

## Top Ten Grape Insect Pests in Nebraska

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### Apple Twig Borer

**Insect Identification:** Adults (beetles) are brown to black in color, cylindrical shaped, and 3/8" long.

**Life Cycle:** Overwinters in adult stage and burrows into live canes. Adults become active in late April and early May. Egg laying occurs between mid-May and mid-June. Eggs hatch in mid-June and larvae burrow into dead or dying canes and feed just below the bark.

**Damage Symptoms:** As canes harden off, adults bore into one-year-old live canes, generally in the nodes near the base. They feed in channels in the middle of the canes. Larvae burrow directly into dead or dying canes.

**Timing:** Survey in late winter or early spring while vines are dormant.

**Monitoring:** Inspect for holes (about 3/16" in diameter) at base of dormant canes near bud. Adult beetles can be detected on canes in spring at the 3-6" shoot growth. No damage thresholds have yet been established.

### Grape Flea Beetle

**Insect Identification:** Adults (beetles) are shiny, metallic dark blue and 3/16" long. Young larvae are dark brown, 1/16", but lighten as they grow, eventually reaching 1/3".

**Life Cycle:** Overwinters as an adult and emerges in April.

**Damage Symptoms:** Adults feed on young buds, chewing on the sides and ends, and hollowing them out. Larvae and adults feed on upper and lower leaf surfaces.

**Timing:** Monitor for adults from late April until buds have grown to a length of 1/2" or more. Beetles can be spotted on canes and buds.

**Monitoring:** Monitoring should be carried out along vineyard borders adjacent to woods or protected areas and in the center of the vineyard. At least 25 vines should be inspected at four locations. If bud damage averages 4% or more, an insecticide application may be justified.



### Climbing Cutworm

**Insect Identification:** Adults are medium sized moths with a wingspread of 1" -1½". The female is medium to dark brown, whereas the male is lighter brown. A triangular-shaped spot is present on the anterior margin of each forewing. Cutworm larvae are dull gray brown and 1 1/5" - 1 ½" in length when fully grown.

**Life Cycle:** Overwinter as partially-grown larvae and resume feeding in early May. Larvae hide during the day under bark and in soil litter, and emerge at night to feed.



**Damage Symptoms:** Larval feeding occurs on primary buds, but secondary and tertiary buds may also be attacked at the time of bud swell. Climbing cutworms also feed on young leaves.

**Timing:** Larvae feed from bud swell until shoots are 3/8" - 5/8" long.

**Monitoring:** Begin monitoring for leaf damage and presence of caterpillars in early May.

## Eastern Grape Leafhopper

**Insect Identification:** Adults are 1/8" and pale yellow with three black spots and zig-zag lines of deeper yellow on the forewings. Young nymphs are semi-transparent with red eyes, but darken with each molt.

**Life Cycle:** Adults overwinter in leaves and litter. They enter vineyards in spring and feed on leaves. There can be one to two generations per season in Nebraska.



**Damage Symptoms:** Both nymphs and adults feed on the underside of grape leaves by piercing leaf tissues and sucking out plant juices. Damaged leaves become mottled with yellow dots. Excrement and honeydew secreted by the leafhoppers drops on the berries reducing their quality.

**Timing:** Nymphs emerge and begin feeding in early July through October

**Monitoring:** On one shoot per vine, inspect 5 leaves starting at the 3<sup>rd</sup> leaf from the base. Record number of "damaged" leaves on each shoot. Studies done by the University of California indicate that a vine can tolerate up to 20% leaf loss a month after fruit set before the yield is affected.

## Grape Berry Moth

**Insect Identification:** Adult is a mottled brown moth, 1/4" in length. The hind portion of the wings is gray-blue with brown markings, while the front portion is gray-blue and without markings. Larvae are 2/5" when fully grown. They are pale olive-green with a purplish tinge, but can vary in color depending on their food source.

**Life Cycle:** There are two or more generations per year. Eggs are laid singly on buds, stems, and on newly formed berries, and hatch in three to six days.



**Damage Symptoms:** Larvae of the first generation feed on blossoms and young grape clusters. Second generation larvae enter berries to feed. Entry sites are visible as small holes. Multiple berries are webbed together. Third generation larvae feed within berries before and after veraison. Berries are often hollowed out by this feeding. Cornell

**Timing:** Early stages of berry development through veraison.

**Monitoring:** Monitor late May for eggs around buds, stems, and young berry clusters, and for emerging larvae. Inspect 10 clusters per vine on a total of 5 vines at both interior and edge sites. Record number of webs within the berry clusters to estimate number of larvae. Ohio State suggests corrective measures if injury to grape clusters is more than 5%.



Pheromone traps are available to monitor adult moth activity. Traps are most useful for timing management activities including insecticide sprays.

## Grape Phylloxera

**Insect Identification:** Wingless adult forms are tiny, yellow-brown, oval or pear-shaped, and aphid-like. The winged forms, which are less likely to be seen, are also aphid-like with wings held flat over back.

**Life Cycle:** In spring, female nymphs hatch from fertilized eggs that have been laid on wood of a vines. They migrate to leaves and produces galls. In about 15 days nymphs mature to adults, lay eggs in the galls, then die. Second generation nymphs hatch from these eggs and disperse to new leaves where they produce galls, mature, and lay third generation eggs. There can be 6-7 generations of the leaf form during the summer.

**Damage Symptoms:** Insect forms galls on the leaves of grapevines. Heavy infestations can lead to premature defoliation and retarded shoot growth.

**Timing:** When shoot length reaches five inches.



**Monitoring:** Begin monitoring when shoot length reaches five inches. Look for young galls on the undersides of terminal leaves. Galls are green with a rough looking surface and are about 1/4" in diameter.

## Redbanded Leafroller

**Insect Identification:** Adults (moths) have rusty red or red-brown bands on their wings with small patches of silver, gold, and orange. A red band is visible across the front wings when the moth is at rest. Larvae are yellowish-green with a green head capsule and reach a length of 7/10". Pupae are deep brown and reach 3/10".



**Life Cycle:** Overwinters as pupae in ground debris. Adults emerge in early spring and lay eggs on undersides of vines. Eggs hatch at around bloom stage. Larvae feed on foliage, and fold or roll leaves together with webbing. There are 2-4 generations each year.

**Damage Symptoms:** Larvae feed on foliage and berry clusters. They remain concealed in webbing on the cluster stem and feed on both the stem and grapes.

**Timing:** Redbanded leafroller larvae are feeding during bloom and continue until harvest.

**Monitoring:** Begin monitoring for leaf damage during bloom and continue until harvest. Look for webbing in and around grape clusters during early berry formation.

## Sphinx hornworm caterpillar

**Insect Identification:** This caterpillar is bright green when young, but darkens to a reddish brown as it matures. It has large, white spots along the sides of the body and is 3" long when fully grown. It has a distinctive "horn" at the hind end. The adult moth is olive green with black and pink markings.

**Life Cycle:** Adults (moths) emerge in late spring, mate and lay eggs. Caterpillars are present throughout June and feed throughout the larval stage.

**Damage Symptoms:** Caterpillars feed on leaves, defoliating grapevines.

**Timing:** Sphinx hornworm caterpillars are active from late July through August.



**Monitoring:** Record number of caterpillars per vine on 3-4 vines.

## Spider Mites

**Insect Identification:** Adults range from dark red/reddish-brown to dull green/brown. They have eight legs and are 1/50" long. Eggs are globe-shaped and very tiny.

**Life Cycle:** Mites overwinter as eggs under bud scales. Nymphs appear early in the growing season. Four to nine generations per year are possible.

**Damage Symptoms:** Nymphs and adults pierce leaf cells to extract plant juices. Both nymphs and adults feed within fine webbing on the underside of leaves. At higher infestations they may "ball up" on shoot tips. Mites cause stunted, chlorotic shoots with small leaves and characteristic pinpoint necrotic areas (stippling) on leaves.

**Timing:** Affected growth stages are from early shoot growth (1-4") to 20 days post-bloom.

**Monitoring:** Monitor for mites by examining underside of leaves. Estimate number of mites on average of ten leaves. Twenty to thirty mites per leaf indicates the potential for serious mite damage.

## Grasshoppers

**Insect Identification:** Nymphs are wingless, but resemble adults. Adults are 1" - 1 ½" long and vary in color from yellowish-green to reddish-brown.

**Life Cycle:** Overwintering is in the egg stage. Eggs hatch from mid May to June. Nymphs start feeding immediately and pass through five or more nymphal stages. Adults are present by late June to early July.

**Damage Symptoms:** Grasshoppers consume leaves, defoliating grapevines.

**Timing:** Grasshoppers are present from July through harvest.

**Monitoring:** Use the square yard method to determine grasshopper density. Visualize a one-square yard area on a vineyard border. As you walk toward the area count the number of grasshoppers jumping in or out of the area in several locations around the vineyard. This will help you estimate the average number of grasshoppers per square yard.

