For several decades, soybeans have been significantly defoliated by the soybean looper. In recent years, cotton has received the same extensive damage. In 1989, 1991, and again in 1993, some cotton fields in south and central Alabama were totally defoliated in late August and early September.

Description
The soybean looper is similar in appearance to the cabbage looper, and the two species are often confused. However, cabbage loopers are generally more susceptible to insecticides than soybean loopers.

The adult soybean looper is a mottled gray to black moth with a wingspan of 1 1/4 to 1 1/2 inches. The hindwings are lighter in color than the forewings. There is a white figure-8 shape near the middle of the forewings.

The larvae taper in size toward the head. They are predominantly green with pale white stripes down the back and sides (Figure 1). Some caterpillars may also have a black stripe down each side. There are three pairs of thoracic legs, two pairs of abdominal prolegs, and an anal pair of prolegs. Soybean loopers may have black thoracic legs instead of green thoracic legs like the cabbage looper. As a result, soybean loopers are often referred to as “blackfooted” loopers. However, this feature is not reliable for specific identification because some soybean loopers have green thoracic legs.

The eggs of soybean loopers are similar to those of bollworms but are somewhat flattened and are found on the bottom sides of leaves.

Life Cycle
The soybean looper life cycle includes the egg, larva, pupa, and adult stages. Female moths lay eggs singly on leaves on the lower half of the plant canopy. The eggs, which are deposited at night, hatch in about 3 to 5 days.

At first, young larvae feed on the lower half of the plant. Larger larvae move up the plant, feeding on cotton leaves for about 2 weeks before pupating. Pupation occurs within a thin, silken web on the underside of leaves. The pupa (nonfeeding) stage is green and lasts about a week. Moths then emerge and mate. Female moths begin laying eggs, and each lays an average of 600 eggs. Hundreds of moths per acre may be present during a heavy soybean looper outbreak.

Loopers are semitropical pests. They can overwinter in the United States only in south Florida and south Texas. Large populations may also migrate from Central and South America and the Caribbean Islands. Looper insecticide resistance may be acquired in these areas where loopers are often exposed to multiple insecticide treatments on vegetables during one season.

Damage
Only the larval stage of the soybean looper is destructive. A single larva can consume about 22 square inches of foliage. Most of this consumption occurs in the last 4 to 5 days of the larval stage. The preferred feeding site is in the lower one-half to two-thirds of the crop canopy although heavy infestations may lead to defoliation of the entire crop canopy (Figure 2).

When compared to the defolia-
portion pattern of other foliage feeding caterpillars, the defoliation pattern of soybean loopers is unusual: soybean loopers feed from the inside out on the plant canopy. In a heavy soybean looper population, the outer canopy will appear undamaged until all the lower leaves on the plant are almost destroyed. Once soybean loopers begin feeding on the outer canopy, they can completely defoliate the plant in 36 to 48 hours.

The pattern of feeding on the inner canopy and the position of soybean loopers on the leaf make spotting early stage looper problems difficult without close inspection. Soybean looper location also makes good insecticide coverage extremely important for successful control.

**Management And Control**

Naturally occurring parasites and diseases have not offered much help in the control of soybean loopers in recent years. A small, parasitic wasp has potential for reducing populations. Currently, however, it seems to be affecting only a small percentage of soybean loopers.

Because chemical controls are not as effective as they once were, early detection of soybean looper problems is necessary to avoid excessive crop damage. Waiting to treat until soybean loopers reach high numbers can create serious problems.

The best survey method for loopers is to use a drop cloth as in soybean surveys. Spread the cloth between the rows and beat or shake the plants over the cloth.

The treatment level of soybean loopers on cotton is approximately five small larvae per row foot when the youngest bolls are not mature. Ten to fifteen larvae per row foot may cause up to 90 percent foliage loss.

Soybean loopers in cotton are often considerably harder to control than those infesting soybeans. First, moths that feed on cotton tend to produce more eggs after feeding on cotton nectar. Increased egg production may be caused by the carbohydrate source found in cotton blooms. Control of soybean loopers on cotton is also difficult because of the dense canopy of cotton. Large numbers of caterpillars, feeding on lower leaves and inside the canopy, are difficult to reach with insecticides. Finally, control of the species is difficult because of a high level of resistance to all classes of insecticides.

Insecticide coverage can be improved by the addition of spray carriers or additives, such as oils. Canopy penetration can be improved by increasing pressure, which will produce smaller spray droplets. Applicators must maximize coverage for insecticides to reach the lower plant, where soybean loopers feed in their early stages.

No currently registered insecticide offers adequate control of soybean loopers on cotton. Larvin offers some success as do biological insecticides such as the B.t.s (Dipel, Condor, Javelin, Design, and Biocot). At least two applications may be necessary to prevent economic damage. The first application should be made when soybean loopers are less than ½ inch, followed by the second application about 5 days later. Accurate surveys are necessary to detect the caterpillars before damaging foliage loss has occurred.

New chemistry from American Cyanamid (Pirate™) will be available in a few years and offers good activity on soybean loopers. In the meantime, entomologists will continue the search for more effective controls and management practices to prevent soybean looper damage in cotton.