

Abstract

The sugarcane aphid (SCA) *Melanaphis sacchari* has been a prominent pest in commercial grain sorghum in the Lower Rio Grande Valley since the fall of 2013. For the past 4 1/2 years we have monitored SCA populations, conducted variety trials, and have studied the invasive aphid to the best of our ability. We have observed in years 2016 and 2017 that the SCA prefers to feed on a particular stage of the sorghum and as long as that stage is present they will begin to enter the commercial fields and feed. We have seen parasitism and fungus in the fields control SCA. We have also looked at a number of sorghum varieties to see which ones offer greater tolerance/resistance to the SCA. With about 350,000 acres of sorghum planted in the LRGV each year, all of these factors constitute a good IPM program for our local growers.

Introduction

Sugarcane aphids (Fig. 1) have piercing sucking mouthparts that allows them to feed on the sap in the xylem of plants removing necessary nutrients from sorghum and excreting large amounts of honeydew (waste of aphids). All SCA are females, they can reach high numbers rapidly. The objectives in this study were to determine the presence of sugarcane aphids feeding in commercial grain sorghum during the growing season and to determine which varieties, insecticides and predators control them effectively.



Figure 1: Distinctive characteristics of the sugarcane aphid *Melanaphis sacchari* and different instars.

Materials and methods

To collect data for comparing populations each year we monitored several Valley commercial sorghum fields throughout each growing season in Hidalgo, Cameron and Willacy counties starting from mid March/April of each year. We monitored the fields for presence of SCA and winged SCA. We counted SCA on flag leaves and on lower leaves. We also surveyed for predators of SCA as well during these counts. For insecticide/variety trials for 2016 and 2017 we were monitoring SCA populations on the station for both SCA and winged SCA to determine when to spray to meet optimal yield potential.

Results and Discussions

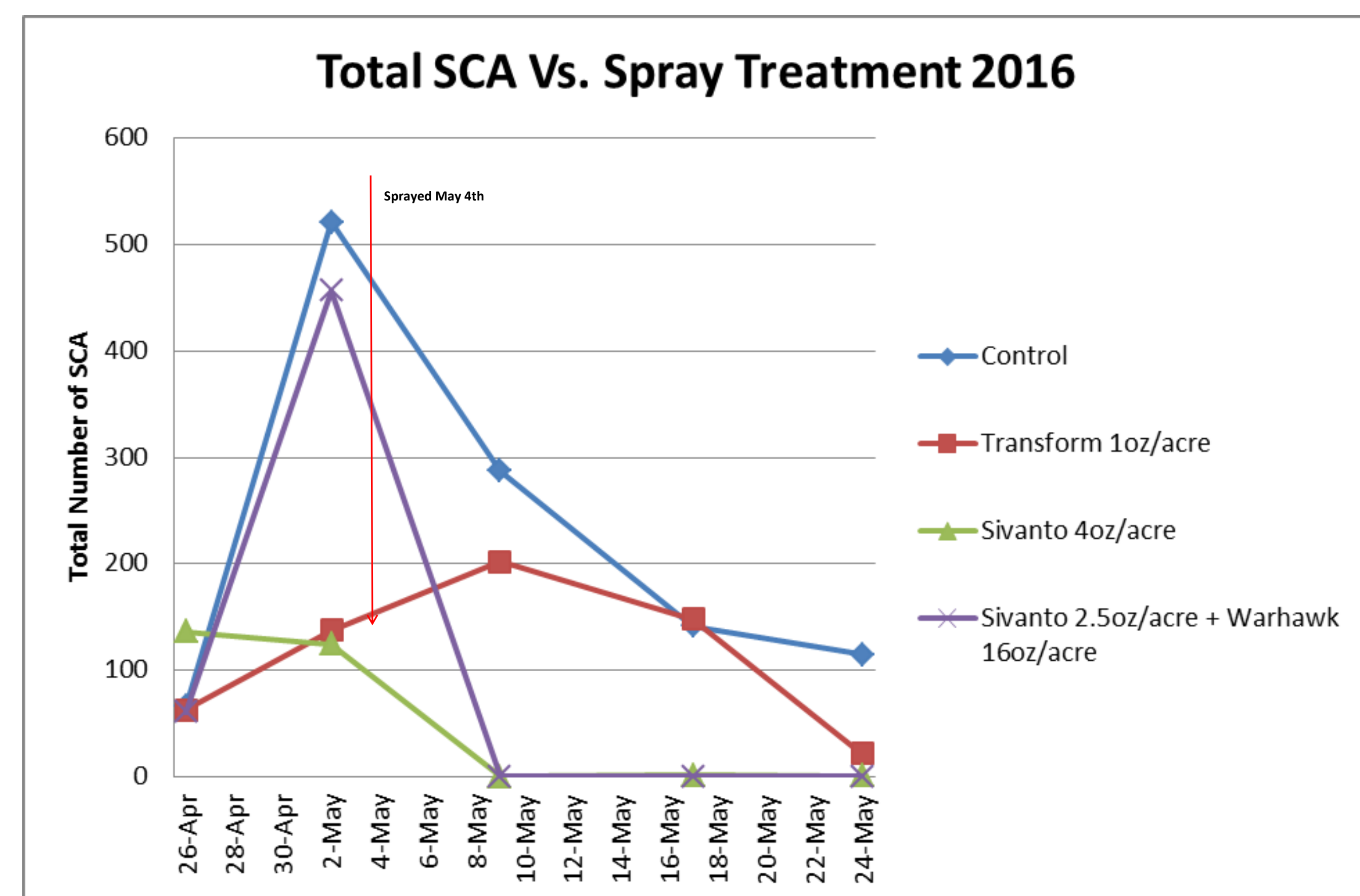


Figure 2: Total SCA vs. Spray Treatment

Variety	Yield (lbs)	Avg SCA	Total SCA
DKS 48-07	2.115	18.760	93.800
Pioneer 85-P56	1.934	66.596	332.980
SP 7715	1.912	58.146	290.730
GA x2609	1.897	41.512	207.560
83-G19	1.870	246.582	1232.910
SP 68M57	1.765	65.032	325.160
DKS 37-07	1.759	38.230	191.150
GA 3960B	1.601	15.318	76.590
SP 70B17	1.492	438.186	2190.930
GA x2617	1.439	21.976	109.880
ANZU 4343	1.346	185.946	929.730
ANZU 4230	1.306	259.976	1299.880

Figure 3: Sorghum Varieties evaluated for SCA and yield in 2016

2016 Schrieber Sorghum Variety Trial				
Variety	Date SCA counted			Yield
	4-Apr	20-Apr	3-May	
DKS 5101	0.0 a	12.27 ab	0.06 a	6198
BH 4100	0.0 a	36.67 a	0.0 a	5802
AG 3201	1.0 a	17.27 ab	0.13 a	5430
RV 9562	0.0a	8.87 b	0.06 a	5277
Dyna Gro M75GR47	3.0 a	12.2 ab	0.0 a	5246
BH 5620	0.0a	14.93 ab	0.13 a	5144

Means separated using GLM/SNK

Figure 4: Cameron County Sorghum Variety Trial 2016

2016 McDaniel Sorghum County variety Trial							
Variety	Date SCA counted						
	4-Apr	3-May	10-May	19-May	25-May	15-Jun	
Dyna Gro M75GR47	0.0 a	369.1 b	0.0 a	0.067 a	0.4a	17.47 a	3708
Terrel RV9562	0.2 a	147.1 b	0.2 a	0.067 a	0.33 a	2.0 a	3237
DKS 5101	0.600 a	190.4 b	0.0 a	0.133 a	0.67 a	3.07 a	3229
BH 5620	0.100 a	11.3 b	0.0 a	0.067 a	9.33 a	29.20 a	3000
Alta AG 3201	1.933 a	95.5 b	0.0 a	0.0 a	0.0 a	5.4 a	2941

Means separated using GLM/SNK

Figure 5: Hidalgo County Sorghum Trial 2016

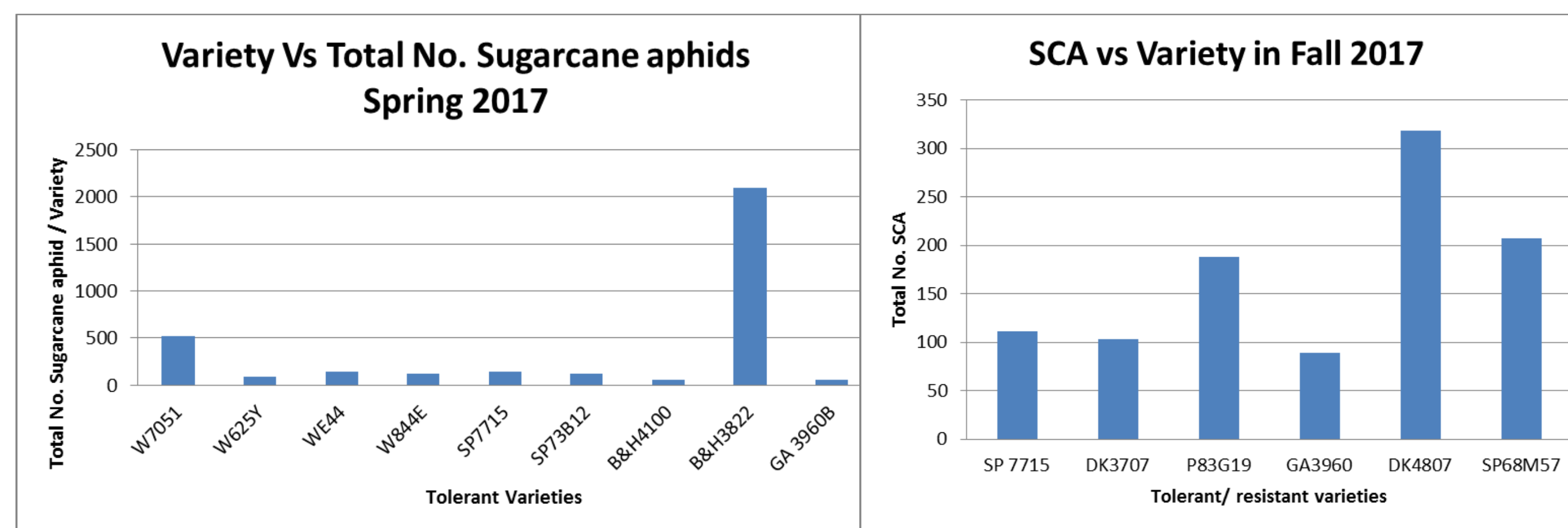


Figure 6: Total SCA per Variety for Fall and Spring Trials of 2017

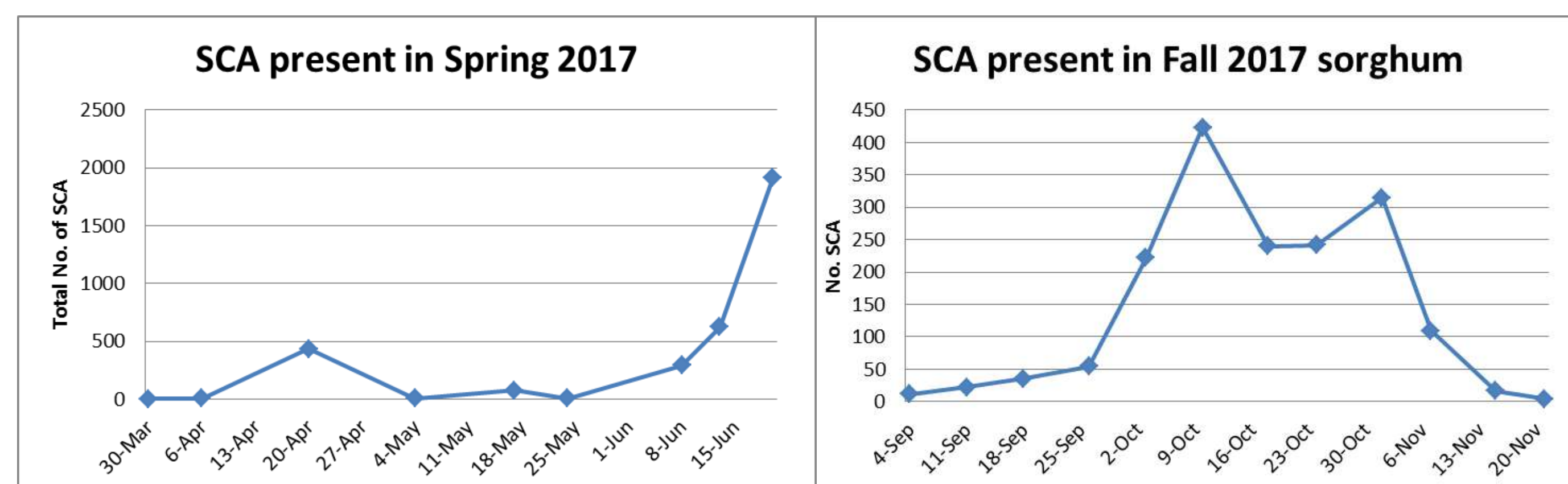


Figure 7: SCA present in Spring and Fall



Figure 8: SCA and SCA mummies parasitized on underside of sorghum leaf



Figure 9: On the left we have brown/ tan mummies and on the right we have blue aphid mummies

- In Figure 2 we conducted a spray trial and saw that Sivanto at 4 oz. was very effective in controlling the sugarcane aphid
- In Figures 3,4,and 5 we had several commercial varieties evaluated for SCA and yield compared for our growers interest
- The phenology for SCA in both 2016 and 2017 followed the same population peaks for the most part as previous years (Fig. 7). The main difference was in Spring of 2017 sugarcane aphids were detected early in mid March in commercial sorghum due to very early planting and very hot weather
- No insecticide seed treatments were used in Spring of 2017 to see exactly when SCA move into commercial sorghum, in this case V7 and V8 stages (Fig. 6)
- Predators were also monitored for control of sugarcane aphid in both years with 2017 showing more parasitism then past years put together. (Fig. 8 & 9)

Conclusions

- In the Spring of 2016 and 2017 we had sugarcane aphid populations present in commercial sorghum
- We learned that when SCA want to feed on commercial grain sorghum in the Spring they will wait for V7 or V8 stage to enter a sorghum field, it is not always the month of April like it had been for 2014, 2015, and 2016.
- Seed treatments work well and will be better used in the Fall when less sorghum is planted so SCA feeding is less aggressive at the beginning of growing stages.
- We had prominent parasitism by two parasitoid species, blue mummies from the Aphenlinus species, and brown/tan mummies from the family Braconidae, Lysiphlebus species identified through 2017 observations.
- About 65% of the Valleys growers had to spray their sorghum for sugarcane aphids at least once during 2017 growing season while in 2016 it was 85%
- 90% of growers are planting a tolerant/resistant variety of grain sorghum in both 2016 and 2017 years.
- Many growers are planting their sorghum early to avoid having to spray for SCA prior to harvest as one way of cultural control.
- 70% of growers in a 2017 survey said the IPM program made them more aware of sugarcane aphids in sorghum and
- 85% of growers said the IPM program made them more aware of pest and beneficial interactions in the field

Acknowledgments

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