

## ✓ Soybean Insects ✕ by ✓

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In this article a short survey is given of the insect species living on soybeans in Suriname, which have been observed during the years 1953—1955. According to their economic importance these insects may be arranged in the following groups: I insect pests of major importance, II insects of minor importance, III insects of no apparent importance.

### I. INSECT PESTS OF MAJOR IMPORTANCE

Four important insect pests of soybean can be recorded, viz. *Laphygma frugiperda* S. & A., *Anticarsia gemmatilis* Hbn.<sup>1)</sup>, *Agrotis repleta* Wlk.<sup>1)</sup>, and *Scapteriscus didactylus* Latr. These insects may cause considerable damage when present in large numbers. Mass-appearance, however, is irregular.

#### *Laphygma frugiperda* S. & A. (fam. Noctuidae)

The area of distribution of this moth extends from the Northern States of the U.S.A. through Central America and the West Indies into South America. The caterpillars are polyphagous and besides soybeans the following foodplants can be recorded for Suriname: rice, corn, sorghum, sugar cane, pasture grasses, peanuts, cabbage and tomato; the foodplants belonging to the grass family are preferred.

*Laphygma* larvae often are highly variable in body pattern and in the hue of their green, dark brown and intermediate colouration. However, all caterpillars can be recognized by the yellowish-white "Y" on the head, by the pronotum with the three parallel pale yellow-white stripes continuing backward over the body, and by the four black dorsal spots arranged trapezoidally on most segments. Fig. 1 pictures the male moth.

In their later stages the caterpillars may completely defoliate the soybean plants. During a mild *Laphygma* attack a remarkably symmetrical leaf injury of various forms may be caused by feeding near the growing tip, where the young not yet unfolded leaves are partly destroyed.

For detailed information concerning the morphology and life history see: WOLCOTT, G. N., 1948, *J. Agr. Univ. Puerto Rico* 32 (3) : 591—593; DINTHER, J. VAN, 1955, *Ent. Berichten* 15 (18) : 407—411.

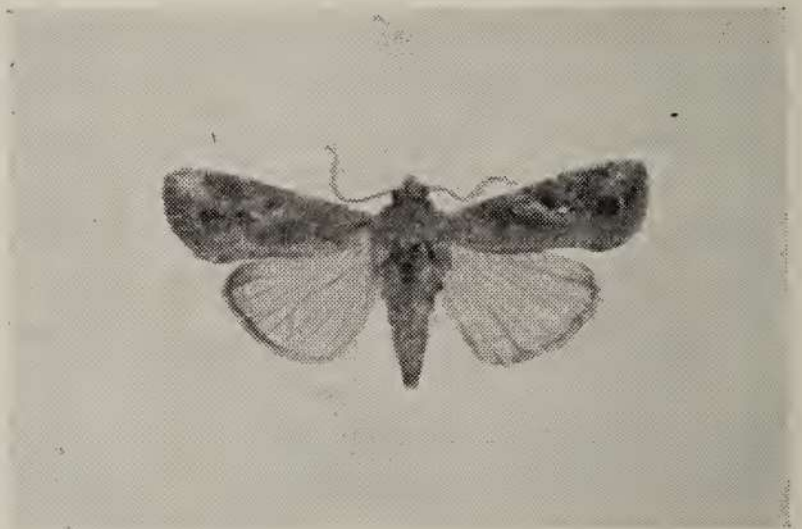


Fig. 1. *Laphygma frugiperda* S. & A., male moth;  $\frac{5}{4} \times$  natural size

<sup>1)</sup> Identifications by E. L. TODD, U.S.D.A.



*Anticarsia gemmatilis* Hbn. (fam. Noctuidae)

Caterpillars of this moth have been reported to attack velvet beans, soybeans, peanuts, alfalfa and the foliage of *Agati grandiflora* in Puerto Rico<sup>1</sup>). The moth occurs from the United States to Paraguay and in the Galapagos Islands. In Suriname, caterpillars have been observed to injure soybeans and peanuts.

## MORPHOLOGY.

**Caterpillars.** As caterpillars may show variation in the amount of green and darker brownish colouring, only a general colour description will be given here.

**Caterpillar of the last instar.** The larva of this stage may reach a length of 3—4 cm and a width of 0.4 cm. The main body colour is dull pale green. Ventrally, the colour is green. Dorsally and dorso-laterally the colour often changes into a reddish-green when the caterpillar becomes full-grown. The yellowish-green coloured head, often red-brownish veined at its occiput and lateral sides, has a width of about 2.7—3 mm.

Dorsally in the median, a pale light fine band, seamed by a darker green or a brownish border, runs longitudinally over the body. Dorso-laterally, at both sides of the median, two similar but more or less distinct darker coloured fine bands are present. Laterally, at the height of the spiracles, a longitudinal pale yellow band, sometimes ornamented with 2 lilac-redbrown parallel and somewhat irregular lines, can be noticed. The pale yellowish-white spiracles have a darker border. The caterpillar body bears dark brown slender setae, often inserted on small dark coloured bases; moreover whitish spots without setae may be noticeable at the abdomen. The posterior border of several abdominal segments is sometimes yellowish in colour. The long abdominal legs of segment 10 are directed backward. A picture of the caterpillar has been reproduced by WOLCOTT (l.c.).

**Younger instar.** Dorsally in the median the pale green body, which is 1.5 cm long, is ornamented with a yellowish-white fine longitudinal band; at both sides and parallel to this band 2 similar bands are present, while finally another yellowish-white band runs at the height of the spiracles. The head is shiny yellowish green. Long slender dark body setae are inserted on small dark bases.

**Pupa.** The mahogany-brown, shiny pupa has a length and width of 1.6—1.8 cm and 0.5 cm, respectively. The abdominal end bears one pair of stout setae-like processes in the median; dorso-laterally, three more setae, often somewhat curled at the tip, are present.

**The moth** (see fig. 2). The wing span varies from 3.5—4.4 cm. The main colour of the upper side of the wings is brown sandy-grey. A pale yellowish-brown indistinct or very marked dark brown line runs from the anterior tip of the fore wing to a point near the middle of the hind margin. The hind wing also bears a brown oblique line that runs from the middle of the anterior margin to the middle of the posterior margin. The colour intensities and the wing pattern are highly

<sup>1</sup>) WOLCOTT, G. N., 1948. The Insects of Puerto Rico. *J. Agr. Univ. Puerto Rico* 32 (3): 620.



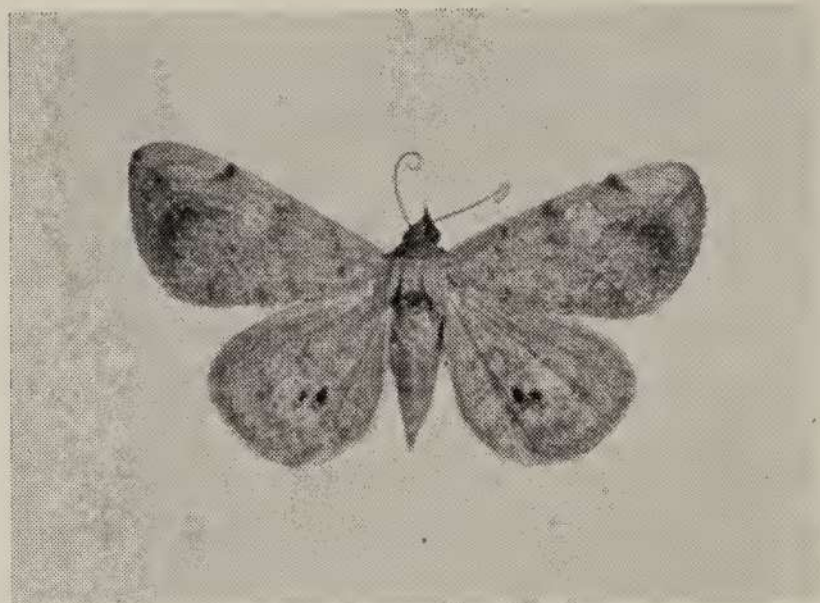


Fig. 2. *Anticarsia gemmatilis* Hbn., male moth:  
 $\frac{5}{4} \times$  natural size

variable; the reniform spot is not or in most cases only vaguely visible. The hind wing is sometimes ornamented with a pair of brown-black eyespots.

The male moth is characterized by its hairy legs, while the antennae are somewhat more ciliated and the upper side of the wings often has a more grey colour than in the female sex.

#### LIFE HISTORY

The young caterpillars gnaw holes in the leaves and also feed along the leaf margins. Soon afterwards, larger parts of the leaf are destroyed, and during their later stages the caterpillars may completely defoliate the plants. When disturbed the caterpillars are very fidgety and make quick jumping movements. The fullgrown caterpillar enters into the soil making an oval-shaped 2.5 cm long earthen cell, its wall consolidated with some silk. In captivity pupation also took place on the ground between fallen leaves and other plant debris that had been loosely spun together; when disturbed the full-grown caterpillar just before pupation turns and revolves with lightning speed. After pupation the caudal pupal extremity with its processes is firmly hooked onto the loosely spun silky cocoon. The length of the pupal stage varies from 7—10 days.

The caterpillars may be parasitized by the larva of a 6.5 mm long yellow-brown Braconid (*Zelomorpha* sp.)<sup>1)</sup>.

#### *Agrotis repleta* Wlk. (fam. Noctuidae)

This cutworm is a general feeder. Its food plants include soybeans, peanuts, tomato and cabbage. The subterranean caterpillar hides in or near the soil during the day but may emerge for nocturnal feeding. The roots and the base of the stem of the foodplant become attacked and the stem is often seriously injured or cut off. The caterpillar may also feed on the foliage.

Pupation takes place in the soil, inside an earthen cell, while a duration of the pupal stage of 12 days has been observed.

The full-grown cutworm attains a length of about 4.5 cm and a width of 0.8 cm. Dorsally, the colour is dark-grey, sometimes with a velvety appearance. The black pronotum has a fine pale greyish line in median that continues backward indistinctly. Dorsally, the 10th abdominal segment is provided with a somewhat rectangularly shaped black zone, which is divided longitudinally by a grey yellowish line. At both sides of the median a light grey longitudinal narrow band may be distinguished while laterally, at the height of the black spiracles and running somewhat obliquely, short light grey zones can be noticed; however,

<sup>1)</sup> Identification by C. F. W. MUESEBECK, U.S.D.A.



these bands and zones are often only vaguely visible. The body bears a few hairs while the short setae are inserted on small black shiny bases. Ventrally, the body and the legs have a dull pale grey colour. The head, with a width of about 3.7 mm, is light brown, the epicranial arms having a black seam; labrum pale.

The chestnut-brown shiny pupa has a length of 2.2—2.6 cm; the abdominal tip is provided with one pair of spines, while laterally a minute process from which a small seta arises can sometimes be distinguished.

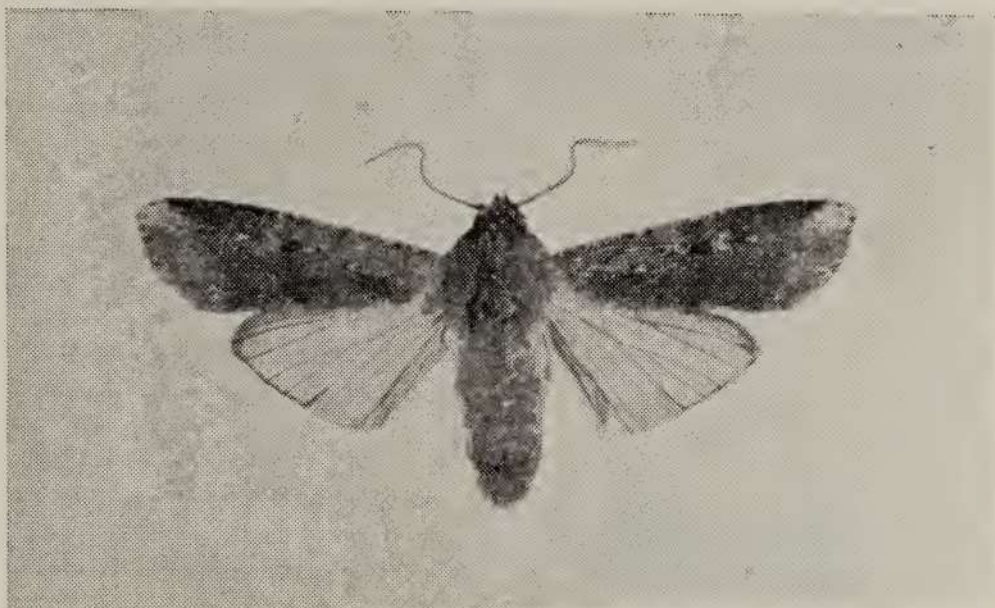


Fig. 3. *Agrotis repleta*  
Wlk., female moth;  
 $\frac{5}{4} \times$  natural size

The moth (see fig. 3). The wing span of the male moth varies from 4.1—5.2 cm; that of the female moth from 4.4—5.5 cm. The front wings are marbled with brown. The reniform spot and the round spot are partly bordered by a fine black line, and the two are connected by a short black bar. The front wings have a sandy-coloured tip; this colour may also have a somewhat golden gloss, and may spread along the lateral wing region. The pearly white hind wings are somewhat hyalinous. The antennae of the male moth have short cilia.

#### *Scapteriscus didactylus* Latr. (fam. Gryllotalpidae)

The mole cricket *Scapteriscus didactylus* Latr. is a very polyphagous feeder. Besides attacking soybeans, it feeds on upland rice, Sorghum, maize, peanuts, tomato, tobacco, lettuce, cabbage and on various grass species. Its rather limited distribution range extends from the eastern part of Venezuela through the West-Indies to Amazonian Brazil.

Young (soybean) plants after their appearance above the ground may become attacked by mole crickets that often tunnel just beneath the soil surface. The insects feed on the young stems, which may be completely cut off. For more detailed information see: DINTHER, J. VAN, 1955, Biology and Control of Mole Crickets, *De Surinaamse Landbouw* 3 (2): 72—77. For further data concerning the morphology and the life history of the closely related Puerto Rican mole-cricket *Scapteriscus vicinus* Scudder reference can be made to the detailed publication by R. H. VAN ZWALUWENBURG, 1918, The Changa or West Indian mole cricket, *Porto Rico Agr. Exp. St., Bulletin* 23.

## II INSECTS OF MINOR IMPORTANCE

Two beetles can be recorded causing damage of minor importance viz. *Cerotoma*



*variegata* F. and *Diabrotica* sp. prob. *capitata* F.<sup>1)</sup>). Moreover, a *Tetranychus* sp. prob. *bimaculatus* Harvey is also injurious. Although this mite has been placed in this section it probably holds an intermediate position between group I and II.

*Cerotoma variegata* F. (fam. Chrysomelidae)

This 4.4—5.5 mm long beetle can regularly be observed in soybean plots. The black elytra are ornamented with a yellowish pattern (see fig. 4) that may show some slight variability. The pronotum has a light yellow-brown colour. The female sex is characterized by a dentiform to spinous outgrowth on the 3rd and 4th antennal joint. Beetles feed on the leaves, causing shot-holes that fuse during a heavy attack. They may also feed on the flowers, damaging the petals and to a lesser degree the pistil and the stamens, giving the flower a wilted appearance. Moreover, the beetles injure the pods, gnawing holes in the husk sometimes even penetrating and attacking the young seeds. This species has also been observed on *Calopogonium* sp.

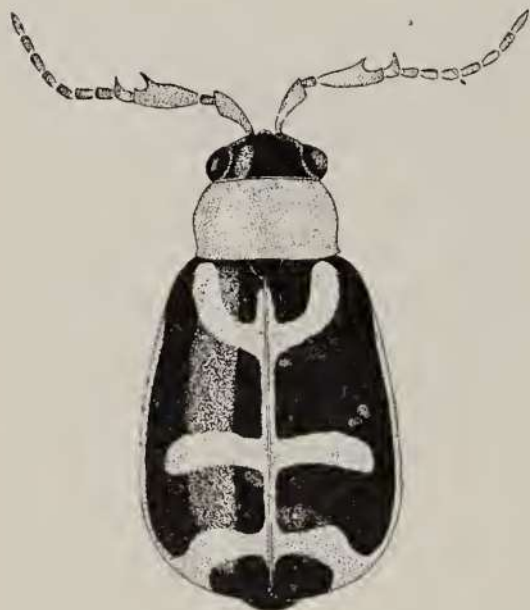


Fig. 4. *Cerotoma variegata* F., female beetle; 8 ×

*Diabrotica* sp. prob. *capitata* F. (fam. Chrysomelidae).

The light or dark brown coloured elytron of this 5—6.5 mm long beetle is ornamented with 3 yellowish spots, situated, respectively, on the anterior half, just beneath the middle and on the posterior inner angle. These spots are variable in shape and size and are sometimes indistinct or may even be absent. In exceptional cases it has been noticed that the anterior and middle spot are fused. Laterally, the elytron has a yellow border, sometimes smoothly and slightly curved inward near the anterior and middle spot. The pronotum colour varies from yellowish brown to brown.

For the type of injury caused by this beetle on soybean plants reference can be made to the feeding habits of *Cerotoma variegata* F.

*Tetranychus* sp. prob. *bimaculatus* Harvey (fam. Tetranychidae)

The adult female mite, which has a body length of 0.45—0.59 mm (measured from the tips of the pedipalpi to the abdominal end) deposits her spherical hyalinous to pale yellowish-green eggs directly upon the lower side of the soybean leaf. The eggs, with a diameter of 0.13—0.15 mm, are usually clustered rather closely. They may also be attached to the silk threads of the web that is spun over the leaf surface. During mass-appearances eggs are also deposited on the stalks and pods of the plant.

The newly hatched "red spider" is nearly colourless; the two following stages that can be distinguished become yellow-green or more orange in colour. The adult mite is reddish and usually possesses on either side of the body a dark spot, caused by the food contents.

<sup>1)</sup> Identification by G. B. VOGT, U.S.D.A.



The time required for the development of a single generation can be estimated to taken about 10 days, and the numbers of mites increase very rapidly during times of drought.

The spiders of a young colony soon form a small web on the leaves; where red spiders are abundant the web becomes quite conspicuous and may even completely envelop the plant. Infested leaves soon show yellowish spots between the veins. Later the whole leaf may turn yellow to yellowish brown. Finally the plant shrivels up and gradually dies. The amount of damage to the soybean crop will depend largely upon the stage in which the plants are attacked; when plants become infested before or during flowering, pod formation and development can be seriously impaired.

### III INSECTS OF NO APPARENT IMPORTANCE

The following insects causing no damage of importance can be recorded:

a 2.5—3.2 mm long Chrysomelid with shiny black elytra belonging to the genus *Monolepta*<sup>1)</sup>; a 3.4—4 mm long *Systema* sp. prob. *literata* L.<sup>2)</sup> (fam. Chrysomelidae), with a yellow slightly undulating longitudinal narrow band on its shiny black elytron; an *Omophoita* sp.<sup>1)</sup> (fam. Chrysomelidae); a 4.5—5 mm long not yet identified Carabid, with head and elytra dull black and the pronotum orange-brown coloured, while the elytron is ornamented with a round whitish spot at its posterior area.

Finally, a 1.2—1.5 cm long green Pentatomid, *Acrosternum armigera* Stal.<sup>2)</sup>, with a yellowish small lateral border along the head, the pronotum and the basal part of the corium, has been noticed.

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James, M. T., The Blowflies of California (Diptera, Calliphoridae). *Bull. Calif. Insect Survey* 4 (1), 1955.

Dit artikel is ook voor de Nederlanders van belang, omdat er vele soorten in behandeld worden, die ook hier voorkomen, maar bovendien een aantal met een Aziatisch-Amerikaanse verspreiding. — KR.

Clegg, John, *The Observer's Book of Pond Life*. Frederick Warne & Co., Ltd., London, april 1956. Gebonden.

In dit alleraardigste boekje vindt men een overzicht van de planten en dieren, die in meren en plassen voorkomen. Het bevat 32 gekleurde platen van een uitstekende kwaliteit, 8 met planten, de andere met dieren. Hiervan zijn er 4 met Libellen, elk met 4 soorten in beide geslachten, één met Waterwantsen, 2 met huisjes van larven van Kokerjuffers, één met 12 soorten Trichoptera, één met Kroosmotjes, 2 met Waterkevers, één met Watermijten. De andere gekleurde platen geven afbeeldingen van slakken, schaaldieren enz. Bovendien zijn er nog 16 platen met ongekleurde afbeeldingen (vooral larven) en 16 met foto's. Tekst plus index beslaan 129 pagina's.

En de prijs van al dit fraais? Slechts 5 shilling! — LPK.

Correctie. Door een allerongelukkigste samenloop van omstandigheden is het register van deel 15 precies 20 pag. te hoog genummerd.

<sup>1)</sup> Identifications by G. B. VOGT, U.S.D.A.

<sup>2)</sup> Identifications by R. I. SAILER, U.S.D.A.