

Herbicide Residues in Compost

Compost may contain herbicide residues. Here is what composters should know and how they can help prevent contamination.

During the spring and summer of 2020, a persistent herbicide called clopyralid showed up in test results of finished compost blends applied to gardens in Oregon and Washington. Clopyralid and other herbicides in the same chemical family show up in finished compost every few years, according to the Oregon Department of Agriculture. These herbicides leave residues in compost that can damage sensitive garden plants, such as tomatoes, beans, peas, sunflowers, eggplant, parsley, potatoes, petunias, pansies, and cannabis even at low concentrations of about two parts per billion.

What is clopyralid?

Clopyralid is the common name for a long-lived herbicide used primarily on agricultural land to kill broadleaf weeds such as clover, dandelion and thistle. It is the active ingredient in several pesticide products, including Confront, Stinger, Redeem and Curtail. Products containing clopyralid are used on grain crops, pastures, golf courses, cemeteries, rights-of-way and certain vegetables and fruits. State rules prohibit the use of clopyralid on residential or commercial properties.

Clopyralid residue is the most commonly found herbicide contaminating compost in the Northwest. Testing in 2020 found the presence of clopyralid residue in a number of agricultural crops and wastes, including mushroom compost, dairy manure, straw and canola meal. Clopyralid residue may also be found in straw used for dairy and horse bedding and grains fed to livestock and poultry.

Problems with clopyralid in compost

Clopyralid residue may persist in plant material after it has been harvested. Most herbicides break down in a composting process. However, clopyralid and other herbicides in its chemical family, which also includes aminopyralid and picloram, are very slow to break down and residues may remain in finished compost.

Clopyralid contaminated compost can damage sensitive plants.

Crops treated with clopyralid are banned as composting feedstock, but those materials are indistinguishable from crops not treated with clopyralid and sometimes still end up at composting facilities, which can contaminate finished compost. Manure may also become a contaminant because grain or hay crops treated with the herbicide passes through an animal's digestive tract. Mushroom compost may be



Herbicide damage on tomato leaf.

contaminated with clopyralid as it is made from straw, manure and other agricultural materials.

Plant damage from compost contaminated with clopyralid is problematic for businesses, residential gardeners, as well as the composting industry. Clopyralid contaminated compost hurts customer confidence in compost and if not addressed could eventually negatively impact compost sales.

Regulatory roles and responsibilities

Several state agencies have regulatory responsibilities and respond collaboratively when gardens are harmed by compost contaminated with clopyralid.

DEQ regulates composting facilities through permits to ensure facility operations are protective of the environment and public health. DEQ collaborates with permitted composting facilities to minimize receipt of problematic composting feedstocks and create quality compost products.

The Oregon Department of Agriculture regulates the sale and use of pesticides in Oregon with the goals of protecting people and the environment from any adverse effects of pesticide use while maintaining the availability of pesticides. The agency investigates pesticide complaints to determine compliance with the Oregon Pesticide Control Act, and initiates any necessary administrative actions.

The department also regulates the sale of fertilizer, agricultural amendments, agricultural minerals and lime to ensure that these materials are correctly labeled and registered; meet state heavy metal requirements; and are not



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adulterated. Compost may be required to be registered as an agricultural amendment or an agricultural mineral depending on the product claims that are made by the composter. Registered compost products would be considered adulterated if they contained pesticides that are not correctly listed on the label.

The Oregon Health Authority oversees Oregon's Pesticide Exposure Safety and Tracking (PEST) program, which seeks to reduce acute pesticide-related illness or injuries in the state. OHA tracks acute pesticide exposure and educates the public about safely using and storing pesticides.

What can composting facilities and retailers do?

The US Composting Council provides a list of best management practices to minimize contamination of finished compost. A few of the recommendations are identified below.



Turning composting windrows.

How to prevent acceptance of clopyralid contaminated feedstocks

Before accepting agricultural wastes, golf course waste or other wastes where clopyralid may be present, ask the following questions to determine if clopyralid has been used on the plant material:

- If you're using vegetative waste from agriculture or landscaping, what herbicides were used on the landscape, hay, pasture or crop?
- If you're using manure, what were the animals fed? Was it clopyralid free?
- If you're using mushroom compost, were all compost ingredients in compost clopyralid free?

Conduct regular plant growth bioassay testing using susceptible plant seeds on finished compost, particularly if using agricultural wastes or mushroom substrate. Test compost or perform a bioassay on the compost before delivering to customers. Several websites provide lists of testing labs and instructions for performing bioassays.

Educate compost users and gardeners about appropriate compost use. Compost is a soil amendment not a planting medium. Compost blended with soil will be less likely to damage plants, even if herbicides are present because soil microbes help break down herbicide residues.

Where to find more information?

- [Oregon Department of Agriculture Pesticide Complaint](#) To report a complaint about an improper pesticide use or application.
- [Oregon Health Authority Pesticide Exposure](#) Resources for investigating/tracking health effects reported by people exposed to pesticides.
- [Oregon State University Master Gardener Program](#) Contains resources for gardeners.
- [US Composting Council Persistent Herbicides](#) Contains factsheets about persistent herbicides; Best Management Practices to Minimize Contamination; guidance for conducting bioassays; lists of testing labs and more.
- [Washington State University Clopyralid in Compost](#) Contains information about clopyralid and other persistent herbicides; guidance for conducting bioassays; photos of clopyralid damaged plants; and more.
- [Oregon State University Herbicide carryover in hay, manure, compost and grass clippings](#) Information about clopyralid and other herbicides of concern, including guidance on bioassays.
- [Improving Garden Soils with Organic Matter](#) OSU Extension guidance on importance and use of compost.
- [Soil Test Interpretation Guide](#) OSU Extension guidance for gardeners and compost users.
- [Fertilizing Your Garden](#) OSU Extension guidance for gardeners.

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.