

# grape berry moth

*Endopiza viteana* Clemens

## INTRODUCTION

The grape berry moth, a major pest of cultivated grapes, is native to eastern North America where it originally occurred on wild grapes. Its present range of distribution is the territory east of the Rocky Mountains, wherever its wild or cultivated hosts occur. The grape berry moth feeds only on grapes and has 1 1/2 or 2 generations per year.

## THE ADULTS

The adult moths begin to emerge from overwintering pupae in mid- to late May before the blossom period of the widely planted Concord variety. Emergence of the overwintering generation peaks in mid-June and continues until mid-July. First generation adults begin to fly in late July, they peak in early August, and continue to emerge until early September.

The adult grape berry moth is small and has an inconspicuous brownish appearance. When resting it is about 6 mm long. Its wingspread is 9 to 12 mm. The forewings are grey blue at the base and become cream-colored with brown patches towards the tips

(Fig. 1). The smaller smokey-brown hindwings are hidden underneath the forewings when the moth is at rest. The body color is brown. During most of the day moths rest on the vines. Around mid- or late afternoon they become active and their rapid, zig-zag flight can be observed until after dusk.

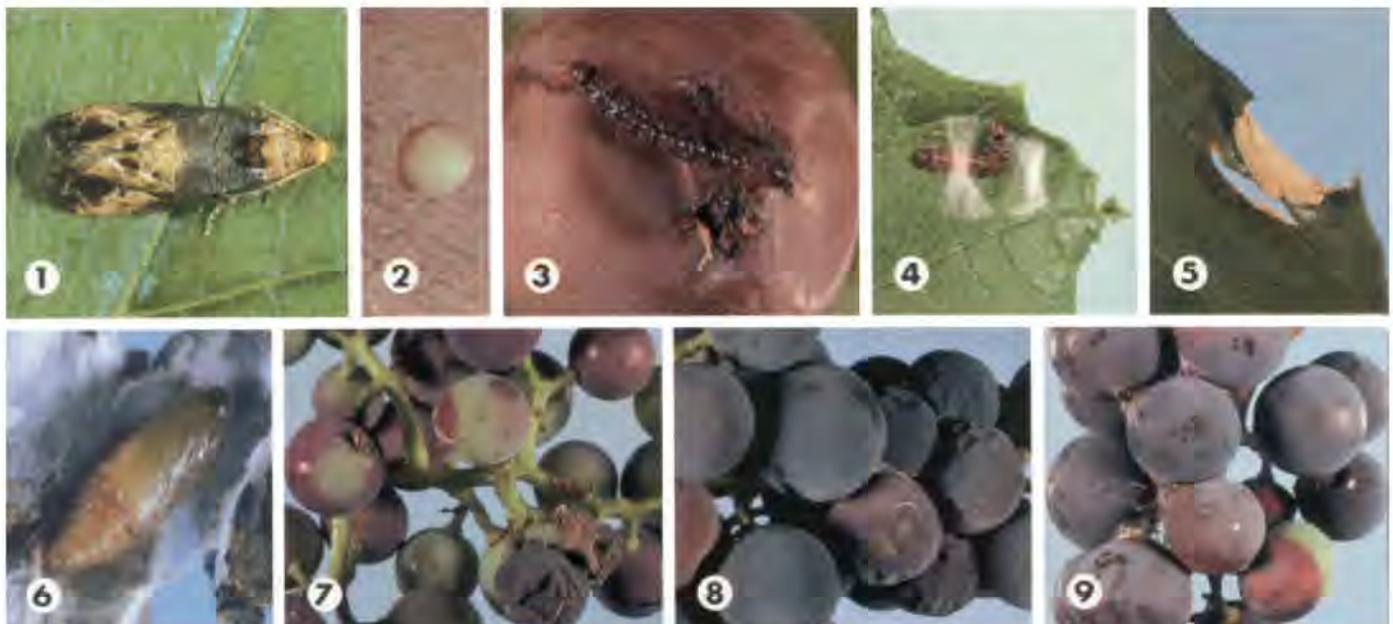
## THE EGGS

In early spring eggs are laid singly on buds, stems, or on newly-formed berries. Later, most eggs are deposited directly on the grape berries. Depending on temperature, eggs hatch after 4 to 8 days. The opaque white eggs are oval, scale-like, and measure only 0.7 mm across (Fig. 2).

## THE LARVAE

The newly hatched larva is creamy white with a dark brown head and thoracic shield. As the larva grows, its body becomes greenish and eventually turns purple. The head of the mature larva is light brown but the thoracic shield remains dark colored (Fig. 3). The mature larva measures 10 mm in length.

The first larvae in the spring feed on tender stems, blossom buds, and the newly set berries. Often they feed inside large protective webbings which can involve the entire cluster. When berries have reached about 3 mm in diameter, larvae begin to burrow into them. Second generation larvae feed only on the berries. They usually enter where berries touch each other or where the berry is joined to the stem. Once inside



the fruit, larvae feed just below the skin but eventually the inside of the berry is attacked. Often larvae feed successively on 2 to 3 berries. Up to seven berries can be destroyed by a single larva. Mature first generation larvae move to a leaf where they cut out a circular flap to construct a pupation chamber (Figs. 4 & 5). Also, some larvae pupate in the fruit cluster where they have fed. Most fully developed second generation larvae spin down to the ground where they construct overwintering pupal cells in fallen leaves.

## THE PUPAE

The grape berry moth overwinters in the pupal stage. The pupa is 5 mm long and is either light-brown with a green shade on the abdomen or entirely dark green (Fig. 6).

## INJURY

The damage by early first generation larvae can be quite serious since a single larva can destroy a dozen or so potential berries by feeding on buds, flowers, and the newly set fruit. Late first generation and all second generation larvae feed only on the berries. Often a reddish spot surrounds the point of larval entry. This discoloration can extend over half of the surface of an otherwise green berry. Injured berries ripen prema-

turely, split open, and shrivel (Figs. 7 & 8). Webbing produced by the larvae prevent injured berries from dropping to the ground (Fig. 9). Larval feeding directly reduces yield and contaminates the crop. More importantly, feeding by grape berry moth larvae creates infection sites for rot organisms and invites attack by *Drosophila* flies. Infestations by the grape berry moth can vary greatly from year to year and are often very uneven in a vineyard.

## CONTROL

In light infestations, injured berries can be removed by hand. Several cultural methods have been used in the past to reduce the overwintering grape berry moth population. A measure of control can be achieved by gathering the leaves with the pupal cells in the fall and destroying them. Covering leaves containing cocoons under the trellis with a 2.5 cm covering of compact soil will prevent emergence. This operation must be completed 15 days ahead of the bloom period. Where the grape berry moth is an annual problem, postbloom sprays with insecticides may be necessary if the problem is severe. Consult the nearest Cooperative Extension office for control recommendations. Sex pheromone traps have been used to monitor emergence and activity of male moths. Use of these traps may be helpful to improve timing and determine the need for control measures against this grape pest.

### GUIDE TO STAGES

STAGE	TIMING	WHERE TO LOOK
Adults		
1st flight	Late May (before bloom) until mid-July	Pheromone traps.
2nd flight	Late July until early Sept.	Pheromone traps.
Eggs		
1st generation	Late May until mid-July	On stems, blossom buds, or newly set berries; later only on berries.
2nd generation	Late July until early Sept.	On berries.
Larvae		
1st generation	Early June until late July	First on stems, blossom buds or newly set berries; blossoms and small berries often webbed together; later only in berries.
2nd generation	Early Aug. until end of Sept.	In berries.
Pupae		
1st generation overwintering	Late June until Aug. Aug. until late May of following year	On leaves on the vine. On fallen leaves on the ground.

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