

2021

Levels of Nonnutritive Substances in Fertilizers

Annual Report to the Legislature

As Required by RCW 15.54.433

December 2021

Washington State Department of Agriculture
Washington State Department of Ecology



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REPORT TO THE LEGISLATURE

Levels of Nonnutritive Substances in Fertilizers

(As required by RCW 15.54.433)

Prepared by the Washington State Department of Agriculture (WSDA)
and the Washington State Department of Ecology (Ecology)

December 2021

Background

All fertilizers must be registered with the Washington State Department of Agriculture (WSDA) before they can be sold or distributed in the state. Legislation enacted in 1998 strengthened the state's fertilizer laws to protect human health and the environment by establishing standards for allowable levels of nine metals that are sometimes found in commercial fertilizers and by making information about the contents of fertilizer products available to the public. One of the information provisions of the law is a requirement that WSDA and the Department of Ecology (Ecology), in consultation with the Department of Health (Health), prepare a report to the Legislature presenting information on levels of nonnutritive substances in fertilizers and the results of any agency testing of products. This is the 11th biennial report to the Legislature on the levels of nonnutritive substances in fertilizers, and agency testing, as required by the statute.

Fertilizer Registration Requirements

As of Oct. 22, 2021, 9,248 fertilizers were registered for distribution in Washington. As part of the information submitted for registration, the registrant must submit a metals analysis for each of its products. The metals that must be analyzed are: arsenic, cadmium, cobalt, lead, mercury, molybdenum, nickel, selenium, and zinc. Specific preparation and analysis methods are required. The levels reported by the company are compared against the Washington standards for these metals. If the levels exceed the standard for any of the nine metals, the product cannot be registered for distribution in Washington.

In addition to WSDA review and comparison to metals standards, all micronutrient and waste-derived fertilizers must go through an additional review by Ecology before they can be registered. Ecology consults with Health and the Department of Labor & Industries as part of its review process. Waste-derived fertilizers range from cement kiln dust (used as a liming agent) and electric arc furnace dust (a source of zinc) to animal manure and bone meal. The Ecology review process is explained below.

All fertilizers registered by WSDA meet the Washington standards for metals, with the vast majority meeting the standards by a wide margin. When reviewing new products, WSDA occasionally finds one with metals levels and application rates that cause it to exceed the standards. In most cases, the company is able to address the problem by (1) using different source materials (with lower metals levels) in the product, and/or (2) lowering the rate of application on the label.

Another important aspect of Washington's fertilizer law is the requirement that all fertilizer labels have a statement directing purchasers to the WSDA website where they can find information about the metals levels in the product. The metals information is in a database that includes the product name, the registering company, the nutrient guarantees, and the maximum levels of metals declared by the company to be in the product.

Fertilizer Compliance Activities

WSDA routinely samples a number of fertilizers each year and analyzes them for the nine metals covered by the Washington standards. WSDA continues to focus its metals sampling efforts on those fertilizers it believes are most likely to have relatively high metals levels. These include, but are not limited to, certain phosphate fertilizers, micronutrients, and industrial waste-derived fertilizers.

WSDA also conducts routine inspections of facilities that sell fertilizer. As part of the inspection, officials check fertilizer labels for compliance with the website notification requirement. If labels are found without the website notification language, steps are taken to ensure that the label is revised or the product is removed from distribution.

Metals Content of Registered Fertilizers

Data Gathered from the Registration Process

The Washington standards are expressed as pounds per acre per year.

Metals	Lbs./acre/year
Arsenic (As)	0.297
Cadmium (Cd)	0.079
Cobalt (Co)	0.594
Mercury (Hg)	0.019
Molybdenum (Mo)	0.079
Nickel (Ni)	0.713
Lead (Pb)	1.981
Selenium (Se)	0.055
Zinc (Zn)	7.329

The most recent information regarding registered fertilizers and reported metals content is on our website at our [Fertilizer Product Database | Washington State Department of Agriculture](#). A review of the information shows the metals content varies greatly among registered fertilizers. In some cases, metals concentrations vary by one or even two orders of magnitude. How can these products all meet the Washington metals standards? The answer lies in the fact that the standards are not based solely on the amount of metals in fertilizers, but rather the amount of metals to be added to soil over time (measured in pounds per acre per year) through the application of the fertilizer. Therefore, a fertilizer that has a high concentration of a particular metal may pass the standards if only a small amount is applied to the soil. Conversely, a fertilizer with low concentrations of metals can be applied at high rates and still pass the standards. The net effect in either case is that regulated metals levels are below the allowable levels as defined under RCW 15.54.800 and WAC 16-200-7064.

Another variation in the metals data occurs with products that contain one or more of the three metals cobalt, molybdenum or zinc. These three metals are classified as essential for plant growth. For example, soils in Eastern Washington are low in zinc and applications of zinc-based fertilizers have shown improved crop yields. Many of Washington's fruit, vegetable and row crops receive applications of zinc. When a particular metal such as zinc is used as a plant nutrient, the levels of that metal are allowed to exceed the Washington metals standards. Thus, the high levels of zinc found in certain registered products are not cause for concern.

Data Gathered from Field Sampling

WSDA conducts a routine sampling program to monitor fertilizers for their metals content. A total of 83 fertilizers were sampled and analyzed from November 1, 2019 to October 22, 2021. Analysis results of all the samples collected since 1999 can be found on WSDA's website at: <https://agr.wa.gov/departments/pesticides-and-fertilizers/fertilizers/metals>

Ecology Micronutrient and Waste-Derived Fertilizer Review Summary 2019 -2021 Biennium (July 2019-June 2020, July 2020-July 2021)

State law (RCW 15.54.820) requires Washington State Department of Ecology (Ecology) to evaluate micronutrient and waste-derived fertilizers to be sold in the state for consistency with chapter 70A.205 RCW (solid waste management act), chapter 70A.300 RCW (hazardous waste management act), and 40 USC §6901 (resource conservation and recovery act). Ecology's evaluation must determine whether the use of a micronutrient or waste-derived fertilizer is consistent with the laws listed above.

To evaluate micronutrient and waste-derived fertilizer product registration applications to determine whether use is consistent, Ecology relies upon a variation of the methodology first implemented in 1999 (WSR 98-15-156), WAC 173-303-505, and RCW 15.54.820. Evaluation of fertilizer products is generally a comparison of the concentrations of eight leachable toxic metals and halogenated organic compounds present in fertilizer products to the maximum allowed concentrations set in statute (WAC 173-303-090(8)). The eight toxic

metals are: arsenic (As), barium (Ba), cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), selenium (Se), and silver (Ag).

Products that exceed the maximum allowable metals concentrations can still pass Ecology's evaluation if the registrants can conclusively demonstrate that no dangerous waste is used to manufacture the fertilizer product. However, products reviewed by Ecology rarely exceed maximum allowable metals concentrations based on TCLP (Toxicity Characteristic Leaching Procedure) analysis, and those that do usually meet the metals criteria on the second round of TCLP analysis.

Summary information on the fertilizer products that Ecology has evaluated and determined that their use is consistent with chapters 70A.205 and 70A.300 RCW, and 40 USC §6901 is available on Ecology's website at: <https://apps.ecology.wa.gov/fertilizercommon/>.

Between July 1, 2019 and June 30, 2021 (2021 state biennium) Ecology determined that the use of 357 micronutrient or waste-derived fertilizer products is consistent with chapters 70A.205 and 70A.300 RCW, and 40 USC §6901. During that time, two products were determined to be outside the scope of the Ecology waste-derived and micronutrient fertilizer review process.

Summary

Washington State is in its 24th year of implementing metals standards. With rare exception, fertilizers continue to pass the Washington metals standards, most by a wide margin.

Additional Information

More information on metals in fertilizer, including regulations, studies and publications can be found on WSDA's website at: <https://agr.wa.gov/departments/pesticides-and-fertilizers/fertilizers/metals>

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