

SOYBEAN INSECT MANAGEMENT GUIDE

Controlling damaging populations of insects is always a production issue in Midsouth soybeans. The decision to apply control measures is usually based on “thresholds”, which is the number of insects of a particular species that have reached the level thought to reduce yield. Thresholds for triggering insect control measures are the best tool available at the present time.

It is possible that published thresholds do not equally represent all soybean production environments. Thus, research that will produce insect control recommendations that are specific for major cropping systems (e.g., dryland vs. irrigated, early- vs. late-planted) is needed.

An example is the different thresholds that likely should be used for dryland vs. irrigated soybeans because these two production systems have different yield potentials and, subsequently, different economic potentials. Further support for starting with these two production systems is past research that shows that: 1) soybean looper larval weight is decreased and their developmental period is increased by plants growing on drier soils, and 2) yield reduction resulting from looper infestation is greater for irrigated than for nonirrigated soybeans.

Generally, two methods are used for counting insects in a crop—sweep nets and drop cloths. The drop cloth is the most accurate method to sample for soybean insect pests, but both methods give objective measures to generate estimates that can be used to determine levels related to thresholds. In narrow-row soybeans, the sweep net is the preferred method of sampling.

Numerous insect species can do damage to soybeans in Mississippi, and they are grouped into two classes—stem feeders and foliage feeders. Those that should be accounted for are listed in Table 1. Their treatment thresholds and recommended classes of insecticides to use for needed control are included (see [Miss. Insect Control Guide for Agronomic Crops](#), soybeans p. 22-44 & 97, and linked labels in Table 2 for details).

In many cases, simultaneous infestations of several foliage-feeding species will occur in a given field. When this situation exists, control measures should be applied when any combination of these insects meets or exceeds the treatment threshold.

Naturally occurring diseases (fungal, bacterial, and viral) and beneficial predators and parasites are important in the control of soybean insects, and can often keep insect pests from reaching treatable levels.

- The presence of diseased insect larvae indicates that a population of harmful insects is being controlled naturally, so insecticide applications should be withheld for a short period to determine if the disease will effectively control the population.
- Some early-season applications of insecticides to soybeans can significantly reduce predators and parasites. Thus, regular scouting of soybean fields to determine levels of both harmful and beneficial insects is important to protect the beneficials so that their full benefit will be realized.

Table 1. Major* insect pests of soybeans, their treatment thresholds, and classes of insecticides that can be used for control. Three-cornered alfalfa hopper (TCAH) is a stem feeder—the other insects are classed as foliage feeders. See [Miss. Guide—Soybeans](#) (p. 22-44 & 97) for detailed information.

Insect	Thresholds	Insecticide Classes [^]
TCAH**	Plants <10 in. tall, check for stand reduction; plants >10 in. tall, treat when have 50 hoppers per 25 sweeps. End treatment at R6.	OP, P, P+D, P+CN
Bean leaf beetle (BLB)	Apply insecticide if beetles are present and defoliation [#] reaches 35% before bloom; after bloom, treat when defoliation reaches 20% or if 50% of plants have pod feeding prior to R6.	C, OP, P, P+D, P+CN
Velvetbean caterpillar (VBC), Green Cloverworm (GCW)	Before R1, apply insecticide when have 8 or more worms ½ in. long or longer per ft. of row, or 35% defoliation; after R1, treat when have 4 or more worms ½ in. long or longer per ft. of row, or 20% defoliation.	C, D, IGR, OP, OX (GCW), P, SPN, P+CN
Soybean looper (SL)	Before R1, apply insecticide when have 8 or more worms ½ in. long or longer per ft. of row, or 35% defoliation; after R1, treat when have 4 or more worms ½ in. long or longer per ft. of row, or 20% defoliation.	D, IGR (except Dimilin), OX, SPN, D+P
For a complex of VBC, GCW, and SL, use a threshold of 300 caterpillars/100 sweeps before R1, and 150/100 sweeps after R1. Count each SL twice when using a sweep net to sample. End treatment for all three species at R6 + 7 days (R6.5).		
Corn earworm	Before R1, treat at 35% defoliation; After R1, treat when have 3 worms per ft. of row (drop cloth) or nine worms per 25 sweeps. Drop cloth preferred for sampling.	C, D, OX, SPN, IGR+SPN, P+D
Beet armyworm	Before R1, treat at 35% defoliation; After R1, treat at 20% defoliation. Usually controlled by beneficial insects and diseases.	D, IGR, OX, SPN, IGR+SPN, P+D
Fall armyworm	Before R1, treat at 35% defoliation; After R1, treat at 20% defoliation.	D, IGR, OP, OX, P, SPN, IGR+SPN, P+D,
Stink bugs (southern green, green, brown)	One bug (nymphs larger than 1/4 in.) per ft. of row (drop cloth) or 9 bugs per 25 sweeps before R6. After R6, 20 bugs/25 sweeps.	OP, P, P+D, P+CN

* Tarnished plant bugs, thrips, potato leaf hopper, and dectes stem borer rarely cause economic damage in soybeans.

**[Recent research](#) indicates no apparent benefit from treatment during reproductive development.

[^]Rotate insecticide chemistries for resistance management and always be aware of the class of insecticide used at each application. C = Carbamate; CN = Chloro-nicotinyl; D = Diamide; IGR = Insect Growth Regulator; OP = Organophosphate; OX = Oxadiazine; P = Pyrethroid; SPN = Spinosyn.

[#]In all cases, base defoliation estimates on whole plant average; i.e., average % in top, middle, and bottom of plant. (*, [# Mississippi Crop Situation blog, June 19, 2015](#)).

Table 2. Insecticide class and insecticides in each class that can be used for effective insect resistance management in soybeans.

Insecticide class	Insecticides*
Carbamate (C)	Sevin (carbaryl), Larvin (thiodicarb), Lannate (methomyl)
Diamide (D)	Belt (flubendiamide), Prevathon (chlorantranilipole)
Insect Growth Regulator (IGR)	Dimilin 2L (diflubenzuron), Intrepid 2F (methoxyfenozide)
Organophosphate (OP)	Orthene (acephate), Dimethoate (dimethoate)
Oxadiazine (OX)	Steward (indoxacarb)
Pyrethroid (P)	Baythroid XL (beta-cyfluthrin), Brigade and Discipline (bifenthrin), Asana XL (esfenvalerate), Prolex and Declare (gamma-cyhalothrin), Karate Z (lambda-cyhalothrin), Ambush and Pounce (permethrin), Mustang Maxx and Respect (zeta-cypermethrin)
Spinosyn (SPN)	Tracer and Blackhawk (spinosad), Radiant SC (spinetoram)
P + CN	Brigadier (bifenthrin + imidacloprid), Endigo ZC (lambda cyhalothrin + thiamethoxam), Leverage 360 (beta-cyfluthrin + imidacloprid)
P + D	Besiege (lambda-cyhalothrin + chlorantraniliprole)
IGR + SPN	Intrepid Edge (methoxyfenozide + spinetoram)

*See [Miss. Guide–Soybeans](#) (p. 22-44 and 97) for application guidelines, restrictions specific to and performance ratings for each insecticide, and restricted use/entry interval designations. Click links for each insecticide's label.

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The below content is extracted from the 2016 Mississippi Insect Control Guide, p. 29.

The dynamic threshold table for bollworms at the bottom of the page was added to the 2016 Guide. The data in the table are a direct result of work done for MSPB Project No. 01-2011 through 01-2014. This project resulted in a Ph.D. dissertation by Dr. Brian Adams under the direction of Dr. Don Cook.

Bollworms
(Corn Earworms or "Podworms")
and
Tobacco
Budworms



Insecticide	Amount of Formulation per Acre	Pounds Active Ingredient per Acre	Acres 1 Gallon or 1 Pound Dry Will Treat	Comments
chlorantranilipole (D) Prevathon 043SC	14 – 20 oz.	0.047 – 0.067	9 – 6.4	Preharvest interval is 1 day. Adjuvants such as methylated seed oil (MSO) may be added for improved coverage.
chlorantranilipole (D), λ-cyhalothrin (P) Besiege	7 – 9 oz.		18 – 14	
flubendiamide (D) Belt 4SC	2 – 3 oz.	0.0625 – 0.094	64 – 43	
indoxacarb (OX) Steward 1.25EC	5.6 – 11.3 oz.	0.055 – 0.11	22.8 – 11.5	Toxic to fish, birds, and aquatic invertebrates. Do not feed or graze livestock on treated fields. Postharvest interval: 21 days. Maximum AI per acre per season: 0.44 lb.
methomyl (C) Lannate 2.4LV	12 – 24 oz.	0.225 – 0.45	10.6 – 5.3	Toxic to fish, aquatic invertebrates, bees and wildlife. Do not graze forage within 3 days and hay within 12 days of last application. Do not apply within 14 days of harvest. Maximum AI per acre per season: 1.35 lb. Use .45 lb. AI of methomyl for high populations of corn earworms.
methoxyfenozide (IGR), spinetoram (SPN) Intrepid Edge	4 – 6.4 oz.		32 – 20	
spinetoram (SPN) Radiant 1SC	2 – 4 oz.	0.016 – 0.031	64 – 32	Preharvest interval is 28 days.
spinosad (SPN) Blackhawk	1.7 – 2.2 oz.	0.038 – 0.05	75 – 58	Toxic to bees and mollusks. Do not feed treated forage or hay to beef or dairy cattle. Preharvest treatment interval: 28 days. Maximum AI per acre per season: 0.186 lb. REI: 4 hours.

Pyrethroids may not control bollworms. It is recommended to use only the highest labeled rate of pyrethroids + 0.5 – 0.75 lb of acephate to control bollworms in the Delta region.

The **BOLLWORM OR CORN EARWORM**, found on cotton and corn, is commonly referred to as the “podworm” in soybeans. It varies in color from light green to pink, dark brown, or rust, with pale lines running the length of the body. It has four pairs of abdominal prolegs and is about 1¼ inch long when fully grown. The worm usually curls up when knocked to the ground. Infestations occur most often during the reproductive stages of the soybean plant. In high numbers, this insect can cause significant yield loss.

THRESHOLD: Before bloom, treat on 35 percent defoliation level. If you use a drop cloth to detect bollworms, threshold is three worms per foot of row after bloom. With a sweep net, threshold is nine worms per 25 sweeps after bloom. **For dynamic thresholds that account for price received and control costs, use Table 1 below.**

*Bollworms or podworms are difficult to sample with the sweep net. Sweep deeper into the canopy, using extra force; supplement with visual check for pod or bloom feeding.

Table 1. Economic thresholds for corn earworm larvae based on sweep net sampling.

Crop value (\$/bu)	Larvae/25 sweeps				
	Control Costs (\$/acre) ¹				
	10	15	20	25	30
6	7.4	11.0	14.7	18.4	22.1
7	6.3	9.5	12.6	15.8	18.9
8	5.5	8.3	11.0	13.8	16.5
9	4.9	7.4	9.8	12.3	14.7
10	4.4	6.6	8.8	11.0	13.2
12	3.7	5.5	7.4	9.2	11.0
13	3.4	5.1	6.8	8.5	10.2

Based on early-planted Maturity Group IV soybean varieties with >50 bu/acre yield potential.

¹Including application costs.

Soybeans	Restricted Entry Interval (hours)	Restricted Use (R)	Stem Feeders				Defoliators							Defoliators and Pod Feeders				Pod Feeders		
			Cutworm	Threecornered Alfalfa Hopper	Blister Beetle	Garden Webworm	Grasshopper	Green Cloverworm	Saltmarsh Caterpillar	Soybean Looper	Cabbage Looper	Spider Mite	Velvetbean Caterpillar	Bean Leaf Beetle	Beet Armyworm	Yellowstriped Fall Armyworm	Corn Earworm	Green Stink Bug	Brown Stink Bug	
Ambush/Pounce	12	X		7	6	7	6	8	4	2	6	0	8	4	3	7	4	4	4	3
Asana XL/Adjourn	12	X	8	8	7	8	7	9	5	3	7	0	9	4	3	7	5	8	5	
<i>Bacillus thuringiensis</i>	4		0	0	0	5	0	8	3	6	6	0	8	0	2	0	2	0	0	
Baythroid XL	12	X	8	8	7	8	7	9	5	3	7	0	9	4	3	7	5	9	5	
Belay	12																	7	7	
Belt	12				9			9	8	9	9				8	9	8			
Brigade/Discipline/Fanfare	12	X	9	9	7	7	7	9	6	3	7	6	9	7		8	5	9	6	
Cruiser	12			7									5							
Dimethoate	48		0	6	5	5	7	3	1	2	2	4	3	6	2	4	2	7	6	
Endigo	24	X	8	8	7	8	7	9	5	3	7	0	9	8	3	7	5	9	7	
Gaucha	12			5										5						
Hero	12	X	9	9	7	7	7	9	6	3	7	6	9	7		8	5	9	6	
Intrepid	4					8		8	8	8			8		8		5			
Karate/Silencer/Lambda-Gy	24	X	8	8	7	8	7	9	5	3	7	0	9	4	3	7	5	8	6	
Lannate 2.4 LV	48	X	2	5	5	8	6	9	4	7	7	0	9	4	7	7	8	7	5	
Larvin 3.2 F	48	X	5	2	2	8	5	9	5	8	8	0	9	8	7	7	8	3	2	
Leverage	12	X	8	8	7	8	7	9	5	3	7	0	9	6	3	7	5	9	6	
Mustang Max/Respect	12	X	8	8	7	8	7	9	5	3	7	0	9	4	3	7	5	9	6	
Orthene/Acephate	24	X				8				7								8	9	
Prolex/Declare	24	X	8	8	7	8	7	9	5	3	7	0	9	4	3	7	5	8	5	
Sevin	12		5	3	8	3	7	8	5	1	1	0	8	8	3	6	6	5	4	
Steward	12		9	0	0	8	0	9	5	8	9	0	4		8	8	8	3	2	
Tracer	4		7	0	0	8	2	9	5	8	9	0	9	3	8	7	8	1	1	

Rating Scale: 0 = no control, 10 = excellent. The performance ratings in the chart are for comparison purposes only and are not necessarily a measure of percent control. Modified from University of Arkansas "Insecticide Recommendations for Arkansas MP144."