

# Control Insects on Soybeans

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Although your soybean fields contain many insects, only a few are of economic importance. Natural enemies often suppress populations of the few destructive species. In addition, soybeans can tolerate high insect populations without reduction in yields. Insects must be correctly identified and population levels or damage assessed before deciding on the control measure. Correct identification is essential in determining the correct insecticide and rate to use. Regular scouting of soybeans assures an awareness of insect infestations and allows proper timing of insecticide applications.

## Scouting Soybeans

Use the drop cloth method for sampling worms and some species of beetles in row-planted soybeans. Use a sweep or shake cloth net for sampling the more active insects in solid or narrow row-planted soybeans. The drop cloth is a white, heavy, unbleached cloth, 36 inches long, with a 1/2-inch or larger dowel, 42 inches long, attached to each side. The width of the cloth varies with row spacing to be sampled.

Take samples by fully extending the cloth with the dowels parallel to each row and sliding it forward on the ground under the plants. Take care not to disturb the plants. While kneeling between the rows, extend each arm forward parallel with the row on either side and gently bend the plants over the drop cloth. Shake plants vigorously to dislodge the insects (see illustration above). Shake approximately 1 1/2 row feet of plants from each row for a 3 row foot sample. Count the insects on the cloth. Select sample sites at random to give

adequate field coverage. Sample all sides of the field to facilitate early detection of invading insects. Check 3 row feet in four locations for the first 25 acres. Add one additional sample site for each additional 5 acres up to 10 sample sites total per field. Sample sites should be located in fields at least 50 feet from field borders.



While kneeling between the rows, extend each arm forward parallel with the row on either side and gently bend the plants over the drop cloth. Shake plants vigorously.

## Treatment Levels

The treatment levels listed for each insect are general guidelines for timing of insecticide applications. These levels are suggested to determine where yield reductions may begin. Under some conditions, such as drought stress where compensation is not possible, the level may be lower; or if the plant is highly productive and can compensate for feeding, the level may be raised. When determining the need to treat, consider the crop conditions and potential insect population damage in making the decision.

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## Insects That Feed on Roots

**Grape Colaspis Larvae** – Grape colaspis larvae feed on roots of seedling soybean plants as they move up to the soil surface prior to pupation. Populations may develop in soybeans following forage crops or following soybeans when a high population of adults was present the previous season. If seedling soybean plants are stunted and plant mortality is prevalent, grape colaspis could be the problem. Dig up the soil around plants in these areas and sift to determine if the small white grape colaspis larvae (grubs) are present. There are no effective pesticides for control of grape colaspis. When stands have been reduced to critical levels, replant the infested area 7 to 10 days after damage was observed.

## Insects That Feed on Stems

**Cutworms** – Cutworms may destroy soybean stands. However, cutworm populations are sporadic in occurrence, and damaging infestations are usually spotty. Infestations most often occur during early, wet seasons where heavy vegetative cover has been worked into the soil. Detect cutworm feeding by walking through fields and looking for seedling plants that have been damaged near or just below the soil surface. Inspect the soil around damaged plants to determine if cutworms are still present. Spot treatments are advisable when an active infestation is present and 30 percent or more of the plants are destroyed. Fewer than four to six plants per row foot remaining in conventional rows (30-38 inches) is another indication that control is needed.

**Table 1. Insecticides for Control of Cutworms**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Sevin 4F	1 - 1 1/2 qt	2.7 - 4	21
Sevin XLR	1 - 1 1/2 qt	2.7 - 4	21
Sevin 80S	1 1/4 - 1 7/8 lb		21
Lorsban 4E	1 - 2 pt	4 - 8	28
Larvin 3.2	1 1/4 - 1 7/8 pt	4.3 - 6.4	28
Asana XL 0.66E	5.8 - 9.6 oz	13 - 22	21
Karate 2.08 CS (capsule suspension formulation)	0.96 - 1.6 oz	80 - 133	45
Scout Xtra 0.9E	2.28 - 3.41 oz	37.5 - 56	21
<b>Treatment Level:</b> Treat when infestations threaten to reduce stand to less than 4 to 6 plants per row foot.			

**Threecornered Alfalfa Hoppers** – Threecornered alfalfa hoppers girdle plant stems and leaf petioles. Plants girdled near the soil surface may die while others overcome the damage and survive. However, damaged plants are subject to subsequent breakage at the girdled point which may result in yield loss. Plants are susceptible to mainstem girdling until they are about 9 to 10 inches tall. Girdling by later generations is higher up on the stems or on the leaf petioles and does not appear to affect yields. Check plants weekly during the critical growth period to determine incidence of girdling. If 50 percent of the plants are girdled, or if fewer than four to six ungirdled plants per row foot remain in conventional rows (30-38 inches), and threecornered alfalfa hopper nymphs are still present, control measures are recommended. Direct insecticide treatments to the lower part of the plant.

**Table 2. Insecticides for Control of Threecornered Alfalfa Hoppers**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Dimethoate 4E	1 pt	8	21
Asana XL 0.66E	5.8 - 9.6 oz	13 - 22	21
Karate 2.08	0.96 - 1.6 oz	80 - 133	45
Scout Xtra 0.9E	1.71 - 2.28 oz	56 - 75	21
PennCap M 2E	2 - 3 pt	2.7 - 4	20
Methyl Parathion	3/4 - 2 pt	4 - 10.7	20
<b>Treatment Level:</b> Apply treatment when 50 percent of the plants are girdled or if fewer than 4 to 6 plants per row foot remain in conventional rows (30 to 38 inches) and hopper nymphs are still present. Damage usually occurs when beans are less than 10 inches tall.			

## Foliage and Bloom Feeders

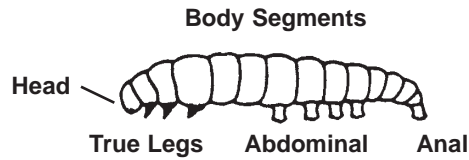
The greatest number of insects on soybeans are foliage feeders. They may be present at any time during the growing season. Research has shown that considerable foliage loss can be tolerated without yield reductions. Some worms also feed on blooms in addition to the foliage. Plants completely stripped of blooms usually rebloom and yield loss is not incurred, but maturity may be delayed.

**Thrips** – Thrips sometimes injure seedling soybean plants. Symptoms are a silvery appearance to the leaves and a lack of plant vigor. Feeding injury is most apparent under drought conditions. Normally, plants outgrow the damage and can tolerate very high thrips number (100/plant). Under extremely stressed conditions, thrips may cause plant mortality. **Control of thrips is not normally recommended.**

# IDENTIFICATION GUIDE

To Caterpillars on Soybeans Using Number of Abdominal Prolegs and Description

## GENERAL INSECT



### Number of Abdominal Prolegs and Description

### Physical Appearance

#### ONE SET OF PROLEGS

**Geometrid Larvae**  
Various colors.



#### TWO SETS OF PROLEGS

**Soybean and Cabbage Looper**  
Green colored, often black true legs, white stripes.



#### THREE SETS OF PROLEGS

**Green Cloverworm**  
Green colored, wiggles violently when touched.



#### FOUR SETS OF PROLEGS

**Corn Earworm**  
Various colors, often balls up when touched.



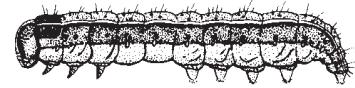
#### Velvetbean Caterpillar

Green to black colored, white stripe, wiggles violently when touched.



#### Fall Armyworm

Usually brown, smooth appearance, prominent white-to creme-colored inverted "Y" on front of head.



#### Beet Armyworm

Green to black, prominent black spot above second true leg.



#### Yellowstriped Armyworm

Double row of triangular shaped markings on back, with bright yellow stripe on side.



**Grasshoppers** – Grasshoppers are sometimes found in young soybeans near field borders after migrating from nearby weed hosts. Spot treatment may be advisable when significant feeding occurs. Aerial insecticide applications are more effective than ground applications.

**Table 3. Insecticides for Control of Grasshoppers**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Lorsban 4E	1/2 - 1 pt	8 - 16	28
Sevin 80S	1 1/4 lb		21
Sevin XLR	1 qt	4	21
Karate 2.08	1.6 - 1.92 oz	67 - 80	21
Scout Xtra 0.9E	2.28 - 3.41 oz	37.5 - 56	21
Asana XL 0.66E	5.8 - 9.6 oz	13 - 22	21
Methyl Parathion	2.0 pt	4	20

**Treatment Level:** Before bloom, treat when 40 percent defoliation occurs. After bloom, treat when 25 percent defoliation occurs.

**Garden Webworms** – Garden webworm larvae may feed on soybean foliage early in the season but seldom are of economic importance. The webworms are easily recognized by the webbing in terminals with worms feeding inside the web. Control is not normally required.

**Table 4. Insecticides for Control of Garden Webworms**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Methyl Parathion	3/4 - 2 pt	4 - 10.7	20
Karate 2.08	1.6 - 1.92 oz	67 - 80	45
<i>Bacillus thuringiensis</i>	Check label		

**Treatment Level:** Before bloom, treat when 40 percent defoliation occurs. After bloom, treat when 25 percent defoliation occurs.

**Armyworms** – Several species of armyworms may attack soybeans during the year. The yellowstriped armyworm occasionally develops in high enough numbers on seedling soybeans to cause injury. However, plants usually recuperate from feeding injury with no reduction in yield. No control is necessary unless plants are being killed. The beet armyworm seldom develops in high enough numbers to be considered economic, but if populations develop, they occur mid- to late season. The larvae may feed on blooms and pods in addition to the foliage. Fall armyworm larvae usually occur in late season, but occasionally they are present in high numbers on seedling soybeans. Control is usually not required.

**Table 5. Insecticides for Control of Fall Armyworms and Beet Armyworms**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Larvin 3.2	1 pt	8	28
Lannate 2.4 LV	3/4 - 1 pt	8 - 10.7	14
Tracer 4	1.5 - 2 oz	64 - 85	28

**Treatment Level:** Before bloom, treat when 40 percent defoliation occurs. After bloom, treat when 25 percent defoliation occurs.

**Bean Leaf Beetle** – Bean leaf beetle adults are present from May through plant maturity. Several generations occur each season with the greatest number usually occurring in late August. Feeding by adults causes the characteristic “shot holes” in the leaves. Beetles may also feed on pods when leaves become old. Beetles seldom cause enough damage to be an economic hazard.

**Table 6. Insecticides for Control of Bean Leaf Beetles**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
PennCap M 2E	2 - 3 pt	2.7 - 4	20
Sevin 4F	1 pt	8	21
Sevin XLR	1 pt	8	21
Sevin 80S	2/3 lb		21
Lannate 2.4 LV	3/4 pt	10.6	14
Asana XL 0.66E	5.8 - 9.6 oz	13 - 22	21
Karate 2.08	0.96 - 1.6 oz	80 - 133	45

**Treatment Level:** Before bloom, treat when 40 percent defoliation occurs. After bloom, treat when 25 percent defoliation occurs.

**Green Cloverworms** – Green cloverworm larval populations may appear early in the season and are usually found in most fields during the entire season. Although they feed on the foliage and contribute to overall defoliation, larvae at times may be considered beneficial since they serve as a food source for beneficial insects. **Control of green cloverworm is not normally required, but if defoliation treatment levels are found, use the same insecticides recommended for velvetbean caterpillars.**

**Corn Earworms** – Corn earworms are recognized for damaging pods, but they are foliage feeders also and contribute to overall defoliation. When blooms are present, preferential feeding will be on blooms. **However, plants usually recuperate without reduction in yield.** For more information, see corn earworms under Pod Feeders.

**Loopers** – Loopers may appear from mid- to late season and may cause economic losses at high population levels. Loopers will defoliate plants rapidly when high populations occur. Populations, if they occur, are more prevalent in the southern areas of the state.

**Table 7. Insecticides for Control of Soybean Loopers**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Lannate 2.4 LV	1.5 - 2.25 oz	3.5 - 5.3	14
Larvin 3.2 F	1 1/8 - 1 7/8 pt	4.3 - 7.1	28
Tracer 4	1 - 2 oz	64 - 128	28
<i>Bacillus thuringiensis</i>	Check label		0

**Treatment Level:** Before bloom, treat for 40 percent defoliation. After bloom, treat for 25 percent defoliation plus 6 to 8 large worms per row foot.

**Velvetbean Caterpillars** – Velvetbean caterpillars are voracious feeders, and high numbers may strip plants of foliage quickly. Normally, this insect pest does not occur in Arkansas until late season and usually only in southern areas. It may require control in some years.

**Table 8. Insecticides for Control of Green Cloverworms and Velvetbean Caterpillars**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
<i>Bacillus thuringiensis</i>	Check label		
Penncap M 2E	2 pt	4	20
Methyl Parathion 4E	1 pt*	8	20
Sevin 4F	1 pt	8	21
Sevin XLR	1 pt	8	21
Sevin 80S	2/3 lb		21
Lannate 2.4 LV	2/5 pt	20	14
Ambush 2E	3.2 - 6.4 oz	20 - 40	60
Pounce 3.2E	2 - 4 oz	32 - 64	60
Larvin 3.2	10 oz	12.8	28
Asana XL 0.66E	2.9 - 5.8 oz	22 - 44	21
Karate 2.08	0.96 - 1.6 oz	80 - 133	45
Scout Xtra 0.9E	1.71 - 2.28 oz	56.2 - 75	21
Tracer 4	1 - 2 oz	64 - 128	28

**Treatment Level:** Before bloom, treat when 40 percent defoliation occurs. After bloom, treat when 25 percent defoliation occurs. For velvetbean caterpillar, after bloom, treat when 25 percent defoliation occurs plus 6 to 8 larvae 1/2-inch or larger per row foot.

\*Use higher rate of Methyl Parathion for green cloverworm.

**Blister Beetle** – Blister beetle adults infest some fields, usually in spots. Several species occur, but the striped blister beetle is the most common. If the

infestation is detected early enough, spot treatments using Sevin may be warranted. Populations usually move from the field after a few days.

**Table 9. Insecticides for Control of Blister Beetles**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Sevin 4F	1/2 - 1 pt	4 - 8	21
Sevin XLR	1/2 - 1 pt	4 - 8	21
Sevin 80S	0.625 - 1.25 lb		21
Karate 2.08	1.6 - 1.92 oz	67 - 80	45
Methyl Parathion 4EC	0.75 - 2.0 pt	4 - 10	20

**Treatment Level:** Before bloom, treat for 40 percent defoliation. After bloom, treat for 25 percent defoliation. Spot treatment may be needed in some cases.

## Pod Feeders

The greatest potential loss to soybeans is caused by insects that attack pods. Beans are consumed by the insects, and diseases (rot) may enter damaged bean pods resulting in additional loss.

**Corn Earworms** – Corn earworm is considered to be the most important insect attacking soybean pods. The small worms feed on foliage, later moving to blooms and pods. Fields with plants not covering the row middle are most often infested. Natural mortality of young worms is very high, and their feeding damage is relatively insignificant. Treat for corn earworm when populations approach four or more worms, 1/2-inch or longer, per row foot. For dryland beans under stress, treat when levels approach three larvae per foot. Usually one insecticide application is sufficient for control.

**Table 10. Insecticides for Control of Corn Earworms**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Asana XL 0.66	5.8 - 9.6 oz	13 - 22	21
Ambush 2.0 E	6.4 - 12.8 oz	10 - 20	60
Pounce 3.2 E	4 - 8 oz	16 - 32	60
Scout Xtra	1.7 - 2.28 oz	56.3 - 75	21
Sevin 80S	1 - 2 lb		21
Sevin 4F	1 - 3 pt	2.7 - 5.3	21
Sevin XLR	1 - 3 pt	2.7 - 5.3	21
Lannate 2.4 LV	0.6 - 1 pt	8 - 13.3	14
Larvin 3.2 F	10 - 16 oz	8 - 12.8	28
Karate 2.08	0.96 - 1.6 oz	80 - 133	45
Tracer 4	1.5 - 2.0 oz	64 - 85	28

**Treatment Level:** Before bloom, treat when 40 percent defoliation occurs. After bloom, treat when population approaches 4 larvae, 1/2-inch or larger, per row foot on vigorously growing beans. For dryland beans under stress, treat when populations approach 3 larvae, 1/2-inch or larger, per row foot.

**Table 11. Bollworm Treatment Levels on Soybeans for Different Row Spacing Using Shake Cloth**

Row Spacing (Inches)	Bollworms Per Foot
38	4
30	3
19	2
9 (Drill)	1

**Stink Bugs** – Stink bugs may feed on pods. Infestations are usually found along field borders or in areas near woods. Stink bugs insert digestive juices into the bean, and deterioration of the tissues results in lowered soybean quality. Apply control measures when levels approach one bug per row foot. In most instances, stink bug infestations are heaviest along field borders, and spot treatments may provide adequate control.

**Table 12. Insecticides for Control of Stink Bugs**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Karate 2.08	1.6 - 1.92 oz	67 - 80	45
Methyl Parathion 4E	1 pt	8	20
PennCap M	2 pt	4	20
Scout Xtra 0.9E	2.27 oz	56.3	21
<b>Treatment Level:</b> Treat for 1 stink bug per row foot or 9 per 25 sweeps. Use methyl parathion or PennCap M if populations are predominantly brown stink bugs.			

**Spider Mites** – Spider mites occasionally attack soybeans around field edges as a result of migration from alternate host plants around fields. Spider mites reproduce rapidly and tend to be a problem in hot, dry weather. Spot treatment around field edges may be required where infestations are spotty.

**Table 13. Insecticides for Control of Spider Mites**

Insecticide	Formulation Per Acre	Acres Per Gallon	Days to Harvest
Lorsban 4E	1 pt	8	28
Dimethoate 4E	1 pt	8	21
<b>Treatment Level:</b> Treat when spider mites are numerous.			

## Doublecrop Soybean Insects

Late-planted beans after wheat are more susceptible to damage from corn earworms and late-season defoliators such as soybean loopers and

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FSA2067-PD-2-02RV

velvetbean caterpillars. The corn earworm is attracted to open canopy beans, especially when blooming occurs. Planting narrower rows to attain a closed canopy would lower the probability of a damaging corn earworm population occurring. In addition, closed canopy soybeans produce a more favorable environment for insect parasites, predators and diseases to reduce populations of damaging insects.

## Using the Sweepnet

Sweepnet sampling is conducted with a heavy-duty 15-inch diameter sweepnet. Swing the net briskly through the top 15 inches of the canopy. Some of the keys to taking good samples with the sweepnet are:

1. The bottom of the net should be angled up so that dislodged insects will fall into the net. Each pass of the net through the canopy counts as one sweep.
2. Sample only one row per sweep in soybeans planted on 36-inch or greater row widths. In narrow rows, let the normal arch of the sweep continue through the adjacent row(s).
3. Sweeps should be made 2 1/2 to 3 feet apart down the row. Be aware of your shadow.

The sweepnet has several advantages for sampling soybean insects. It can be used on any row width. It is more efficient to use than the drop cloth in short- to moderate-height soybeans once the correct technique is learned. Also, the sweepnet is quicker than the drop cloth early in the season when insect populations are low. Disadvantages of the sweepnet are that sample uniformity is hard to maintain, less of the plant is sampled compared to the drop cloth, it is less efficient than the drop cloth in the late season and sweepnets are not readily available.

**Table 14. Equivalent Economic Threshold Conversion Between Drop Cloth and Sweepnet**

Insect	Drop Cloth	Sweepnet		
	Number/ Ft of Row	No./25 Sweeps	No./50 Sweeps	No./100 Sweeps
Stink bugs	1	9	18	36
Soybean looper, cabbage looper, velvetbean caterpillar, green clover worm <sup>1</sup>	6	29	58	116
Corn earworm <sup>2</sup>	4	15	30	60
<sup>1</sup> Threshold numbers in association with 40 percent defoliation before bloom and 25 percent after bloom. Number represents medium and large larvae. <sup>2</sup> Corn earworm is difficult to sample with sweepnet; sweep deeper into the canopy using extra force. Supplement with visual checks for bloom and pod feeding.				

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