

# European Grapevine Moth

*Lobesia botrana*

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Native to Mediterranean Europe, European Grapevine moth was reported for the first time in the United States in Napa Valley in October of 2009. Grape is the preferred host and larvae feed inside the berries.

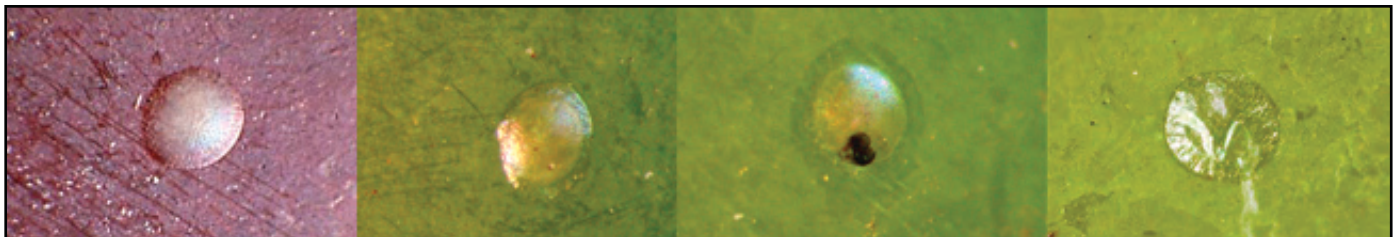
**Adult Male:** 0.24 to 0.3 inch long, wings tan-cream in color, with bluish-gray blotches and brown and black markings.

**Damage:** First generation larvae feed on flower clusters inside a “nest” of webbing. Second and third generation larvae feed inside berries, hollowing them out and leaving the outer skin and the seeds. Webbing, excrement and fungal infections damage the bunch.



**Larva:** From 0.04 inch at emergence to 0.6 inch when fully grown. Young larvae are creamy white with black heads. Older larvae are tan to yellow-brown, turning dark green or maroon as they mature. They have visible white tubercles at the base of the body hairs. Heads are tan to yellow-brown, with a distinct dark border on the outer edge of first segment behind the head.

**Pupa:** ¼ inch long inside a grayish white silken cocoon.



**Eggs:** Elliptical, flat, 0.03 inches in diameter, laid singly on smooth surfaces of developing flower clusters in spring and on berries in 2nd and 3rd generations. Creamy white when first laid, turning yellow as embryo develops and black when the head of the developing larva is formed. The outer shell is translucent after the larvae hatch.

More information at: <http://www.ipm.ucdavis.edu/EXOTIC/eurograpevinemoth.html>



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Photos: Servicio Agrícola y Ganadero, Chile and Jack K. Clark  
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	Life Cycle	Monitor
<p><b>Before bud break</b></p> 	<p>First generation male flight may begin near bud break and continue for 4 to 5 weeks. Adult females begin to emerge about a week after males. Adults fly at dusk and mate in flight 1 to 6 days after emergence.</p>	<p>Set red delta traps with <i>Lobesia botrana</i> lures two weeks before bud break. Attach trap to trellis immediately above the canopy. Set at least 2 traps per vineyard with a minimum of 1 trap per 30 acres. Monitor trap weekly through harvest.</p>
<p><b>1<sup>st</sup> generation: Flower Separation through fruit set</b></p>  <p style="text-align: right; font-size: small;">Photo: J. Malak</p>	<p>Eggs of the first generation are laid singly on flat surfaces on or near the flower cluster (cluster stem, flower caps, bracts). They hatch in 7 to 11 days. Larvae web flower parts together to form “nests” prior to bloom through fruit set, feeding inside the web on pre-bloom flowers and newly set berries. Larval development is completed in 25 to 30 days. Pupae form inside webbed cocoons in the flower cluster, in a folded lobe of a leaf blade or under the bark. Adults emerge 6 to 14 days after pupation.</p>	<p>At peak trap catch, begin to monitor 100 flower clusters per block (1 cluster per vine). Look for eggs laid on flower caps, bracts or cluster stem. Take note of egg color and the time it takes to change from white (freshly laid) to yellow and finally black (immediately prior to hatching). The outer shell is translucent after the larva hatch. After egg hatch, monitor flower clusters. Look for flower parts webbed together forming a nest with larvae inside. Small larvae may penetrate individual pre-bloom flowers.</p>
<p><b>2<sup>nd</sup> Generation: Pea berry size through early veraison</b></p>  <p style="text-align: right; font-size: small;">Photos: Larry Strand</p>	<p>Eggs of the second generation are laid individually on shaded developing green berries. When berries are pea size, each larva ties several berries together with webbing and feeds on berry surfaces. Larvae penetrate mid-size berries where two berries touch or where the pedicel attaches and feed internally. About early veraison, pupae form as described for the first generation.</p>	<p>One week after trapping the first moth of the second flight, begin to monitor 100 clusters. The berries may be about pea size. Observe the cluster in direct sunlight and look for shiny eggs laid singly on berry surfaces. Note timing of egg development and hatch. After egg hatch, look for berries tied together with webbing. Separate berries and look for larvae and entry holes in the berries.</p>
<p><b>3<sup>rd</sup> generation: Early veraison through post-harvest</b></p>  <p style="text-align: right; font-size: small;">Photo: Kaley Taylor</p>	<p>Eggs of the third generation are laid on single berries around veraison. Shortly after hatching, larvae penetrate the berries where the berries touch each other and feed internally on ripening fruit. Larvae can be found inside one or more berries. Infested clusters contain webbing and excrement. A larva can fully excavate the berry leaving the seeds and somewhat intact berry “skin” full of excrement and loosely attached to the pedicel.</p>	<p>One week after trapping the first moth of the third flight, begin to monitor 100 clusters. The clusters will be past veraison and eggs will be easier to locate on dark fruit. Note timing of egg development. Look for shriveled berries. To verify the berry shrivel is caused by larvae, gently squeeze the berry to force a larva to exit. Inspect the bunch for frass, webbing and larvae.</p>
<p><b>Overwintering: After harvest</b></p>  <p style="text-align: right; font-size: small;">Photo: Jack Clark</p>	<p>In fall, nights longer than 11 hours during egg and or larval development cause diapause (resting stage). In September through October pupae form inside silken cocoons under the bark of cordons and trunks. In early February pupa begin post-diapause development.</p>	<p>If traps were not placed in a block during the growing season, but an infestation is suspected, examine any clusters that remain after a hand harvest. Look for larvae inside damaged berries, webbing and frass. In machine harvested blocks look under the bark for pupae on cordons and trunks.</p>