

BIOCYCLE

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**BIOREMEDIATING
EXPLOSIVES
CONTAMINATED SOILS**

**ORGANICS RECYCLERS
TAKE BIG CHUNK
OUT OF SOLID WASTE**

**TAKING
A CLOSER
LOOK AT
COMPOST
MICROBIOLOGY**

**ENVIRONMENTAL
MANAGEMENT SYSTEMS
MAKE A BIG DIFFERENCE
IN SUCCESSFUL COMPOSTING**

Numbers of beneficial organisms like *Bacillus* increase nutrient cycling and disease suppressive qualities of compost.

SETTING METALS STANDARDS FOR FERTILIZERS

The U.S. Composting Council has developed a White Paper discussing use of Canadian heavy metal standards for fertilizer products in the United States — and the potential impact on composts registered as fertilizers.

Ron Alexander and Nora Goldstein

IN 1997, the issue of the lack of heavy metal standards for fertilizer products was spotlighted when a newspaper account in the *Seattle Times* reported that a fertilizer contained high levels of some contaminants not normally considered acceptable. The concern over the safety of inorganic fertilizers culminated in Washington state adopting Canadian standards developed for fertilizers.

The situation in Washington led a national organization, the Association of American Plant Food Control Officials (AAPFCO), to address the lack of standards for heavy metals in inorganic fertilizer products. In February, 1998, AAPFCO passed a motion to recommend adoption of the Canadian standards (Table 1).

To better understand the impact of these heavy metal standards on compost products, the U.S. Composting Council put together a White Paper (from which this article is adapted) on the origin and tentative recommendation for use of the Canadian standards for heavy metals in fertilizer products, and the implications for composting and organics recycling activities.

In the United States, composters may register their compost products with a state department of agriculture either as a fertilizer or a soil amendment. The determining factors regarding how compost products are registered are based on the label claims a composter makes (its marketing/sales strategy), and whether the state has enacted a Uniform Soil Amendment Bill, which en-

ables a product to be registered as a soil amendment and thus claim those benefits (e.g. improving the physical characteristics of soils) on the bag or in sales literature. A compost that bears a nutrient claim is usually registered and regulated as a fertilizer.

"Manipulated" animal manures are considered to be fertilizers when marketed as such or if nutrient claims are made. Although AAPFCO defines manipulation as "processed or treated in any manner, including drying to a moisture content of less than 30 percent," many states have not established a clear cut definition of the terms manipulated or manipulated manures. Manipulation also has been defined as screening, composting, bagging, etc. by various regulatory entities. If the Canadian standards are approved by AAPFCO and enacted by states, compost facility operators would be directly affected if their product is registered as a fertilizer (like they already are in Washington state).

AAPFCO INITIATIVES ON FERTILIZER REGULATIONS

AAPFCO is comprised of officials from the United States, Canada and Puerto Rico who regulate commercial fertilizers as well as other products such as soil amendments, agricultural liming materials and horticultural growing media. AAPFCO develops and updates model legislation that governs the labeling and distribution of these products so that interstate commerce is less affected. Once approved, model bills, terms and definitions, and Statements of Uniform Interpretation and Policy (SUIP) may be enacted by the regulating authority; however, the regulating authorities are not required to enact AAPFCO model documents. For example, most states have enacted some version of AAPFCO's Uniform State Fertilizer Bill, but only 37 states have enacted the Uniform Soil Amendment Bill.

AAPFCO's Canadian standards initiative began with a recommendation by the AAPFCO Heavy Metals Task Force that the association adopt scientifically sound standards for the acceptable cumulative levels of substances not generally recognized as plant nutrients when applied to the soil. The By-Products and Recycled Materials Subcommittee of AAPFCO's Environmen-

Table 1. Maximum acceptable cumulative metal additions to soil (Canadian)/cumulative pollutant loading rates (US EPA)

Pollutant	Canadian Standards (kg/ha)	US EPA Part 503 (kg/ha)
Arsenic	15	41
Cadmium	4	39
Cobalt	30	n/a
Copper	100	300
Mercury	1	17
Molybdenum	4	n/a
Nickel	36	420
Selenium	2.8	100
Zinc	370	2,800

tal Affairs Committee then presented a recommendation to the Board of Directors to adopt the Canadian standards for fertilizers into a *Metals in Fertilizer* SUIP. A goal of this action is to discourage other states from adopting standards on their own (as Washington did), threatening the uniformity in fertilizer regulation.

AAPFCO officials are authorized under the Uniform State Fertilizer Bill to stop the sale of an adulterated fertilizer product. Until the new SUIP is adopted, an adulterated fertilizer product is defined as one that "contains any deleterious or harmful substance in sufficient amounts to render it injurious to beneficial plant life, animals, humans, aquatic life, soil or water when applied in accordance with directions for use." The definition in the AAPFCO *Metals in Fertilizers* SUIP is more specific. It reads: "As an interim guide for implementation of Section 12(a) of the Uniform State Fertilizer Bill, fertilizers are considered adulterated when they contain metals in amounts greater than the levels established by the Canadian standards. Biosolids shall be adulterated when they exceed the levels of metals permitted by the United States Environmental Protection Agency Code of Federal Regulations, Section 503. Note: These interim guidelines are intended for use until scientific risk based standards are established by ongoing studies which are expected to be completed within two years."

The ongoing studies referred to by AAPFCO include a risk assessment done in California on arsenic, lead and cadmium in fertilizers and a recently completed study by The Fertilizer Institute (TFI) that is evaluating the risk associated with applying fertilizer in commercial applications (formally titled "Applicator Risk Assessment Study"). The Canadian standards are not based on an ac-

tual risk assessment (as are EPA's Part 503 regulations). Instead, they were developed by a group of scientists who based them on long-term cumulative metal additions to soils.

While the heavy metal limits are still in evaluation stage, AAPFCO has more clarity on the issue of labeling fertilizers that meet the Canadian standards. The organization drafted an SUIP for *Product Labels That Meet Metal Guidelines*, which reads: "When applied as directed, this product meets the guidelines for metals adopted by the Association of American Plant Food Control Officials." Products that meet the Canadian standards for heavy metals in fertilizers will be required to include the above statement on their label, since all state officials have indicated they would accept this language on labels distributed in their state.

UPCOMING VOTES ON ADOPTION

At the AAPFCO annual meeting in August, 1999, members will vote on keeping the *Metals in Fertilizer* SUIP (Canadian standards) in tentative status for another year, and will vote to approve the SUIP for *Product Labels That Meet Metal Guidelines* as official. As noted, AAPFCO is still seeking additional scientific data (risk based, peer reviewed) to evaluate the risk from heavy metals in fertilizers distributed in the United States. Since these two SUIPs are in tentative status, any regulatory authority may adopt the SUIPs on an interim basis. Or, they may adopt any other standard or labeling statement if the political pressures in their state to do so are strong enough.

All chemical (inorganic) fertilizer products, both in bulk and bagged form, will be affected by these SUIPs, as will organic fertilizers, many animal manure products, and any other products registered and marketed as a fertilizer (bearing nutrient claims on the label). The types of products affected in

The current SUIP for *Metals In Fertilizers* defines biosolids as adulterated only if the metal content is above those outlined in the US EPA Part 503 regulations.

WHAT ARE THE CANADIAN STANDARDS?

THE Canadian standards for heavy metals in fertilizers were developed in 1979 in a trade document, and are enforced under the authority of the (Canadian) Fertilizers Act and Regulations, Agriculture and Agri-Food Canada (AAFC). The metals standards are generally applicable to fertilizers and supplements applied to land or used in crop production. These standards have been used to evaluate and manage all products regulated under the (Canadian) Fertilizer Act and for which metal concerns have been raised (e.g., organic fertilizers, processed sewage, compost, phosphate rich fertilizers such as monoammonium phosphate and diammonium phosphate, and recycled inorganic materials).

Between 1993 and 1995, the AAFC met-

al standards were reevaluated in response to (heavy metal) standard development activities elsewhere (e.g., the U.S. EPA's heavy metals limits for biosolids), the variety of by-products being proposed for reuse as fertilizers and supplements, and the progressive depletion of rock phosphate deposits worldwide. It was concluded that the AAFC metal standards remain valid. The Canadian standards for metals in fertilizers and supplements are based on what the Fertilizer Section, Plant Products Division of the Canadian Food Inspection Agency deemed as the total, acceptable, cumulative metal addition limits for soils. The Canadian standards affect all fertilizers and soil amendments, including compost and biosolids, marketed in Canada.

While the standards themselves are still in evaluation, AAPFCO has more clarity on the issue of labeling fertilizers that meet the Canadian standards.

the United States will be dependent upon states' fertilizer and soil amendment laws, as well as their interpretation of the laws and definitions within. The current SUIP for *Metals in Fertilizers* defines biosolids as adulterated only if the metal content is above those outlined in the US EPA Part 503 regulations.

IMPLICATIONS FOR THE COMPOSTING INDUSTRY

Any state's Department of Agriculture can adopt the Canadian standards for heavy metals in fertilizer, for use on an interim basis, as a means to define if a fertilizer product is adulterated. This would enable those states to order the stop sale of any adulterated products until they can meet the standards. Under current interpretation of the *Metals in Fertilizer* SUIP, all products marketed as fertilizers (making nutrient claims), or defined as fertilizers by the Uniform State Fertilizer Bill or

a particular state's Department of Agriculture, will be affected by this SUIP. This would have an immediate effect on composts registered as fertilizers and many manure products (those in the category of manipulated animal manures). These products will be required to meet both the new metal standards and the labeling requirements. Under current interpretation, biosolids products would not be affected, unless they are marketed and registered as fertilizers. Biosolids that are directly land applied (especially where nutrient data is provided along with the product) have not been addressed thus far.

Since the term manipulated manure is open for interpretation in many states, it will be difficult to determine how states will categorize composted manure (even if they do not make nutrient claims as fertilizers). These labeling requirements could be extremely problematic if not standard-

FERTILIZER REGULATION EVOLUTION IN WASHINGTON STATE

CONCERN over the content of heavy metals in fertilizers appears to have begun in Quincy, Washington, when farmers blamed crop yield reductions and sick looking cows on the use of fertilizer products containing a steel mill by-product. This by-product was considered a hazardous waste at the steel mill, and handled as such, but based on EPA's Resource Conservation and Recovery Act (RCRA) regulations, could be sold as a fertilizer ingredient. Eventually, the Washington State Department of Ecology (DOE) created a team to evaluate the issue of heavy metals (nonnutritive elements) in fertilizer products and the state legislature passed Senate Bill 6474 — the Fertilizer Regulation Act — giving DOE oversight authority over waste-derived fertilizers.

In June, 1998, the state adopted the Canadian standards for maximum acceptable heavy metals additions to soils. The annual (heavy metal) limits were calculated by converting the kg/ha values into lbs/acre. Washington state assigned a long-term cumulative metals additions to soils of 45 years. The resulting limits, in annual maximum pounds/acre, are Arsenic — .297; Cadmium — .079; Cobalt — .594; Mercury — .019; Molybdenum — .079; Nickel — .713; Lead — 1.98; Selenium — .055; Zinc — 7.329. The state Department of Agriculture may allow higher concentrations of certain micronutrients when guaranteed to provide needed nutrients to plants. The law also allows the heavy metal standards to be modified if acceptable risk-based or peer-reviewed data become available which warrants their modification. All fertilizers, agricultural liming materi-

als, manipulated animal manure products, and any other products making nutrient claims fall under the purview of this law. (Liming materials are considered fertilizer products in Washington state.) Soil amendments currently are not regulated by the Department of Agriculture, and therefore do not fall under this law. However, if a compost product or any other soil amendment makes a nutrient claim or is registered as a fertilizer in Washington, then it has to comply. The language used on a product's bag or label will determine whether it will be considered a fertilizer or a soil amendment.

The law also requires that all fertilizer products distributed in Washington, at a minimum, must have the following labeling statement:

"This product has been registered with the Washington State Department of Agriculture. When applied as directed, this fertilizer meets the Washington standards for arsenic, cadmium, cobalt, mercury, molybdenum, lead, nickel, selenium, and zinc. You have the right to receive specific information about Washington standards from the distributor of this product." After July 1, 1999, the label also has to state that product content details are available via the Internet (and the web site is provided). Two bills have been introduced in Washington state's legislature suggesting modification of the labeling requirement. One supports the standard labeling language developed by AAPFCO (see main article).

Finally, the state Department of Agriculture will begin Ecological Review of waste-derived and micronutrient fertilizers in July as part of their fertilizer registration process.

ized on a national basis.

Companies that want to register their compost with a state department of agriculture but are in a state that hasn't instituted the Uniform Soil Amendment Bill, will have to register it as a fertilizer, thus subjecting themselves to the *Metals In Fertilizers* SUIP. (Conversely, some composters want to register their products as a fertilizer, automatically subjecting it to the SUIP.) In these instances, the adoption of the Canadian standards could be a deterrence to registering composts. Companies marketing manure products, and those making nutrient claims for their products, may choose to change the product name to something other than manure, or may choose not to make nutrient claims. Not providing this nutrient data is problematic to end users who rely on that information to determine supplemental fertilizer requirements.

Based on the fertilizer survey completed in Washington state, most fertilizer products likely will meet the Canadian standards, because they are applied at relatively low application rates, and the heavy metals standards are based on cumulative loading rates. Under current interpretation, yard trimmings, biosolids, food residuals, municipal solid waste, and other composts should not be affected by the *Metals in Fertilizer* SUIP, unless they are registered as fertilizers. If, however, they are registered as a fertilizer (or make nutrient claims), composts may not be able to be applied at recommended application rates for maximum efficacy as a soil amendment. Manure-based products in Washington state that are registered as a fertilizer or that make nutrient claims are feeling the most impact from the new fertilizer law. For example, a typical fertilizer application rate may be only 0.5 to one ton/acre, whereas a compost application rate could be five to 100 tons/acre.

There are several questions that exist regarding future interpretations of the *Metals in Fertilizer* SUIP by individual states. For instance, how will the SUIP affect the land application of biosolids, since testing and reporting of biosolids for nutrients, as well as heavy metal content, is required? Will certain states choose to adopt the

AAPFCO RULE MAKING PROCESS

THE rule making process within AAPFCO usually begins with one of its committees evaluating an issue. If deemed to be relevant, especially over a multiple state area, and requiring action, the committee will develop a course of action, which could be in the form of a model bill, a revision to an existing bill or regulation, or Statements of Uniform Interpretation and Policy (SUIP), and recommend it to the AAPFCO Board of Directors at their mid-year meeting, usually held each year in February. The board will then either send the proposal back to committee for further review, or approve it, which begins a six month review process by the AAPFCO membership.

Next, the proposal would be voted upon by the membership at its

annual meeting in August. If approved, the proposal receives tentative status, allowing interested states to enact it on an interim basis. At the following mid-year meeting, the sponsoring committee would recommend to the AAPFCO board to approve the proposal, or keep it in tentative status for further evaluation. If the committee recommends to the board that the proposal become official and the board approves the recommendation, then the proposal is voted upon by the membership at the annual meeting in August. If the membership votes for adoption, then the proposal is passed, and is recommended as an officially approved document by the association for adoption by all regulatory authorities.

Canadian standards for soil amendment products, as Canada has? California already has created a Heavy Metals Facilitated Rule-Making Committee to evaluate the heavy metal standards for biosolids and other organic products. The possibility of the Canadian standards snowballing to affect products other than fertilizers is very possible, and could be done on a state by state basis (not uniformly).

In a nutshell, the bottom line for composters is this: If you make a nutrient claim or register your product as a fertilizer — and sell the product in a state that has adopted the *Metals In Fertilizer* SUIP — you need to comply with the heavy metals limits in the Canadian standards. ■

Ron Alexander of R. Alexander Associates in Cary, North Carolina prepared the White Paper for the U.S. Composting Council on the AAPFCO approach to regulating heavy metals in fertilizers. For more information, background documents, or the USCC's recommendations for action, contact the USCC at (440) 989-1552; easimbrogno@centuryinter.net.

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