Phenology and Insecticide Choices to Manage the SCA in 2016 in the Rio Grande Valley

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Sugarcane Aphid Informative Meeting - Weslaco, April 12, 2016

UNIVERSITY OF KENTUCKY

Phenology: study of life cycle events influenced by annual changes in seasons, climate, and habitat (i.e. latitude, altitude)

Planting time

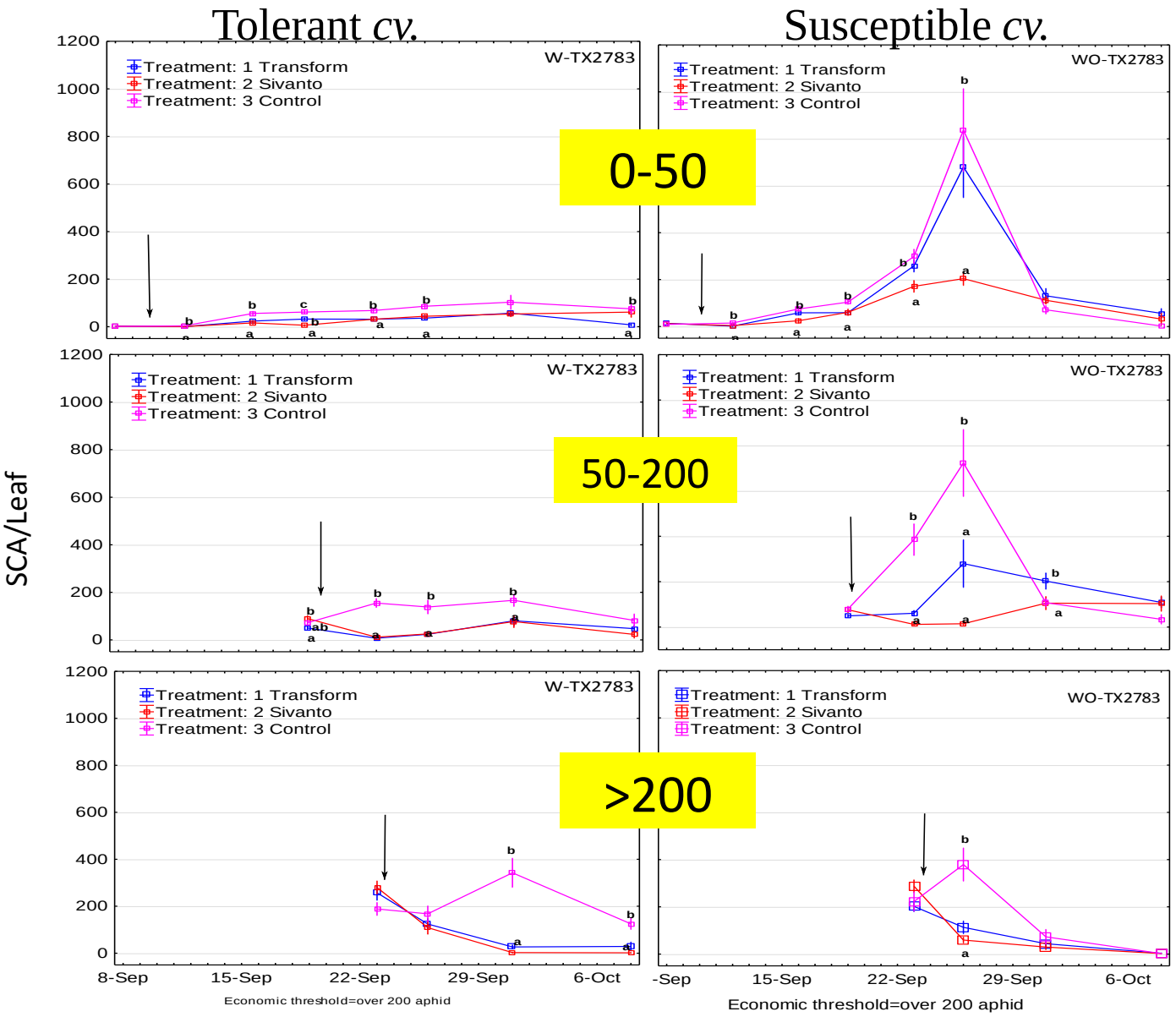
Environment

Control

Management

Cultivar

Fall 2014

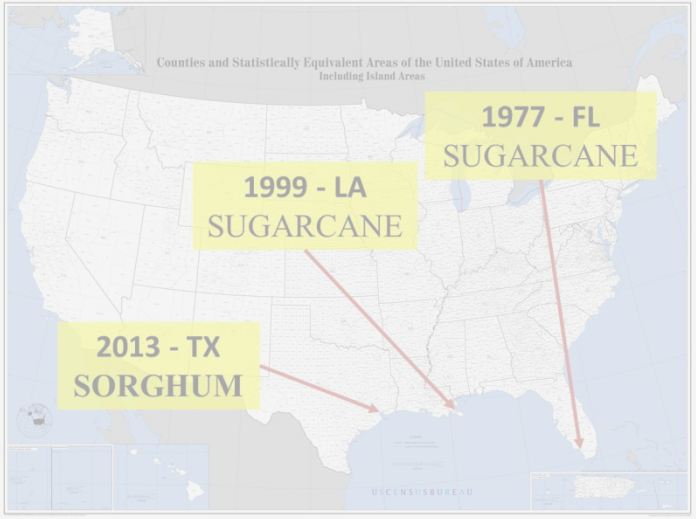

Tolerant *cv.*
Susceptible *cv.*
SCA/Leaf
0-50
50-200
>200
W-TX2783
WO-TX2783
Treatment: 1 Transform
Treatment: 2 Sivanto
Treatment: 3 Control
1200
1000
800
600
400
200
0
8-Sep
15-Sep
22-Sep
29-Sep
6-Oct
Economic threshold=over 200 aphid

http://sorghumcheckoff.com/pest-management/

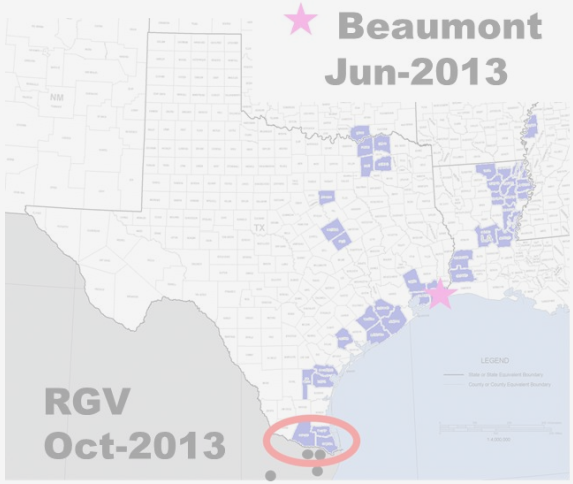
Company/Brand	Hybrid*	Maturity
Pioneer	83P17	Med-Full
Pioneer	83P56	Med-Full
DEKALB	37-07	Med-Early
DEKALB	Pulsar	Med-Early
Sorghum Partners	SP 7715	Med-Full
Sorghum Partners	SP 78M30	Med-Full
Sorghum Partners	SP 73B12	Med-Full
Richardson	RS260E	Med-Full
Richardson	Sprint W FG	Med-Early
Richardson	Jowar I	Full
Richardson	Swift	V. Early
Alta	AG1201	Early
Alta	AG1301	Med-Early
Alta	AG1203	Med-Early
Mycogen	627	Med-Early
Mycogen	1G688	Medium
B-H Genetics	BH 4100	Medium
B-H Genetics	BH 3400	V Early
Warner Seed	W-844-E	Med-Full
Warner Seed	W-7051	Med-Full
Golden Acres	3960B	Med

Sugarcane aphid (*Melanaphis sacchari*)

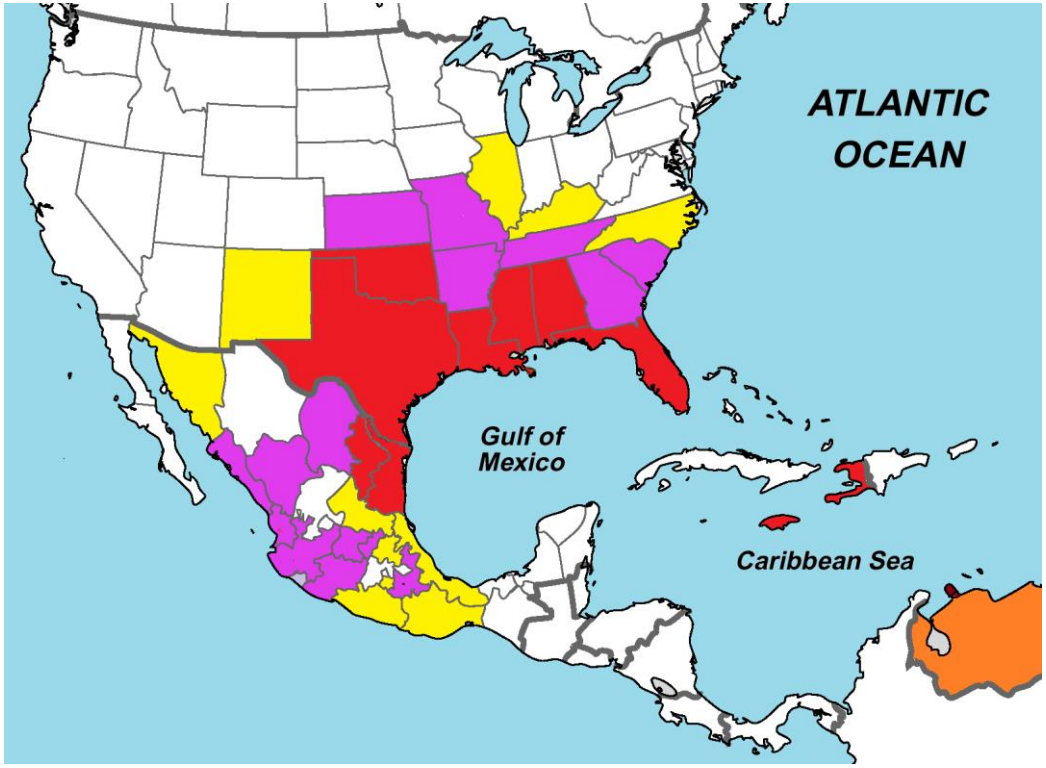
Historic records on the presence of SCA in the U.S.



SCA in TX sorghum 2013



Distribution in the U.S and Mexico 2015



	2013	2014	2015
U.S.A.	6	12	16
Mexico	2	11	19

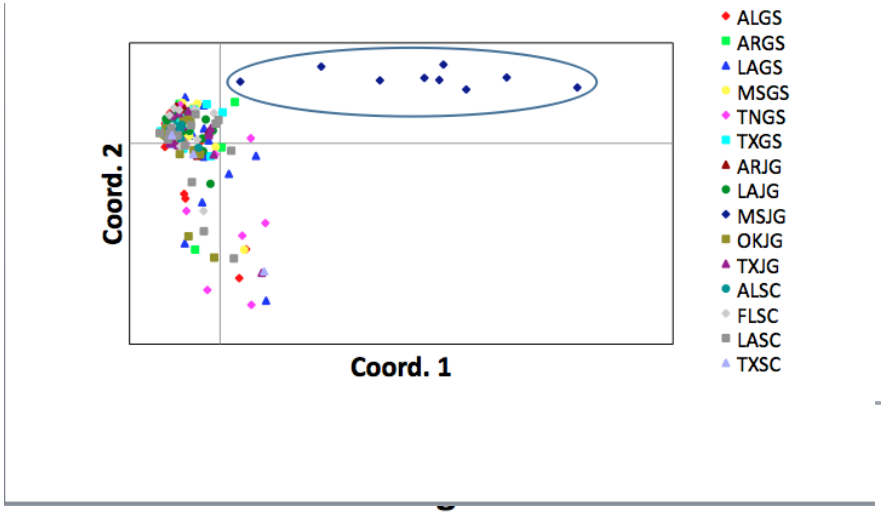
Sexual forms: Sugarcane Aphid

Peña-Martinez et al. 2016

Sexual forms found on Mexico on areas near the sea level or higher elevation (1500 m)

Partial Component Analysis of SCA hosts by geographic Interaction in MS, LA, OK, AR and TX

Dr. Raul Medina,
Texas A&M University

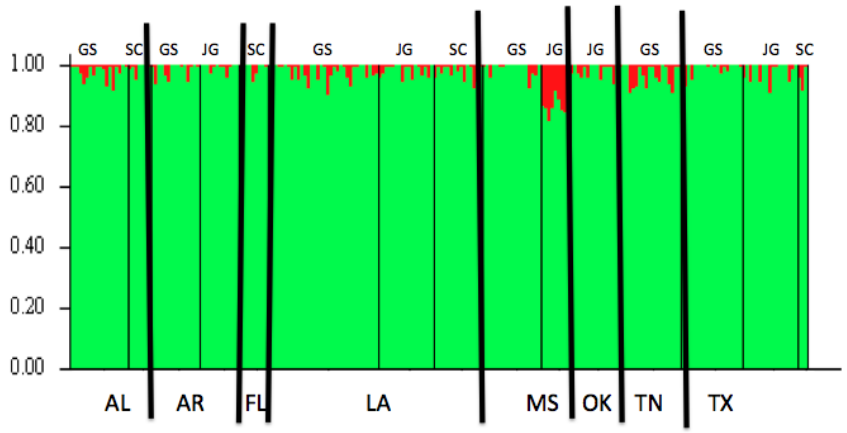


Identification of SCA:

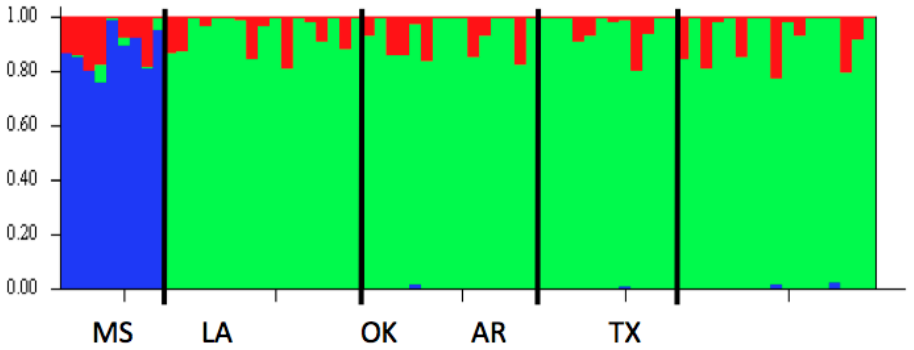
Melanaphis sacchari

Based on Taxonomic and molecular analysis of US populations

Host-Plants and Geographic Locations



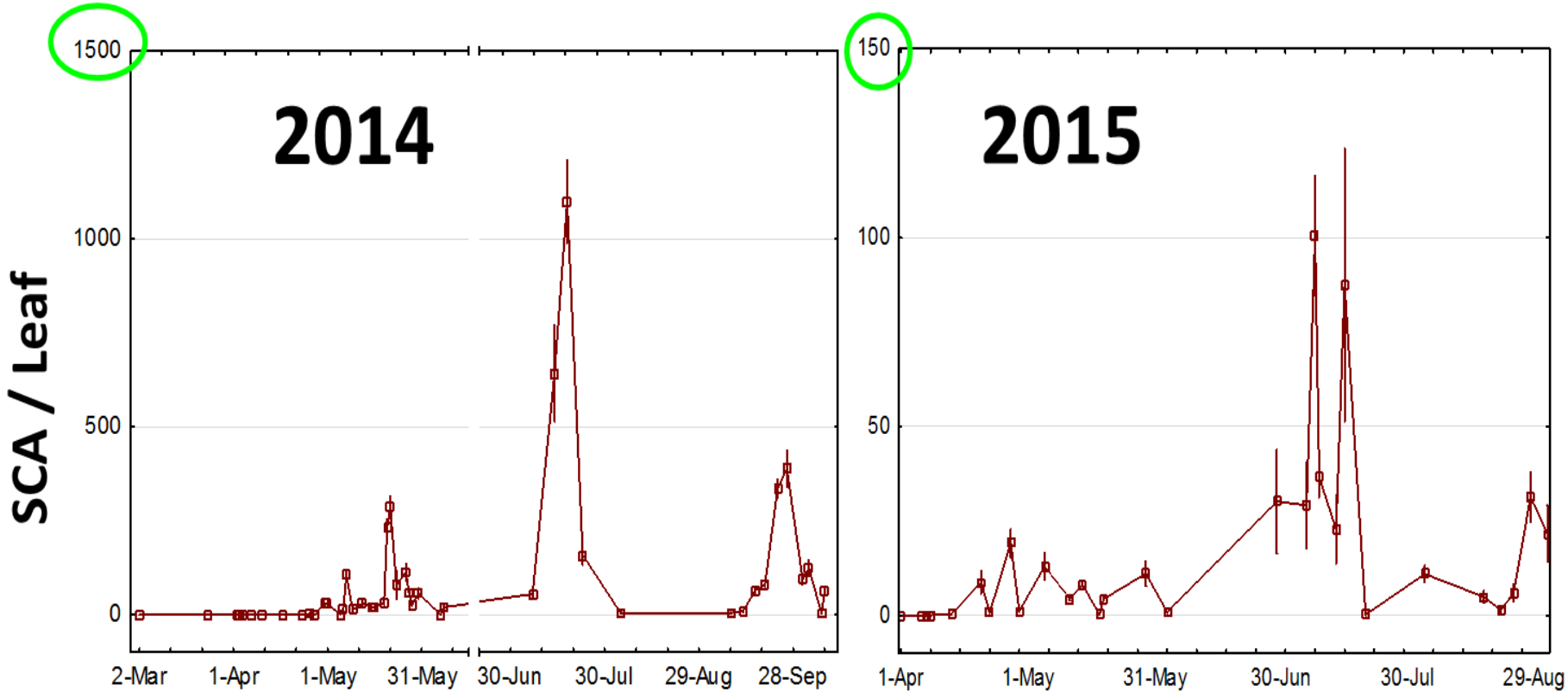
Geographic Structuring of Johnson grass-Associated *M. sacchari*



GS: grain sorghum, JG: Johnson grass, SC : sugarcane,

Sugarcane aphid (*Melanaphis sacchari*)

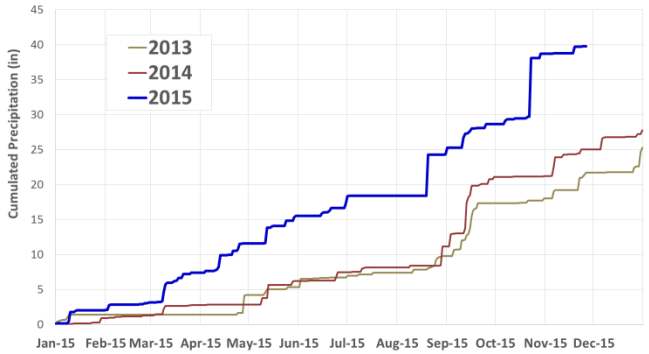
SCA PHENOLOGY: 2014 vs. 2015

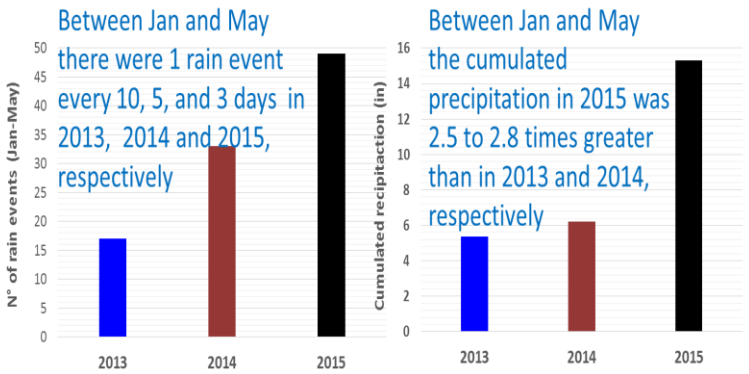


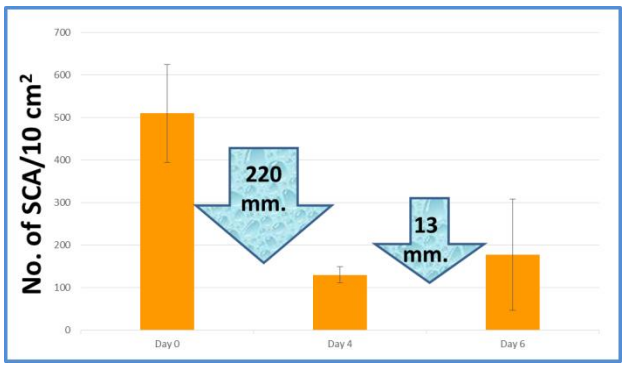
Mean numbers of SCA/leaf in the Rio Grande Valley on 13 and 15 commercial sorghum fields in 2014 and 2015, respectively

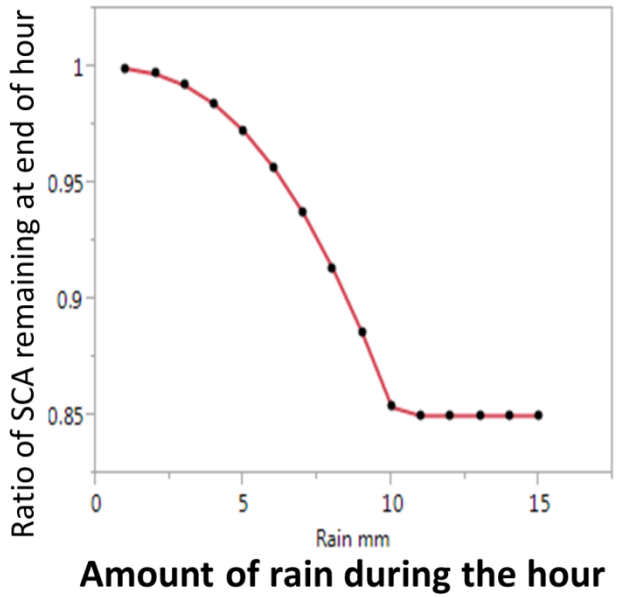
Almost 99% of commercial sorghum growers used Transform® 1, 2 or 3 times during the spring season

Environmental Conditions



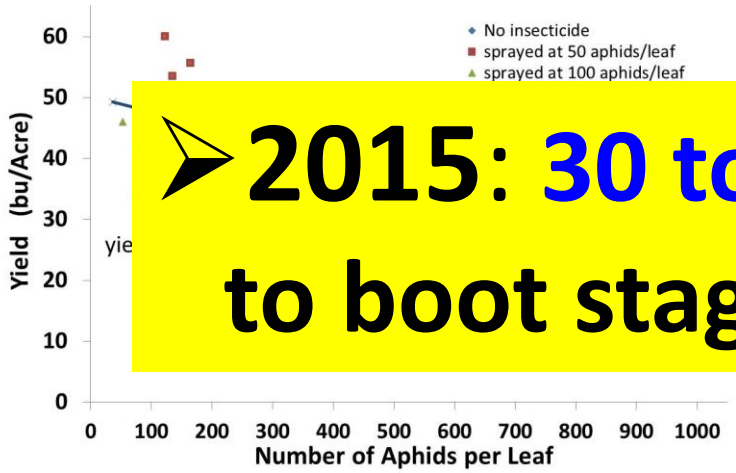


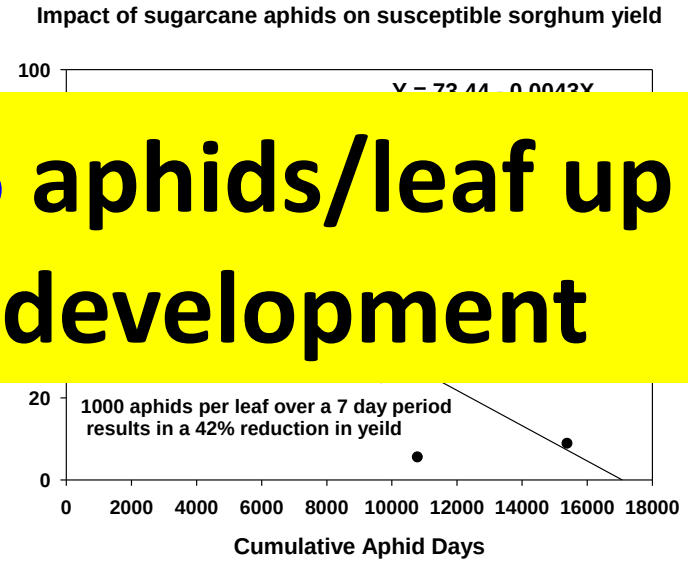




Threshold has been changed based on further studies leaded by Dr. Brewer (Corpus Christi, TX) and Dr. Kerns (Winnsboro, LA)

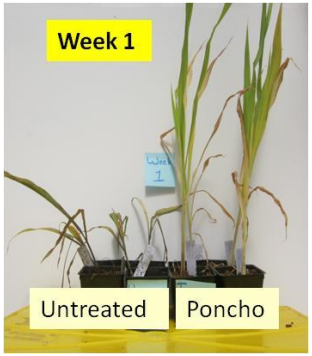
➢**2014**: **50 to 125** aphids/leaf up to boot stage of development



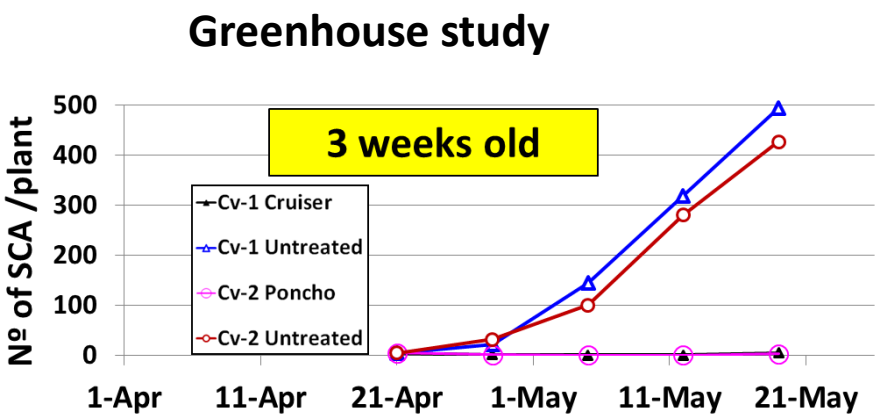


➢**2015**: **30 to 135 aphids/leaf up to boot stage of development**

Seed treatment



Alex Navarro



Seed treatments protect sorghum for at least 4 to 6 wks after emergence

Insecticides recommended for the management of the SCA in sorghum - 2016

- Transform® (*sulfoxaflor*)
- Sivanto® (*flupyradifurone*)

High volume of water is important for good coverage

- Ground ≥10 GPA
  15-20 GPA is better
- Air ≥ 5 GPA
  10 GPA is suggested

Insecticide / Mode of action	Use	Reapplication interval	Rate	PHI
Transform® WG MoA: 4C	Max 2 sprays or 3 oz/A	14 days	0.75 - 1.5 oz/A	14 d
Sivanto® 200 SL MoA: 4D	Max/season 28 oz/A	7 days	4.0 - 10.0 oz/A	• 7 d forage • 21 d grain

Is Transform® working?

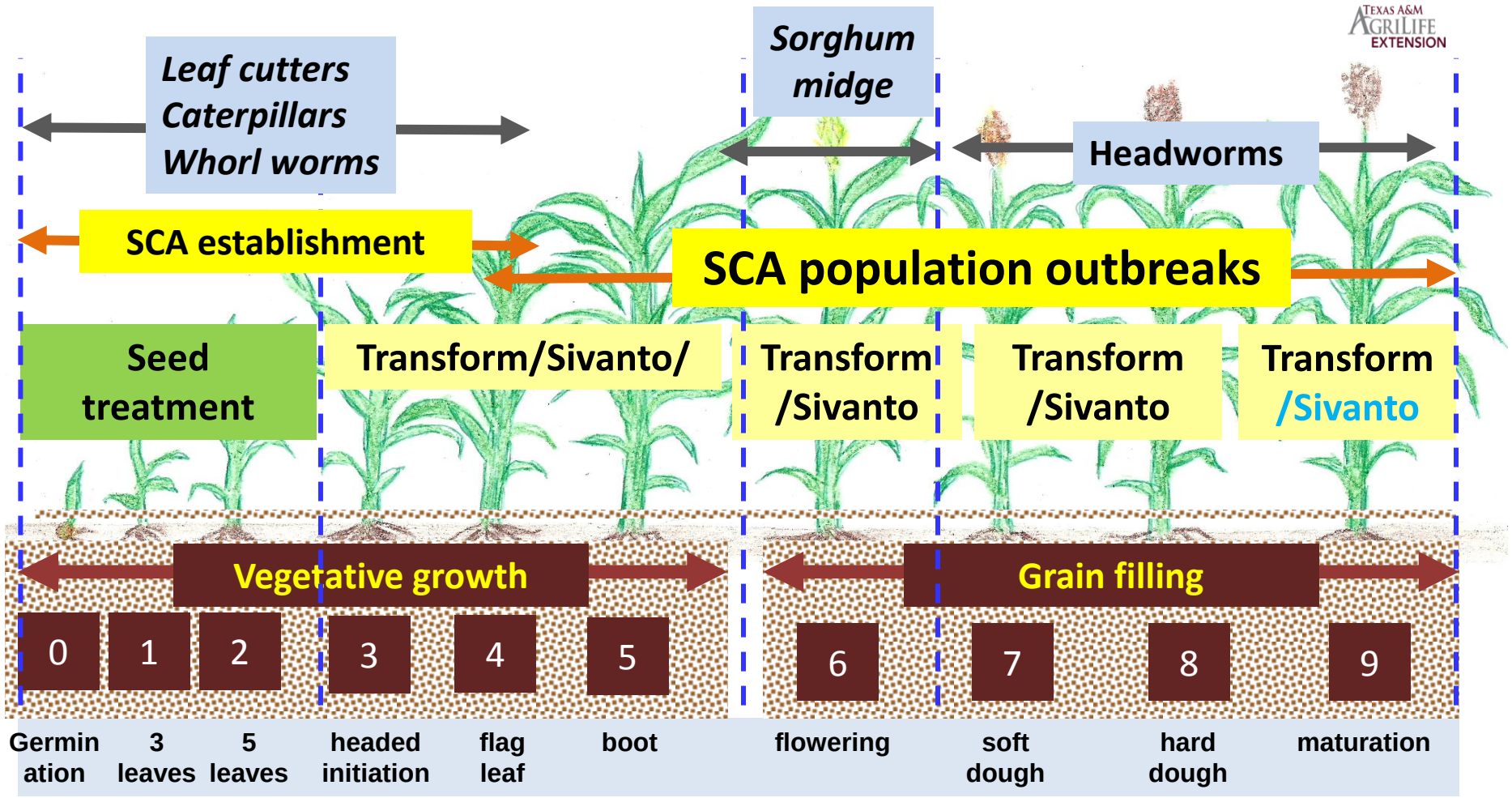
Transform®

- Spray 9/25
- Pics 9/29

Sorghum Planted on:

31 May 15 August

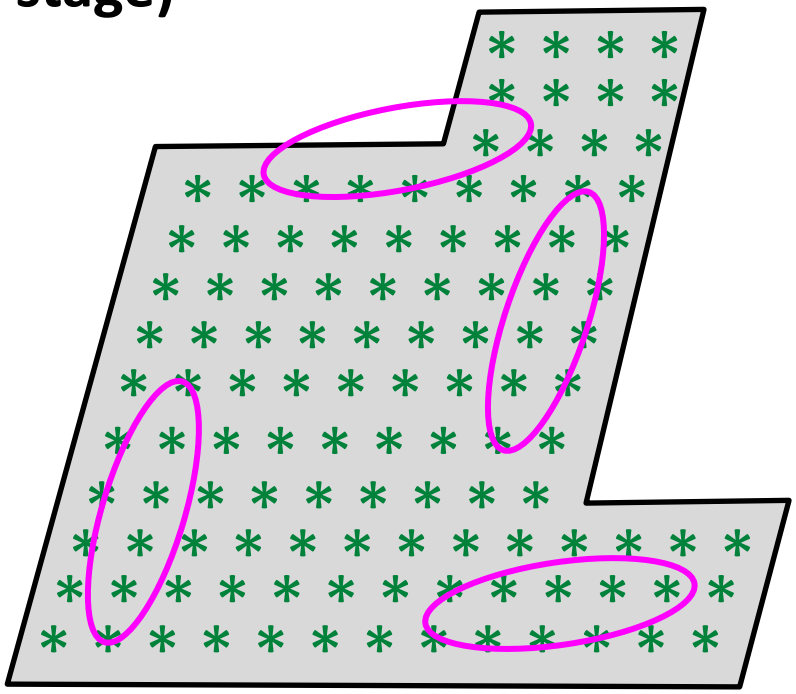
Control options for SCA, and other sorghum pests - 2016

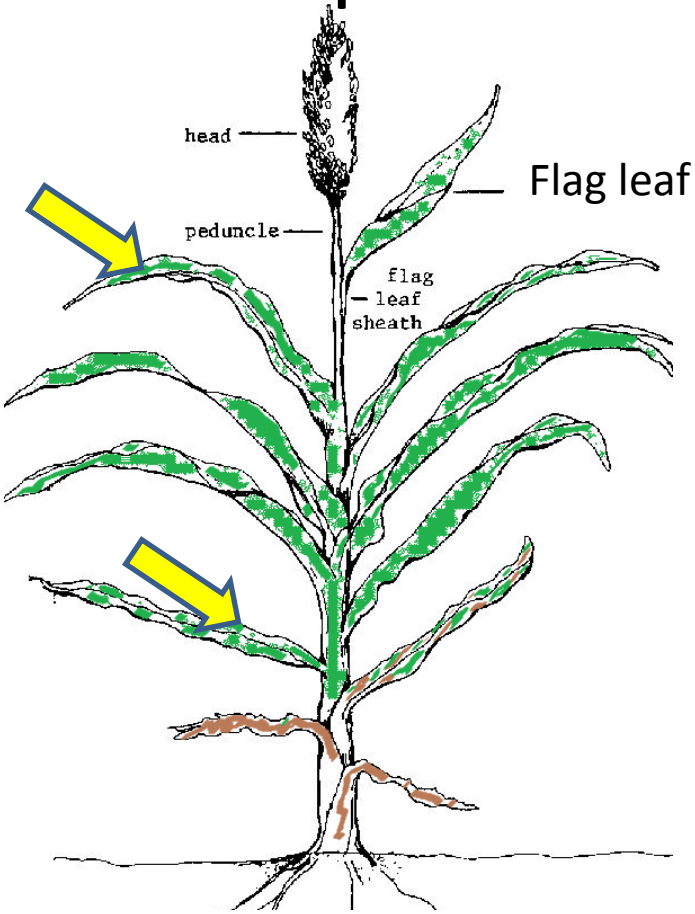


Whorl feeders	*Midge*	*Headworms*
Prevathon	**Chlorpyrifos** 1pt	**Lannate/Belt/Prevathon**

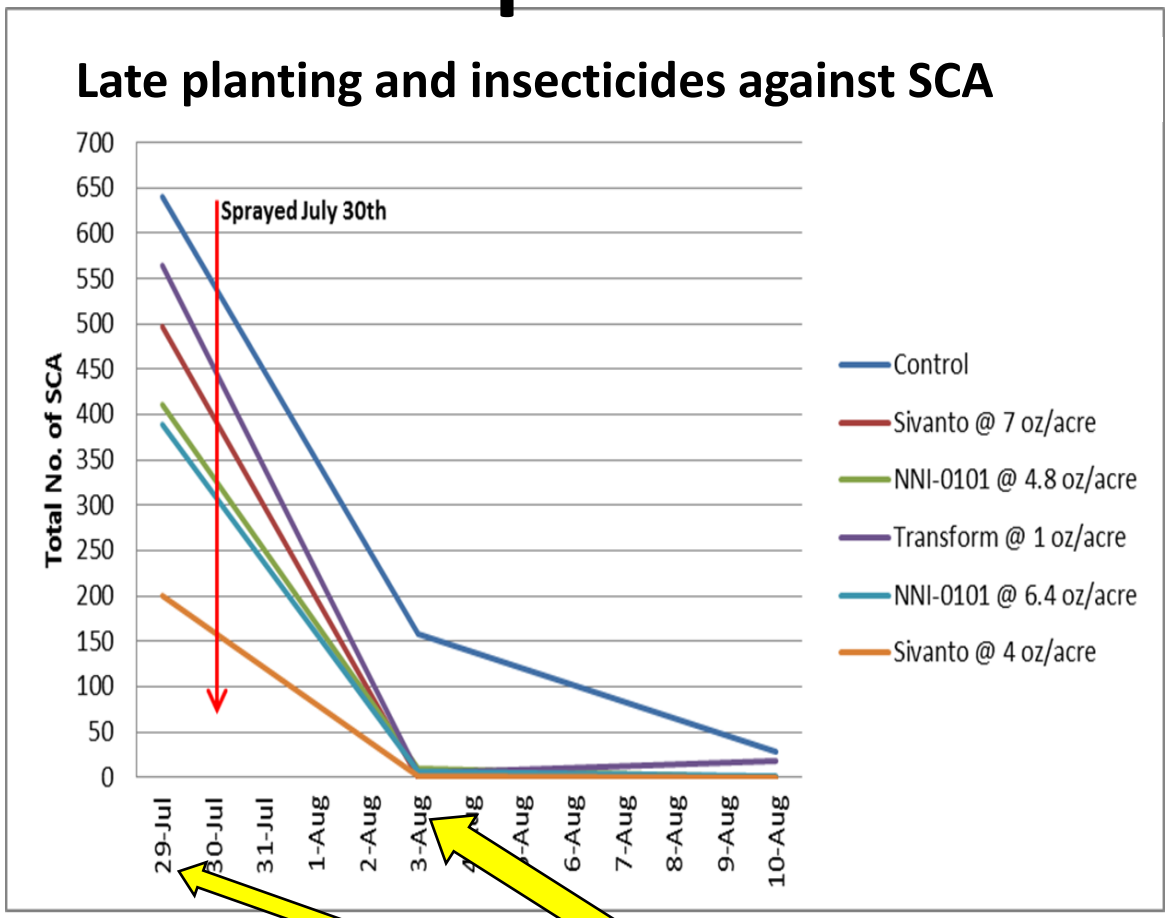
SCA sampling

- 40 plants per field when plants are small → Check entire plant, lower side of leaf
- **20 plants per field in large plants (older than 5 leaf-stage)** → **2 leaves per plant 1 leave below flag leaf and the green lowest leaf in plant**





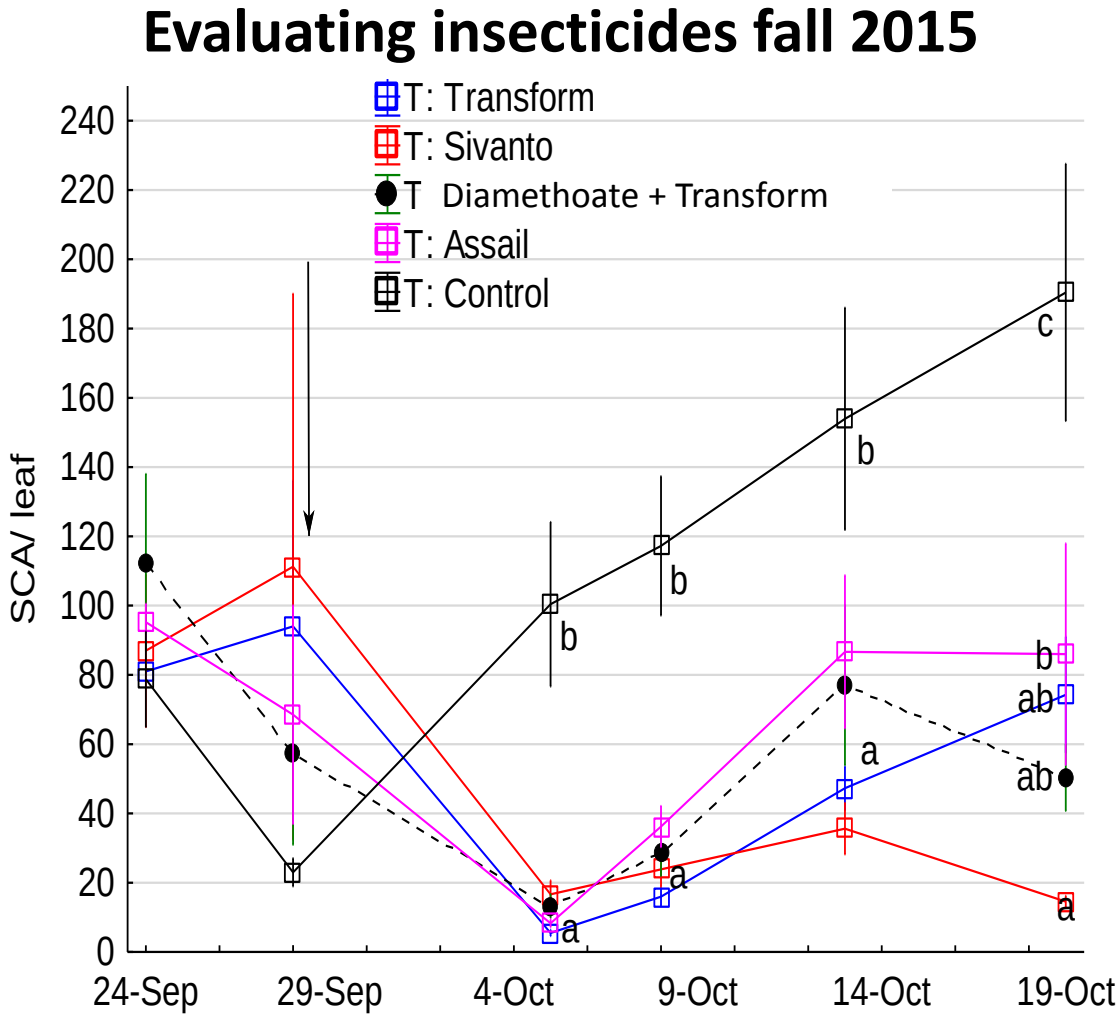
Insecticide options for 2015



SCA July 30th Spray (SNK)

	29-Jul	3-Aug	10-Aug
Control	640 a	158.50 a	28.33 a
Transform	564.33 ab	4.83 b	18.5 ab
Sivanto 7 oz	497.17 ab	0 b	0 b
Nichino 4.8 oz	410.80 b	10.07 b	0 b
Nichino 6.4 oz	389.17 b	6.37 b	0.667 b
Sivanto 4 oz	200.7 c	0.60 b	0 b

Insecticide options for 2015



Rio Grande Valley

Fall 2015 Test

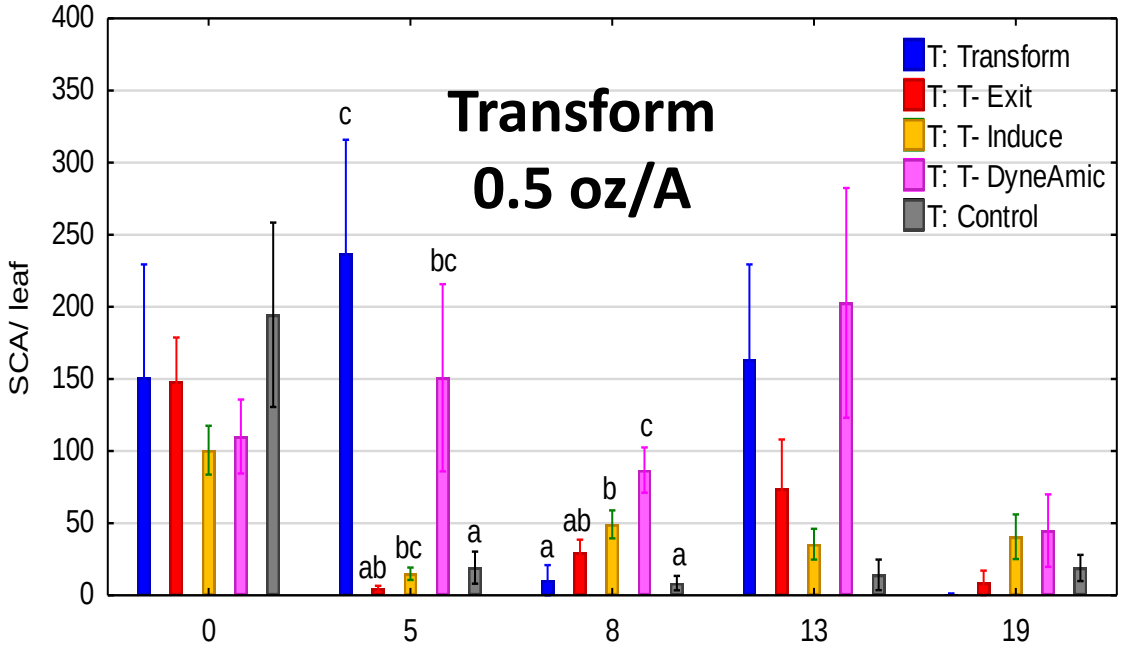
Untreated seeds

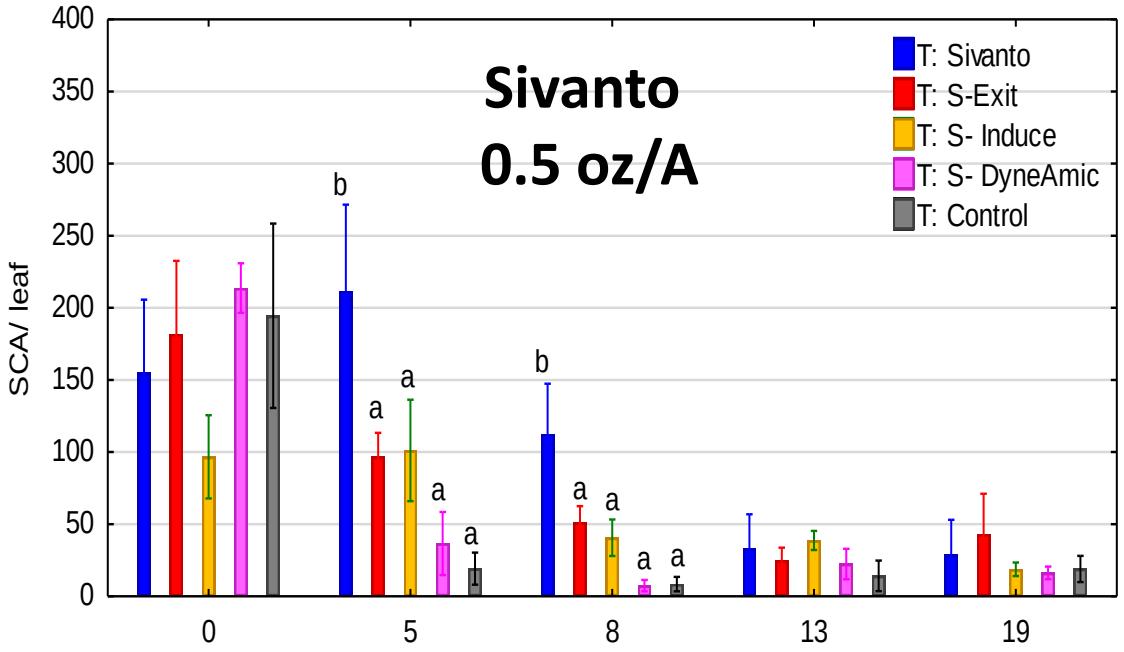
Planted on: 08/31/15

Sprayed on: 09/30/15

Day 0 = Sept 30
Day 5 = Oct 5
Day 8 = Oct 8
Day 13= Oct 13
Day 19 = Oct 19

SCA crash on control was due to complete deterioration of plants due to sugarcane aphid damage.





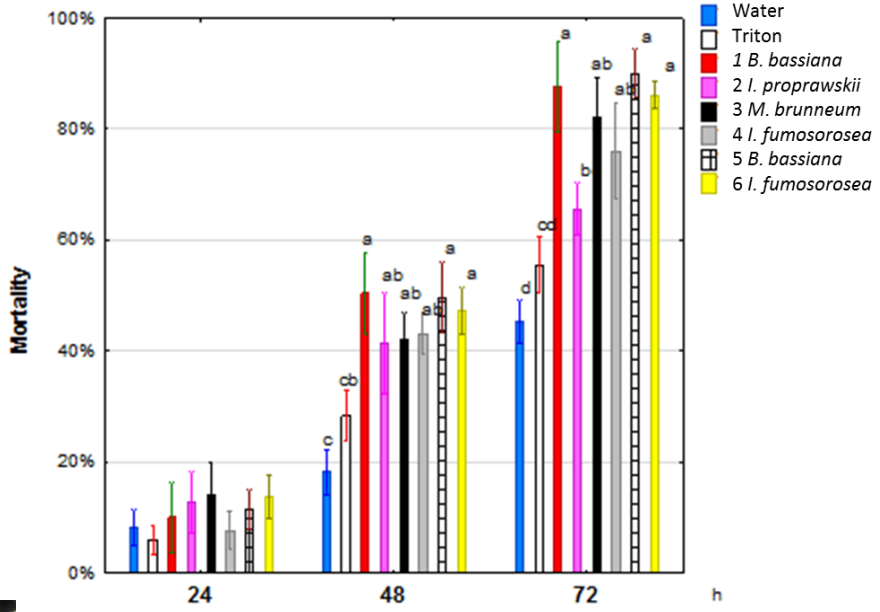
Natural enemies

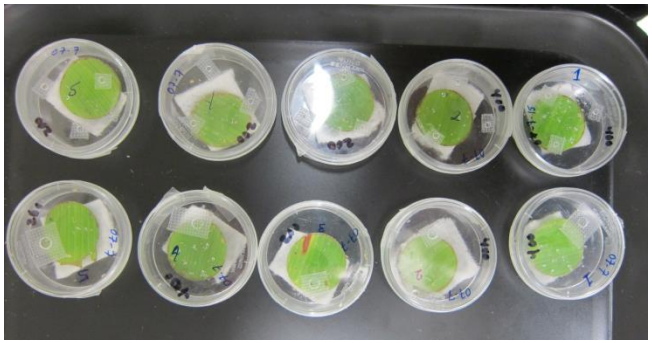
Numerical response of natural enemies to still cannot keep up with large population explosions of SCA

Evaluation of entomopathogenic fungi for SCA control

Karla Cruz

In bioassays, *B. bassiana, M. brunneum* and *I. fumosorosea caused >80% mortality*





Ten *M. sacchari,* and tallies at 24, 48, 72 h.

Harvest and desiccants

- **Honeydew** and **sooty mold** may affect **Glyphosate**
- **Sodium chlorate** can be a better option when SCA have deposited honeydew or presence of sooty mold
- If **SCA are abundant and move into** heads **Transform®** (14-d PHI) may be included with the desiccant spray

Summary

- There are tools to manage the SCA: **Seed treatments, resitant/tolerant cultivars, early planting**
- **Transform**® (sulfoxaflor) worked effectively to control SCA, it was recently approved for its use in 2016.
- **Sivanto** ® (flupyradifurone) is very effective against the SCA,
- Threshold approx. 30 to 120 SCA/leaf (*Brewer &Kerns*)
- Natural enemies were abundant but no sufficient
- Yield losses can be great: from 50 to 100%

Thank you!

Acknowledgments

Grower cooperators

Daniel Sekula
Gabriela Esparza-Diaz
Raul Medina
Robert Bowling
David Kerns
Raul Medina
Karla Cruz-Aldaco
Miguel Arias
Jorge Arellano
Alex Navarro
Brad Cowan
Enrique Perez
Web Wallace
Beto Garza
Sergio Davila
Lauren Fann
Joe Martinez
Alma Olguin
Elizabeth Arzola
George Loya
Kendall Duke
John Norman
Samuel Zapata
L. Rodriguez de Bosque
Sergio Sanchez
Victor Maya

Texas Sorghum Producers

SORGHUM CHECKOFF

USDA NIFA
United States Department of Agriculture
National Institute of Food and Agriculture

Southern IPM Center

Colleagues

- **Bill Rooney** -Texas A&M Univ., College Station
- **Mike Brewer** - AgriLife Research, Corpus Christi
- **Scott Armstrong** - USDA-ARS, Stillwater, OK
- **Mo Way** - AgriLife Research, Beaumont
- **David Kerns** - Louisiana State University
- **JP Michaud** – Kansas State University

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Helicoverpa armigera (Old World Bollworm)

- Annual losses in Brazil : $2 billion, yields were reduced by 35%
- OWB developed rapid resistance to insecticides and Bt-cultivars
- USDA-APHIS confirmed the first U.S. detection on June 17, 2015 in Florida