

EPPO Datasheet: *Spodoptera litura*

Last updated: 2023-03-15

IDENTITY

Preferred name: *Spodoptera litura*

Authority: (Fabricius)

Taxonomic position: Animalia: Arthropoda: Hexapoda: Insecta:
Lepidoptera: Noctuidae

Other scientific names: *Prodenia litura* Fabricius

Common names: cluster caterpillar, cotton leafworm, cotton worm, rice cutworm, tobacco caterpillar, tobacco cutworm, tobacco leaf caterpillar, tropical armyworm

[view more common names online...](#)

EPPO Categorization: A1 list

[view more categorizations online...](#)

EU Categorization: A1 Quarantine pest (Annex II A)

EPPO Code: PRODLI



[more photos...](#)

Notes on taxonomy and nomenclature

Spodoptera litura and *S. littoralis* were regarded as the same species when Aurivillius synonymized *Noctua litura* (Fabricius, 1775) and *Prodenia littoralis* (Boisduval, 1833) under the name *Prodenia litura* Fabricius in 1897. Viette (1963) reviewed the species and suggested that there are two distinct species.

HOSTS

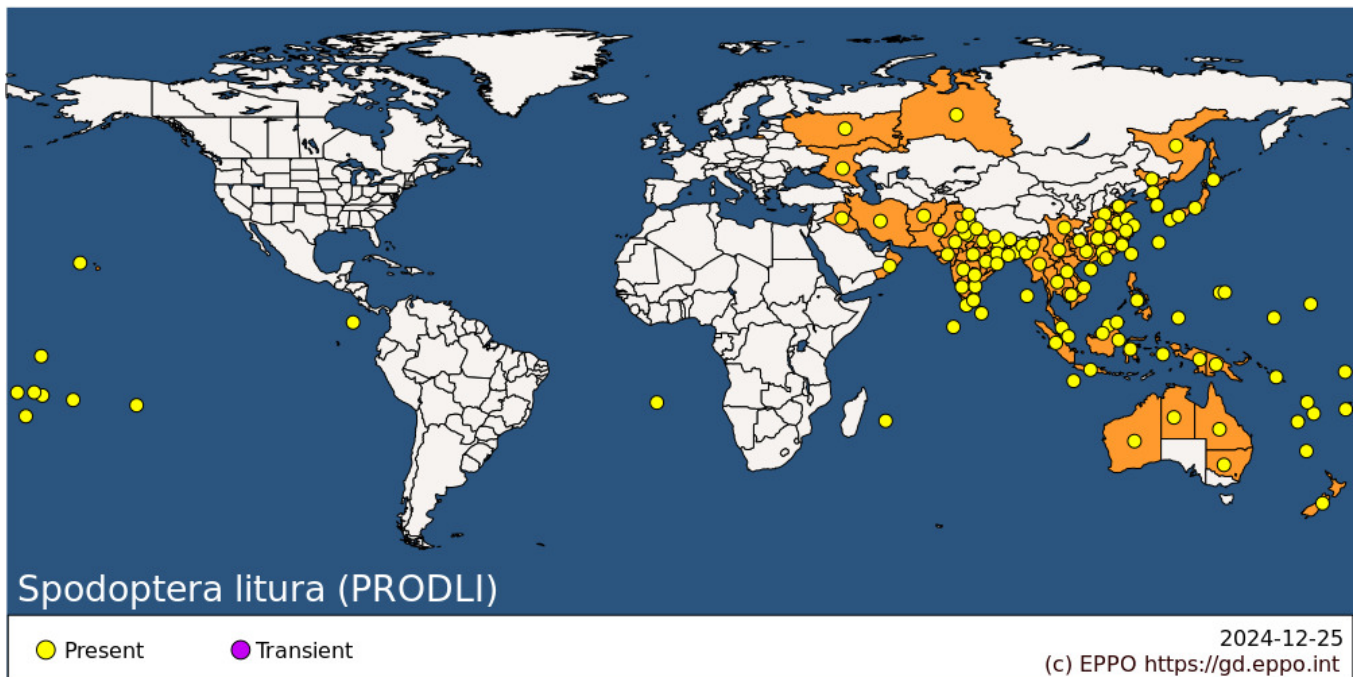
S. litura is highly polyphagous (Brown & Dewhurst, 1975, Holloway, 1989). Its host range covers over 40 plant families and at least 120 plant species. Some of the main crop species attacked by *S. litura* are taro (*Colocasia esculenta*), cotton, flax, groundnut, jute, lucerne, maize, potato, sweet potato, rice, soybean, tea, tobacco. Vegetables and fruits, including several *Brassica* species, bell pepper, cucurbitaceous vegetables, eggplant, *Phaseolus*, citrus, *Vigna* etc. (Ahmad *et al.*, 2013, Sang *et al.*, 2016, Ullah *et al.*, 2016) and aromatic and medicinal plants (such as sage, rosemary, mint, marjoram and coriander (Meena *et al.*, 2017, Wen *et al.*, 2007) are also important crops attacked by this pest. Other hosts include ornamentals and wild plants. In most of the EPPO region, outdoor crops are not likely to be attacked and most of the potential hosts are ornamentals and vegetables under protected cultivation. In the south of the region, cotton, lucerne, soybean, *Trifolium* and several vegetables are potential hosts for *S. litura*.

Host list: *Abelmoschus esculentus*, *Acaciella glauca*, *Allium cepa*, *Amaranthus blitum*, *Arachis hypogaea*, *Brassica juncea*, *Brassica oleracea*, *Brassica rapa* subsp. *chinensis*, *Camellia sinensis*, *Capsicum annuum*, *Chenopodium murale*, *Chenopodium album*, *Citrus reticulata*, *Cleome viscosa*, *Colocasia esculenta*, *Convolvulus arvensis*, *Corchorus olitorius*, *Coriandrum sativum*, *Dahlia coccinea*, *Daucus carota*, *Eucalyptus* sp., *Ginkgo biloba*, *Glycine max*, *Gossypium barbadense*, *Gossypium hirsutum*, *Hibiscus rosa-sinensis*, *Ipomoea batatas*, *Jatropha curcas*, *Linum usitatissimum*, *Medicago sativa*, *Melissa officinalis*, *Mentha* sp., *Morus alba*, *Nicotiana tabacum*, *Ocimum basilicum*, *Origanum* sp., *Oryza sativa*, *Phaseolus vulgaris*, *Pisum sativum*, *Plectranthus* sp., *Raphanus sativus*, *Ricinus communis*, *Rosa* sp., *Salvia rosmarinus*, *Sesbania sesban*, *Solanum lycopersicum*, *Solanum melongena*, *Solanum tuberosum*, *Sorghum bicolor*, *Spinacia oleracea*, *Theobroma cacao*, *Trianthema portulacastrum*, *Trifolium alexandrinum*, *Vigna angularis*, *Vigna unguiculata*, *Zea mays*

GEOGRAPHICAL DISTRIBUTION

S. litura currently occurs throughout most of South and East Asia, Oceania, some African islands and Hawaii. It is considered native to South-East Asia and has been introduced into Western Asia, Australia, New-Zealand and most of the Pacific islands. *S. litura* cannot survive freezing temperatures and it is considered unlikely that the few

occurrences reported from Russia are related to establishment outdoors.



EPPO Region: Russia (Central Russia, Far East, Southern Russia, Western Siberia)

Africa: Reunion, Saint Helena

Asia: Afghanistan, Bangladesh, Brunei Darussalam, Cambodia, China (Anhui, Aomen (Macau), Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Shandong, Shanghai, Sichuan, Xianggang (Hong Kong), Yunnan, Zhejiang), Christmas Island, Cocos Islands, India (Andaman and Nicobar Islands, Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Uttarakhand, Uttar Pradesh, West Bengal), Indonesia (Irian Jaya, Java, Kalimantan, Maluku, Sulawesi, Sumatra), Iran, Iraq, Japan (Hokkaido, Honshu, Kyushu, Ryukyu Archipelago, Shikoku), Korea Dem. People's Republic, Korea, Republic, Laos, Malaysia (Sabah, Sarawak, West), Maldives, Myanmar, Nepal, Oman, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam

North America: United States of America (Hawaii)

Oceania: American Samoa, Australia (New South Wales, Northern Territory, Queensland, Western Australia), Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Micronesia, New Caledonia, New Zealand, Niue, Norfolk Island, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, Wallis and Futuna Islands

BIOLOGY

Between 2 and 5 days after emergence, females lay between 200 and 4000 eggs, depending on host plant, temperature and relative humidity. The eggs are laid on the underside of the leaves of the host plant in egg masses covered by bristles (scales) from the end of the mother's abdomen. Eggs cannot develop at temperatures below 8°C (Rao *et al.*, 1989), larvae require a minimum of 0.9 degree-days to properly develop and daily minimum temperatures below -5°C are lethal (Matsuura & Naito, 1997). Development speed and fecundity increases towards higher temperatures and higher humidity up to a maximum of 35°C (at 75% RH) when oviposition stops (Garad *et al.*, 1984, Hardik & Dolly, 2020).

The eggs hatch within ca. 4 days under warm conditions (around 25°C), or up to 11-12 days at 15°C. The larvae pass through six instars in 16 days at 30°C. At lower temperatures maturation may take up to 3 months. The young larvae (first to third instar) feed in groups, leaving the epidermis on the other side of the leaf intact. Later, the (4th to 6th instar) larvae disperse and spend the day among leaf litter or in the ground under the host plant, feeding at night and early in the morning.

The pupal stage is spent in earthen cells in the soil and lasts about 8 days at 30°C. Longevity of female adults is about 4-10 days with males living up to 16 days (Etman & Hooper, 1980). Adult longevity reduces at higher temperature and lower humidity. Under optimal conditions, the life cycle can be completed in about four weeks. In Japan (Nakasiju & Matsuzaki, 1977), four generations develop between May and October, while in the humid tropics there may be eight to twelve annual generations (Fand *et al.*, 2015). In the seasonal tropics, several generations develop during the rainy season, while the dry season is spent in the pupal stage.

For more information, see Etman and Hooper (1980), Garad *et al.* (1984), Hardik and Dolly (2020), Miyahara *et al.* (1971), Rao *et al.* (1989).

DETECTION AND IDENTIFICATION

Symptoms

On most crops, damage arises from extensive feeding by larvae, leading to complete stripping of the plants. Some examples of symptoms include: on cotton, leaves are heavily attacked, and cotton bolls have large holes in them from which yellowish-green to dark-green larval excrement protrudes; on tobacco, leaves develop irregular, brownish-red patches and the stem base may be gnawed off; on maize, larvae damage whorl leaves, bracts and young kernels.

Morphology

Eggs

Spherical, somewhat flattened, 0.6 mm in diameter, laid in tight batches and usually covered with hair-like scales from the tip of the abdomen of the female. These typical noctuid eggs contain many ribs (35-65) as goes for all taxa within this genus. The micropylar rosette is flat. Eggs are white at first and usually change colour to pale orange-brown or pink with a pearly shimmer.

Larva

First instar larvae are 1–2.5 mm long, the final instar larvae may attain 40–45 mm in length. Larvae are variable in overall colour (blackish-grey to dark-green, becoming reddish-brown or whitish-yellow) and markings. Typically, older larvae have a Y-shaped-marking across the head capsule and thorax shield. Late instars often have dark and light longitudinal bands and two dark semilunar spots dorsolaterally on each abdominal segment, of which the spots on the first and eighth abdominal segments are larger than the others. The spot on the first abdominal segment often interrupts the lateral line running across the spiracula. *S. litura* and *S. littoralis* have a small yellow dot at the base of the black patch dorsolaterally on the second and third thoracic segment, which distinguishes them from other *Spodoptera* species.

Pupa

15-20 mm long, red-brown; cremaster with two small spines. This trait is shared with at least *S. littoralis*, *S. eridania* and *S. frugiperda*. *Spodoptera exigua* has an extra pair of smaller spines anterodorsally of the cremaster. The spines that make up the cremaster are variable in size, fragile and prone to breakage.

Adult

Moth with grey-brown body, 15–20 mm long; wingspan 30–38 mm. The forewings are grey to reddish-brown with a strongly variegated pattern and paler lines along the veins. Males usually have an ochreous patch on the forewing and more bluish areas at the wing base and tip. The hindwings are greyish-white with grey margins, often with contrasting dark veins (unlike *S. littoralis*, which usually has lighter veins). The variability and similarity of the two species often makes it difficult to distinguish them visually and a genital dissection is needed. Females are characterized by a completely sclerotized and elongate ductus bursae (length more than three times the width). The juxta in males is triangular with a narrow base and a pointed process, the ampulla is slightly curved.

For more information on the morphological discrimination between the common *Spodoptera* pest species and a detailed description of the different stages, see the EPPO Standard PM 7/124 (EPPO, 2015). (Pogue, 2002) reviews the *Spodoptera* genus.

Detection and inspection methods

Pheromone traps can be used to detect the presence of adults and are the primary method for detecting Lepidoptera. Adults are nocturnal and therefore difficult to detect during the day. Eggs and larval stages can be found on a host plant or commodity, as well as feeding damage to the leaves. Older larvae tend to feed at night and rest on or in the soil at the base of the plant during the day. Pupae cannot be detected on the plant since pupation takes place in the soil. Methods to identify *S. litura* exist, see EPPO Standard PM 7/124 and references therein (EPPO, 2015). However, reliable morphological identification of immature stages either requires additional information (e.g. origin and host plant) or molecular analysis (van de Vossenbergh & van der Straten, 2014).

PATHWAYS FOR MOVEMENT

In colder climates, *S. litura* migrates to avoid the cold season. Adults can fly over 30 km over 12 h (in laboratory conditions; Tu *et al.*, 2010), facilitating dispersion. In international trade, eggs or larvae may be present on planting material, cut flowers or vegetables. Recent findings of the species in the EPPO region originated from glasshouses stocked with plants introduced from South-East Asia.

PEST SIGNIFICANCE

Economic impact

S. litura is an extremely harmful pest, the larvae of which defoliates many economically important crops in Southern Asia and the Pacific. In controlled experiments on soybeans in India, crops chemically protected from *S. litura* and other pests yielded over 42% more than crops which were not sprayed (Srivastava *et al.*, 1971). On tobacco, it was estimated that two, four and eight larvae per plant reduced yield by 23-24, 44.2 and 50.4%, respectively (Patel *et al.*, 1971). 5, 10, 20 and 40 larvae per 100 Chinese cabbage plants resulted in yield losses of 7.6, 16.4, 36.2 and 66.3% respectively (Choi *et al.*, 2011). On taro, an average of 4.8 4th-instar larvae per plant reduced yield by 10%, while an average of 2.3 and 1.5 larvae per plant reduced yield of aubergines and *Capsicum* in glasshouses also by 10% (Nakasiju & Matsuzaki, 1977).

Control

Chemical control of *S. litura* has been reported in relation to various crops in India. Numerous organophosphorus, synthetic pyrethroid and other insecticides have been used, followed by the occurrence of multiple resistance in the target pest (Armes *et al.*, 1997, Ramakrishnan *et al.*, 1984, Zaka *et al.*, 2014) and a continued search for other chemical control methods including other insecticides (Ahmad & Gull, 2017) and insect and plant growth regulators (Khatun *et al.*, 2017, Ray *et al.*, 2013, Singh, 2001). There is an interest, especially in India, in various antifeedant compounds or extracts (such as azadirachtin) and endophytic fungi.

Numerous studies have been carried out on possible biological control methods. Natural enemies (parasitoids, predators and diseases) have been extensively documented (e.g. see Rao *et al.*, 1993). A nucleopolyhedrosis virus (NPV) has been evaluated against *S. litura* (Bhutia *et al.*, 2012), certain *Bacillus thuringiensis* (*Bt*) isolates are effective as a microbial pesticide (Patel *et al.*, 2018), fungi and microsporidia have been recorded as parasites (e.g. see Anand & Tiwary, 2009), and entomopathogenic nematodes have been evaluated (Acharya *et al.*, 2020, Yan *et al.*, 2020). The NPV against *S. litura* is commercially available. The same goes for *Bt* and several nematode species (such as *Steinernema carpocapsae*, which is effective against *S. litura*). However, it is unclear whether these biocontrol agents have been implemented as control measures against *S. litura* in practice.

Integrated pest management techniques are gradually being adopted in *S. litura* control. In these, a combination of

the abovementioned chemical and biological control agents are used alongside pheromone lures and traps to catch adults and monitor the population. Additional measures include clean cultivation to expose pupae to natural enemies and the planting of trap crops such as sunflower and taro to attract *S. litura* (Zhou, 2009). Thakur *et al.* (2022) found that a combination of entomopathogens (fungi, bacteria and nematodes) can have a synergistic effect on the mortality of *S. litura*. Das and Roy (1985) reviewed the use of pheromones against *S. litura*. Irradiation has also been proposed as a control measure. Irradiated, sterile adult males are added to a population of *S. litura* and could be a viable component in integrated pest management (Seth *et al.*, 2016). However, this technique does not appear to have been implemented in practice so far.

Phytosanitary risk

S. litura has been introduced into several countries outside its native range where it has become a major pest to many economically important crops. For example, in northern parts of New Zealand it causes damage to pastures, and it is also known to be a pest in protected cultivation in colder areas of China, India and Japan where it could potentially sustain a viable population for most of the year (Hardik & Dolly, 2020, Matsuura *et al.*, 1992, Vashisth *et al.*, 2012). *S. litura* cannot survive cold (freezing) winters and requires high humidity to successfully complete its life cycle, limiting the potential of establishment in the EPPO region to a few areas in the Mediterranean. Establishment in the EPPO region under glass may be possible. The species could also exploit outdoor food plants during warmer months and re-enter greenhouses where to avoid adverse conditions during colder periods. It has strong dispersal capabilities, increasing the possibility of (re)introduction into colder areas in summer and potentially rapidly expanding its range with increased temperatures due to climate change. More details on the risk of introduction can be found in the EFSA Pest Categorization (EFSA, 2019).

Spodoptera littoralis, which is similar to *S. litura* in terms of biology and host plant range, is already fairly widespread in Mediterranean countries and has not spread further north (outside of greenhouses). If introduced, *S. litura* would likely have a similar distribution range in the Mediterranean, where it would be in direct competition with already established populations of *S. littoralis*. This could imply that *S. litura* cannot easily establish itself outdoors in the presence of *S. littoralis*, though further research would be needed to confirm this. Therefore the main phytosanitary risk for the EPPO region from *S. litura* is its possible introduction into glasshouses, which could occur in most parts of Europe, where it may damage many ornamental and vegetable crops.

PHYTOSANITARY MEASURES

The introduction of *S. litura* in the EPPO region is to be avoided regardless of the host plant concerned. Although control with insecticides is possible, there have been many cases of resistance. Biological control alternatives are available and are increasingly being included and tested in integrated pest management plans e.g. see Thakur *et al.* (2022). Several additional control measures associated to unregulated hosts and pathways could be implemented against *S. litura*. This includes growing potential hostplants in isolation from areas with *S. litura* for at least three months prior to international transportation and temperature treatment of host plants. An existing cold-storage treatment of cut flowers (10 days at < 1.7°C) could be extended to other host plants (EFSA, 2019).

REFERENCES

Acharya R, Yu Y-S, Shim J-K & Lee K-Y (2020) Virulence of four entomopathogenic nematodes against the tobacco cutworm *Spodoptera litura* Fabricius. *Biological Control* **150**, 104348.

Ahmad M, Ghaffar A & Rafiq M (2013) Host plants of leaf worm, *Spodoptera litura* (Fabricius)(Lepidoptera: Noctuidae) in Pakistan. *Asian Journal of Agriculture and Biology* **1**(1), 23-28.

Ahmad M & Gull S (2017) Susceptibility of armyworm *Spodoptera litura* (Lepidoptera: Noctuidae) to novel insecticides in Pakistan. *The Canadian Entomologist* **149**, 649-661.

Anand R & Tiwary BN (2009) Pathogenicity of entomopathogenic fungi to eggs and larvae of *Spodoptera litura*, the common cutworm. *Biocontrol Science and Technology* **19**, 919-929.

- Armes NJ, Wightman JA, Jadhav DR & Ranga Rao GV (1997) Status of insecticide resistance in *Spodoptera litura* in Andhra Pradesh, India. *Pesticide Science* **50**, 240-248.
- Bhutia KC, Chakravarthy AK, Doddabasappa B, Narabenchi GB & Lingaraj VK (2012) Evaluation and production of improved formulation of nucleopolyhedrosis virus of *Spodoptera litura*. *Bulletin of Insectology* **65**, 247-256.
- Brown E & Dewhurst C (1975) The genus *Spodoptera* (Lepidoptera, Noctuidae) in Africa and the near east. *Bulletin of Entomological Research* **65**, 221-262.
- Choi D-S, Kim D-I, Kim S-G, Ko S-J, Kang B-R & Kim S-S (2011) Control thresholds for managing common cutworm, *Spodoptera litura* (Fabricius)(Lepidoptera: Noctuidae) on Chinese Cabbage. *Korean journal of applied entomology* **50**, 215-220 (in Korean, English abstract).
- Das B & Roy P (1985) Sex pheromone of the tobacco caterpillar *Spodoptera litura* (F.)(Lepidoptera: Noctuidae) and its use in integrated pest management. *Journal of Bengal Natural History Society* **4**, 127-138.
- EFSA Panel on Plant Health, Bragard C, Dehnen-Schmutz K, Di Serio F, Gonthier P, Jacques M-A, Jaques Miret JA, Justesen AF, Magnusson CS, Milonas P, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Thulke H-H, Van der Werf W, Vicent Civera A, Yuen J, Zappalà L, Malumphy C, Czwienczek E & MacLeod A (2019) Pest categorisation of *Spodoptera litura*. *EFSA Journal* **17**, e05765.
- EPPO (2015) EPPO Standards PM 7/124 (1) Diagnostics. *Spodoptera littoralis*, *Spodoptera litura*, *Spodoptera frugiperda*, *Spodoptera eridania*. *EPPO Bulletin* **45**, 410-444.
- Etman AA & Hooper G (1980) Developmental and reproductive biology of *Spodoptera litura* (F.)(Lepidoptera: Noctuidae). *Australian Journal of Entomology* **18**, 363-372.
- Fand BB, Sul NT, Bal SK & Minhas PS (2015) Temperature impacts the development and survival of common cutworm (*Spodoptera litura*): simulation and visualization of potential population growth in India under warmer temperatures through life cycle modelling and spatial mapping. *PLoS one* **10**, e0124682.
<https://doi.org/10.1371/journal.pone.0124682>
- Garad G, Shivpuje P & Bilapate G (1984) Life fecundity tables of *Spodoptera litura* (Fabricius) on different hosts. *Proceedings: Animal Sciences* **93**, 29-33.
- Hardik P & Dolly K (2020) Effect of abiotic factors on the life cycle of *Spodoptera litura* Fabricius, 1775 (Lepidoptera: Noctuidae). *Applied Ecology and Environmental Sciences* **8**, 87-91.
- Holloway JD (1989) The moths of Borneo: family Noctuidae, triline subfamilies: Noctuinae, Heliethinae, Hadeninae, Acronictinae, Amphipyrynae, Agaristinae. *Malayan Nature Journal* **42**, 57-228.
- Khatun MR, Das G & Ahmed KS (2017) Potentiality of buprofezin, an insect growth regulator on the mortality of *Spodoptera litura* (Fabricius). *Journal of Entomology and Zoology Studies* **5**, 736-740.
- Matsuura H & Naito A (1997) Studies on the cold-hardiness and overwintering of *Spodoptera litura* F. (Lepidoptera: Noctuidae) : VI. Possible overwintering areas predicted from meteorological data in Japan. *Applied Entomology and Zoology* **32**, 167-177.
- Matsuura H, Naito A, Kikuchi A & Uematsu S (1992) Studies on the cold-hardiness and overwintering of *Spodoptera litura* F. (Lepidoptera: Noctuidae). V. Possibility of larval and pupal overwintering at the Southern extremity of the Boso Peninsula. *Japanese Journal of Applied Entomology and Zoology* **36**, 37-43 (in Japanese, English abstract).
- Meena N, Lal G, Meena R, Harisha C & Meena S (2017) Pest scenario of coriander (*Coriandrum sativum* L.) and population dynamics in semi-arid region of Rajasthan. *International Journal of Tropical Agriculture* **35**, 779-783.
- Miyahara Y, Wakikado T & Tanaka A (1971) Seasonal changes in the number and size of the egg masses of *Prodenia litura*

. *Japanese Journal of Applied Entomology and Zoology* **15**, 139-143 (in Japanese, English abstract).

Nakasiju F & Matsuzaki T (1977) The control threshold density of the tobacco cutworm *Spodoptera litura* (Lepidoptera: Noctuidae) on eggplants and sweet peppers in vinyl-houses. *Applied Entomology and Zoology* **12**, 184-189.

Patel AS, Shelat HN & Patel HK (2018) Isolation and insecticidal potential of native *Bacillus thuringiensis* against *Helicoverpa armigera* and *Spodoptera litura*. *International Journal of Current Microbiology and Applied Sciences* **7**, 1330-1339.

Patel H, Patel N & Patel V (1971) Quantitative estimation of damage to tobacco caused by the leaf eating caterpillar, *Prodenia litura* F. *PANS Pest Articles & News Summaries* **17**, 202-205.

Pogue MG (2002) *A world revision of the genus Spodoptera Guenée: (Lepidoptera: Noctuidae)*. American Entomological Society Philadelphia.

Ramakrishnan N, Saxena V & Dhingra S (1984) Insecticide-resistance in the population of *Spodoptera litura* (F.) in Andhra Pradesh. *Pesticides* **18**, 23-27.

Rao GVR, Wightman JA & Rao DVR (1989) Threshold temperatures and thermal requirements for the development of *Spodoptera litura* (Lepidoptera: Noctuidae). *Environmental Entomology* **18**, 548-551.

Rao GVR, Wightman JA & Rao DVR (1993) World review of the natural enemies and diseases of *Spodoptera litura* (F.) (Lepidoptera: Noctuidae). *Insect Science and Its Application* **14**, 273-284.

Ray DP, Dutta D, Srivastava S, Kumar B & Saha S (2013) Insect growth regulatory activity of *Thevetia nerifolia* Juss. against *Spodoptera litura* (Fab.). *Journal of Applied Botany and Food Quality* **85**, 212.

Seth RK, Khan Z, Rao DK & Zarin M (2016) Flight activity and mating behavior of irradiated *Spodoptera litura* (Lepidoptera: Noctuidae) males and their F1 progeny for use of inherited sterility in pest management approaches. *Florida Entomologist* **99**, 119-130, 112.

Singh H (2001) Role of plant growth regulators on the developmental profile of *Spodoptera litura*: Effect of plant growth stimulants. **63**, 329-339.

Srivastava O, Malik D & Thakur R (1971) Estimation of losses in yield due to the attack of arthropod pests in soybean. *Indian Journal of Entomology* **33**, 224-225.

Thakur N, Tomar P, Sharma S, Kaur S, Sharma S, Yadav AN & Hesham AE-L (2022) Synergistic effect of entomopathogens against *Spodoptera litura* (Fabricius) under laboratory and greenhouse conditions. *Egyptian Journal of Biological Pest Control* **32**.

Tu YG, Wu KM, Xue FS & Lu YH (2010) Laboratory evaluation of flight activity of the common cutworm, *Spodoptera litura* (Lepidoptera: Noctuidae). *Insect Science* **17**, 53-59.

Ullah MI, Arshad M, Afzal M, Khalid S, Saleem M, Mustafa I, Iftikhar Y, Molina-Ochoa J & Foster JE (2016) Incidence of *Spodoptera litura* (Lepidoptera: Noctuidae) and its feeding potential on various citrus (Sapindales: Rutaceae) cultivars in the Sargodha Region of Pakistan. *Florida Entomologist* **99**(2), 192-195.

van de Vossenbergt BT & van der Straten MJ (2014) Development and validation of real-time PCR tests for the identification of four *Spodoptera* species: *Spodoptera eridania*, *Spodoptera frugiperda*, *Spodoptera littoralis*, and *Spodoptera litura* (Lepidoptera: Noctuidae). *Journal of Economic Entomology* **107**, 1643-1654.

Vashisth S, Chandel Y & Kumar S (2012) Biology and damage potential of *Spodoptera litura* Fabricius on some important greenhouse crops. *Journal of Insect Science* **25**, 150-154.

Viette P (1963) Le complexe de *Prodenia litura* (Fabricius) dans la région malgache (Lép. Noctuidae). *Publications de la Société Linnéenne de Lyon*, 145-148 (in French).

Wen H, Hao H, Lu F & Liou T (2007) Survey of insect pests on herbs in southern Taiwan. *Plant protection Bulletin (Taipei)* **49**, 127 (in Chinese).

Yan X, Shahid Arain M, Lin Y, Gu X, Zhang L, Li J & Han R (2020) Efficacy of entomopathogenic nematodes against the tobacco cutworm, *Spodoptera litura* (Lepidoptera: Noctuidae). *Journal of Economic Entomology* **113**, 64-72.

Zaka SM, Abbas N, Shad SA & Shah RM (2014) Effect of emamectin benzoate on life history traits and relative fitness of *Spodoptera litura* (Lepidoptera: Noctuidae). *Phytoparasitica* **42**, 493-501.

Zhou Z (2009) A review on control of tobacco caterpillar, *Spodoptera litura*. *Chinese Bulletin of Entomology* **46**, 354-361 (in Chinese, English abstract).

CABI and EFSA resources used when preparing this datasheet

CABI Datasheet on *Spodoptera litura*. <https://www.cabi.org/isc/datasheet/44520>

EFSA Pest survey card on *Spodoptera litura*. <https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2019.5765>

ACKNOWLEDGEMENTS

This datasheet was extensively revised in 2023 by Jan E.J. Mertens and Tom H. van Noort of the NPPO of the Netherlands, their valuable contribution is gratefully acknowledged.

How to cite this datasheet?

EPPO (2024) *Spodoptera litura*. EPPO datasheets on pests recommended for regulation. Available online. <https://gd.eppo.int>

Datasheet history

This datasheet was first published in the EPPO Bulletin in 1979 and revised in the two editions of 'Quarantine Pests for Europe' in 1992 and 1997, as well as in 2023. It is now maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', 'Hosts', and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

CABI/EPPO (1992/1997) *Quarantine Pests for Europe (1st and 2nd edition)*. CABI, Wallingford (GB).

EPPO (1979) Data Sheet on Quarantine Organisms no 42: *Spodoptera litura*. *EPPO Bulletin* **9**(2), 142-146. <https://doi.org/10.1111/j.1365-2338.1979.tb02463.x>



Co-funded by the
European Union