

IOWA STATE UNIVERSITY
University Extension

SOYBEAN APHID MANAGEMENT

FIELD GUIDE 2008



*A visual aid for identifying,
managing and defending
your soybean fields from
yield-robbing aphids.*

Soybean Aphids in 2008 – Biology and Management

During any growing season, the soybean aphid remains a threat to cause economic damage to soybeans. This publication reviews what is currently known about soybean aphids and suggests management strategies.

By Marlin E. Rice and Matt O'Neal



Cover photo by Marlin Rice

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SOYBEAN GROWTH STAGES

Growth stages can overlap within a field. A growth stage begins when the majority (50 percent or more) of the plants in a field are at or beyond that stage.

Vegetative stages

VE: Emergence

VC: Unrolled unifoliolate leaves

V1: First unrolled trifoliolate leaf

V2: Second unrolled trifoliolate leaf

V(n): n-th unrolled trifoliolate leaf

Reproductive stages

Bloom – R1 and R2

R1: Beginning bloom

Plants have at least one open flower at any node.

R2: Full bloom

Plants have an open flower at one of the two uppermost nodes on the main stem.

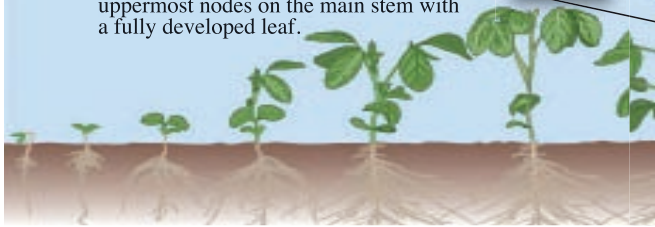
Pod development – R3 and R4

R3: Beginning pod

Pods are $\frac{3}{16}$ inch long at one of the four uppermost nodes on the main stem with a fully developed leaf.

R4: Full pod

Pods are $\frac{3}{4}$ inch long at one of the four uppermost nodes on the main stem with a fully developed leaf.



VE	VC	V1	V2	V3	
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Seed development – R5 and R6

R5: Beginning seed

Seeds are $\frac{1}{8}$ inch long in the pod at one of the four uppermost nodes on the main stem.

R6: Full seed

Pods contain green seeds that fill the pod capacity at one of the four uppermost nodes on the main stem.

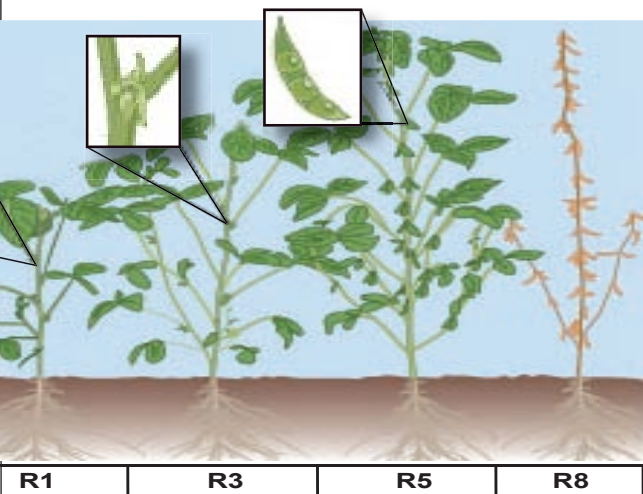
Maturity – R7 and R8

R7: Beginning maturity

One pod on the main stem has reached its mature color (tan or brown).

R8: Full maturity

95 percent of the pods have reached their mature pod color.



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IDENTIFYING THE APHID

Origin of Soybean Aphid

The soybean aphid (*Aphis glycines*) is native to eastern Asia, including China, Indonesia and Japan, where it is an infrequent pest of soybeans. It was first detected in North America in Wisconsin in July 2000 and now occurs throughout all Midwestern soybean producing states. It is not known how this insect entered the United States, but historical records of other aphid interceptions by the U.S. Department of Agriculture suggest that the soybean aphid most likely was introduced mistakenly via an international flight from Asia.

History in Iowa

The soybean aphid is a major pest for soybean growers in Iowa. Several outbreaks have occurred since the aphid invaded the state, including 2003, 2005 and 2007. During outbreaks, if aphid populations are left untreated their populations can easily exceed several thousand per plant. Such high populations may require an insecticide application to prevent yield loss. Correspondingly, in 2003 approximately 2.9 million acres in Iowa were sprayed with insecticides to reduce aphid populations and a survey of 2,400 Iowa farmers indicated



that yield losses reached 57.7 million bushels of soybeans. However, in 2004 only 50,000 acres were treated for soybean aphids because of very low aphid populations. The most recent outbreak occurred in 2007, when nearly half of all the soybeans grown in Iowa were treated with an insecticide. The on-again, off-again nature of these outbreaks may continue into the future, but growers should not rely on this trend as part of a pest management program.

Description of Soybean Aphid

The soybean aphid is the only aphid in North America that will develop large, persistent colonies on soybeans. Therefore, any cluster of aphids found on soybeans must be soybean aphids. There are both wingless and winged forms. Wingless soybean aphid adults are about $\frac{1}{16}$ inch in length, pale yellow or green, and have dark-tipped cornicles (tail pipes) near the end of the abdomen. The winged form has a shiny black head and thorax with a dark green abdomen and black cornicles. Aphids feed through piercing-sucking mouthparts.



Winged aphid

Other Soybean Arthropods

Whiteflies, spider mites and thrips occur on soybean and may be confused with aphids, but only spider mites cause economic damage. Correct identification of these arthropods is necessary to prevent unnecessary insecticide applications.



Whiteflies



Spider mite



*Soybean thrips and
soybean aphid*

Distribution in Iowa

Soybean aphids occur in every Iowa county. Since its discovery in northeastern Iowa in August 2000, the soybean aphid quickly spread across Iowa. Twelve months later, the aphid was detected in western Iowa in Woodbury County and by summer's end of 2002 it occurred statewide.



Biology and Seasonal Cycle

The seasonal cycle of the soybean aphid is complex. Eggs are laid on buckthorn in the fall, overwinter there, and hatch in the spring, giving rise to wingless females. These wingless females on buckthorn reproduce without mating and the young develop into winged females that migrate in search of soybean. There may be up to four generations on buckthorn in the spring.

Females on soybean reproduce without mating and produce wingless daughters that continue the cycle. During the summer, winged aphids may develop on soybean, which puts much of the Iowa soybean crop at risk because the aphids are easily carried by winds to areas where the aphid may not have overwintered.

Soybean aphids may have 15 to 18 generations on soybean. Reproduction is affected by temperature. The optimum temperatures for reproduction and longevity are 72 to 77°F with the relative humidity below 78 percent. Field based estimates of aphid population growth in Iowa suggest that a population can double in size every 5¹/₂ to 7 days. When temperatures



exceed 81°F the developmental time is lengthened. At 95°F, the lifespan is greatly shortened and no young are produced.

In late summer the wingless females produce young that develop into both winged females and males. These winged aphids migrate back to buckthorn, where they mate. These mated females subsequently lay eggs, beginning a new seasonal cycle that passes through the winter.

Host Plants

Buckthorn, a small woody tree, is the primary host for soybean aphids. Soybean aphids prefer to lay their eggs on seedling or sapling trees in the fall. Eliminating buckthorn might seem to be a logical approach to reducing soybean aphid populations, but this is impractical. Buckthorn grows widely across Iowa in wooded areas and river bottoms, and has been planted in shelterbelts as windbreaks. If all the buckthorn in a county could be eliminated,



Two soybean aphid eggs on buckthorn.

winged aphids could still fly in from other counties to infest soybean fields.

Soybean is a secondary host because the aphids do not reproduce sexually on this plant. Crimson clover and red clover also are excellent hosts for soybean aphids and will support high levels of aphid reproduction. Berseem clover and kura clover will support aphid reproduction to a lesser extent. White clover, white sweet clover and yellow sweet clover are extremely poor hosts and only can support low levels of aphids.

First Occurrence in Soybeans

Very small colonies of aphids occasionally can be found from late May to mid June. The first detection on soybeans can occur on seedling soybean plants (V1-V2 stage). Aphids can frequently be found in early June in extreme northeast Iowa, but in 2006 the first aphids were reported from Ames on May 31. Despite this early occurrence, it takes several weeks for populations to spread across a field and reach levels that could reduce yield.

Year to Year Population Variation

Since 2000, aphid populations have gone through dramatic high and low cycles. Generally, high populations (>2,000 aphids/plant) occurred in 2001, 2003, 2005 and 2007 followed by low populations (<250 aphids/plant) in 2002, 2004 and 2006. Our understanding of this insect is still incomplete and it would be premature to say that the soybean aphid population oscillates through predictable high and low cycles.

However, an analysis of data from suction traps across the Midwest provides insight into these high and low cycles.



Winged soybean aphids are collected in these traps as they fly between soybean fields in the summer and then in the early fall as they migrate back to buckthorn. In high aphid years, large numbers of winged aphids are trapped in July and early August, but by late August, the capture of winged aphids drops off dramatically.



Very few, if any male and female winged aphids are collected in the early fall migrating back to buckthorn to lay their eggs. Low numbers of overwintering eggs leads to low numbers of aphids colonizing soybeans the following spring. In contrast, for low aphid years, very small numbers of winged aphids are trapped during July and August, but in September significantly more aphids (nearly 40 times more) are trapped. Large numbers of winged aphids captured in the fall suggest that large numbers of eggs will probably be laid on buckthorn, followed by large populations of aphids next spring.

Injury Symptoms in Soybean

Soybean aphids may distort soybean leaves and heavily-infested plants may have yellow leaves. Honeydew, a sticky and shiny liquid is excreted by the aphids as a byproduct from ingesting large amounts of plant juices. Honeydew accumulates on stems and the top surface of leaves. Excessive honeydew permits the growth of sooty mold, turning the leaves dark and interfering with plant photosynthesis. Heavily-infested plants may be stunted. Plants stunted during the early reproductive growth stages of soybean may have reduced pod set and seed counts, resulting in lower yields.

Feeding by soybean aphids causes flowers and small pods to abort, reducing the number of pods per plant. Aphid feeding also competes with the soybean plant for nutrients, which reduces the number of soybeans per pod and, less frequently, the size of soybeans. Therefore, protecting plants during the flowering stages (R1-R2) and green-bean pod stages (R5-R6) helps protect soybean yield. These soybean stages typically occur from mid July into early August in Iowa.



*Sooty mold and
aphid honeydew
on soybean leaves.*

Virus Transmission

Soybean aphids can transmit several viruses including alfalfa mosaic virus, bean yellow mosaic virus and soybean mosaic virus. The soybean aphid is an efficient transmitter of soybean mosaic virus, requiring less than 30 minutes of feeding time for efficient transmission. Soybean mosaic virus is of primary concern because it can cause significant yield loss, although yield losses from this disease have not yet been documented in the state. Insecticides are ineffective in preventing aphid-transmitted viruses. This virus may be more important when it occurs in plants that also are infected with bean pod mottle virus that is transmitted by the bean leaf beetle. Growers may want to consider an insecticide program that interrupts the bean leaf beetle feeding in an effort to prevent bean pod mottle virus transmission. Plant-expressed symptoms of these two viruses are similar and cannot be separated visually from each other in the field.





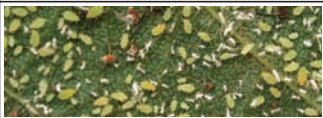


Natural Enemies

Soybean aphids are eaten by several predatory insects, including lady beetles (especially the multicolored Asian lady beetle), insidious flower bugs (also called Orius bugs), and green lacewings. The multicolored Asian lady beetle is capable of eating as many as 200 soybean aphids a day. These predators help suppress soybean aphid population growth in June and early July when fields have small aphid populations. Once aphids fully infest a field (80 percent or more of plants with aphids) and populations reach 100 to 200 aphids per plant, the impact of these predators is limited and aphid populations are likely to increase. Lady beetles feed on soybean aphid eggs on buckthorn during the fall. This predation on eggs may significantly reduce the soybean aphid population the following spring and be partly responsible for the population cycles during the last six years.

Fungal pathogens also have been observed to reduce soybean aphid populations in Iowa, Minnesota and Wisconsin. This disease causes a very quick (less than one week) decline in aphid numbers, and is believed to be partly responsible

for the reduction in late season aphid densities in 2007. The fungus kills the aphid, causing it to shrivel and turn brown.

Stingless, parasitic wasps also attack soybean aphids and lay eggs inside them. The wasp larva kills the aphid, causing it to swell and turn tan in color. The swollen aphid is called a mummy. Later, an adult wasp emerges from the mummy. A female wasp may parasitize up to 180 aphids during her short life-span of one week. Currently, parasitic wasps are not a major source of soybean aphid mortality in Iowa. However, in their native China, these wasps significantly reduce aphid populations. In 2007, the Asian species of wasp, *Binodoxys communis*, was released in the Midwest. It is too early to know the impact introduced parasitic wasps will have in reducing soybean aphid outbreaks. However, if more than 40 percent of aphids on a plant are mummies, the aphid population is unlikely to increase.

Beneficial Insects	
<p>Asian lady beetle (Helps suppress population growth in early stages of infestation.)</p>	
<p>Lady beetle larva (Larvae feed on aphids and other soft-bodied insects.)</p>	
<p>Orius bug (Feed primarily on aphids.)</p>	
<p>Green lacewing (Larvae feed primarily on aphids.)</p>	
<p>Soybean aphid fungus (Fungus kills the aphid causing it to turn brown.)</p>	
<p>Soybean aphid mummy (Parasitic wasp larvae kill aphids, causing it to swell.)</p>	
<p>Binodoxys wasp (Binodoxys can kill soybean aphids.)</p>	

MANAGING APHIDS

Management Considerations

Do not use insecticides when small populations of soybean aphids occur in the field. Do not tank mix an insecticide with an early season herbicide when aphid populations are not present or below the economic threshold. Insecticides will kill beneficial insects and this often permits aphid populations to recover quickly and increase rapidly in size, thereby requiring an additional insecticide application. Preserve early season natural enemies, like lady beetles, which help suppress small aphid populations. Scout the field over several days to determine if the aphid population is increasing or decreasing. Conditions that favor an increase in aphids are:

- plants under drought stress,
- potassium deficient soils,
- cool temperatures, and
- absence of beneficial insects.

If most of the aphids are winged or nearing this stage, they may leave the field; an insecticide may not be needed because the population will rapidly decline. Also check for parasitized aphids (called mummies). Do not spray if a majority of the aphids have turned to mummies.

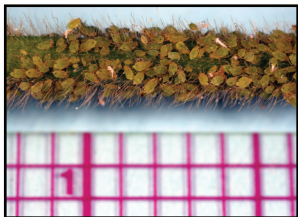
Economic Threshold

The *economic injury level* and *economic threshold* are two important concepts that help us understand soybean aphid and yield loss relationships. The economic injury level is the lowest number of insects that will cause economic damage; that is, yield loss that equals the cost of control. University research has determined the economic injury level to be 654 aphids per plant during the R1 to R5 growth stages for 30-inch row soybeans. The economic threshold is a similar concept, but it is a *lower pest density* at which management action should be taken to prevent an increasing pest population from reaching the economic injury level. The economic threshold has been set at **250 aphids per plant**. The economic threshold of 250 aphids per plant provides a 5 to 7 day lead time before the aphid population would be expected to exceed the economic injury level – and cause economic damage. Field populations that average less than 250 aphids per plant should not be sprayed, even with increasing commodity prices. Research shows that yield losses can rarely be detected when populations are smaller than 250 aphids per plant. Therefore, we recommend an insecticide be applied when the economic threshold is reached and aphid populations are increasing.

Field Scouting

Scouting must be conducted to determine aphid presence and abundance. Begin scouting for soybean aphids the last week of June, especially in northeastern Iowa. Check for aphids on the youngest two or three trifoliolate leaves and stems in the plant terminal. Scout five locations for each 20 acres. Also look for ants or lady beetles on the soybean plant – they are good indicators of the presence of aphids. Lady beetles feed on aphids while ants tend to the aphids and “milk” them for honeydew. Field scouting should occur weekly until plants reach the mid-seed stage (R5.5) or the field is sprayed.

When aphids are found, estimate the population size per plant. Develop a mental reference for gauging populations on other plants by first counting small colonies to establish what a cluster of 100 or 250 aphids looks like, and then use this as a guide. As a point of reference, a colony that completely covers all sides of a stem for one inch will contain 250 to 300 aphids.



Speed Scouting

University of Minnesota entomologists have developed a binomial sampling plan, called “speed scouting.” This scouting plan can greatly decrease scouting time in a field



because every insect is not counted. The binomial scouting cut-off point is 40 aphids per plant. If a plant has less than 40 aphids, it is considered to be non-infested. However, if the plant has 40 or more aphids (remember, counting additional aphids is not necessary after 40), the plant is infested. Based on the speed scouting sampling plan, three treatment decisions are possible:

1. Do not treat that field,
2. Treat that field, and
3. Resample that field in 3 to 4 days.

(See chart on page 29 for details.)

Speed scouting is NOT a new economic threshold! The economic threshold is 250 aphids/plant through pod set. Speed scouting is simply an alternative scouting method that considers whether a plant is infested or not. If there are more than 40 aphids, then the plant is infested. This sampling plan uses the *percent infested plants* as an indicator of damaging soybean aphid populations.

Speed Scouting Directions

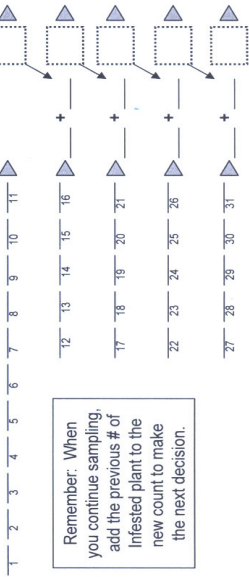
1. Select the first plant at random. If less than 40 aphids are on the entire plant, mark a minus [-] for that non-infested plant. If at least 40 aphids are on the plant (STOP COUNTING when you reach 40 – this is the speedy part), mark a plus [+] for that infested plant.
2. Choose a direction at random and walk 30 rows or paces to the next plant.
3. Repeat Step #1 until 11 plants are sampled in different areas of the field.
4. Make a decision using the total number of infested plants (the total number of pluses).
5. If you must ‘continue sampling’ (7 to 10 plants with a +), sample five more plants and use the new total number of plants (16) to make a decision.
6. If no decision is reached, sample additional sets of five plants until 31 plants are sampled. Remember, always use the total number of plants to make a decision.
7. If no decision can be made after sampling 31 plants, resample the same field in 3 to 4 days.
8. A ‘TREAT’ decision must be confirmed a second time 3 to 4 days later. If confirmed, apply an insecticide in 3 to 4 days.

Also available online at:

www.soybeans.umn.edu/pdfs/2007/aphid/speed_scouting_2007.pdf

Speed Scouting Chart

Use these - = Less than 40 aphids/ plant ('non-infested')
 Notations: + = 40 or more aphids/ plant ('infested')



Remember: When you continue sampling, add the previous # of infested plant to the new count to make the next decision.

DO NOT treat. Resample in 7-10 days	CONTINUE sampling 5 more plants	TREAT decision, confirm in 3-4 days
6 or less	7 to 10	11 or more
10 or less	11 to 14	15 or more
14 or less	15 to 18	19 or more
18 or less	19 to 22	23 or more
22 or less	23 to 26	27 or more

STOP SAMPLING!
 Resample the same field
 in 3-4 days.

CONFIRM 'TREAT' DECISION
 Resample the same field in 3-4 days
 Apply insecticide in 3-4 days if confirmed

Plant Stage: _____

Notes: _____

INSECTICIDE RECOMMENDATIONS

Insecticide Selection

Optimal soybean aphid control and yield protection depends both on product selection and timing of the application. The best insecticide would be one that provided the greatest efficacy (percent of killed aphids), the most residual activity (extended control), the least environmental impact (mortality of beneficial insects), and the least cost to the producer. There are no perfect insecticides, but there are performance traits that may help determine product selection.

Several insecticides are labeled for soybean aphid (or Chinese aphid on some labels). These are listed in the table on page 34. Read and follow all label directions, and take special note of the pre-harvest interval that determines how many days must pass between the insecticide application and legal harvest.



Photo by Mick Lane, ISA

Insecticide Timing

Insecticide applications made during the early soybean reproductive stages (R1-R4) have provided the largest and most consistent yield protection. After soybeans reach the R5.5 stage, the yield benefit of any insecticide application substantially decreases.

On-farm strip-trial data have shown that fields sprayed in early August had larger yields than fields sprayed in mid August. During 2003, for each day delay in spraying after August 1, an average of 0.5-0.6 bushel was lost daily. Fields sprayed in late August and early September often showed no yield response to the insecticide application because the aphid damage had occurred prior to this time. In contrast, during 2002, aphid populations increased earlier in the season and some fields sprayed twice during mid and late July benefited from both treatments with significant yield increases.

Fields should be sprayed before the economic injury level of 654 aphids per plant is reached. If heavy honeydew, sooty mold and stunted plants appear in the field, then the optimum time for an insecticide application has passed.

Insecticide Application

Aphids can be effectively killed with either ground or aerial application. However, the following three elements are required for optimum control (98 percent kill or higher): increased application pressure, increased carrier (water) per acre, and small droplet size. Thorough coverage of a soybean plant is essential for optimum aphid control, especially because soybean aphids feed on the underside of leaves. If insecticide control is poor, expect the remaining aphids to reproduce and potentially reach the economic threshold again.

Insecticide Evaluation

Numerous insecticides, including seed treatments, have been evaluated for their capacity to manage soybean aphids. Generally, foliar-applied insecticides provide the best plant protection and yield protection against soybean aphids with little difference in performance between insecticides of either the organophosphate or pyrethroid chemical classes. In Iowa trials, seed treatments applied at planting were generally ineffective at keeping soybean aphids below the economic threshold of 250 aphids per plant.

*Properly applied
insecticides can
provide control
of aphids.*



Photo by Mick Lane, ISA

Insecticides Labeled for Soybean Aphids.

Product	Active ingredient	Chemical class	Rate	Pre-harvest interval
Asana XL*	esfenvalerate	pyrethroid	5.8-9.6 fl oz/acre	21 days
Baythroid XL*	cyfluthrin	pyrethroid	2.0-2.8 fl oz/acre	45 days
Cobalt*	chlorpyrifos + gamma-cyhalothrin	organophosphate + pyrethroid	13-26 fl oz/acre	30 days
Cruiser ¹	thiamethoxam	neonicotinoid	100 g/100 kg seed	---
Leverage*	imidacloprid & cyfluthrin	neonicotinoid + pyrethroid	3.8 fl oz/acre	45 days
Decis*	deltamethrin	pyrethroid	1.5-1.9 fl oz/acre	21 days
Gauche ¹	imidacloprid	neonicotinoid	62.5 g/100kg seed	---
Hero*	zeta-cypermethrin + bifenthrin	pyrethroid	4.0-10.3 oz/acre	21 days
Lorsban 4E*	chlorpyrifos	organophosphate	1-2 pts/acre	28 days
Mustang Max*	zeta-cypermethrin	pyrethroid	2.8-4 fl oz/acre	21 days
Nufos*	chlorpyrifos	organophosphate	1-2 pts/acre	28 days
PennCap M*	methyl parathion	organophosphate	1-3 pts/acre	30 days
Proaxis*	gamma-cyhalothrin	pyrethroid	1.92-3.2 fl oz/acre	45 days
Warrior II*	lambda-cyhalothrin	pyrethroid	0.96-1.6 fl oz/acre	30 days

*Restricted-use insecticide

¹ Rate of seed treatments is given as grams product/kilogram seed (1 kg = 2.4 lbs)

Insecticide Performance

Insecticide evaluations in Iowa suggest that organophosphates and pyrethroids vary little in their ability to control soybean aphids. However there may be conditions that favor one class over another.

The pyrethroid insecticides have provided consistent control in many university insecticide trials. Pyrethroid insecticide performance is enhanced during cool temperatures. Under drought conditions, growers are discouraged from using pyrethroids, as these tend to flair spider mites. Lorsban, an organophosphate insecticide, exhibits a vapor action, especially during high temperatures. This can improve coverage in tall plant canopies or narrow-row or drilled soybeans. Although organophosphates have activity against adult spider mites, growers should be aware that there is poor activity against spider mite eggs. If spider mites are present, fields should be scouted three days after application to insure sufficient spider mite control.

Consider leaving a small, unsprayed test strip in the field. Information gained from this strip will help determine the real value and performance of the insecticide treatment and yield gained.

Seed Treatments

Cruiser (thiamethoxam) and Gaucho (imidicloprid) are systemic seed treatments that are absorbed into the plant during germination. These insecticides tend to concentrate in the actively growing areas on the plant (new leaves and root tips). Soybean aphids feed on the plant ingesting the insecticide. Insecticide trials in Iowa have determined that seed treatments lack the residual activity necessary to suppress soybean aphid populations during late July and August.

Tank Mixing Insecticides With Herbicides

Tank mixing an aphid insecticide with a glyphosate application for weed control in glyphosate-resistant soybeans may seem like a logical approach to reduce costs. However, it is impractical because of timing and application issues. The optimum time for controlling soybean aphids has been between mid/late July and early August. The optimum time for glyphosate applications on soybean is when the weeds are less than 4 inches tall, which is most likely to be in June. Insecticides applied in June do not have the residual activity needed to significantly suppress later soybean aphids. Early season insect-



ticide applications also kill beneficial insects, which may allow aphid populations to recover more quickly and cause economic damage to the crop.

Additional problems occur with an insecticide/herbicide tank mixture. Glyphosate is typically applied with low pressure and large droplet size to prevent drift problems. Research shows that under such conditions, the insecticide performance is decreased and more aphids survive the application. Given these concerns, we recommend growers avoid applying tank mixtures of an insecticide and herbicide in June.



Unsprayed (left) and sprayed soybeans (right) for aphid control.

Tank Mixing Insecticides With Fungicides

The potential arrival of Asian soybean rust in Iowa has increased interest in fungicide applications to soybeans. The timing and application method of fungicides against soybean rust may overlap with the management of soybean aphids. Like insecticides, fungicides require complete plant coverage and are applied at high pressure and small droplet size. Currently there are no known adverse interactions between fungicides labeled for use against soybean rust and insecticides labeled for soybean aphid control. However, many fungicides are toxic to fungi that attack aphids and their use could lead to an increasing aphid population. Currently registered soybean fungicides (Bravo, Bumper, Folicur, Headline, Laredo, Quadris, Propimax, Stratego and Tilt) used in the laboratory have reduced the infectivity of fungi that kill aphids by 28 to 100 percent. Farmers who apply fungicides for soybean rust control should closely monitor aphid populations in their fields.

Preventive Tactics

In addition to insecticides, some preventive tactics may help reduce aphid problems. Early planting was thought to allow soybeans to escape or delay aphid population buildup and virus disease. However, results have been inconsistent. Additionally, early planting encourages bean leaf beetle colonization and subsequent bean pod mottle virus infection, so adjusting planting date should be considered carefully before implementation.

Planting seed of resistant plants may also be a future option. Currently, there are very few varieties that are resistant to soybean aphids



Soybean aphid colony with shed skins (white) and fungus killed aphids (brown).

but more resistant varieties are being tested in the Midwest and are expected in 2009. These resistant varieties dramatically reduce soybean aphid populations but do not produce aphid-free plants. The resistance is plant derived, not transgenic, and therefore will not require a refuge. Resistant varieties can be planted in certified-organic production systems. It is not yet clear if they can be left untreated with insecticides to achieve optimal yield. Field scouting for aphids is still suggested if growers decide to plant an aphid resistant soybean variety. More resistant soybean varieties are expected in the near future.



Prognosis for Iowa

The soybean aphid is firmly established as a pest of soybean in Iowa. After seven years of experience with the pest and observing its damage potential, it would seem reasonable to expect economic damage to occur somewhere in Iowa every year. The damage is likely to be greater during years when drought and other stresses occur in soybeans. Preemptive field scouting and the timely application of control measures when the aphid population reaches the economic threshold are necessary steps to successfully manage the insect and prevent economic damage.

Additional Information

For more information on soybean aphids, consult the Web sites:

www.soybeanaphid.info

www.planthealth.info/aphids_basics.htm

ACKNOWLEDGEMENTS

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The speed scouting chart was developed by entomologists at the University of Minnesota.

Marlin E. Rice is a Professor with Extension and research responsibilities in the Department of Entomology. Matt O'Neal is an Assistant Professor with research and teaching responsibilities in the Department of Entomology.

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...and justice for all

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