Sugarcane Aphid (Hemiptera: Aphididae): Host Range and Sorghum Resistance Including Cross-Resistance From Greenbug Sources

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ABSTRACT The graminous host range and sources of sorghum [*Sorghum bicolor* (L.) Moench.] plant resistance, including cross-resistance from greenbug, *Schizaphis graminum* (Rondani), were studied for the newly emerging sugarcane aphid, *Melanaphis sacchari* (Zehntner), in greenhouse no-choice experiments and field evaluations. The sugarcane aphid could not survive on field corn, *Zea mays* (L.), Teff grass, *Eragrostis tef* (Zucc.), proso millet, *Panicum miliaceum* L., barley, *Hordeum vulgare* L., and rye, *Secale cereale* L. Only sorghum genotypes served as hosts including Johnsongrass, *Sorghum halepense* (L.), a highly suitable noncrop host that generates high numbers of sugarcane aphid and maintains moderate phenotypic injury. The greenbug-resistant parental line RTx2783 that is resistant to greenbug biotypes C and E was resistant to sugarcane aphid in both greenhouse and field tests, while PI 55607 greenbug resistant to biotypes B, C, and E was highly susceptible. PI 55610 that is greenbug resistant to biotypes B, C, and E maintained moderate resistance to the sugarcane aphid, while greenbug-resistant PI 264453 was highly susceptible to sugarcane aphid. Two lines and two hybrids from the Texas A&M breeding program B11070, B11070, AB11055-WF1-CS1/RTx436, and AB11055-WF1-CS1/RTx437 were highly resistant to sugarcane aphid, as were parental types SC110, SC170, and South African lines Ent62/SADC, (Macia/TAM428)-LL9, (SV1*Sima/IS23250)-LG15. Tam428, a parental line that previously showed moderate resistance in South Africa and India, also showed moderate resistance in these evaluations. Overall, 9 of 20 parental sorghum entries tested for phenotypic damage in the field resulted in good resistance to the sugarcane aphid and should be utilized in breeding programs that develop agronomically acceptable sorghums for the southern regions of the United States.

KEY WORDS host plant resistance, sugarcane aphid, greenbug, cross-resistance

The sugarcane aphid *Melanaphis sacchari* (Zehntner) (Homoptera: Aphididae) was first discovered on sorghum [*Sorghum bicolor* (L.) Moench], in the United States in Florida as early 1922 (Wilbrink 1922), and later confirmed by Denmark (1988), although it also has a history of infesting sugarcane, *Saccharum officinarum* (L.), in Florida (Mead 1978, Denmark 1988) and Louisiana (Hall 1987, White et al. 2001). The bioeconomics of the sugarcane aphid infesting sugarcane are still lacking in that recognizable damage shows only as secondary symptoms of sooty molds from the plant being covered in honeydew (Hall 1987, White et al. 2001). In sugarcane, the sugarcane aphid can vector Sugarcane yellow leaf virus, a casual agent of yellow leaf disease, which has been added to the certification standards for micropropagated sugarcane in Louisiana (Akbar et al. 2010). In the late summer of 2013, the sugarcane aphid expanded its regional presence by infesting grain sorghum near Beaumont, TX, and thereafter discovered in grain sorghum throughout the eastern half of the state of Texas to include north central Texas, the Gulf Coast, South Texas including the Rio Grande Valley, Louisiana, Oklahoma, and Mississippi. During the 2014 sorghum production season, the aphid survived the winter in northern State of Tamaulipas, Mexico, and in south Texas where it eventually progressed to the northeast into Arkansas, more northern latitudes of Oklahoma, south central Kansas, and as far west as Hale Center, TX. From the two production seasons observed in Texas, and from previously published literature from other countries such as South Africa (van Rensburg 1973), and India

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(Sharma et al. 2013), sugarcane aphids prefer to infest sorghum on the underside of the lower leaves where infesting colonies increasing rapidly from flowering to grain fill. The entire plant, including the inflorescence and leaves are covered in honey dew and sooty mold. This has resulted in mechanical harvesting problems in southern United States in that the honeydew interferes with harvesting machinery, and compounds the economic loss caused by the sugarcane aphid. Our objectives were to evaluate graminous host plants, for suitability as hosts, and to screen for host plant resistance to the sugarcane aphid, including known sources that are used to differentiate greenbug biotypes.

Materials and Methods

Aphid Origin and Culture. *M. sacchari* used in these studies were collected from grain sorghum near Bay City, Matagora County, TX, in August of 2013. A single parthenogenic female was reared on RTx7000, a susceptible sorghum genotype used in greenbug biotype determinations. The progeny from this single female were maintained by transfer to RTx7000 seedlings once a week within enclosures in the greenhouse under T-6 fluorescent lighting and a 24-h temperature range (max 31°C and min 19°C) in the fall of 2013.

Host Range Determinations. For host range determinations of sugarcane aphid, field corn, *Zea mays* (L.), Teff grass, *Eragrostis tef* (Zucc.) Trotter, forage sorghum, *Sorghum bicolor* (L.) 'BMR AF7301', proso millet, *Panicum miliaceum* L., Johnsongrass, *Sorghum halepense* (L.), barley, *Hordeum vulgare* L., rye, *Secale cereale* L., and the cultivated sorghums JS222, M627, PI 264453, RTx7000, RTx2737, RTx2783, PI 550607, and PI 556010 were used to determine host suitability and preference. The latter six sorghums are used to differentiate greenbug biotypes by phenotypic response from feeding injury (Burd 2006). Seed of each genotype were planted in cone-tainers (model SC10, S7S greenhouse supply, Tangent, OR) in a three-layer media of potting soil, fritted clay, and sand (from bottom to top, respectively). The cone-tainers were maintained in the greenhouse at 23.9°C with a photoperiod of 14:10 (L:D) h. When the plants reached the 3–4 leaf stage on 28 October 2013, they were infested with 10 sugarcane aphid nymphs. Seven replicates (i.e., individual plants in a cone-tainer) were infested, and the same number were not infested and grown for comparative purposes of measuring plant height. All plants were evaluated 12 November 2013 using a chlorosis rating of 1–9: 1, healthy; 2, 1–5% chlorotic; 3, 5–20%; 4, 21–35%; 5, 36–50%; 6, 51–65%; 7, 66–80%; 8, 81–95%; and 9, 95–100% or dead (Webster et al. 1991, Burd 2006). Chlorosis ratings were initiated when the susceptible control (RTx7000) was estimated to be 95% dead. Following the damage rating, each plant was cut at the soil surface so plant height could be measured (cm) and the number of leaves could be counted for both infested and non-infested plants. The continuous variables of aphid numbers, plant height, and number of leaves on a sorghum entry were subject to one-way ANOVA, with sorghum entry means compared ($\alpha = 0.05$) using least squared means pair-wise comparisons procedure (SAS 9.3, SAS Institute 2010). For the leaf chlorosis ratings, the Proc Rank procedure was used to compare rating estimates by sorghum genotype, with chlorosis estimates separated ($\alpha = 0.05$) by least squared means pair-wise comparisons procedure (SAS 9.3, SAS Institute 2010).

Phenotyping in the Field. The sorghum types evaluated in the greenhouse study were also evaluated in the field during the 2014 production season, in addition to more lines used to identify resistant sources to the sugarcane aphid. The additional sorghum genotypes including eight lines B11055, B11070, TAM428, Ent62/SADC, SC110, SC170, (Macia/TAM428)-LL9, and (SV1*Sima/IS23250)-LG15 and six hybrids ATx642/RTx2783, ATx2752/RTx2783, ATx2752/RTx437, ATx642/RTx436, A11055/RTx436, and A11055/RTx437 were included because they are related to RTx2783 (a derivative of SC110 that is known to be resistant to the greenbug biotypes C and E) or other lines that have potential phenotypic resistance (Table 1). On 18 February 2014, these lines were planted at the Texas A&M AgriLife Hiler Farm, Weslaco, TX, and a duplicate set were planted on 13 March at the Texas A&M AgriLife Research and Extension Center, Corpus Christi, TX. Three m rows of each line were planted in a complete randomized block, with 1-m alleys. Replicates 1–3 at both sites were treated with Cruiser 5FS (47.6% a. i. thiamethoxam; Syngenta Crop Protection, Greensboro, NC 27419) with 455 ml/100 kg of seed, along with the seed safener Concep III (74.3% a. i. Fluxofenin, Syngenta Crop Protection) with 0.4 g/kg seed, and Apron XL (33% a. i. Mefenoxam, Syngenta Crop Protection) 2.75 ml/100 kg seed. The remaining six replications were treated with identical seed treatments of Concep and Apron XL, and no insecticide.

The sorghum lines were evaluated for phenotypic injury near full physiological maturity on 11 June 2014 at Corpus Christi, TX, and 13 June 2014 for Weslaco, TX, by using a 1–9 damage rating scale (Sharma et al. 2013), where a rating of 1) represents few aphids present on the lower one to two leaves, with no apparent damage to the leaves; 2) lower one to two leaves showing aphid infestation, and 1–20% of the infested leaves or area showing damage symptoms; 3) lower two to three leaves showing aphid infestation, and 20–30% of the infested leaves or area showing damage symptoms, with moderate levels of honeydew and black moulds on the leaves or soil; 4) lower three to four leaves showing aphid infestation, and 30–40% of the infested leaves or area showing damage symptoms, with moderate levels of honeydew and black moulds on the leaves or soil; 5) lower four to five leaves showing aphid infestation, and 40–50% of the infested leaves or area showing damage symptoms, with moderate levels of honeydew and black moulds on the leaves or soil; 6) aphid infestation up to five to six leaves, and 50–60% of the infested leaves or area showing damage symptoms, and heavy honeydew and black mold on the leaves and on the soil below; 7) aphid infestation up to six to seven leaves, and 60–70% of the infested leaves or area

Table 1. Sorghum genotypes evaluated for sugarcane aphid (SCA) damage including the sorghum differentials used to determine greenbug (GB) biotypes

Pedigree	Background	Aphid resistance status
RTx2783	Parental Line	GB differential resistant to biotype C & E, (Peterson 1984)
RTx7000	Parental Line	GB differential susceptible to all GB biotypes (Burd 2006)
RTx2737	Parental Line	GB differential, resistant to biotype C, (Burd 2006)
B11055	Parental Line	Unknown
B11070	Parental Line	Unknown
TAM428	Parental Line	Resistant to SCA in South Africa (Teetes et al. 1995)
Ent62/SADC	Parental Line	Resistant to SCA in South Africa (Teetes et al. 1995)
SC110	Parental Line	Resistant to SCA in South Africa (Teetes et al. 1995)
SC170	Parental Line	Resistant to SCA in South Africa (Teetes et al. 1995)
(Macia/TAM428)-LL9	Parental Line	Resistant to SCA in South Africa (Teetes et al. 1995)
(SV1*Sima/IS23250)-LG15	Parental Line	Resistant to SCA in South Africa (Teetes et al. 1995)
AF7301	Sorghum Sudangrass Brown mid-rib	Unknown
JS222	Grain Hybrid	Unknown
M 627	Grain Hybrid	Resistant to GB biotype C, E and I (Park et al. 2006)
ATx642/RTx2783	Grain Hybrid	Resistant to GB biotype C and E
ATx2752/RTx2783	Grain Hybrid	Resistant to GB biotype C and E
ATx2752/RTx437	Grain Hybrid	Resistant to GB biotype C
ATx642/RTx436	Grain Hybrid	Unknown
A11055/RTx436	Grain Hybrid	Unknown
A11055/RTx437	Grain Hybrid	Unknown

Table 2. Chlorosis ratings, number of sugarcane aphids, plant height (cm) differences, and number of leaves for sorghum entries subjected to sugarcane aphid infestations under no-choice evaluation

Crop	Cultivar	Chlorosis rating[a]	Mean number of aphids /plant[b]	Difference in plant height[c]	Mean leaves/plant[d]
Grain Sorghum	RTx7000	7.6 ± 1.32ab	840 ± 102c	13.4 ± 3.69cd	6.0 ± 0.2b
Grain Sorghum	RTx2737	7.6 ± 1.02ab	849 ± 93c	27.1 ± 1.74a	5.1 ± 0.1bc
Grain Sorghum	RTx2783	1.3 ± 0.18d	801 ± 86c	1.9 ± 1.83d	7.0 ± 0.0a
Grain Sorghum	PI 550607	8.9 ± 0.14a	971 ± 31bc	10.1 ± 2.57cd	5.0 ± 0.0cde
Grain Sorghum	PI 550610	5.3 ± 1.08bc	427 ± 110d	12.4 ± 1.88cd	5.0 ± 0.2cde
Grain Sorghum	M 627	6.4 ± 1.02c	739 ± 51c	19.3 ± 6.52abc	5.9 ± 0.3bc
Grain Sorghum	JS222	6.9 ± 1.14ab	1106 ± 87bc	15.3 ± 1.70bc	5.7 ± 0.3bcd
Grain Sorghum	PI 264453	8.6 ± 0.30a	1355 ± 68a	12.1 ± 3.43cd	4.1 ± 0.1e
Forage sorghum	AF7301	8.0 ± 0.84ab	1150 ± 51ab	20.7 ± 2.97a	5.7 ± 0.1bcd
Johnsongrass	Native	6.3 ± 1.29c	1229 ± 95ab	16.4 ± 6.81ab	4.9 ± 0.7de

[a]Chlorosis Ratings (1–9), df = 15, 96; $F = 37.2$; $P > F = 0.0001$; Column means followed by the same lowercase letters are not significantly different, $P > 0.05$; LSD.
[b]Mean number of aphids per plant, df = 9, 69, $F = 7.78$; $P = <0.0001$; $P > 0.05$; LSD.
[c]Mean difference in plant height (Controls – Infested), df = 9, 69, $F = 4.35$; $P = <0.0002$; $P > 0.05$; LSD.
[d]Mean difference in leaf numbers, df = 9, 69, $F = 7.58$; $P = <0.0001$; $P > 0.05$; LSD.

showing damage symptoms, and heavy honeydew and black molds on the leaves and on the soil below; 8) aphid infestation up to seven to eight leaves, and 70–80% of the infested leaves or area showing damage symptoms, and heavy honeydew and black molds on the leaves and on the soil below; 9) heavy aphid infestation up to the flag leaf, and 80% of the leaves showing aphid damage symptoms, and heavy honeydew and black molds on the leaves and on the soil. Damage ratings were analyzed by Proc Rank, with the means compared ($\alpha = 0.05$) using least-squared means pair-wise comparisons procedure (SAS 9.3, SAS Institute 2010). Seed treated sorghum plots versus no insecticide seed treatment were contrasted against each other using Proc *t* test ($\alpha = 0.05$).

Results and Discussion

Host Range. Sugarcane aphids survived and reproduced on all sorghum genotypes including Johnsongrass, but did not prefer nor survive on proso millet, field corn, Teff grass, winter wheat, rye, or barley as a host when infested at the 3–4 leaf stage (Table 2). The non-sorghum genotypes were removed from statistical analysis because the sugarcane aphid did not survive on these hosts. Within the sorghum types, RTx2783, which is resistant to greenbug bitoypes C and E, showed a high degree of tolerance in supporting >800 aphids on a plant, and not statistically different than the susceptible RTx7000, but resulted in a damage rating significantly lower than any of the other sorghum (Table 2). The entry M627 which is resistant to greenbug C, E, I, and K had the second lowest chlorosis rating of 3.4 and supported a mid range of sugarcane aphid. Entry PI 550610, which is resistant to greenbug biotypes B, C, E, G, H, and I, expresses a form of antibiosis in that it supported from 50 to 80% fewer sugarcane aphid, and was statistically the lowest number of aphids from any entry in the experiment, and had a moderate damage rating of 5.3. This is in contrast to PI 550607 which is also resistant to greenbug biotypes B, C, E, G, H, and I, that supported high numbers of sugarcane aphid and the highest damage rating of the greenbug differentials. The greenbug biotype C-resistant RTx2737 exhibited no resistance to the sugarcane aphid in terms of damage rating or aphid numbers. The PI 264453 (greenbug biotype E resistant, Kofoid et al. 2012) was not resistant to sugarcane aphid, and supported the highest number of any of the entries, followed by the brown midrib forage sorghum AF7301. Johnsongrass supported >1200 sugarcane aphids during the evaluation period and resulted in a moderate damage rating of 6.3.

Plant height differences for infested plants versus control plants, ($df = 9, 69, F = 4.35, P = <.0002$) were significantly affected by sorghum entry when infested by sugarcane aphid (Table 2). Less than 2 cm difference in height were recorded between the tolerant RTx2783 when infested, versus the controls, as opposed to a >13-cm difference within the susceptible RTx7000 (Table 2). Although M627 had the second lowest chlorosis rating, it also had the greatest difference in height for the infested versus the noninfested plants. The greenbug biotype C differential RTx2737 had 27-cm difference in plant height, the greatest difference of any of the grain sorghum types. The PI 264453, JS222, and PI 550607 had mid range difference in plant height. The number of leaves that developed under heavy sugarcane aphid pressure ($df = 9, 69, F = 7.58, P = <.0001$) is a good indicator of plant growth under heavy aphid pressure (Table 2). The highly tolerant RTx2783 had the highest number of formed leaves, with a mean of 7.0 per plant. The remaining sorghum types that have documented greenbug resistance (RTx2737, PI 550607, PI 550610, M627) had between 5 and 6 leaves and did not differ statistically, followed by statistically lower JS222 and Johnsongrass, with <5 leaves per plant.

Field Phenotyping. Damage ratings from the sorghum trial at Weslaco were statistically different ($df = 1, 140, F = 16.7, P > F = 0.001$) when the untreated plots ($\bar{x} = 5.65 \pm 0.35$ SE) were contrasted against the seed treated ($\bar{x} = 4.81 \pm 0.21$ SE) ratings; therefore, the ranked estimates for comparing chlorosis ratings were conducted separately (Figs. 1 and 2, respectively). The Weslaco untreated plots showed a great diversity ($df = 19, 59, F = 22.24, P > F = <0.0001$) in phenotypic reaction to sugarcane aphids, with (Macia/TAM428)-LL9, AF7301, RTx7000, RTx2737, M627 and ATx642/RTx2783, ATx642/RTX437 resulting in >7.0 damage rating, an indication that the sugarcane aphid colonies had reached up to 6–9 leaves and causing leaf damage, sooty mold, and in some cases the aphids colonized the florescence of the plant (Fig. 1). TAM428 received a damage score of 5.6, which is considered a moderate phenotypic reaction, and comparable to field tests recorded from

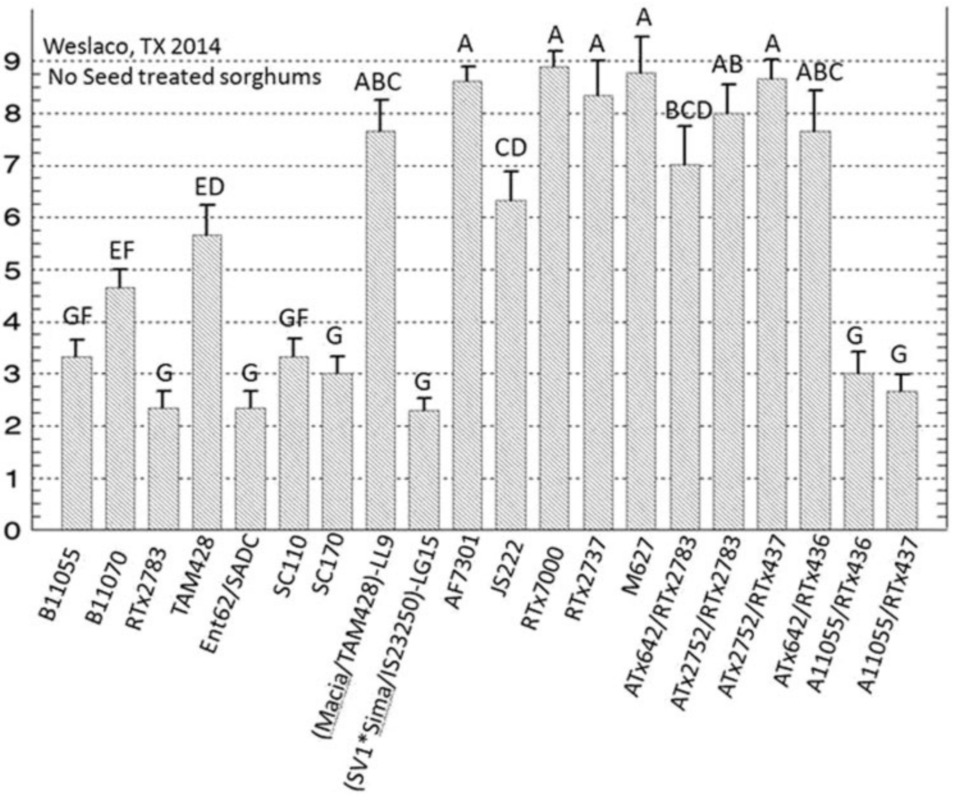

Fig. 1. Sorghum entries planted without seed-treated insecticide and evaluated for phenotypic damage from sugarcane aphid, *M. sacchari*, at the Texas A&M AgriLife Hiler research farm, Weslaco, TX, using the 1–9 scale (Sharma et al. 2013), 13 June 2014.

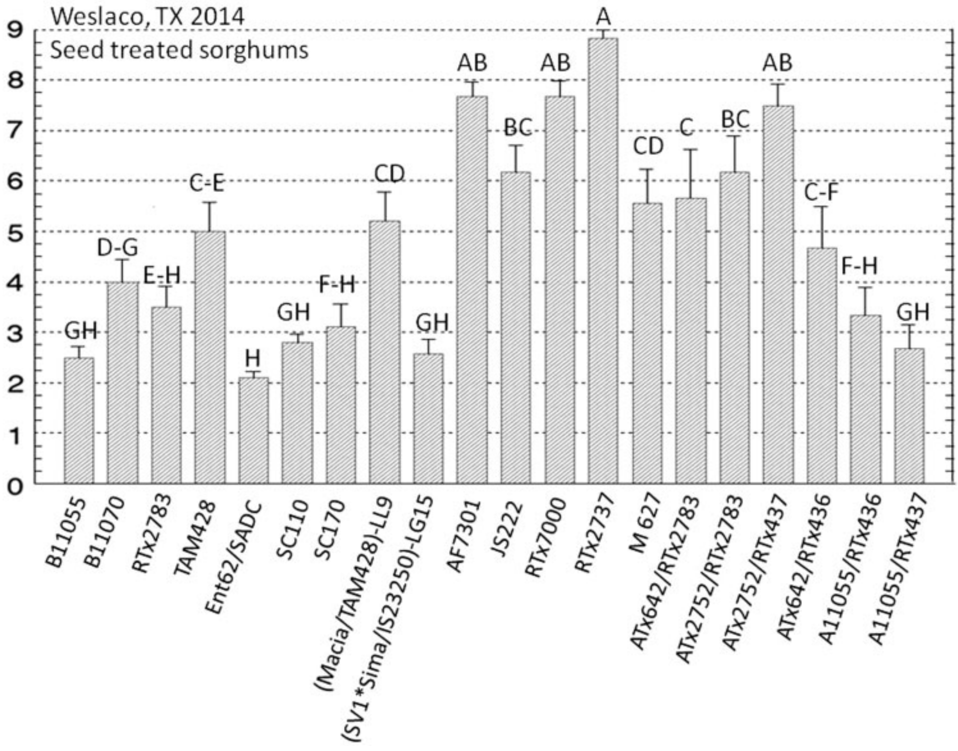

Fig. 2. Sorghum entries planted with seed treatment and evaluated for phenotypic damage to the sugarcane aphid, *M. sacchari*, at the Texas A&M AgriLife Hiler research farm, Weslaco, TX, using the 1–9 scale (see Sharma et al. 2013), 13 June 2014.

Maharashtra, India (Sharma et al. 2013). The nontreated B11070 from Weslaco was <5.0 and did not separate statistically from the TAM428. However, the remaining eight lines including B11055, Tx2783, Ent62/SADC, SC110, SC170, (SV1*Sima/IS23250)-LG15, AB11055/RTx436, and AB11055/RTx437 resulted in very favorable, low damage scores below 3.0, indicating that good sources of host plant resistance are inherent within these genotypes (Fig. 1).

The Weslaco seed-treated sorghums showed a very similar pattern in reaction to sugarcane aphid infestation (df = 19, 119, $F = 14.57$, $P > F = <0.0001$), when compared to the nontreated, but the insecticide lowered the damage ratings in the more susceptible genotypes AF7301, RTx7000, ATx642/RTx2783, and ATx642/RTx437 when compared to the untreated lines (Figs. 1 and 2). Only RTx2737 exceeded an 8.0, and very closely approached a 9.0, exceeded the rating for RTx7000, considered the susceptible in this test. A duplicate showing of very good sources of resistance was displayed from the B11055, Tx2783, Ent62/SADC, SC110, SC170, (SV1*Sima/IS23250)-LG15, A11055/RTx436, and A11055/RTx437 where they were very near a chlorosis rating of 3.0 or less. The B11070 rating was statistically higher with a rating of 4.0, and the TAM428 was 5.0, showing a mid-range resistance to the sugarcane aphid.

The analysis for the contrast of seed treated versus non-treat sorghums at Corpus Christi was not significant (df = 1, 140, $F = 1.17$, $P > F = 0.29$), with an overall damage means of 3.95 ± 0.27 SE for the untreated, and 3.77 ± 0.18 for the treated. The data for damage ratings were not analyzed separately as was the Weslaco site. The overall means for treated and untreated were indicative of infestations that were not as severe at Corpus Christi when compared to Weslaco (Fig. 3). This may be due to the fact that the sorghum was planted on March 13 as opposed to February 18 for Weslaco, and the sugarcane aphid appears to exponentially increase following boot to grain formation (van Rensburg 1973), and (Sharma et al. 2014). Only two susceptible lines, JS222 and RTx7000 exceeded a damage rating of 7.0, while AF7301 and RTx2737 were just under 7.0 (Fig. 3). The TAM 428 was just under a 4.0 rating at Corpus Christi, and not statistically different than the resistant RTx2783 with a 3.4. The highly resistant lines B11055, B11070, Ent62/SADC, SC110, SC170, (SV1*Sima/IS23250)-LG15, AB11055/RTx436, and AB11055/RTx437 again showed consistent inherent resistance to the sugarcane aphid.

Discussion

From the sorghum genotypes used to differentiate greenbug biotypes, RTx2783 is a good source of resistance to the sugarcane aphid based on no-choice tests in the greenhouse, and from phenotyping in the field. RTx2783 was developed for greenbug resistance to biotypes C and E, and has a complex breeding

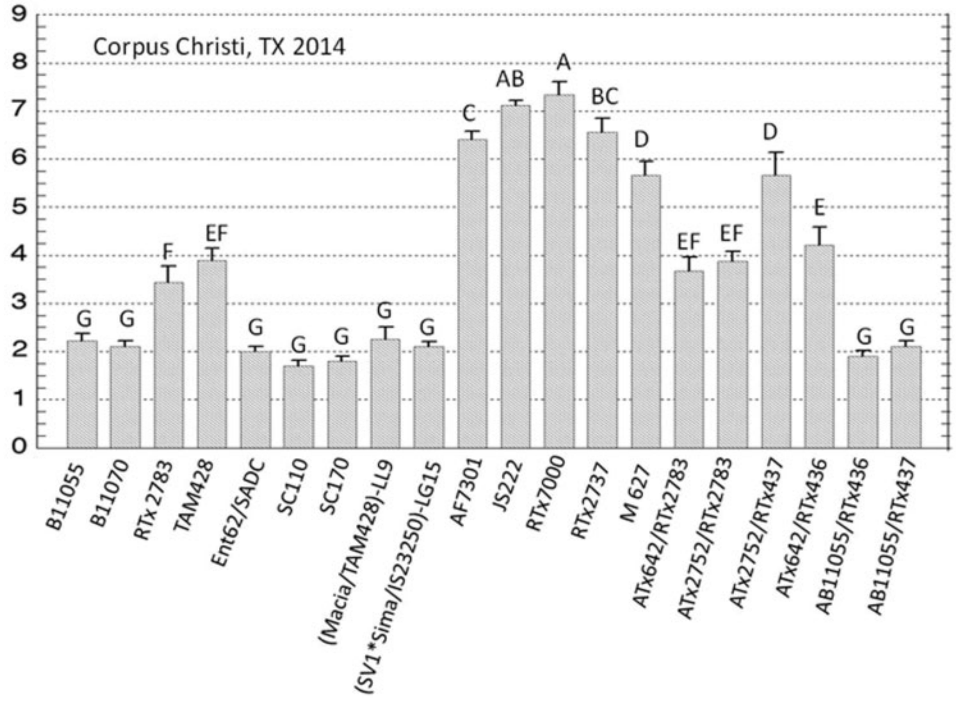

Fig. 3. Sorghum entries evaluated for phenotypic damage to the sugarcane aphid, *M. sacchari*, cultivated at the Texas A&M AgriLife Research and Extension Center, Corpus Christi, TX, using the 1–9 scale (see Sharma et al. 2013), 11 June 2014.

background (Peterson et al. 1984), which originates from Capbam (also known as Savarski), of Russian origin, and SC110 that comes from the converted lines from the USDA/Texas A&M program for shortening day-length. Manthe (1992) evaluated SC110 to the sugarcane aphid in South Africa and found it to be moderately resistant. At a minimum from these evaluations, RTx2783 is highly tolerant to sugarcane aphid in that it supports the same number of aphids as the susceptible RTx7000, but does not show the injury symptoms. We were unable to field test the greenbug resistant to biotypes C and E differentials PI 550607 and PI 550610 for lack of available seed, but PI 550607 was highly susceptible to sugarcane aphid, and PI 550610 was moderately resistant to sugarcane aphid in the greenhouse no-choice test. RTx2737, the greenbug C resistant differential, was highly susceptible to sugarcane aphid in greenhouse and field, and on some occasions more susceptible than the RTx7000.

Other substantial findings from these experiments are that approximately six sorghum germplasms B11055, B11070, Ent62/SADC, SC110, SC170, and (SV1*Sima/IS23250)-LG15, have a high degree of resistance to the sugarcane aphid. Both B11055 and B11070 are seed parent lines that share a common parent, which likely is the source of sugarcane aphid resistance, but little is known about this line. Further, the resistance in these lines appears dominant, as the hybrids of B11055, A11055/RTx436, and A11055/RTx437 are both resistant. The agronomic elite line Ent62/SADC was consistently resistant at Weslaco and Corpus Christi and was recognized as resistant to sugarcane aphid in South Africa (Peterson 2002). The parental lines from South Africa (SV1*Sima/IS23250)-LG15, SC110, and SC170 consistently provided resistance in the field and resulted in low scores that would prevent any mechanical harvest problems. These parental lines should be pursued for phenotypic resistance in breeding programs. The (Macia/TAM428)-LL9 was moderately resistant in the field phenotyping, but did not perform as consistently as the previously mentioned, especially at Weslaco without a seed-applied insecticide treatment.

TAM428 is reported to have both antixenosis and antibiosis resistance to sugarcane aphid in sorghum (Teetes et al. 1980, Manthe 1992, Xu 1982), and these two forms of resistance have been reported to be consistent with plant age (Teetes, et al. 1995). However, we found from field phenotyping that ratings varied from <3 under less sugarcane aphid pressure at Corpus Christi, to >5 under heavier pressure at Weslaco, using the same chlorosis scale that TAM428 was evaluated under in India (Sharma et al. 2013, 2014).

Johnsongrass, a universal North American weed species, supported high numbers of sugarcane aphid, and maintained a moderate chlorosis rating. This also coincides with many observations in the field that Johnsongrass is a good noncrop host for sugarcane aphid. The brown midrib forage sorghum AF7301 is susceptible to sugarcane aphid infestations which could have a negative impact on forage production for livestock in the southern United States. Proso millet, field corn, Teff grass, winter wheat, rye, and barley do not appear to host the sugarcane aphid when infested at the 3–4 leaf stage.

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