

LepIntercept

An identification resource for intercepted Lepidoptera larvae



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NOCTUIDAE - *S. frugiperda* (J. E. Smith) *Non-Rep*

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Taxonomy

Noctuoidea: Noctuidae: Noctuinae: *Spodoptera frugiperda* (J. E. Smith)

Common names: fall armyworm, cogollero, whorlworm, corn leafworm, southern grassworm

Synonyms: *Laphygma frugiperda*

Larval diagnosis (Summary)

- Characteristic body coloration (see Figs. 1-3 and Detailed Information)
- Dorsal pinacula of A1-8 are larger than the diameter of the corresponding spiracle
- Minute sclerotized bar connecting the SD1 setal base to a tonofibrillary platelet on the meso- and metathorax
- Cuticle with granulose texture

Host/origin information

Larvae of *S. frugiperda* are routinely intercepted from locations in Central and South America on a variety of hosts. The most common origin is Mexico, accounting for 65% of all records. Other common origin/host combinations are listed here:

Origin	Host(s)
Colombia	<i>Alstroemeria</i> , <i>Chrysanthemum</i> , <i>Gerbera</i>
Dominican Republic	<i>Capsicum</i>
Mexico	<i>Apium</i> , <i>Brassica</i> , <i>Capsicum</i> , <i>Gladiolus</i> , <i>Ocimum</i> , <i>Zea mays</i>

Recorded distribution

Spodoptera frugiperda is widely distributed throughout North, Central, and South America. It is also present in the Caribbean (Pogue 2002).

Identification authority (Summary)

Spodoptera frugiperda is highly polyphagous, thus host data often does not help identification. Origin data is useful because this species does not naturally occur outside of the New World. The morphological characters listed here should be sufficient to identify *S. frugiperda* to species, even in early instars.

Pest characterization

(Based on Cavey 2001, Pogue 2002)

- Taxonomy: **High**. Species identification is often possible.
- Distribution: **Low**. *Spodoptera frugiperda* is present in the U.S.
- Potential Impact: **High**. *Spodoptera frugiperda* is a pest species.

This ranking characterizes *S. frugiperda* as not quarantine significant for the U.S.

Larval diagnosis (Detailed)

The larva of the fall armyworm, *Spodoptera frugiperda*, was at least partially described by Luginbill (1928), Crumb (1956), Etcheverry (1957), Okumura (1961), Peterson (1962), Dekle (1976), Pastrana and Henandez (1979), Passoa (1991), and Pogue (2002). The larva has been photographed many times; some examples are Passoa (1991), Pogue (2002), and Wagner et al. (2011).

Typical interceptions of *S. frugiperda* are immediately recognized by their characteristic appearance. The ground color is normally some shade of brown or gray, more rarely the larva is light green or almost black. The dorsal pinacula of A1-8 are large, greater than the diameter of

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Fig. 1: Late instar, lateral view



Fig. 2: Late instar, lateral view



Fig. 3: Late instar, lateral view

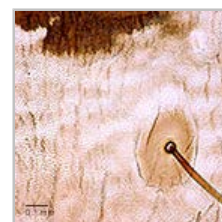


Fig. 4: Cuticle texture



Fig. 5: Crochets



Fig. 6: Head



Fig. 7: Mandible



Fig. 8: Hypo. complex

the corresponding spiracle (Levy and Habeck 1976), and especially conspicuous on last few abdominal segments where they form a square on A8 (Dekle 1976). Some individuals do not have the lateral spot on A1 typical of most other *Spodoptera*. However, there is a minute sclerotized bar connecting the SD1 setal base to an adjacent ventral muscle attachment (tonofibrillary platelet) on the meso- and metathorax (Weisman 1974, 1986; Passoa 1991) which is typical of the genus (and many other noctuids; see *S. exigua*). *Spodoptera frugiperda* has SD1 is hairlike on the mesothorax, metathorax, and A9. The blade on the hypopharyngeal complex is a long ridge in our example, much like the example in Passoa (1991: fig. 7) but shorter. We show a rare form of *S. frugiperda* with dashes on the dorsum, normally these are absent (see Passoa 1991, Pogue 2002, Wagner et al. 2011).

Some green forms of *S. frugiperda* resemble *S. exigua* if the pinacula are very pale (Passoa 1991). Crumb (1956) separated these two species, in part, by the position of a line connecting the P1 setae on the head. The line is above the apex of the front in *S. frugiperda* but below the apex in *S. exigua* (see illustrations in Okumura 1961). The cuticle has flat granulose texture (Passoa 1991: fig. 4, Pastrana and Henandez 1979: fig. 128). No other *Spodoptera* species studied by Pogue (2002) has the combination of large pinacula and granulose skin.

Identification authority (Detailed)

Spodoptera frugiperda is highly polyphagous, thus host data often does not help identification. The recorded distribution includes almost the entire New World (Pogue 2002), but *S. frugiperda* does not naturally occur in the Old World. Early instar larvae that show the spot on A1, the large pinacula and the granulose texture can be identified as *S. frugiperda*.

Origin records

S. frugiperda has been intercepted from the following locations:

Argentina, Barbados, Belize, Brazil, Canada, China, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, Guatemala, Guyana, Haiti, Honduras, Indonesia, Israel, Jamaica, Mexico, Micronesia, Netherlands, Nicaragua, Panama, Peru, Puerto Rico, Thailand, Trinidad and Tobago, Turkey, Venezuela

Records from China, Indonesia, Israel, Micronesia, the Netherlands and Thailand require confirmation.

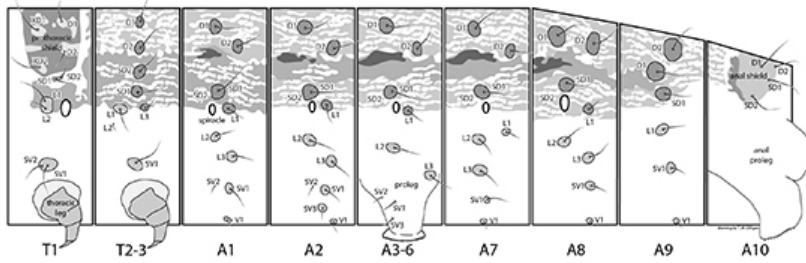
Host records

S. frugiperda has been intercepted on the following hosts:

Abelmoschus esculentus, *Abelmoschus* sp., *Allium cepa*, *Allium porrum*, *Allium schoenoprasum*, *Allium* sp., *Alstroemeria* sp., *Amaranthus* sp., *Ananas comosus*, *Ananas* sp., *Anethum graveolens*, *Anethum* sp., *Apiaceae*, *Apium graveolens*, *Apium graveolens* var. *dulce*, *Apium* sp., *Artemisia dracuncululus*, *Artemisia* sp., *Asparagus officinalis*, *Asparagus* sp., *Aster* sp., *Asteraceae*, *Basilicum* sp., *Beta vulgaris* var. *cicla*, *Brassica campestris*, *Brassica chinensis*, *Brassica juncea*, *Brassica oleracea*, *Brassica oleracea* var. *botrytis*, *Brassica oleracea* var. *capitata*, *Brassica oleracea* var. *italica*, *Brassica pekinensis*, *Brassica rapa*, *Brassica rapa* ssp. *chinensis*, *Brassica rapa* ssp. *pekinensis*, *Brassica* sp., *Brassicaceae*, *Bromelia* sp., *Callistephus chinensis*, *Callistephus* sp., *Capsicum annuum*, *Capsicum frutescens*, *Capsicum sinense*, *Capsicum* sp., *Carica papaya*, *Carya* sp., *Celosia* sp., *Chenopodium berlandieri* ssp. *nuttalliae*, *Chenopodium berlandieri* ssp. *nuttalliae*, *Chrysanthemum* sp., *Cicer arietinum*, *Cichorium endivia*, *Citrullus lanatus*, *Citrus aurantiifolia*, *Codiaeum* sp., *Cordyline* sp., *Coriandrum sativum*, *Cucurbita* sp., *Cymbidium* sp., *Cymbopogon citratus*, *Cynara cardunculus*, *Cynara scolymus*, *Cyperus papyrus*, *Dianthus* sp., *Diospyros* sp., *Dysphania ambrosioides*, *Eruca vesicaria*, *Eryngium foetidum*, *Eryngium* sp., *Fabaceae*, *Fragaria ananassa*, *Fragaria* sp., *Gerbera* sp., *Gladiolus* sp., *Gypsophila* sp., *Helianthus annuus*, *Helianthus* sp., *Heliconia* sp., *Hydrangea* sp., *Hypericum* sp., *Iris* sp., *Lablab* sp., *Lactuca sativa*, *Lactuca* sp., *Lagenaria siceraria*, *Lamiaceae*, *Leucaena* sp., *Lilium* sp., *Limonium* sp., *Lycopersicon* sp., *Mangifera indica*, *Manihot esculenta*, *Maranta leuconeura*, *Maranta* sp., *Matthiola* sp., *Mazus* sp., *Melicoccus bijugatus*, *Mentha arvensis*, *Mentha sachalinensis*, *Mentha* sp., *Moluccella laevis*, *Moluccella* sp., *Momordica charantia*, *Momordica* sp., *Musa paradisiaca*, *Musa* sp., *Ocimum basilicum*, *Ocimum* sp., *Opuntia* sp., *Origanum majorana*, *Origanum* sp., *Origanum vulgare*, *Penstemon* sp., *Persea americana*, *Petroselinum crispum*, *Phaseolus* sp., *Phaseolus vulgaris*, *Phormium* sp., *Physalis philadelphica*, *Physalis pubescens*, *Physalis* sp., *Piper* sp., *Pisum sativum*, *Pisum sativum* var. *macrocarpon*, *Pisum* sp., *Poaceae*, *Prosopis* sp., *Punica granatum*, *Ranunculus* sp., *Raphanus* sp., *Rosa* sp., *Rosaceae*, *Rosmarinus officinalis*, *Rubus* sp., *Rubus ursinus*, *Rumohra* sp., *Saccharum officinarum*, *Salvia officinalis*, *Salvia* sp., *Sechium edule*, *Setaria italica*, *Setaria* sp., *Solanum integrifolium*, *Solanum lycopersicum* var. *lycopersicum*, *Solanum melongena*, *Solanum* sp., *Solidago* sp., *Spinacia oleracea*, *Strelitzia* sp., *Stromanthe* sp., *Tagetes lucida*, *Tagetes* sp., *Theobroma cacao*, *Thymus* sp., *Thymus vulgaris*, *Tulipa* sp., *Vaccinium corymbosum*, *Vaccinium* sp., *Vigna* sp., *Yucca* sp., *Zantedeschia* sp., *Zea mays*, *Zea* sp., *Zingiber officinale*, *Zizania* sp.

Setal map

Spodoptera frugiperda (J. E. Smith)



Gilligan, T. M. & S. C. Passoa. 2014. *LepIntercept*. An identification resource for intercepted Lepidoptera larvae. Identification Technology Program (ITP), USDA/APHIS/PPQ/SS.T, Fort Collins, CO (accessed at www.LepIntercept.org).

Spodoptera frugiperda setal map



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LepIntercept - An identification resource for intercepted Lepidoptera larvae by Todd M. Gilligan and Steven C. Passoa
Identification Technology Program (ITP), Fort Collins, CO. Last updated February 2014.

