

Basics of Biosolids Management

Workshop Course Outline

Overall description

This two day workshop will cover basics of biosolids management through a combination of talks and interactive workshops. Topics to be covered include nutrient management, risk assessment, metals in biosolids, land application basics, emerging contaminants, public perception and communication, and types and uses of Class A materials. Meeting attendees can expect to develop a clear understanding of the benefits and concerns regarding land application of biosolids. A range of different end use options for biosolids will be presented. There will be ample opportunity for question and answer so that any specific concerns or questions can be addressed.

Wednesday, July 30

Session 1 Tressa Nicholas

- Overview of Sludge and Biosolids

Because biosolids contain nutrients and organic matter, they are considered a beneficial resource by EPA and DEQ; therefore, the reuse of biosolids through land application is encouraged. When land-applied, biosolids can be used as fertilizer to help improve and maintain productive soils and stimulate plant growth. Regardless of whether biosolids are disposed of or beneficially reused, they are subject to certain federal, state, and local regulations. Before biosolids may be land applied, they must be treated to meet standards for pathogens, vectors, and metals. This session will review some of the federal and state rules and guidance associated with biosolids and beneficial use versus disposal. The differences between sludge versus a biosolids, categories of biosolids and biosolids management plans will be discussed.

Session 1 Craig Cogger

- Nutrient Management for Class B
- Hands-on Calculation

Nitrogen is the limiting nutrient for biosolids application in most cases. Biosolids act as a slow-release fertilizer, and only a portion of the total nitrogen in biosolids becomes available to plants during the growing season after application. This presentation will discuss nutrient release rates from biosolids, crop nitrogen requirements, and calculation of agronomic application rates.

We will use a calculation spreadsheet in a hands-on group activity to calculate agronomic application rates for two agricultural examples. (We will need some attendees to bring laptops so we can work this as a group).

Session 2 Craig Cogger

- Biosolids to protect our soils

Long-term research on biosolids application to agricultural crops in the Pacific Northwest has demonstrated the capacity of farming systems using biosolids to reverse loss of organic matter, maintain or improve crop yields, and improve soil quality. This presentation will review results of long term research in dryland wheat and irrigated grass systems and highlight effects on nutrient availability and soil quality.

Session 3 Sally Brown

- Hazards of Metals in Biosolids (what are metals we're concerned about and why are we concerned; how metals cause problems and biosolids role)
- EPA 503 Risk Assessment Process

Class B biosolids are typically applied to meet the nitrogen needs of a crop. When applied to meet nitrogen demands, it is recognized that biosolids will likely provide more than enough phosphorus for plants. What is often not considered is that biosolids provide all essential nutrients for plants. Metals in biosolids, including copper, zinc, iron, and manganese, are all essential plant nutrients. This session will include a review of required plant nutrients and biosolids concentrations of these elements.

There is a perception that biosolids contain high levels of heavy metals. The majority of these metals are required nutrients. This will be discussed in the first part of the session. The second part will focus on metals that are not plant nutrients. These include arsenic, cadmium, lead and mercury. The basics of risk assessment, including how to identify the most sensitive individual and the most important risk pathway will be discussed. The EPA Part 503 risk assessment process will be explained. Current biosolids concentrations of metals that are not plant nutrients will be put into a risk assessment context.

Session 4 Sally Brown

- Microconstituents in Biosolids – what are we finding, where do they come from and why are we concerned
- Workshop – Dose in the home vs. dose in the soil OR Domestic dose vs. Terrestrial dose

Microconstituents is one of the terms used to describe a broad class of compounds that are commonly found in municipal biosolids. They include chemicals that are typically found in household products and pharmaceuticals. Examples include estrogen from birth control pills and anti microbial compounds from soaps and toothpaste. This session will include a general introduction to these compounds including chemical names and everyday products. Information on environmental fate in soil systems will be presented. Finally concentrations in biosolids will be compared to concentrations in household products. A workshop at the end of the session will include calculations of equivalent doses- from home product to biosolids

Thursday, July 31

Session 5 Craig Cogger

- Getting to Class A – Types of Technology and End Uses

Class A biosolids have been treated to reduce pathogens to low levels, making the biosolids suitable for use on all crops without waiting periods for pathogen die-off. This allows the use of biosolids in areas with immediate public access, such as parks and gardens. Class A biosolids are most commonly produced by heat-treatment, including hot composting, heat-drying, and thermophilic digestion. The physical and nutrient properties of Class A products made by these different processes differ, and each is best suited for specific end uses. This presentation will provide an overview of types of Class A biosolids, and their appropriate end uses. It will not focus on the details of different technologies, but rather on the Class A products themselves.

Session 6 Dave Ruud

- Boulder Park Inc.

This session will focus on a case study of Boulder Park Inc. (BPI) a third-generation, family farming operation. Boulder Park Inc. has been in the biosolids land application business since 1994 and accepting biosolids for application on our farms since 1992. The principles in the company are third and fourth generation Douglas County farmers. In these years we have accepted and utilized thousands of tons of biosolids from many different municipalities. BPI applies to dryland wheat in a summer fallow rotation so we always have sites available for deliveries. In winter we maintain snow free areas to deliver to with our fleet of snow removal equipment. As neighbors see the results from biosolids there is a demand that outstrips our supply. As a result BPI is always looking for more sources to satisfy our ever increasing farmer demand. Boulder Park Inc. has extensive experience in both land application and transportation as we have been transporting material for several years for different municipalities.

Session 7 Sally Brown & Maile Lono-Batura

- Messaging Workshop – Who is your audience? What information do they require? What types of media and outreach help to illustrate this? How to deliver this message?

Biosolids program managers have to explain what biosolids are to a wide variety of stakeholders. This includes potential customers, rate payers, municipal managers and regulators. Each audience will require different information and a different level of detail in order to satisfy their questions. This workshop will help program managers identify the appropriate level and type of information to provide for different audiences.

Session 8 Panel Q&A

This session will provide the opportunity for attendees to dialogue in more detail with all of the instructors and to bring specific questions and site specific issues that they may be facing with their biosolids or sludge. The instructors will be able to assist them in a collaborative panel discussion.