CAPS Datasheets provide pest-specific information to support planning and completing early detection surveys.

Autographa gamma

Scientific Name
Autographa gamma (Linnaeus, 1758)

Synonyms:
Phytometra gamma (Linnaeus)
Plusia gamma (Linnaeus)

Common Name
Silver Y moth
beet worm
gamma owlet

Figure 1. *Autographa gamma* adult. Photo credit: Julieta Brambila, USDA-APHIS-PPQ, Bugwood.org, CC BY-NC 3.0 US

Type of Pest
Moth, defoliator

Taxonomic Position
Class: Insecta, **Order:** Lepidoptera, **Family:** Noctuidae, **Subfamily**: Plusiinae

Pest Recognition
This section describes characteristics of the organism and symptoms that will help surveyors recognize possible infestations/infections in the field, select survey sites, and collect symptomatic material. For morphological descriptions, see the Identification/Diagnostic resources on the AMPS pest page on the CAPS Resource and Collaboration website.

Pest Description

Adult: Moths have a marbled appearance with a color ranging from silver grey, dark brown to velvety black. In the forewings, they have a distinct silver mark in a “Y” shape, a kidney-shaped (reniform) spot with a shiny border, and a diffuse black streak (see arrows in Figs. 2 and 4B) (Chumakov and Kuznetsova, 2009; Jones and Jones, 1984). The wingspan varies between $1^1/_2$ to $1^7/_8$ in. (Brambila and Passoa, 2016; Jones and Jones, 1984). In the spring, these moths tend to be smaller and more gray; in the summer, they tend to be larger and more brown (Brambila, 2016). Adults are active during the day and night and are often seen nectar feeding on flowers (Carter, 1984; Hill, 1987). When at rest, the wings are held tent-like over the abdomen and the thorax has a big tuft of scales (Fig. 7 B). This is common for Plusiinae but is not typical for other moths.

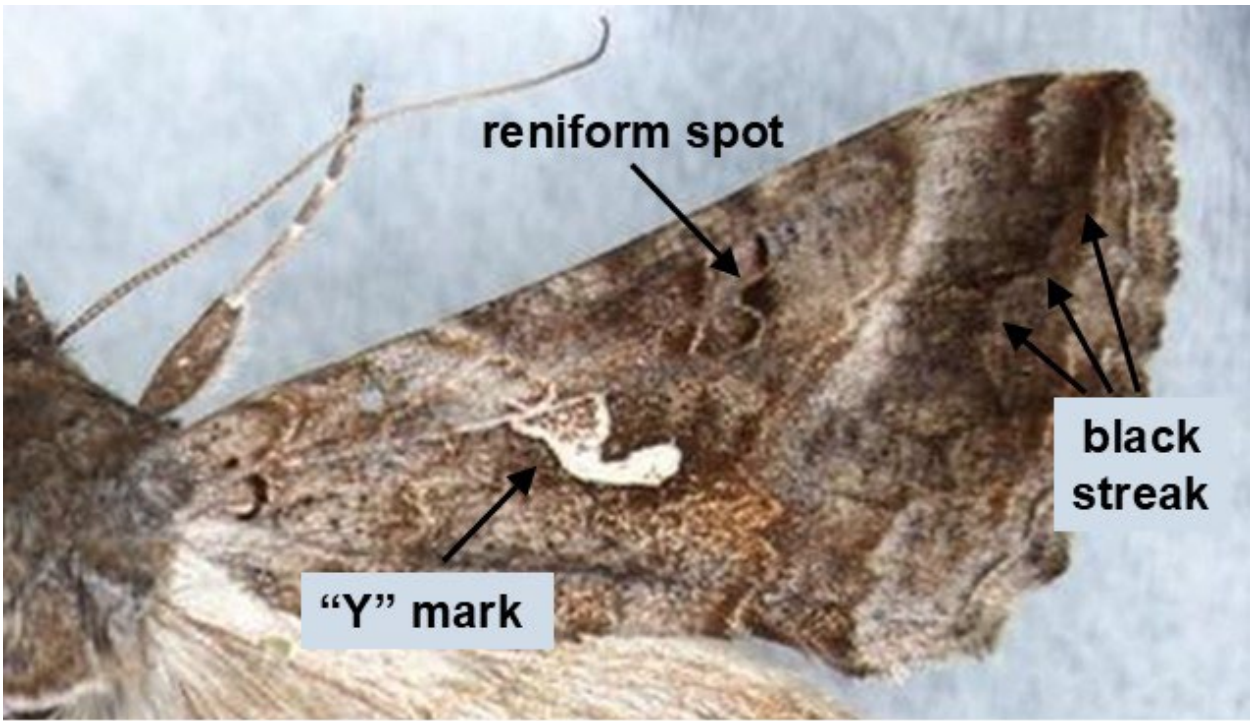

Figure 2. *Autographa gamma* front wing showing distinct recognition characters: “Y” mark, reniform spot, and black streak. Photo credit: Julieta Brambila, USDA-APHIS-PPQ, Bugwood.org, CC BY-NC 3.0 US and modified to label key features

Egg: Eggs are round, cream-colored and very small (0.5 mm in diameter) (Fig. 3A) (Korycinska, 2012; Uğur, 1995). They are laid singly or in small clusters, primarily on the underside of leaves (Avidov and Harpaz, 1969; Schwitulla, 1963; Uğur, 1995). If identification of an egg is critical, molecular identification is the most reliable option, and dead eggs can often be barcoded after preservation in 95% ethanol.

Larva: The larva of *A. gamma* is highly variable making identification challenging; however, larvae can be preserved in 95% ethanol for DNA barcoding. Mature larvae are approximately 1 to $1^{1}/_{2}$ in. long (Chumakov and Kuznetsova, 2009; Rashid et al., 1971) and bright green to dark olive green (Fig. 3B) (Jones and Jones, 1984). The head is often pale green but sometimes it is marked with tiny black dots and there may be a thick black stripe on the side of the head (genal dash).
Larvae move in a typical inch-worm fashion by raising their mid-section and moving forward in a looping motion. They can be found feeding externally on leaves, buds, young shoots, and flowers of their host (Chumakov and Kuznetsova, 2009; Hill, 1987). Caterpillars found feed internally on fruits or in stems are not likely to be *A. gamma* except in the case of leafy vegetables such as lettuce where larvae may bore into the head. When disturbed, larvae of *A. gamma* drop off the plant (Hill, 1987).

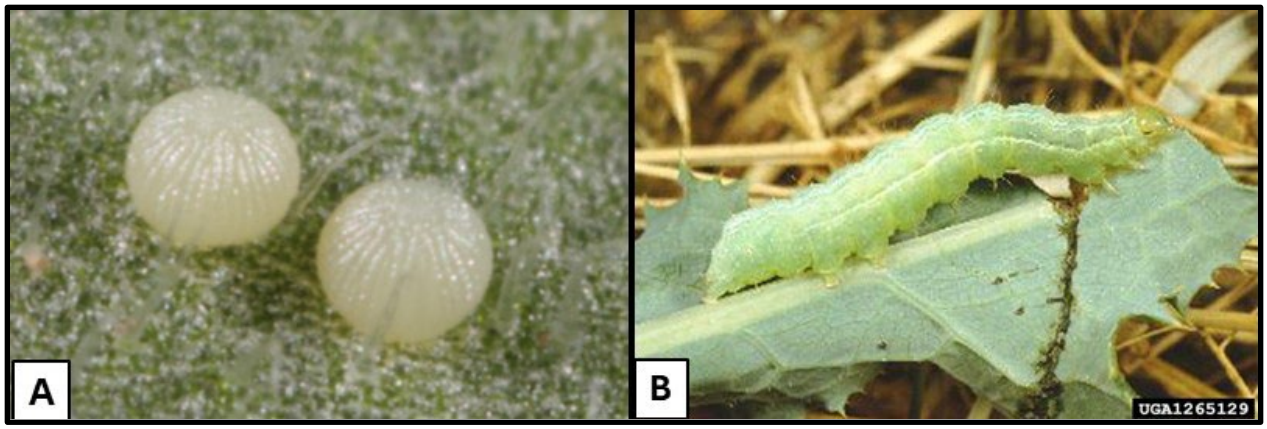

Figure 3. *Autographa gamma* eggs **(A)** and larva **(B).** Photo credits: (A) Jurgen Rodeland, http://www.rodeland.de/fotos/lepidoptera/autographa_gamma.htm and (B) Paolo Mazzei, Bugwood.org, CC BY-NC 3.0 US

Pupa: Pupae are dark, covered by a pale silken cocoon, and approximately 1 in. long (Fig. 4A) (Hill, 1987). The cocoon of *A. gamma* is a white or pale thin silken covering (see examples on Lepiforum eV [ed.] (2025)).They can usually be found on the plant attached to a leaf or buried in the soil ~$^1/_2$ in. deep (Hill, 1987; Schwitulla, 1963).

As with the eggs and larvae, rearing to the adult stage or barcoding is needed to confirm an identification of *A. gamma*.

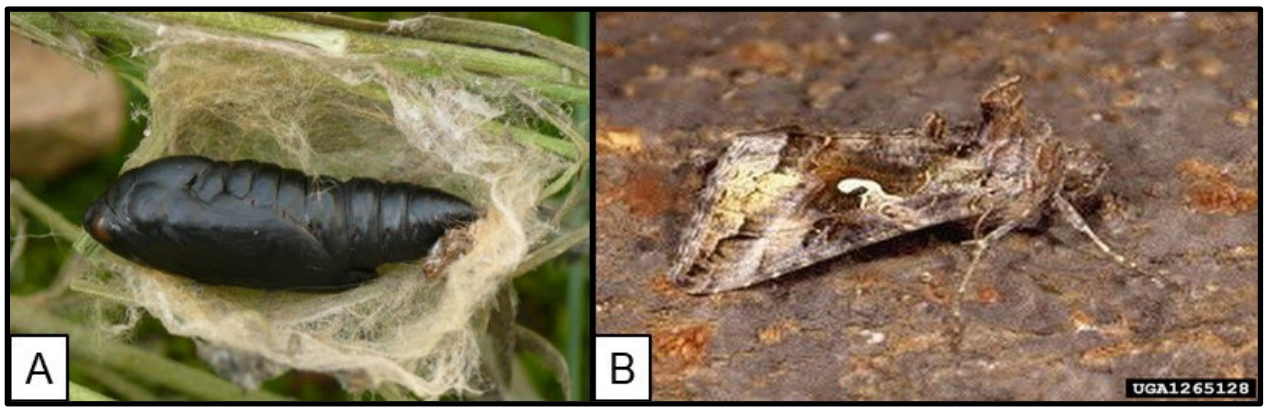

Figure 4. *Autographa gamma* pupa **(A)** and adult in lateral view **(B)**. Photo credits: (A) Harald Süpfle, Wikimedia Commons, CC BY-SA 3.0 and (B) Paolo Mazzei, Bugwood.org, CC BY-NC 3.0 US

Signs and Symptoms

In all hosts: Larvae are defoliators. They will make holes in leaves and eventually skeletonize them. They start feeding on older leaves and then move on to younger leaves. During outbreaks, high larval populations may also target the hearts (e.g., lettuce hearts, beet taproots) of plants and leaf-stalks (Hill, 1987; Novak, 1975; Schwitulla, 1963).

In certain host plants, distinct signs other than defoliation may appear. In artichoke, *Autographa gamma* larvae may feed on the flower heads (the edible portion of the plant), causing injured, twisted, or perforated bracts (Collet and Pérennec, 2009). In

grape, larvae can feed on the fruit skin, leading to rotten and spoiled bunches; one larva can damage >20 ripe grapes (Abdullagatov and Abdullagatov, 1986). In iceberg lettuce, larvae tend to burrow 2-3 leaves into the head, so they are not easy to observe (Collier, 2017).

Easily Mistaken Species

Autographa gamma is very similar to several North American species in the subfamily Plusiinae (Figs. 5-7) (Brambila, 2016; Eichlin and Cunningham, 1978; Fetzner Jr. and Fetzner, 2018). Some of these can be distinguished by external morphology characteristics, while others will require dissection of genitalia. The wing color of *A. gamma* is not distinctive, and final identification requires examination of male genitalia (Brambila and Passoa, 2016).

***Autographa californica* and *A. pseudogamma* (Fig. 5 B & C)** share similar wing coloration and a distinct silver shining mark ('stigma') in a "Y" shape on the forewings with *A. gamma*. Therefore, genitalia examination is needed to correctly identify them (Brambila, 2016). *Autographa californica* is a polyphagous pest of vegetables, forage crops, and legume crops, including peas, alfalfa, and clover while *A. pseudogamma* is reported from hardwood and conifer forests; no other host information is available (Crabo et al., 2024). *Autographa californica* occurs in the eastern United States and the Midwest but is especially common in the western United States (Moth Photographers Group, 2025c). The range of *A. pseudogamma* is Canada, New England and the western United States. It is absent from most of the Midwest and the southern United States (Moth Photographers Group, 2025d). Both species can be found throughout the Pacific Northwest, but *A. pseudogamma* is mostly found at high elevations (Crabo et al., 2024). Surveys in the western United States should expect more suspects needing genitalic dissection or barcoding. Numbers of *A. californica* in the eastern and midwestern states should be smaller and *A. pseudogamma* should be largely absent.

***Trichoplusia ni* (Fig. 5D)** can often be separated from *A. gamma* by forewings that lack contrasting bands or areas of different colors. The stigma is usually composed of a solid dot and a u-shaped portion that may be fused together. Because the wing coloration and the shape of the marks are variable, it may be necessary to dissect the genitalia for a correct identification (Fig. 5D) (Brambila, 2016). Both species feed on a wide range of plants, but like *A. gamma*, *T. ni* prefers brassicas. *Trichoplusia ni* can be found throughout most of the United States (Capinera, 2020).

***Autographa ampla* (Fig. 6B)** and ***Anagrapha falcifera* (Fig. 6C)** both have a solid, contrasting rectangular shaped marking in the middle of the lower margin of the forewing. This marking is absent, or diffuse if present, in *A. gamma.* On the forewing, the stigma of most specimens of *A. falcifera* and *A. ampla* have a thin white extension that touches part of the rectangular marking. The stigma of *A. gamma* has no extension. Both of these species can be found in most areas of the United States (Moth Photographers Group, 2025a; Moth Photographers Group, 2025b).

***Ctenoplusia oxygramma* (Fig. 6D)**, the 'sharp stigma looper'**,** has a stigma that is characteristically solid, elongated, and comes to a point in the middle of the wing. This mark can aid in distinguishing it from *A. gamma* (Brambila, 2016)*. Ctenoplusia oxygramma* occurs most commonly in the eastern and midwestern states (Brambila, 2016; Moth Photographers Group, 2025e; Pogue, 2005).

***Rachiplusia ou* (Fig. 6E)** resembles *A. gamma,* but it can be identified by the presence of setae that look like spines on the tibia of all three pairs of legs by an experienced identifier (Brambila and Passoa, 2016) or by dissection of genitalia. Along with *A. californica*, it is the species most likely to be confused with A. *gamma* in traps. It is widespread over the central, eastern, and southern United States (Crabo et al., 2024; Pogue, 2005).

***Chrysodeixis chalcites* (Fig. 7B)** is also included in the National Priority Pest List. It has been detected in Michigan, Indiana, Pennsylvania, and Illinois, but is not known to be established in the United States (Bledsoe, 2021; Smith-Pardo et al., 2025). It is similar in size and appearance to *A. gamma* but can be differentiated by forewings which are gold to bronze, and while it has silver marks in the forewings as in *A. gamma*, these marks are more oval in shape (Colunga-Garcia et al., 2010). *Chrysodeixis chalcites* is present in southern Europe, the Mediterranean region, Africa, and in east central Canada (Ontario) (Murillo et al., 2013). See the CAPS Pest Datasheet for images.

***Chrysodeixis includens* (Fig. 7C)** differs from *A. gamma* in having a metallic bronze sheen on the forewing. This coloration is absent in *A. gamma* (Beadle and Leckie, 2012). The middle of the forewing fringe often has a black spot in *C. includens* (Habeck, 1968). *Chrysodeixis includens* is present across the continental United States, but is most common in the southern and eastern United States (Carter and Gillett-Kaufman, 2020).

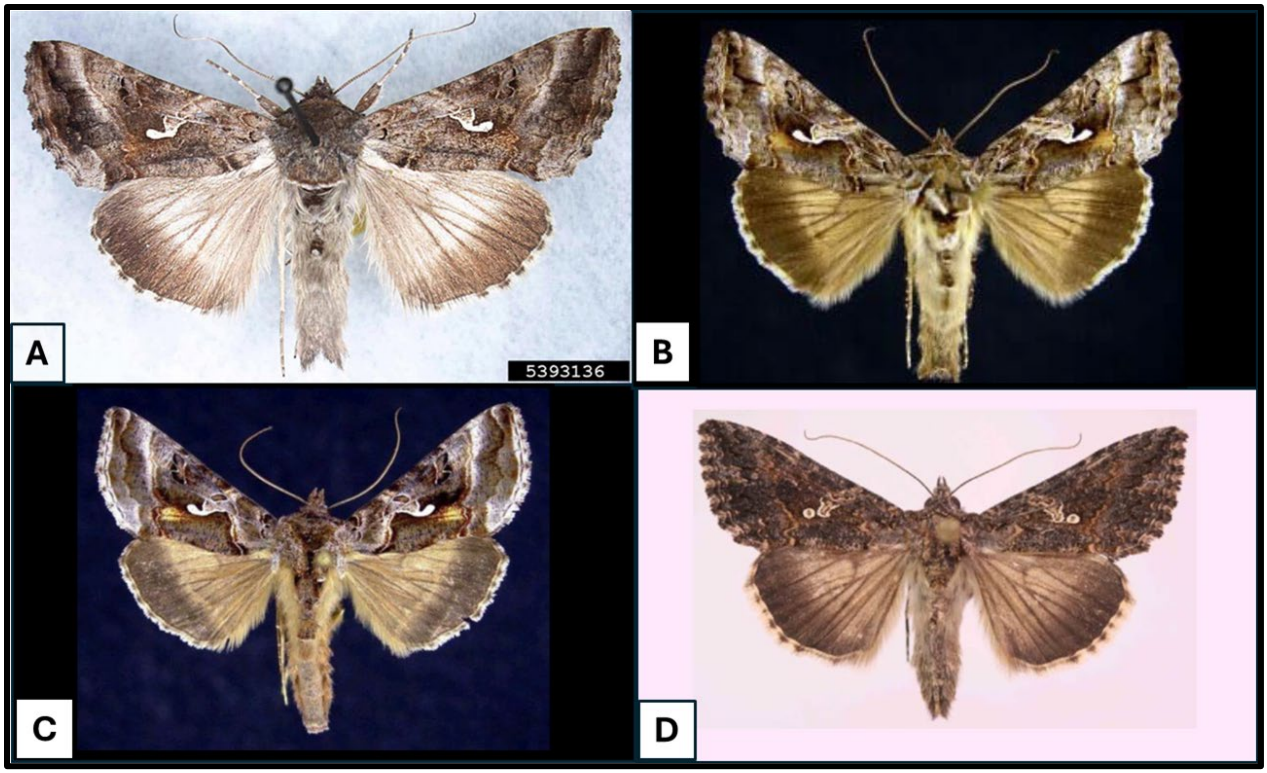

Figure 5. *Autographa gamma* mistaken species: *Autographa gamma* **(A)**, *A. californica* **(B)**, *A. pseudogamma* **(C)**, and *Trichoplusa ni* **(D).** Photos credits: (A) Julieta Brambila, USDA-APHIS-PPQ, Bugwood.org, CC BY-NC 3.0 US; (B, C) Jim Vargo, Moth Photographers Group and (D) Lyle Buss, University of Florida.

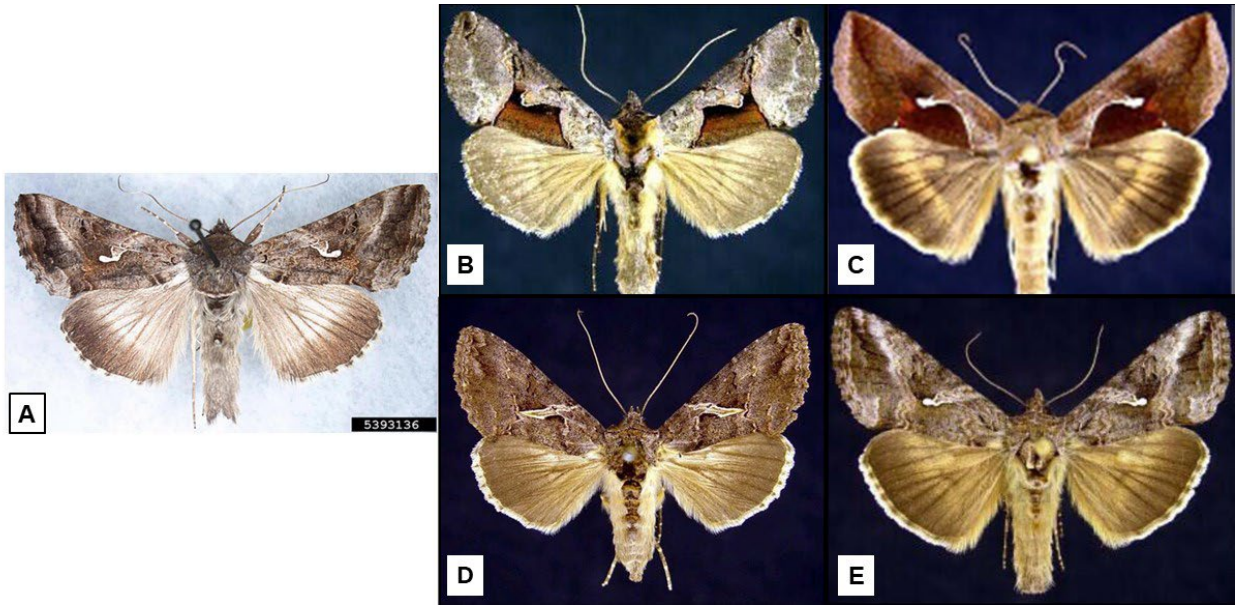

Figure 6. *Autographa gamma* mistaken species: *Autographa gamma* **(A)**, *Autographa ampla* **(B)**, *Anagrapha falcifera* **(C)**, *Ctenoplusia oxygramma* **(D)** and *Rachiplusia* ou **(E).** Photo credits: (A) Julieta Brambila, USDA-APHIS-PPQ, Bugwood.org, CC BY-NC 3.0 US; (B, C, D, and E) Jim Vargo, Moth Photographers Group

Figure 7. *Chrysodeixis* species in comparison to *A. gamma*: *Autographa gamma* **(A)**, *Chrysodexis chalcites*, a mistaken species listed in the National Priority List **(B),** and *Chrysodexis includens* **(C)**. Photo credits: A, B) Paolo Mazzei, Bugwood.org and (C) Russ Ottens, University of Georgia, Bugwood.org, all photos CC BY-NC 3.0 US

Commonly Encountered Non-targets

The approved survey method is using a bucket trap baited with *Autographa gamma* lure. The lure contains the following blend: (*Z*)-7-dodecenyl acetate (*Z*7-12:Ac) and (*Z*)-7-dodecenol (*Z*7-12:OH).

Numerous insects from multiple orders, including Diptera, Gryllidae, Heteroptera, Hymenoptera, Lepidoptera, and Odonata, are attracted to the individual components of this pheromone blend and may be captured in traps targeting *A. gamma* (El-Sayed, 2024). The most common Lepidoptera attracted to components of the *A. gamma* traps include the following families: Argyresthiidae, Coleophoridae, Cosmopterigidae, Crambidae, Gelechiidae, Geometridae, Noctuidae, Pieridae, Pyralidae, and Yponomeutidae (El-Sayed, 2024).

Morphologically similar members of the subfamily Plusiinae (looper moths) are likely to be encountered in trapping surveys, including the easily mistaken species discussed in the previous section and multiple other related moths present in the United States (Brambila and Passoa, 2024; Passoa, 1992). Brambila and Passoa (2024), Brambila (2016), and Passoa (1992) report that the following moths have been found in *A.*

gamma surveys: *Anagrapha falcifera, Autographa ampla*, *A. biloba, A. californica, A. precationis*, *A. pseudogamma, Chrysodeixis includens, Ctenoplusia oxygramma, Pseudoplusia includens*, *Rachiplusia ou*, *Spodoptera frugiperda,* and *Trichoplusia ni.*

Biology and Ecology

Autographa gamma is a migratory moth that flies from the Mediterranean, where it is endemic, to northern Europe, where populations cannot persist in winter. The moths migrate northward in the spring and southward in the fall, and the size of migratory populations varies from year to year (Collier, 2017; Duthie, 1983). There are 2-5 generations per year, depending on the climate and available host plants (Golikhajeh et al., 2016; Hill and Gatehouse, 1993; Honěk et al., 2002; Saulich et al., 2017; Taha et al., 2012). Adult moths are active from April through November in regions where *A. gamma* is endemic. In northern Europe, they appear only in early and late summer (Chapman et al., 2013; Schwitulla, 1963).

Females emit a sex pheromone to attract males. Once mated, females lay between 278 and 1,484 eggs in their lifetime (Dochkova, 1972; Hill, 1987). Eggs are laid singly or in small clusters primarily on the underside of leaves (Avidov and Harpaz, 1969; Schwitulla, 1963; Uğur, 1995). Larvae go through 5-6 instars, during which they feed extensively on leaves as well as buds, young shoots, and flowers (Rashid et al., 1971). Depending on the temperature, larval development takes between 12 and 51 days (Dochkova, 1972; Hill and Gatehouse, 1992; Tarabrina, 1970; Uğur, 1995). Pupation occurs in cocoons located mainly on the plant, but also in the soil, and it takes 5-11 days for adults to emerge (Golikhajeh et al., 2016; Tarabrina, 1970; Uğur, 1995). Adults live for up to 25 days (Avidov and Harpaz, 1969; Golikhajeh et al., 2016; Rashid et al., 1971).

Moderate humidity, temperatures of about 64 °F, and an abundance of nectar are the most suitable conditions for the moth's development (Duthie, 1983). *Autographa gamma* can overwinter as 3rd or 4th instar larvae or as pupae among the leaves of its hosts or under the litter/debris in the southern portion of its range in Europe (e.g., Bulgaria) or deep in the snow for the winter months (November through April) as 3rd or 4th instar larvae in Hokkaido, Japan (Dochkova, 1972; Kaneko, 1993; Saito, 2007). It can survive temperatures as low as 32 °F (Kaneko, 1996).

Known Hosts

Autographa gamma is highly polyphagous with over 175 known host plant species, including cultivated crops, ornamentals, and weeds (Casteels and De Clercq, 1997; Duthie, 1983; Maceljski and Balarin, 1972; Vajgand, 2022). It is a pest of both field and greenhouse production (Klug and Meyhöfer, 2009; Scopes and Biggerstaff, 1974). Some preferred cultivated hosts include *Beta vulgaris, Brassica* spp., *Lactuca sativa* var. *capitata*, *Medicago sativa*, and *Pisum sativum* (Dochkova, 1972; Hill and Gatehouse, 1992).

The host list below (Table 1) includes cultivated and wild plants that 1) are infested by the pest under natural conditions, 2) are frequently described as major, primary, or

preferred hosts, and 3) have primary evidence for feeding and damage documented in the literature. Plants are highlighted in bold if they are commercially produced and the pest causes economically significant damage.

Table 1. Preferred hosts of *Autographa gamma*.

Scientific Name	Common Name	Presence in the US*	Type/Use	Reference
Abutilon theophrasti	velvetleaf	Present	weed	(Grubisic et al., 2006)
Athyrium distentifolium	alpine lady fern	Present	ornamental	(McHaffie, 1997)
Beta vulgaris	sugar beet	Present	cultivated	(Golikhajeh et al., 2016)
Brassica oleracea	cabbage	Present	cultivated	(Broekgaarden et al., 2010)
Brassica oleracea* var. *capitata f. alba	white cabbage	Present	cultivated	(Poelman et al., 2010)
Brassica oleracea* var. *capitata f. rubra	red cabbage	Present	cultivated	(Jankowska, 2006)
Brassica oleracea* var. *gemmifera	brussels sprouts	Present	cultivated	(Jankowska, 2006)
Brassica oleracea* var. *sabauda	Savoy cabbage	Present	cultivated	(Jankowska, 2006)
Brassica oleracea* var. *botrytis	cauliflower	Present	cultivated	(Rahn, 1983)
Brassica oleracea acephala	kale	Present	cultivated	(Cartea et al., 2009)
Brassica oleracea* var. *viridis	collards	Present	cultivated	(Silva et al., 1968)
Clinopodium nepeta (= *Calamintha nepeta)*	N/A	Present	wild	(Hausmann and Scalercio, 2016)
Cannabis sativa	hemp	Present	cultivated	(Bakro et al., 2018)
Capsicum annuum	bell pepper	Present	cultivated	(Vajgand, 2010)
Chrysanthemum sp.	daisy	Present	cultivated	(Scopes and Biggerstaff, 1974)
Cichorium intybus	chicory	Present	cultivated	(Bertel and Latteur, 1996)
Convolvulus arvensis	field bindweed	Present	wild	(Tóth et al., 2004)

Scientific Name	Common Name	Presence in the US*	Type/Use	Reference
Corylus avellana	hazelnut	Present	cultivated	(Vajgand, 2022)
Cynara cardunculus* subsp. *cardunculus (=*Cynara scolymus*)	artichoke	Present	cultivated	(Collet and Pérennec, 2009)
Daphne laureola	spurge-laurel	Present	wild	(Alonso, 2004)
Fragaria ×ananassa	strawberry	Present	cultivated	(Alvarado, 2009)
Glycine max	soybean	Present	cultivated	(Mureșanu et al., 2020)
Humulus lupulus	hops	Present	cultivated	(Campbell, 2019)
Lactuca sativa	lettuce	Present	cultivated	(Díaz et al., 2006)
Linum usitatissimum	flax	Present	cultivated	(Kanervo, 1947)
Malus sieversii	N/A	Absent	wild	(Jashenko and Tanabekova, 2019)
Medicago sativa	alfalfa	Present	cultivated	(Honěk et al., 2002)
Nicotiana tabacum	tobacco	Present	cultivated	(Vasilev and Todorovski, 1974)
Ocimum basilicum	basil	Present	cultivated	(Hausmann and Scalercio, 2016)
Pisum sativum	pea	Present	cultivated	(Dochkova, 1972)
Rheum rhaponticum	Rhapontik	Absent	wild	(Szwejda, 2002)
Rumex sp.	dock	Present	wild	(Spencer, 1980)
Solanum betaceum	tree-tomato	Absent	cultivated	(Ares, 2021)
Solanum lycopersicum	tomato	Present	cultivated	(Munteanu-Molotievskiy et al.,
Solanum melongena	eggplant	Present	cultivated	(Szwejda and Rogowska, 2011)

Scientific Name	Common Name	Presence in the US*	Type/Use	Reference
Solanum tuberosum	potato	Present	cultivated	(Pape, 1928)
Solidago altissima	goldenrod	Present	wild	(Rashid et al., 1971)
Spinacia oleracea	spinach	Present	cultivated	(Klug et al., 2003)
Tanacetum vulgare	common tansy	Present	wild	(Schmitz, 1998)
Trifolium alexandrinum	clover	Present	wild	(Rashid et al., 1971)
Triticum sp.	wheat	Present	cultivated	(Ualiyeva et al., 2022)
Vitis vinifera	grape	Present	cultivated	(Abdullagatov and Abdullagatov, 1986)

*Presence in the U.S. confirmed by NRCS (2025)

Autographa gamma has been caught in pheromone traps in corn (*Zea mays*) fields (Ivas and Mureşanu, 2011; Suciu et al., 2014; Tărău et al., 2023). However, we could not locate evidence of this pest feeding or developing on corn.

Pest Importance

Autographa gamma is highly polyphagous, migratory, and periodically becomes economically important (Casteels and De Clercq, 1997; Hajyieva and Soroka, 2008; Honěk et al., 2002; Legrand and Wauters, 1997). Environmental conditions, specifically cold, dry springs followed by warm summers with strong winds, favor damaging outbreaks (Chapman et al., 2012; Dewar and Woiwod, 1994; Legrand and Wauters, 1997).

Crops that have been impacted by significant outbreaks in Europe include beans, beets, cabbage, carrots, chicory, flax, lettuce, peas, potatoes, rapeseed, sugar beet, and tomatoes (Casteels and De Clercq, 1997; Dewar and Haylock, 1996; Kanervo, 1947; Legrand and Wauters, 1997; Monnet, 1997; Schwitulla, 1963). Sugar beets are one of the most affected crops (Dewar and Haylock, 1996; Dochkova, 1972; Novak, 1975), with sporadic losses reaching up to 57% (Hajyieva and Soroka, 2008). In Finland, past outbreaks have caused economic losses by completely destroying clover and flax seedlings and damaging other crops, including beets and legumes (Kanervo, 1947; Schwitulla, 1963). Although *A. gamma* migrates in high numbers and is still an important agricultural pest in Finland, there have been no reports of significant economic loss in the last three decades (Torniainen and Mikonranta, 2018). The extensive damage to crops could have been attributed to past agricultural practices (e.g., no weed control).

Autographa gamma is listed as a harmful organism by the following countries: Costa Rica, Ecuador, Mexico, Peru, and the Republic of Moldova (USDA-PCIT, 2024). There may be trade implications if this pest becomes established in the United States.

Pathogens or Associated Organisms Vectored

Autographa gamma is not known to vector any pathogens in the field. In one old laboratory study, *A. gamma* larvae were reported to transmit 'mosaic virus of tobacco' after they had been manually transferred from infected to uninfected tobacco plants (Sukhov and Vovk, 1945). We could find no additional evidence suggesting that *A. gamma* is an important vector.

Known Distribution

Autographa gamma is distributed in Asia, Europe, and North Africa (Table 2) (Carter, 1984).

Table 2. Countries where *Autographa gamma* is known to occur.

Continent	Country	Reference
Asia	India	(Riyaz and Ignacimuthu, 2024)
Asia	Iran	(Golikhajeh et al., 2016)
Asia	Iraq	(Younis et al., 1988)
Asia	Israel	(Dunkelblum and Gothilf, 1983)
Asia	Japan	(Saito, 1988)
Asia	Kazakhstan	(Jashenko and Tanabekova, 2019)
Asia	North Korea	(Ronkay, 1981)
Asia	Saudi Arabia	(El-Hag and El-Meleigi, 1991)
Africa	Algeria	(Zeghti et al., 2019)
Africa	Egypt	(Harakly, 1975)
Africa	Ethiopia	(Kravchenko et al., 2015)
Africa	Libya	(El-Maghrabi and Amin, 2007)
Africa	Morocco	(Hill and Gatehouse, 1993)
Europe	Albania	(Beshkov, 1994)
Europe	Austria	(Schreier, 1966)
Europe	Belarus	(Hajyieva and Soroka, 2008)
Europe	Belgium	(Jansen, 2005)
Europe	Bulgaria	(Kostova et al., 2019)
Europe	Croatia	(Koren, 2018)
Europe	Cyprus	(John et al., 2015)
Europe	Czech Republic	(Honěk et al., 2002)
Europe	Denmark	(Lutz et al., 2024)
Europe	England	(Collier, 2017)
Europe	Finland	(Torniainen and Mikonranta, 2018)

Europe	France	(Rahn, 1983)
Europe	Germany	(Klug, 2006)
Europe	Greece	(Cheke and Ashcroft, 2017)
Europe	Hungary	(Tóth et al., 2019)
Europe	Ireland	(Walsh et al., 2013)
Europe	Italy	(Hausmann and Scalercio, 2016)
Europe	Latvia	(Petrova et al., 2013)
Europe	Liechtenstein	(Huemer, 2018)
Europe	Lithuania	(Ostrauskas et al., 2002)
Europe	Macedonia	(Beshkov, 1994)
Europe	Malta	(Borg and Sammut, 2002)
Europe	Moldova	(Munteanu-Molotievskiy et al., 2019)
Europe	Montenegro	(Beshkov, 2004)
Europe	Netherlands	(Winkler et al., 2005)
Europe	Norway	(Andersen, 1982)
Europe	Poland	(Szwejda and Rogowska, 2011)
Europe	Portugal	(Marabuto, 2018)
Europe	Romania	(Stanca-Moise, 2017)
Europe	Russia	(Nikolaevitch and Vjatcheslavovna, 2002)
Europe	San Marino	(Flamigni et al., 2008)
Europe	Scotland	(McHaffie, 1997)
Europe	Serbia	(Keresi and Almasi, 2009)
Europe	Slovakia	(Panigaj and Panigaj, 2008)
Europe	Slovenia	(Jez et al., 2015)
Europe	Spain	(Alvarado, 2009)
Europe	Sweden	(Plepys et al., 2002)
Europe	Switzerland	(Erhardt, 1990)
Europe	Turkey	(Uğur, 1995)
Europe	Ukraine	(Kanarskyi et al., 2011)

Autographa gamma has been captured in Iceland and Greenland, but breeding populations are not known to be established there (Downes, 1988). There are reports of *A. gamma* in Brazil (Bieżanko et al., 1949) and Uruguay until 1970 (Erazo-Moreno et al. (2019) citing Biezanko et al. (1957)). Erazo-Moreno et al. (2019) confirmed that *A. gamma* was previously present in both countries. Negative data from trapping suggests that the moth failed to establish and is currently absent.

Autographa gamma is likely present in South Korea, but without more conclusive evidence, it was not included in the distribution table. This moth was included in an older USDA document regarding *Citrus reticulata* var. *unshu* from South Korea without

direct evidence of presence in the country (USDA-APHIS-PPQ, 2006). More recently, an iNaturalist observation and multiple online datasets hosted by GBIF.org (2025), including both human observations (Kwon, 2022; Kwon, 2024) and preserved museum specimens (E. and H., 2024), contain multiple *A. gamma* records from South Korea.

Pathway

Autographa gamma is an obligate migrant moth that can travel long distances on its own. Every year, populations of this moth migrate to northern Europe in the spring and back to southern Europe and North Africa in the fall (Alerstam et al., 2011; Chapman et al., 2012; Collier, 2017; Thompson and Nelson, 2003). *Autographa gamma* is a very effective flier, with recorded average flight speeds of 35 mph, which the moth reaches by selecting the most favorable wind direction and altitude (Alerstam et al., 2011). The flight habits of these migratory moths expose them to high wind speeds, enabling them to cover extremely long distances (Alerstam et al., 2011; Chapman et al., 2008). *Autographa gamma* covered the distance from southern Europe to Poland (approximately 900 miles) within one growing season (Lipa (1977) cited by Swejda and Rogowska (2011)) and one simulation estimated that *A. gamma* could fly approximately 165 miles per night (Chapman et al., 2012). Should this moth ever establish in North America, it could easily migrate into or across the United States.

Autographa gamma eggs or larvae could potentially move through international trade on plants and commodities (Korycinska, 2012). The past presence of *A. gamma* in Brazil and Uruguay may have been the result of an introduction through imports from Europe (Erazo-Moreno et al., 2019).

Use the PPQ Commodity Import and Export manuals listed below to determine 1) if host plants or material are allowed to enter the United States from countries where the organism is present and 2) what phytosanitary measures (e.g., inspections, phytosanitary certificates, post entry quarantines, mandatory treatments) are in use. These manuals are updated regularly.

Agricultural Commodity Import Requirements(ACIR) manual: ACIR provides a single source to search for and retrieve entry requirements for imported commodities.

Potential Distribution within the United States

Based on the known distribution of *Autographa gamma* and comparing those climates to Global Plant Hardiness Zones (Takeuchi et al., 2018), we expect that *A. gamma* could establish in plant hardiness zones 3-11. *Autographa gamma* has suitable conditions for permanent establishment in the continental United States, except for the high elevation regions of the Rocky Mountains as well as Hawaii, Puerto Rico, and the coastal parts and interior of Alaska. Year-round activities of *A. gamma* could occur in Florida, Louisiana, most of Alabama, Georgia, Mississippi, South Carolina, Texas, the coast of North Carolina, most of California and southern Arizona, and Hawaii and Puerto Rico. These areas represent potential overwintering sites for the moth, from where it will migrate. More than 9 generations per year can occur in the southernmost parts of Florida and Texas, and parts of California and Arizona. Between 5-8

generations are predicted for the Southeast, Southwest, and most of California, while the Midwest and most of the Northeast could have 3-4, and the Northwest and the Rockies 1-2 generations per year (SAFARIS, 2025).

Autographa gamma is highly polyphagous and can develop on numerous crops, wild plants, and weed hosts, suggesting that all states and territories may be at risk for establishment. At highest risk are sugar beets, brassicas (including cauliflower, cabbage, collards, brussels sprouts, and kale), and lettuce. Sugar beets are grown on over 800,000 acres, mainly in Minnesota, North Dakota, and Idaho; brassicas are grown on over 94,000 acres, primarily in California, Georgia, Florida, New York, Arizona, North Carolina, and South Carolina; lettuce is grown on more than 300,000 acres, primarily in California and Arizona (NASS, 2024).

Autographa gamma has also been reported as a greenhouse pest (Klug and Meyhöfer, 2009; Scopes and Biggerstaff, 1974) and, with its broad host range, could also become established in this type of enclosed production system in the United States.

Survey and Key Diagnostics

Approved Methods for Pest Surveillance*:

For the current approved methods and guidance for survey and identification, see Approved Methods for Pest Surveillance (AMPS) pest page on the CAPS Resource and Collaboration website, at https://approvedmethods.ceris.purdue.edu/.

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Versions

January 2014 Datasheet completed (Version 1)
December 2025 (Version 2)

- Created **Pest Recognition** section
- Added **Easily Mistaken Species** section
- Added **Commonly Encountered Non-targets** section
- Updated **Biology & Ecology** section
- Created a table for **Known hosts** section
- Updated **Pest Importance** section with economic losses in various countries.
- Updated **Pathogens or Associated Organisms Vectored** section
- Created a table for **Known Distribution** section
- Updated **Pathway** section
- Updated **Potential Distribution within the United States** section
- Updated guidance for **Approved Methods** section.

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