



Watch Out for: Grapes

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Description

Grapes are grown for wine, juice, and table use in all regions of the Midwest. They are particularly sensitive to pesticide drift because certain herbicide products can injure the vines, significantly reduce yields, or contaminate the fruit.

Grapes are a high-value crop, with an annual value of \$4,000 to \$5,000 per acre, and a processed value that may be ten times that amount. Losses to growers and liability of applicators can be of considerable economic concern.

Products of Special Concern

Grapes are particularly sensitive to growth regulator herbicides, including the phenoxy, benzoic, and pyridine classes of compounds. The most common products are 2,4-D (phenoxy) and dicamba (benzoic), which are widely used in corn and soybean production.

Growth regulators pose a great risk because they can cause significant injury at fractions of typical application rates. For example, 2,4-D can damage grapes at 100 times lower than labeled rates.



The three grape clusters on the left were exposed to dicamba. Exposed clusters have less than half the number of berries of normal clusters.

Crops Affected: Grapes.

Products of Special Concern: Growth regulator herbicides (in the phenoxy, benzoic, and pyridine classes (such as 2,4-D, dicamba, and triclopyr).

Timing: Damage can be most severe in early spring.

Loss Potential: Up to \$5,000 per acre for fruit, up to 10 times that amount for processed products.



2,4-D injury symptoms on grape shoots often include a cessation of shoot tip growth and an abundance of lateral shoots.

Phenoxy herbicides (such as 2,4-D) are used to control broadleaf weeds in turfgrass or corn. They are available as ester or amine formulations. Ester formulations are highly volatile and prone to move off-target as vapor. Although most of today's ester formulations are referred to as low-volatile (LV) and pose less risk than products used in the past, they still pose a risk.

Pyridine products — such as picloram (Tordon®) and triclopyr (Garlon®) — are used to control weeds and brush in rights-of-way and can drift and damage grapes.

The majority of injury problems occur on sensitive vegetation immediately adjacent to application sites. The risk of injury decreases rapidly as the distance between application sites and sensitive vegetation increases. However, because grapes are extremely sensitive to growth regulator herbicides and the use of these products is so widespread, vines may be injured several miles from the application site due to vapor drift.

Injury Symptoms and Potential Impact

Growth regulator herbicides, especially 2,4-D and dicamba, can cause severe leaf distortion and stunting in grapevines. Injury is most severe on foliage or other plant parts that emerged within a few days after herbicide exposure. The youngest developing leaves can be severely distorted and stunted, and shoot tips may die. Damage is most severe when exposure occurs early in the season (April-May) during the early stages of shoot growth prior to grape flowering.

Grapes injured at this time can have severely distorted shoots and leaves, aborted or failed flowers, poor fruit set, and low yield. Leaves and shoots that develop a few weeks after 2,4-D exposure may be normal. After dicamba exposure, vine growth usually fails to return to normal throughout the growing season.



Dicamba symptoms on grape flowers include elongated growth, failed blooms, and abnormal fruit set.

Late-season exposure to 2,4-D or dicamba may distort young leaves, but probably does not cause economic loss. While there may not be observable carry-over symptoms from the year of exposure to the next year, it has been documented that grapes repeatedly exposed to these compounds become less productive, ripen later, and may eventually die from other causes due to their weakened condition.

Ways to Avoid Drift and Alternatives

Applicators should always follow all drift reduction measures specified on product labels.

2,4-D is primarily a burn-down herbicide in no-till crop production. It's most frequently applied in April and May, which coincides exactly with the most sensitive grape growth period.

Dicamba is primarily applied postemergence to corn when plants are 4 inches or taller. Dicamba and 2,4-D use patterns may change as new lines of herbicide-tolerant corn and soybeans enter the market.

Applicators can reduce the risk of off-target damage by avoiding volatile herbicides past early May. Early spring applications may not cause problems, even in close proximity to sensitive crops. But if applicators must delay spraying due to poor conditions, applicators should consider eliminating volatile compounds in their burn-down sprays and apply only non-volatile products such as glyphosate.

Grape growers can avoid problems by choosing the grape varieties that are less sensitive to growth regulators, selecting sites that are isolated from crop fields, planting windbreaks, and other practices.



Dicamba symptoms on grapes can include upward cupping of leaves and distorted shoots.

Driftwatch is an online registry that helps pesticide applicators, specialty crop growers, and stewards of at-risk habitats communicate more effectively to protect pesticide-sensitive areas. To see other publications in the Driftwatch series, visit the Purdue Extension Education Store, www.the-education-store.com, or www.Driftwatch.org.

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