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# Soybean Aphid Efficacy Screening Program, 2017

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**Abstract**
Soybean aphid, *Aphis glycines* Matsumura, has drastically changed soybean pest management in the North Central region. To date, SBA can be successfully managed by timely scouting and foliar insecticides in Iowa, but pyrethroid resistance is an emerging issue in the North Central region.

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SOYBEAN: *Glycine max* L.

# Soybean Aphid Efficacy Screening Program, 2017

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Soybean | *Glycine max*

Soybean aphid (SBA)| *Aphis glycines* Matsumura

Soybean aphid, *Aphis glycines* Matsumura, has drastically changed soybean pest management in the North Central region. To date, SBA can be successfully managed by timely scouting and foliar insecticides in Iowa, but pyrethroid resistance is an emerging issue in the North Central region.

In 2017, we established plots at two Iowa State University Research Farms (Northeast and Northwest) on 14 May and 30 May, respectively. NK S24-K2 soybean variety was used for all treatments. Plots were arranged in an RCB design with four replications. Each plot was six rows in width and 50 ft in length at the Northeast location and six rows in width by 44 ft in length at the Northwest location. Two treatments contained a seed treatment and were applied by Syngenta; seventeen treatments received a foliar insecticide (Table 1). Foliar applications at both locations were made on 18 Aug when plants were in the R5 growth stage. For Northeast location, foliar treatments were applied using a backpack sprayer and TeeJet (Springfield, IL) twinjet nozzles (TJ 11002) with 20 gpa at 40 lb psi. For Northwest location, foliar treatments were applied using a custom sprayer and TeeJet (Springfield, IL) flatfan nozzles (TJ 8002) with 14 gpa at 40 lb psi. Soybean aphids were counted on randomly selected whole plants within each plot. The number of plants sampled per plot started at 20 at plant emergence and were gradually decreased to five as plants reached senescence. To estimate the total exposure of soybean plants to SBA, we calculated cumulative aphid days (CAD) based on the number of aphids per plant counted on each sampling date. Yields (bu/acre) were determined by weighing grain with a hopper and corrected to 13% moisture. One-way ANOVA was used to determine treatment effects within each experiment. Means separation for all studies was achieved using a least significant difference test ($\alpha = 0.10$). All statistical analyses were performed using SAS software.

The plots at each farm were uniformly colonized in June and there was light SBA pressure at both locations until after full bloom, or early Aug. At the Northeast location, SBA in the untreated control plots averaged 12 per plant 4 days prior to the 18 Aug application and peaked on 12 Sep at 132 aphids per plant. All treatments provided significant reduction of aphid exposure compared with the untreated check which had 1,872 CAD (Table 1). There was some variability in yield between treatments, but most seed and foliar products labeled for SBA did not produce enough impact to improve yield compared with the untreated control. At the Northwest location, SBA in the untreated control plots averaged 241 per plant 3 days prior to the 18 Aug application and peaked on 9 Sep at 651 aphids per plant. The untreated control had significantly higher CAD compared with seed and foliar treatments (Table 2). There was some variability in yield between treatments, but most seed and foliar products labeled for SBA did not produce enough impact to improve yield compared with the untreated control. Most of the CAD accumulated in late Aug and early Sep and did not affect yield among treatments.

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**Table 1.**

| Treatment and formulationa | Rateb | CADc | Yieldd |
|---|---|---|---|
| Untreated control | – | 1,872.49E | 60.21ABCD |
| Cruiser 5FS | 79.95g | 703..09BCD | 59.35ABCDE |
| Cruiser 5FS + | 79.95g | 321.53AB | 60.10ABCD |
| Warrior II 2.08CS | 1.6 fl oz | | |
| Warrior II 2.08CS | 1.92 fl oz | 960.78CD | 58.77ABCDE |
| Lorsban Advanced 3.76EC | 16.0 fl oz | 152.73A | 58.09DE |
| Warrior II 2.08CS + | 1.92 fl oz | 134.20A | 59.77ABCDE |
| Lorsban Advanced 3.76EC | 16.0 fl oz | | |
| Dimethoate 4E | 16.0 fl oz | 177.66A | 59.32ABCDE |
| Hero 1.24EC + | 5.0 fl oz | 193.72A | 60.67ABC |
| Dimethoate 4E | 16.0 fl oz | | |
| Agri-Mek 0.7SC | 2.5 fl oz | 982.96CD | 58.29CDE |
| Brigadier 2SC | 6.1 fl oz | 147.26A | 59.67ABCDE |
| Carbine 50WG | 2.8 oz | 182.30A | 60.76ABC |
| Cobalt Advanced 2.63EC | 16.0 fl oz | 132.67A | 60.63ABC |
| Transform 50WG | 1.0 oz | 128.69A | 60.96AB |
| Seeker 2.09SE | 2.1 fl oz | 137.78A | 61.13A |
| Sivanto 200 1.76SL | 7.0 fl oz | 207.07A | 59.24ABCDE |
| Movento 2SC | 4.0 fl oz | 615.03BC | 57.41E |
| Endigo ZC 2.06SC | 3.5 fl oz | 131.68A | 60.33ABCD |
| Leverage 360 3SC | 2.8 fl oz | 1,067.80D | 58.58BCDE |
| Tundra 2EC | 6.4 fl oz | 391.21AB | 58.05DE |

Means within columns not followed by the same letter are significantly different. Least significant difference for mean separation of cumulative aphid days ($P < 0.0001$; $F = 6.87$; df = 18, 3). Least significant difference for mean separation of yield ($P = 0.1950$; $F = 1.34$; df = 18, 3).

[a]Formulations are given in pounds of active ingredient per gallon of product for liquids and in percent active ingredient for solids.

[b]Foliar product rates are given as formulated product per acre and seed treatments are given as grams active ingredient per 100-kg seed.

[c]Cumulative aphid days.

[d]Yield in bu per acre.

**Table 2.**

| Treatment and formulationa | Rateb | CADc | Yieldd |
|---|---|---|---|
| Untreated control | – | 14,004.47F | 57.46AB |
| Cruiser 5FS | 79.95g | 6,601.77DE | 60.35AB |
| Cruiser 5FS + | 79.95g | 1,344.30AB | 58.14AB |
| Warrior II 2.08CS | 1.6 fl oz | | |
| Warrior II 2.08CS | 1.92 fl oz | 2,657.48ABC | 59.02AB |
| Lorsban Advanced 3.76EC | 16.0 fl oz | 1,796.35ABC | 62.28A |
| Warrior II 2.08CS + | 1.92 fl oz | 3,854.51BCD | 58.42AB |
| Lorsban Advanced 3.76EC | 16.0 fl oz | | |
| Dimethoate 4E | 16.0 fl oz | 1,718.64AB | 58.47AB |
| Hero 1.24EC + | 5.0 fl oz | 1,070.83AB | 59.07AB |
| Dimethoate 4E | 16.0 fl oz | | |
| Agri-Mek 0.7SC | 2.5 fl oz | 8,442.74E | 57.67AB |
| Brigadier 2SC | 6.1 fl oz | 1,796.60ABC | 55.35B |
| Carbine 50WG | 2.8 oz | 1,394.15AB | 57.06AB |
| Cobalt Advanced 2.63EC | 16.0 fl oz | 1,488.24AB | 61.45AB |
| Transform 50WG | 1.0 oz | 1,235.70AB | 59.20AB |
| Seeker 2.09SE | 2.1 fl oz | 658.33A | 60.37AB |
| Sivanto 200 1.76SL | 7.0 fl oz | 2,467.79ABC | 57.42AB |
| Movento 2SC | 4.0 fl oz | 4,613.69CD | 62.21A |
| Endigo ZC 2.06SC | 3.5 fl oz | 2,369.28ABC | 57.52B |
| Leverage 360 3SC | 2.8 fl oz | 3,235.24ABC | 55.74B |
| Tundra 2EC | 6.4 fl oz | 1,466.81AB | 62.24A |

Means within columns not followed by the same letter are significantly different. Least significant difference for mean separation of cumulative aphid days ($P < 0.0001$; $F = 6.47$; df = 18, 3). Least significant difference for mean separation of yield ($P < 0.0001$; $F = 3.79$; df = 18, 3).

[a]Formulations are given in pounds of active ingredient per gallon of product for liquids and in percent active ingredient for solids.

[b]Foliar product rates are given as formulated product per acre, and seed treatments are given as grams active ingredient per 100-kg seed.

[c]Cumulative aphid days.

[d]Yield in bu per acre.