



# Diagnosing herbicide injury on plants

Noelle Orloff explains how herbicides can accidentally injure desired plants and how to spot herbicide injury.

**D**iagnosing injury to plants from herbicides can be difficult. MSU Extension has released a new guide with photos and descriptions of plant symptoms to aid in assessing and identifying potential non-target herbicide injury. Knowing when and what was applied is vital for diagnosing herbicide injury. In addition, knowing weather conditions, soil type and soil pH, and other environmental factors that affect herbicide performance can be helpful.

“While herbicides are useful tools for managing weeds, sometimes they can also injure desired plants,” said Noelle Orloff, Associate Specialist and plant identification diagnostician in the Schutter Diagnostic Lab. “This injury is referred to as non-target injury, or damage to plants other than the target weeds intended to be controlled by an herbicide application.”

Orloff said non-target herbicide injury is a continuing concern in Montana. For example, plant samples assessed for herbicide injury symptoms by MSU’s Schutter

Diagnostic Lab increased 90% between 2013 and 2018, from 60 to 115 samples annually. The new guide is part of a response to help MSU Extension agents and others diagnose herbicide injury issues. Orloff said diagnosis can be difficult because symptoms may look like those caused by insects, disease or weather conditions. The guide may also be helpful to pesticide applicators to understand and prevent common causes of non-target herbicide injury.

Determining if non-target herbicide injury is the cause of a plant health issue involves assessing multiple types of evidence. An investigator sees the end result of an issue and works backward to try to determine the cause. Diagnosing herbicide injury requires accurately describing symptoms and finding as much information about site history as possible. In some cases, the cause of the problem may be very straightforward, and in other cases more investigation, research, and critical thinking is needed. There are four important questions to ask when diagnosing herbicide injury.

- What are the plant’s symptoms?
- What is the spatial pattern of symptoms in the field or landscape?
- Can symptoms be explained by something other than herbicide?
- What is the Mode of Action of the herbicide suspected to be causing symptoms, and do symptoms match the suspected Mode of Action?

Herbicides affect plants in different ways. Distinguishing whether injury occurs on older leaves or newer leaves is often necessary. Herbicide injury is often categorized by mode of action, or the general way that an active ingredient kills a plant. Because symptoms of herbicides within a mode of action are often similar, it is a useful way to classify symptoms and identify what is causing injury. In addition, distinguishing whether injury occurs on older leaves or newer leaves is often necessary. Common causes of non-target herbicide injury include herbicide drift and herbicide carryover; operator error and faulty application equipment; and environmental and plant factors.

To aid in researching plant health issues, the new guide, *Diagnosing Non-Target Herbicide Injury on Plants*, is available as a downloadable PDF at [store.msueextension.org/publications/AgandNaturalResources/EB0232.pdf](https://store.msueextension.org/publications/AgandNaturalResources/EB0232.pdf) and as an HTML website at [msueextension.org/pubs/herbicideinjuryguide/index.html](https://msueextension.org/pubs/herbicideinjuryguide/index.html).

The guide is written by Orloff; Jane Mangold, MSU Extension invasive plant specialist; and Tim Seipel, MSU Extension cropland weed specialist. Printed guides are funded by a grant from USDA-NIFA. In addition to the online versions of the guide, a free printed copy of the spiral-bound booklet (EB0232) can be ordered from the MSU Extension Distribution Center by visiting [store.msueextension.org](https://store.msueextension.org) or calling 406-994-3273. A nominal shipping charge will be applied. ■