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Soybean aphid efficacy screening program, 2013

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Abstract
Efficacy of several insecticides and host plant resistance to SBA was evaluated. In 2013, we established plots at two Iowa State University Research Farms (Northeast and Northwest) on 19 Jun. "NK S20-Y2" soybean variety was used for all the soybean aphid-susceptible treatments, and "NK S21-Q3" soybean variety was used for the Rag1-containing treatments. Plots were arranged in a RCB design with four replications. Each plot was six rows wide and 50 ft long. For both locations, foliar treatments were applied using a backpack sprayer and TeeJet (Springfield, IL) twinjet nozzles (TJ 11002) with 20 gpa at 40 lb psi. Soybean aphids were counted on randomly selected whole plants within each plot. To estimate the total exposure of soybean plants to soybean aphid, we calculated cumulative aphid days (CAD) based on the number of aphids per plant counted on each sampling date. Yields (bushels/acre) were determined by weighing grain with a grain hopper and corrected to 13% moisture. One way analysis of variance (ANOVA) was used to determine treatment effects within each experiment. Means separation for all studies was achieved using a least significant difference test (LSD; α = 0.10).

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(F46)

SOYBEAN: *Glycine max* L. "NK S20-Y2" and "NK S21-Q3"

SOYBEAN APHID EFFICACY SCREENING PROGRAM, 2013

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Soybean aphid (SBA): *Aphis glycines* Matsumura

Efficacy of several insecticides and host plant resistance to SBA was evaluated. In 2013, we established plots at two Iowa State University Research Farms (Northeast and Northwest) on 19 Jun. "NK S20-Y2" soybean variety was used for all the soybean aphid-susceptible treatments, and "NK S21-Q3" soybean variety was used for the *Rag1*-containing treatments. Plots were arranged in a RCB design with four replications. Each plot was six rows wide and 50 ft long. For both locations, foliar treatments were applied using a backpack sprayer and TeeJet (Springfield, IL) twinjet nozzles (TJ 11002) with 20 gpa at 40 lb psi. Soybean aphids were counted on randomly selected whole plants within each plot. To estimate the total exposure of soybean plants to soybean aphid, we calculated cumulative aphid days (CAD) based on the number of aphids per plant counted on each sampling date. Yields (bushels/acre) were determined by weighing grain with a grain hopper and corrected to 13% moisture. One way analysis of variance (ANOVA) was used to determine treatment effects within each experiment. Means separation for all studies was achieved using a least significant difference test (LSD; $\alpha = 0.10$).

There were moderate CAD at the Northeast Research Farm in 2013. Foliar treatments with an R3 targeted application and the zero aphid treatment were made on 13 Aug. All other foliar applications were made on 21 Aug when plants were in the R4 growth stage. Soybean aphids in the untreated check plots averaged 92 per plant one day prior to the 21 Aug application, and peaked on 31 Aug at 477 aphids per plant. The untreated control had 9,944 CAD and was not significantly different than the seed treatment. There was a significant improvement in reducing aphids with all foliar insecticides versus the untreated control (Table 1). There was some variability in yield between treatments, but most products labeled for soybean aphid were not statistically different. The *Rag1*-containing treatments did suppress CAD; however, adding a foliar insecticide or seed treatments did not significantly improve yield (Table 1). There was higher CAD at the Northwest Research Farm in 2013. All foliar applications were made 23 Aug when plants were in the R4 growth stage. Soybean aphid populations in the untreated check plots averaged 211 per plant two days prior to the 23 Aug application and peaked on 15 Sep at 491 aphids per plant. The untreated control had significantly more CAD than all other treatments. There was a significant improvement in reducing aphids with all foliar insecticides versus the untreated check (Table 2). The *Rag1* treatment had significantly more aphids than other *Rag1*-containing treatments; however, the yield was not significantly reduced. This research was supported by industry gifts of seed, product and research funding.

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Treatment/formulation	Rate1	CAD2	Yield (bu/acre)
Untreated check	---	9944.94C	59.48ABC
CruiserMaxx Vibrance 6.77PS	62.5 g	7291.82B	58.35ABCD
Warrior II 2.08CS	1.92 fl oz	1149.45A	57.09ABCD
Warrior II 2.08CS + Lorsban Advanced 3.76EC	1.92 fl oz 16.0 fl oz	491.07A	57.51ABCD
Lorsban Advanced 3.76EC	16.0 fl oz	1736.26A	57.80ABCD
Asana XL 0.66EC	9.6 fl oz	1423.83A	58.44ABCD
Asana XL 0.66EC + Lannate 2.4LV	8.0 fl oz 8.0 fl oz	1128.05A	58.49ABCD
Orthene 75 97ST	1 lb	2915.13A	60.76AB
Declare 1.25CS	1.02 fl oz	2109.10A	57.99ABCD
Declare 1.25CS	1.28 fl oz	1684.68A	54.88DC
Declare 1.25CS + Dimethoate 4E	1.02 fl oz 4.0 fl oz	1305.53A	56.70ABCD
Belay 2.13SC	4.0 fl oz	6620.40B	58.59ABCD
Endigo ZCX 2.71SC	4.5 fl oz	1809.99A	58.36ABCD
Quilt Xcel 2.2SE	14.0 fl oz	11618.49C	59.85ABC
Warrior II 2.08CS + Quilt Xcel 2.2SE	1.92 fl oz 14.0 fl oz	1081.08A	56.50BCD
Cobalt Advanced 2.63EC	26.0 fl oz	1038.21A	55.82BCD
Cobalt Advanced 2.63EC + Headline 2.09EC	26.0 fl oz 12.0 fl oz	438.29A	61.70A
Besiege 1.25ZC	9.0 fl oz	1860.20A	53.59D
Fastac 0.83EC	3.8 fl oz	2241.44A	57.56ABCD
Hero 1.24EC	5.0 fl oz	1428.98A	57.73ABCD
Stallion 3.02EC	9.0 fl oz	2346.07A	60.44AB
Leverage 360 3SC	2.8 fl oz	1243.56A	54.26D
Rag1	---	3953.23b	54.31a
Rag1 + CruiserMaxx Vibrance 6.77PS	--- 62.5 g	330.83a	56.12a
Rag1 + CruiserMaxx Vibrance 6.77PS + Warrior II 2.08CS	--- 62.5 g 1.92 fl oz	47.12a	59.73a
Rag1 + Warrior II 2.08CS	--- 1.92 fl oz	744.28a	56.55a

Means within columns not followed by the same letter are significantly different (ANOVA; $P < 0.05$).
[1]Foliar product rates are given as formulated product per acre, and seed treatments are given as grams active ingredient per 100kg seed.
[2]Cumulative aphid days.

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Table 2.

Treatment/formulation	Rate1	CAD2	Yield (bu/acre)
Untreated check	---	12864.27C	46.78C
CruiserMaxx Vibrance 6.77PS	62.5 g	8804.83B	49.22B
Warrior II 2.08CS	1.92 fl oz	2183.17A	52.17A
Warrior II 2.08CS	1.92 fl oz	1341.15A	52.61A
+ Lorsban Advanced 3.75EC	16.0 fl oz		
Lorsban Advanced 3.75EC	16.0 fl oz	1385.80A	52.34A
Brigade 2EC	1.6 fl oz	924.57A	52.94A
Orthene 75 97ST	1 lb	1675.22A	52.54A
Magister 1.6CS	12.0	6365.87B	49.24BC
Rag1	---	6686.68b	49.18ab
Rag1	---	109.27a	47.19bc
+ CruiserMaxx Vibrance 6.77PS	62.5 g		
Rag1	---	61.89a	46.71c
+ CruiserMaxx Vibrance 6.77PS	62.5 g		
+ Warrior II 2.08CS	1.92 fl oz		
Rag1	---	1867.04a	50.12a
+ Warrior II 2.08CS	1.92 fl oz		

Means within columns not followed by the same letter are significantly different (ANOVA; $P < 0.05$).
[1]Foliar product rates are given as formulated product per acre, and seed treatments are given as grams active ingredient per 100kg seed.
[2]Cumulative aphid days.