

Are Your Weed-control Products Damaging Nearby Vineyards?

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Grapes are becoming an increasingly important crop in Oregon. There are more than 22,000 acres of vineyard planted in the state, from the Willamette Valley south to Medford and Ashland, along the Columbia Gorge, and into the Milton-Freewater area. There is also a small but growing interest in counties of Central Oregon. The farm gate value (the price of grapes when sold by the farm) is nearly \$130 million annually, making grape production a significant agricultural commodity in the state. Over the past decade, grape growers have become increasingly concerned that herbicides used by homeowners will drift into their vineyards and damage their vines.

Herbicides can cause significant damage to grapevines. Grapevine growth can be stunted and fruit yields lost due to certain active ingredients found in weed-killer products. With the Oregon grape industry growing rapidly near urban boundaries throughout the state, herbicides used in home gardens and residential and urban landscapes can cause serious damage to local vineyards.

How are grapevines damaged by herbicides?

Grapevines are most sensitive to herbicide damage from early spring (March to April) when they break bud until they bloom (late May through early July), depending on the year. Herbicide damage during this time can affect shoot growth and fruit development. Depending on the type and concentration of herbicide exposure, shoot growth can be severely stunted and flowers may dry up and fall off the vine, resulting in reduced yields or no fruit at harvest. If growth is severely stunted, it may take years for the vine to resume normal shoot growth and fruit production. Although spring and early summer can be the most susceptible times for grapevines, damage by herbicide



Photo: Michael Kennedy, © Oregon State University

Figure 1. Herbicide products that contain active ingredients known to cause damage to grapevines can be found at hardware stores, garden centers and other retailers. They may be effective at controlling weeds in your home garden or landscape but should be used with caution, particularly around vineyards, or avoided all together. The photo above features four products that contain herbicides that can damage grapevines.

drift can occur whenever the vine is green and growing (March through October). If there is late season exposure to herbicides, the effect may be found in next season's growth. Depending on the product and timing of herbicide exposure, grape growers may have to throw away fruit if residues prohibit the sale of the grapes.

Young, recently planted grapevines are more sensitive to damage by herbicides. Their shallow root system can be more readily exposed to herbicides, and their small plant size makes them less able to regrow once damaged by herbicide exposure. Young vineyards in your vicinity may not be as apparent to you as older vineyards, so it is important to talk with neighbors if

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Table 1. Active ingredients found in many common herbicide and “weed and feed” products that can be damaging to grapevines through volatility or drift. This is not an exhaustive list of chemical classes that can damage grapevines.

General Name	Chemical name
2,4-D	2,4-dichlorophenoxy-acetic acid
2,4-DB	4-(2,4-dichlorophenoxy) butanoic acid
dichloprop	(R)-2-(2,4-dichlorophenoxy) propanoic acid
fenoprop	2-(2,4,5-Trichlorophenoxy) propionic acid
MCPB	4-(4-Chloro-2-methylphenoxy) butanoic acid
MCPA	(4-Chloro-2-methylphenoxy) acetic acid
triclopyr	(3,5,6-Trichloro-2-pyridinyl) oxyacetic acid
dicamba	3,6-Dichloro-2-methoxybenzoic acid
ALS inhibitors	Chlorsulfuron, metsulfuron methyl, tribenuron methyl, triasulfuron, and more

you see farmland being planted nearby to ensure that your herbicide applications will not affect the crop being grown.

Which herbicide products cause damage?

Herbicides are separated into classes based on their chemical makeup. Grapevines are most sensitive to the herbicide classes that mimic plant growth hormones. A list of herbicide active ingredients is provided in Table 1. Herbicide products that contain these active ingredients are commonly used in gardens, lawns and landscapes, golf courses, right-of-way areas, pastures, and parks, and are used by farmers, landscape maintenance companies, and homeowners. They are widely available for purchase from home improvement centers, hardware stores, and garden centers, and many of the products do not require a license or permit for use. For example, 2,4-dichlorophenoxy-acetic acid, commonly known as 2,4-D, causes damage to grapevines and is found in hundreds of herbicides with different product names.

Some common products used in the garden or home landscape that contain these active ingredients include: Crossbow (2,4-D and triclopyr), Banvel (dicamba), Garlon (triclopyr), Weed-B-Gone (Quicloro, 2,4-D, and dicamba), and Brush Killer (triclopyr). Brush killers and many “weed and feed” type products, which contain both fertilizer and herbicides, may contain these active ingredients (Figure 1, page 1).

If you are unsure whether an herbicide or “weed and feed” product might be damaging, read the label. Product labels will often provide a warning regarding potential damage to other crops such as grapes. As with all pesticides, herbicide product labels are regulated

by law. Anyone who uses herbicides—whether a home gardener, landscaper, or farmer—must read the label beforehand and is liable for its application. The label also provides information about what crop or weed the product can be used for, how much to apply, how often to apply it, the situations in which it can be used, and what type of personal protection (e.g., gloves, boots, and goggles) is required. You can find any herbicide label online before you purchase or apply a product. A benefit of looking up a herbicide label online is that you can zoom in to read the information. Typically, the product label on the container has a small font size that is difficult to read. Labels can be found at several websites, including the National Pesticide Information Center (<http://npic.orst.edu/>). See “For more information” (page 3) for links to additional resources. You can also ask your local Extension horticulturist or Master Gardener if you have questions about pesticide labels and the safe use of these chemicals.

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How are grapevines exposed to herbicides that are applied off-site?

There are two primary ways that herbicides enter into vineyards from off-site applications: direct drift or volatilization. Direct drift is when spray droplets float away during herbicide applications. Volatilization is caused by the evaporation of herbicides from plant or soil surfaces. Normally, herbicide damage is found

when vines are located in close proximity to a field, yard, garden, park, or other site where herbicides were applied. However, damage has also been found to occur miles away from an herbicide application. For this reason, it is critical to carefully consider herbicide applications, even if you are not next door to a vineyard but one is nearby.

How to minimize spray drift and grapevine damage

You can minimize the effects of direct drift by avoiding spraying herbicide when temperatures exceed 70°F, when wind speeds exceed 9 miles per hour, or when there is no wind and an inversion layer forms. An inversion layer is an abnormal condition in which a warmer layer of air sits above a cold air layer at ground level, which causes pollutants to be trapped near the ground. There are additives (spreader-stickers) that can be used with concentrated herbicides to reduce the drift of spray droplets. These products, which are available at garden centers, are highly recommended because they also can be used to reduce drift onto other plants in your garden and landscape. If possible, consider using alternative control methods and avoid herbicides. For example, you might consider digging out troublesome weeds such as blackberries rather than spraying an herbicide.

For more information

OSU Extension publications

The following publications are available in the Oregon State University Extension Catalog.

- *Preventing Herbicide Drift and Injury to Grapes* (EM 8860) <https://catalog.extension.oregonstate.edu/em8860>
- *Pesticide Drift Management* (EM 8934) <https://catalog.extension.oregonstate.edu/em8934>
- *El Manejo de la Deriva de Pesticidas* (EM 8934-S) <https://catalog.extension.oregonstate.edu/em8934s>
- *Pacific Northwest Weed Management Handbook* <http://pnwhandbooks.org/weed>
- *Pacific Northwest Plant Disease Handbook* <https://pnwhandbooks.org/plantdisease/host-disease/grape-vitis-spp-chemical-injury>

Resources for finding labels online

- Mobile Access to Pesticides and Labels (MAPL) <http://pi.ace.orst.edu/mapl/>
- Agrian Label Look-Up <http://www.agrian.com/home/label-lookup/overview>

Additional resources

If you have questions, contact your local Extension horticulturist or Master Gardener program for more information at <http://extension.oregonstate.edu/find-us>.

Or contact:

- Oregon Department of Agriculture <http://www.oregon.gov/oda/programs/Pesticides/Pages/AboutPesticides.aspx>
- National Pesticide Information Center <http://npic.orst.edu/>

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