Soybean Loopers In Louisiana Soybean

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Louisiana soybeans can be attacked by a host of late season caterpillars that are capable of causing severe defoliation. The primary species in this pest complex include the velvetbean caterpillar, green cloverworm, and soybean looper. All are perennial pests of soybeans in Louisiana, but the soybean looper (Plate 1) has been the most difficult to manage in recent years. Historically, outbreaks of soybean looper are somewhat sporadic, but significant yield losses can occur from high infestations that are not managed with timely applications of insecticides. Leaf defoliation levels can be quite severe if soybean looper populations exceed action thresholds (150 per 100 sweeps) (Plate 2). Late-season infestations of this pest are often the result of insecticide treatments that have been applied for other pests, resulting in loss of natural enemies. Sprays that are applied for pests such as stink bug, bean leaf beetle, or three-cornered alfalfa hopper in soybean fields during the mid-to-late growing season can induce outbreaks of soybean looper. However, considerable problems with stink bugs (primarily the redbanded stink bug) in the last five years have increased numbers of late-season insecticide applications, which in turn have increased the occurrence and intensity of soybean looper problems.

In addition, soybean looper infestations are typically more common in farmscapes that have soybean and cotton fields in close proximity. Soybean looper moths which feed on cotton flower nectaries have much higher egg production than moths feeding only in soybean flowers. Therefore, this is one factor contributing to higher numbers of soybean looper larvae in soybean fields adjacent to cotton. Two or three generations of soybean looper can occur in Louisiana per growing season. The intensity of problems increases during the season with the highest populations occurring during August and September.

Soybean looper larvae damage soybean plants by feeding on the foliage. The adults (moths) deposit their eggs on leaves in the mid-to-lower canopy. The caterpillars usually initiate their feeding in the lower soybean canopy and migrate upward moving toward the plant terminal as they grow older. Small larvae do not cause much injury, and may create a "window-paning" effect on leaves by not feeding entirely through the leaf. Most of the significant defoliation is caused by larger caterpillars in the fourth to sixth instar stages of larval development. Greater than 90% of the total leaf consumption takes place during these larval stages. This observation is the reason that most action thresholds used to initiate insecticide applications suggest only counting caterpillars that are greater than ½ inch in length.

Soybean plants can tolerate a significant amount of defoliation without negatively affecting yield. These plants do not need to retain 100 percent of their foliage at any time during their development to reach maximum yield potential. Prior to flowering, plants can tolerate up to 35 percent defoliation without yield loss. However, during flowering, pod set, and seed development, foliage loss greater than 20 percent will decrease yield. As the plant matures and seed have fully developed in pods, defoliation levels have much less of an impact on yield.

Fortunately, several insecticides are recommended for soybean looper control in Louisiana. This list is much shorter today because soybean looper has developed resistance to numerous insecticides in the organophosphate, carbamate, and pyrethroid classes. The most effective products that are currently recommended in Louisiana (Table 1) include Intrepid (methoxyfenozide), Larvin (thiodicarb), Steward (indoxacarb), and Tracer (spinosad). There are several other products that list soybean looper as a target pest, but they either have performed inconsistently or field populations have demonstrated resistance levels. Intrepid has been the standard insecticide for soybean looper across Louisiana as a result of its efficacy, long residual activity, and availability. Although the current label recommends rates as low as 4 oz/acre, Intrepid is recommended at higher rates of 6 to 8 oz/acre in Louisiana, because the lower 4 oz rate has given inconsistent control. Since 2008, less than adequate control has been reported in Louisiana with these lower rates of Intrepid. Factors that could have contributed to this unsatisfactory control include unusually heavy pest pressure, non-labeled rates, application problems, and poor timing of application. Mr. Sebe Brown (graduate student in the LSU Dept. of Entomology working under Dr. J. A. Davis) has measured significant variability in susceptibility to Intrepid among Louisiana soybean looper populations during 2009 (Figure 1). All field collections required more insecticide than the laboratory colony (LSU1) to achieve an estimated 95% mortality level. In spite of these laboratory results, Intrepid has continued to perform very well in most soybean fields. Reduced susceptibility to Intrepid has not yet become fixed in Louisiana populations because soybean loopers do not overwinter here. They migrate each year from areas in lower Florida, Texas, Central America, and the Caribbean basin. Therefore, Intrepid susceptibility of the soybean looper populations that fly into Louisiana will likely be variable and unpredictable. The other insecticides, Larvin, Steward, and Tracer, are alternatives to Intrepid and have performed very well in annual field screening trials. As a statement of caution for Larvin, producers should be aware that this product is very water soluble and exhibits poor rain-fastness. All of these products exhibit a relatively narrow spectrum against Louisiana soybean insects, especially non-caterpillar pests such as stink bugs. For effective control of stink bugs and soybean looper, co-application of products expressing efficacy against both species is necessary.

The agrochemical industry is currently developing two new insecticides, Coragen (chlorantraniliprole) and Belt (flubendiamide) with novel modes of action. Both have demonstrated excellent initial and residual efficacy against soybean looper in Louisiana field trials during 2008 and 2009. Federal and state label approval for Belt is anticipated during 2010, but neither product is currently labeled in soybean.

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Table 1. Insecticides for Soybean Looper Control in Louisiana Soybean[1]

Insecticide (Form.)	IRAC Mode of Action Class	Amount (Form.) / Acre	Lb AI / Acre	Acres/Gal
Intrepid (4F)	18	6 – 8 oz	0.09 – 0.125	16 – 21.3
Larvin (3.2F)	1A	18 – 30 oz	0.45 – 0.75	4.3 – 7.1
Steward (1.25SC)	22A	5.7 – 11.3 oz	0.055 – 0.11	11.3 – 22.6
Tracer (4F)	5	2.0 oz	0.062	64

[1]Note: Action threshold is 8 worms (≥1/2 in) per row foot or 150 worms per 100 sweeps.

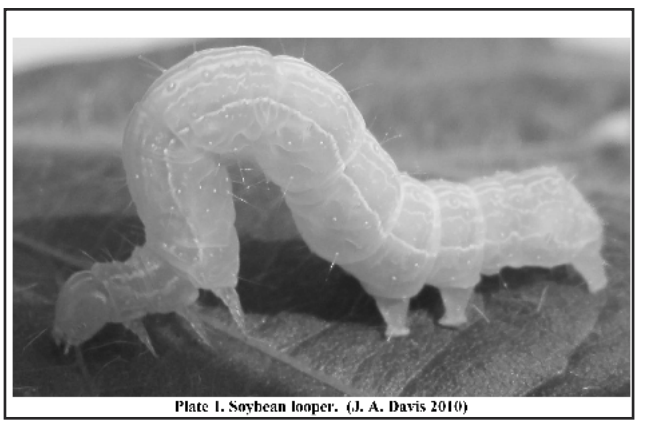

Plate 1. Soybean looper. (J. A. Davis 2010)

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