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# **LEVELS OF NONNUTRITIVE SUBSTANCES IN FERTILIZERS**

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**REPORT TO THE LEGISLATURE**

**December 2017**



**PREPARED BY:**

**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)

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Prepared by the Washington State Department of Agriculture (WSDA)  
and the Washington State Department of Ecology (Ecology)  
December 2017

#### **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 10th 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 November 1, 2017, there are 8,335 fertilizers 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 and 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.

| <b>Washington Standards for Metals</b> |                       |
|--|-----------------------|
| <b>Metals</b>                          | <b>Lbs./acre/year</b> |
| 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: <http://agr.wa.gov/PestFert/Fertilizers/ProductDatabase.aspx>.

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. The question which comes to mind is, '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 128 fertilizers were sampled and analyzed from November 1, 2015 to October 31, 2017. Analytical results for all the samples collected since 1999 can be found on WSDA's website at: <http://agr.wa.gov/PestFert/Fertilizers/Metals.aspx>

#### **Review of Waste-Derived and Micronutrient Fertilizers**

State law requires Ecology to review and approve the registration application of a waste-derived or micronutrient fertilizer for it to be sold in the state (RCW 15.54.330(4)). During the period between July 1, 2015 to June 30, 2017, Ecology recommended 434 products for approval while nine products were not recommended for approval. A summary of the products recommended for approval by Ecology is available on Ecology's website at: [www.ecy.wa.gov/programs/hwtr/dangermat/fert\\_review.html](http://www.ecy.wa.gov/programs/hwtr/dangermat/fert_review.html).

To review registration applications for waste-derived and micronutrient fertilizers, Ecology developed a set of criteria that set maximum levels for leachable metals and halogenated organic compounds in fertilizer products. Eight metals of concern include arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. However, products that exceed the maximum allowable levels in the criteria can still pass Ecology's review if it can be shown conclusively that no dangerous wastes are used to manufacture the product. Detailed

information on the analytical test results for each fertilizer product reviewed by Ecology is available on Ecology's website at:

[http://www.ecy.wa.gov/programs/hwtr/dangermat/fert\\_review.html](http://www.ecy.wa.gov/programs/hwtr/dangermat/fert_review.html).

It should be noted that Ecology does not review waste-derived and micronutrient fertilizer registration applications that are determined by WSDA to be unable to meet the Washington standards for metals. Registration applications that do not meet the metal standards are denied by WSDA prior to Ecology's review process. Also, Ecology does not review applications for fertilizer that do not contain wastes as ingredients or are not micronutrient fertilizers.

### **Summary**

Washington State is in its 20th 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: <http://agr.wa.gov/PestFert/Fertilizers/Metals.aspx>.

For additional copies of this report contact:

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