

# GRAPE PESTS

## CORNELL COOPERATIVE EXTENSION

### Grape Tumid Gallmaker

*Janetiella brevicauda* Felt

Grape tumid galls, also called grape tomato galls, are caused by larvae of a small fly known as the grape tumid gallmaker (GTG). This pest is native

to the northeastern United States and southeastern Canada. It infests only wild and cultivated grapes (*Vitis* spp.). Infestations are generally spotty both within vineyards and within infested vines. In the past, tumid galls were attributed to as many as five species of flies, but it is now thought that the single species *Janetiella brevicauda* accounts for almost all of the damage seen in northeastern vineyards.

#### Life Cycle Overview

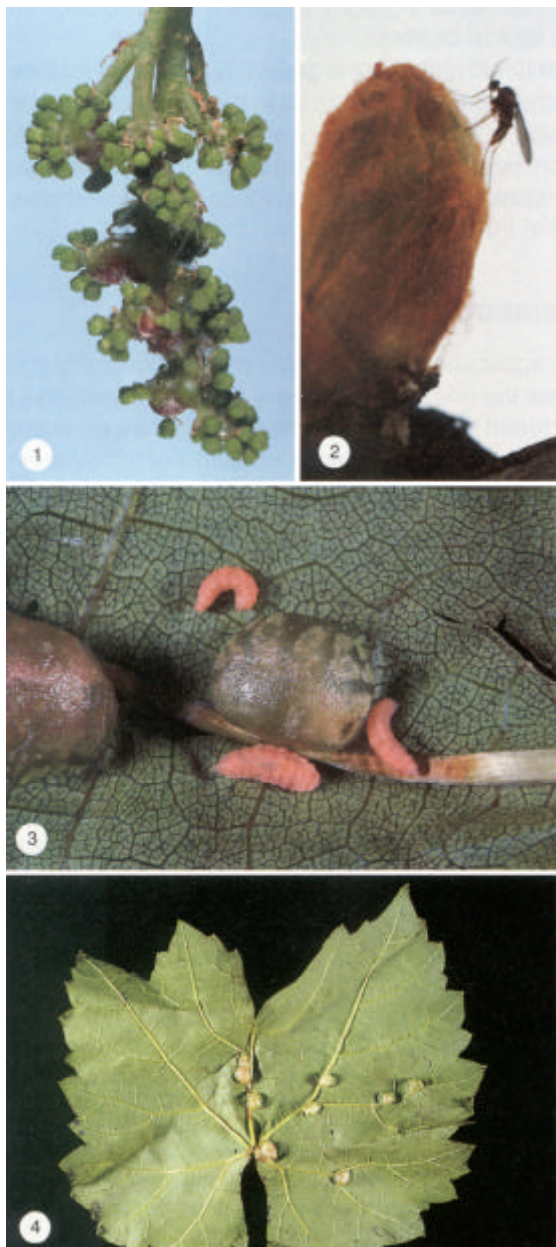
Midges (adults) produce from one to three generations per year. The actual number of generations produced in a given year depends upon weather conditions and the location of the vineyard. The life cycle begins with an egg laid within the unfolding bud or shoot tip. Maggot-like larvae hatch from these eggs and enter the vine tissue. As the larvae feed, a gall forms around them. Figure 1 shows the small reddish galls formed on a grape cluster early in the season.

When the larvae have fully developed, they leave the gall and drop to the soil. There they form a cocoon for pupation within 2.5 to 5 cm (1.0 to 2.0 in.) of the soil surface. Depending on the time of year, the larvae will either pupate and produce emerging midges within two to three weeks, or they will overwinter in the soil and continue development to adulthood the following spring.

#### Adults

Tumid gallmaker adults are small, measuring about 2.5 mm (1/10 in.) long. They are dark brown to reddish, fragile flies with plume-like antennae and only one pair of wings. It is difficult to identify the adults because of the large number of similar gall midges in North America.

The adult is very short lived; most only live one day. It is reported that adults do not feed. Female midges apparently attract males with an odor emitted from the ovipositor. Egg laying begins within 40 minutes of mating. There is some indication that females



Actual Size



prefer to lay egg masses on grape shoots close to the ground.

Adults developing from the overwintered larvae begin to emerge in early to mid-May; emergence of this “spring” generation peaks sometime around mid-June. Most of the adults emerge between 7:00 A.M. and 10:00 A.M. Emergence does not occur if air temperature is below 19°C (66°F).

The spring emergence of midges can include individuals that overwintered as either first, second, or third generation larvae from the previous year. The “first” (first complete) generation of the season emerges from approximately the first week of June until the third week of July. The second generation emerges from mid-July to the third week of August, and the third generation emerges from mid-August to mid-September.

Because adult midges live only a short time, and because they are so small, they are difficult to detect in the vineyard. Adults cling to the undersides of grape leaves or rest in the ground cover during inactive periods. They are thought to be inactive at night and during windy and rainy periods.

## Eggs

Grape tumid gallmaker females lay their eggs in masses between developing tissues at the bud or shoot tips from early May to mid-September (fig. 2). The microscopic eggs are pale to bright orange, measure about 0.25 mm (1/100 in.) long, and hatch in four to six days. Females each deposit an average of more than 200 eggs.

## Larvae

The larval stage of the midge causes the highly visible galls on the grapevine. Upon hatching from the egg, the larvae of GTG bore into the tissue at the shoot tip (mid-May to late September). The boring leaves a whitish circular scar on the vine that is still visible after the gall forms. Larvae are orange, about 3.0 mm (1/8 in.) long, and lack appendages (fig. 3). It is uncertain how many distinct instars tumid gall larvae go through, but upon reaching maturity within the gall larvae exit through the same hole formed on entering the plant tissue. They then drop to the ground and form a cocoon 1.3 to 5.0 cm (1/2 to 2.0 in.) below the soil surface. Late season larvae will overwinter in these cocoons and continue their development the following spring. Early and mid-season larvae will pupate immediately and then emerge as adults to continue the life cycle.

## Pupae

Pupae are about 1.5 mm (1/16 in.) long and 0.8 mm (1/32 in.) wide and vary in color from pale to dark orange. Pupation occurs in the silky cocoons located less than two inches below the soil surface. The overwintered larvae of the spring generation pupate from late April to mid-May. The first complete generation of the season pupates from

mid-June to mid-July, and the second generation from late July to mid-August. Pupation occurs one to two weeks after larvae enter the soil, depending on soil conditions. Adults emerge within one to two weeks following pupation. For overwintering larvae, which can be from the first, second, or third generation, pupation does not occur until the following spring.

## Damage

Grape tumid gall was originally called grape tomato gall because the round, reddish, succulent galls resembled tomatoes. However, grape tumid gall, meaning swollen or distended, is now the encouraged name because it avoids confusion with the tomato plant. The galls, which measure 3.2 to 6.4 mm (1/8 to 1/4 in.) in diameter, are typically located on leaves (fig. 4), petioles, and flower clusters. In heavy infestations, the galling may reduce vine vigor and can cause shoot breakage, but in most instances, galling is of little economic importance. Galling on flower clusters, however, can result in poorly shaped fruit clusters or the complete loss of clusters.

Grape tumid gallmaker is generally not as prevalent in western and central New York as in the southeastern part of the state. Of greatest concern is the overwintered generation, because the offspring of these individuals can severely damage the developing foliage and flower clusters early in the season.

## Management

Pesticide applications for GTG are not economically prudent unless the infestation is heavy or the vineyard has a history of tumid gall problems. Treatment, when economically justified, should be timed to kill adults of the overwintered generation as they emerge. In view of the difficulty in detecting the adults, it may be most feasible to base control measures on the first sign of larval entrance into vine tissues—the small white scar—or on the first indication of gall formation.

There are several parasitic and predatory species of insects that attack the larvae of grape tumid gall midges. Growers might also consider burying the pupae by mounding soil up under the vines early in the season (late April). This form of cultural control might prevent adults from reaching the soil surface. For correct pest management procedures, growers should consult local Cooperative Extension recommendations.

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