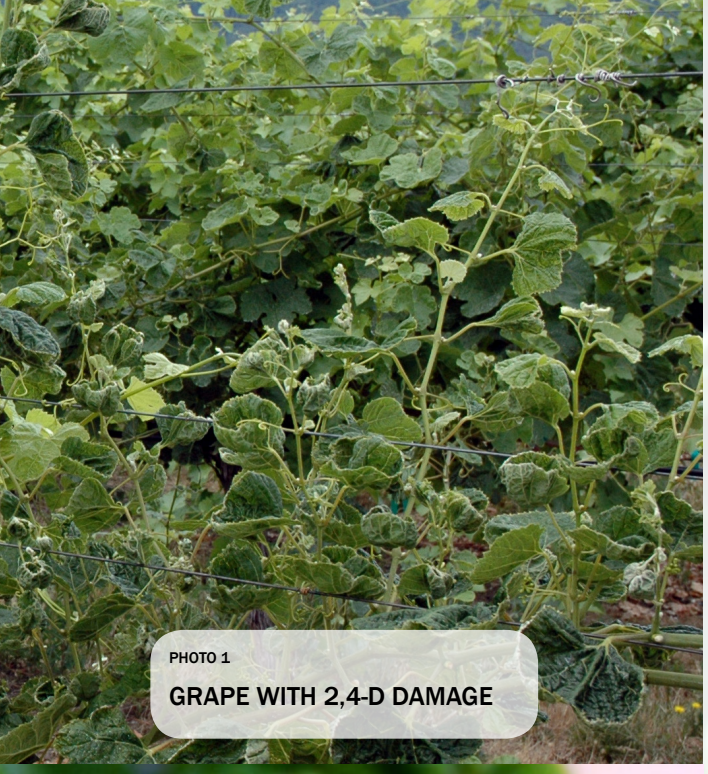

PHOTO 1
GRAPE WITH 2,4-D DAMAGE

PHOTO 2
FLOWER ABORTION IN GRAPE

PHOTO 3
CRABAPPLE WITH
DAMAGE FROM ROUNDUP

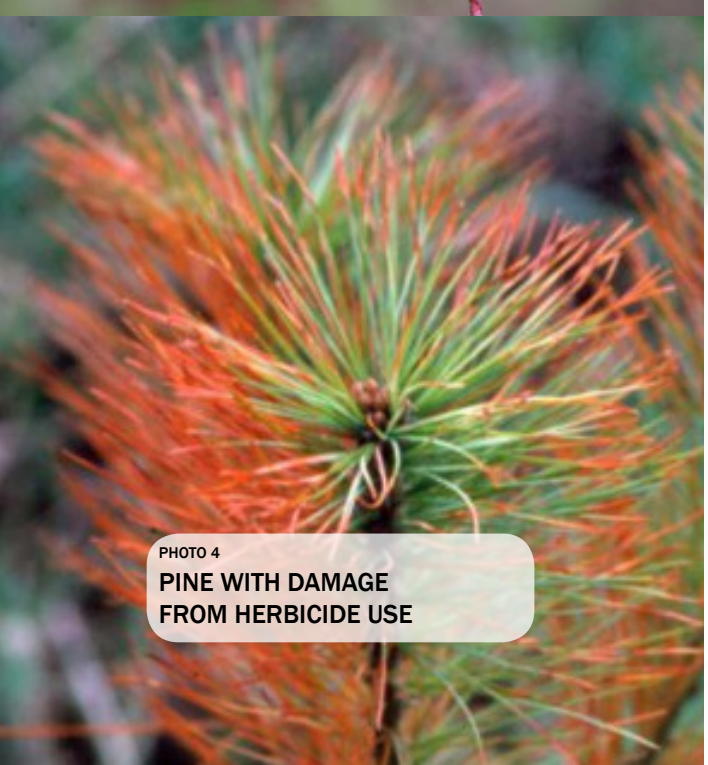

PHOTO 4
PINE WITH DAMAGE
FROM HERBICIDE USE

## What are broadleaf herbicides?

They are pesticides that kill broadleaf or "dicot" plants. They typically do not affect grasses and therefore are important tools in agriculture, forestry, landscaping, and right-of-way weed control.

Many of the most widely used broadleaf herbicides are plant growth regulators (PGR) or synthetic auxins. Synthetic auxins mimic natural plant hormones that regulate many essential functions in the plant. The killing mechanism of these PGRs is not a single activity, but the disruption of several fundamental plant processes, such as maintenance of cell membrane integrity and protein synthesis.

**Familiar examples of PGR herbicides:**

MECOPROP
DICAMBA
TRICLOPYR
CLOPYRALID
2,4-D
MCPA

**Examples of phenoxy PGR herbicides:**

MCPA
2,4-D

## Which plants are sensitive to broadleaf herbicides?

Some plants are particularly sensitive to phenoxy herbicides, including many high-value crops, such as grapes, tomato, cucurbits (melons, zucchini, pumpkin), tree fruits, and nursery crops. Sensitive crops can have a stage of growth in which they are more susceptible to herbicide damage. Two particularly sensitive growth stages are bud break and bloom. During these time periods plants are undergoing rapid growth and cell division.

## Broadleaf herbicide effects on sensitive plants can include:

- Flower abortion, shoot tip curling, stunting of shoot tip growth, deformed leaf growth, and delayed ripening.
- Herbicide damage caused by phenoxy herbicides is usually apparent in two days. Damage caused by other herbicides like glyphosate or ALS inhibitors may not be evident for two to three weeks.

## How does herbicide exposure to sensitive crops occur?

Often, it is the result of drift. Drift is when a pesticide moves off target to an unintended location, sometimes affecting humans, wildlife, or non-target crops.

Drift can occur when small spray droplets are formed at the time of application. Droplet drift is the physical movement of spray droplets through the air to an off-target site. The longer a droplet is airborne, the more likely it is to drift; therefore, larger size droplets tend to have less potential to drift.

After application, under certain weather conditions, some herbicides can volatilize from plant or soil surfaces, producing an herbicide vapor that can move great distances and be deposited on other crops, waterways, or even people. Volatilization occurs when the herbicide applied evaporates, changing from a liquid to a gas or vapor.

Drift can and should be prevented.

## Good neighbors prevent drift

What can you do to be a good neighbor?

- Read, understand, and follow all precautions and restrictions on the herbicide label.
- Find out about weather conditions at the time of application and for the next 48 hours.
- Find out whether there are sensitive crops near the treatment site and create a map of their locations for future reference.
- Know sensitive crops include: grapes, nursery crops, tree fruits, and berries.
- Communicate with neighbors about your plans to spray. Talk to your neighbor about his or her crop and their current stages of development.
- Communicate the location of sensitive crops to the person who will be applying the herbicide product.
- Select herbicides that are less prone to drift or volatilize.
- Plant hedge barriers around your fields.

PHOTO 5
MAKE SURE SPRAY NOZZLES ARE IN GOOD CONDITION

PHOTO 6
DAMAGE FROM HERBICIDE USE

## Preventing spray drift

- Be aware of environmental conditions like the prevailing wind, wind patterns, and the temperature forecast. If conditions change during the application, stop and re-evaluate.
- Choose drift reduction equipment and follow manufacturer use directions.
- Keep equipment calibrated and in good working condition, especially nozzles. Before every application:
  - — Check for plugged filters or nozzles.
  - — Check for worn nozzles.
  - — Check that each nozzle type is aligned and spaced correctly.
  - — Check boom height and stability.
- Contact the manufacturers or your agronomist if you have any questions about your equipment or its calibration.

## Preventing volatile vapor

- The formulation of a pesticide can impact the potential to volatilize. For example, ester formulations of 2,4-D pesticides can be over 30 times more volatile than amine salts.
- Do not apply herbicides, especially ester formulations, during conditions of low humidity and high temperatures. These conditions favor volatilization and the development of small droplets during the application, which can drift from the target application site.
- Volatile vapor drift can occur under what may seem like “ideal” conditions. A still, calm day, especially in spring and fall, might indicate the presence of an inversion where cold air is situated near the ground, which can allow pesticides to drift like a fog to unintended locations. Watch a video about inversions at http://bit.ly/1EgkclC
- Volatile vapors can form days after an application.
- Avoid spraying impervious surfaces like roads and rocks. This can increase the potential to volatilize during high temperatures.
- Volatile vapor drift can be invisible and can travel many miles under extreme temperatures.

Visit OSU’s Extension Spray Drift Prevention site, http://bit.ly/1M6U5OP

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3/2015

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PREVENTING PESTICIDE DRIFT WHEN USING

# BROADLEAF HERBICIDES

BE A GOOD NEIGHBOR

OREGON DEPARTMENT OF AGRICULTURE