

# Avoiding Herbicide Drift Injury on Grape

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## Introduction

In British Columbia we are seeing an increase in herbicide injury to grapes. The acreage of wine grapes has been increasing in areas traditionally planted with other crops. Grapes are particularly sensitive to pesticide drift and certain herbicide products can injure the vines and significantly reduce yields. Grapes are especially sensitive to several herbicides commonly used in agronomic crops, pasture, rangeland, forestry, and even non-crop areas. When applied nearby, these herbicides can cause injury to grapevines through drift.

Grapes are a high-value crop, with an annual value of \$8,000 to \$10,000 per acre, and a processed value that may be ten times that amount. Losses to growers and liability of applicators can be considerable.

## Drift

Non-target “drift” can occur in one of two ways: either as spray drift or vapor drift. Spray drift occurs when small droplets move off the treatment site at or near the time of application. This can happen with any type of herbicide. Vapor drift occurs when the spray material volatilizes or evaporates off the target area and is carried off-site by wind or temperature inversions as a vapor. **Vapor drift is not visible and can cause damage to sensitive plants some distance away (sometimes over a kilometer) from the application site.** The potential for vapor drift is chemical specific and based on the herbicides’ vapor pressure. Vapor pressure is affected by temperature and relative humidity. Because 2,4-D has a high vapor pressure, it readily volatilizes, especially under higher temperatures and low humidity, a condition that occurs quite often in the interior of British Columbia.



Fan shaped leaf (2,4-D injury)



Fan leaves, short internode and wavy shoots (2,4-D injury)

## Products of Concern

Grapes are particularly sensitive to the group 4 herbicides which are products that contain 2,4-D, dicamba, picloram, aminopyralid, triclopyr, MCPA, and others. These products pose a greater risk because they can cause significant injury at fractions of typical application rates. Grapes are highly sensitive to 2,4-D and it is the most common herbicide causing damage to grapes. **2,4-D can damage grapes at a rate that is equivalent to 1% of the labeled rates for weed control in other crops.**

## Symptoms & Impact

2,4-D and dicamba can cause severe leaf distortion and stunting in grapevines. Injury is most severe on foliage 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 during the early stages of shoot growth prior to or during grape flowering.

Grapes injured at this time can have severely distorted shoots and leaves, aborted or failed flowers, poor fruit set, and low yield. Some vine growth may fail to return to normal throughout the growing season, depending on the dose that the plants have received. Young vines may not recover and die.



3 grape clusters with 2,4-D injury (Left), normal grape cluster (Right)

## Ways to Avoid Drift as an Applicator

- **Increase Droplet Size** – Select nozzles that produce larger droplets that are less prone to drift. These will be Air Induction or Drift Gard nozzles. The label directions of most 2,4-D and dicamba products require a droplet size of medium or coarse to avoid spray particle drift.
- **Avoid Application when High Temperature is Forecast** – The risk of volatilization is directly related to air temperature, and as temperature exceeds 25° C, the potential for off-target movement increases. The majority of volatilization occurs within a few days of application, with increasing temperature there is increased potential for volatilization. Check the maximum temperature forecast for the day of application and a few days after application as well.
- **Monitor Wind Speed and Direction** – Wind can move fine droplets off the target area of application. A portion of the herbicide may also evaporate from the surface that it lands upon and move from the treated area with wind currents. Avoid applying 2,4-D if wind speeds are lower than 3 km/hr or greater than 8 km/hr. Herbicides sprayed in calm (no wind) situations may increase drift potential due to inversion drift.
- **Look for Alternative Products to 2,4-D or dicamba** – 2,4-D and dicamba are known to cause the most injury to grapes and they are also known to volatilize and move off target in warm conditions. There are other herbicides that are less volatile or from different herbicide groups that may be a better alternative to control the target weeds. Contact your local agronomist or herbicide supplier for alternatives.
- **Follow Label** – Ensure that all drift reduction measures from the label are followed.

## Ways to Avoid Drift as a Grape Grower

- **Communication is the First Step in Preventing Injury** – Grape growers should communicate with their neighbours about the sensitivity of grapes to 2,4-D and dicamba herbicides.
- **Take note of Neighbouring Crops** – Communicate with neighbours with crops such as cereal crops, pasture and hayfields that may use herbicides for weed control.
- **Roadside Management and Invasive Weed Management** – Share the location of your vineyard with any group that may be controlling invasive species or other weeds in the highway right-of-way and educate them on the sensitivity of grapes to herbicides that contain 2,4-D and dicamba.