.047	97.1	98.51 (+20)
Lorsban 4E	1.0	< 50% NS	72.08 (-6.4)
Lorsban 4E	0.5	<60% NS	86.47 (+8)
Dimethoate 2.6 EC	0.5	< 15%	75.02 (-3.4)
Stallion EC	0.252	Higher than Check	77.26 (-1.2)
Untreated			78.43

\*Average of 1181 aphids per leaf in Untreated Check, 14 DAT

# Sugarcane Aphid: Insecticide Trial, 2015, Lane OK

Chemical	Rate lb ai/A	% Control 14 DAT*	Yield/bu/A
Sivanto	0.0235	60.0	57.4 (+ 14.4)
Transform WG	0.031	28.2	56.6 (+13.6)
Centric	1.0	76.0	51.8 (+8.8)
Lorsban Advanced	0.5	No control	46.2 (+3.2)
Lorsban Advanced + Dimethoate 2.6 EC	0.5	34.5	42.3 (-3.4)
Untreated			43.0

\*Average of 952 aphids per leaf in Untreated Check, 14 DAT

# Sugarcane Aphid: Research Projects at OSU

- Economic threshold evaluations
  - Dr. Michael Brewer is leading an effort to determine a yield loss relationship with the aphid.
  - The project will evaluate yield loss relationships between aphids and resistant and susceptible lines.

# Sugarcane Aphid: Research Projects at OSU

- Sampling schemes
  - Received funding from USDA NIFA to develop a sampling decision tool for consultants and producers to accurately scout and classify fields that need treatment in a timely fashion
  - Will incorporate information on economic thresholds, proper timing, and aphid distribution
  - Will try to use sequential sampling and presence/absence to make sampling efficient but accurate.
  - The goal is also to determine when (and if) natural enemies can play a role in reducing aphid pressure.

# Thanks!



- Ali Zarrabi - OSU
- Kris Giles - OSU
- Norm Elliott USDA-ARS
- Kelly Seuhs - OSU
- Michael Brewer, Robert Bowling, and Allen Knutson, Texas Agrilife Research and Extension
- Nick Seiter, University of Arkansas
- Sebe Brown and David Kerns, Louisiana State University
- Kansas State University



United States Department of Agriculture  
National Institute of Food and Agriculture



STAY  
TUNED!

# The Sugarcane Aphid

What Will Its Impact Be for Oklahoma Sorghum Producers?

Tom A. Royer, Extension Entomologist  
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