



WASHINGTON STATE
UNIVERSITY
EXTENSION



BIOSOLIDS AND COMPOST

BY THE NUMBERS

- Biosolids are applied to more than 15,000 acres of land each year in Washington State, including about 8,000 acres annually in the Boulder Park project.
- Using a conservative average yield increase of 4 bushels per acre for biosolids, fertilized wheat, and a price of \$6.50 per bushel, farmers using biosolids can earn an extra \$26 per acre. This amounts to more than \$200,000 annually for the Boulder Park project alone.
- Agronomic biosolids applications documented in long term research plots increased soil organic carbon from 0.9 to 1.7% in the topsoil, sequestering about 3 tons of carbon per acre of soil.



ISSUE

Biosolids are the solids produced during municipal wastewater treatment. Composts are made from a variety of organic materials, including both urban and agriculture sources such as yard trimmings, biosolids, storm debris, food waste or manure, and food processing residues. While these materials have traditionally been viewed as waste, they can play a valuable role as soil amendments in urban and agricultural settings. They provide nutrients and organic matter and they sequester carbon, thereby conserving resources, restoring soils, and combating climate change.

Biosolids are still viewed as harmful wastes by some citizens and policy makers, creating barriers to their widespread and effective use. Biosolids and compost users need information on the product's proper use, safety, and benefits. Furthermore, biosolids and compost producers need up-to-date information on making and marketing their products, as well as appropriate uses and application rates. Regulators need scientifically based information to guide creation, interpretation, and implementation of biosolids and compost protocols.

RESPONSE

WSU research and Extension scientists have developed a multi-faceted program to identify appropriate and safe uses of biosolids and composts in the Pacific Northwest. This program aims to document benefits and provide education to a wide range of audiences. These audiences include biosolids and compost producers, regulators, farmers, gardeners, and concerned citizens.

The program's projects include both applied research and Extension education. The research projects identified appropriate application rates for biosolids and other organic amendments, documented long term soil improvement in agricultural and urban settings, developed a potting mix product that is now sold commercially, and evaluated composting effects on contaminant fate.

Extension education has included workshops, field days, webinars, worksheets, Master Gardener training, and publications for gardeners and farmers. A key Extension event is the week-long, hands-on Compost Facility Operators class held annually at WSU Puyallup. Other recent programs include presentations and workshops in Idaho, Oregon, and British Columbia, as well as on-going programs in Washington.



QUOTES

“Operations have become much more efficient and streamlined [since taking the compost facility operators class], and the quality of our end product has greatly increased as well. I also have a much better understanding of other people’s needs, within the composting industry, when we work in tandem on any given project together.”

IMPACTS

Biosolids production in Washington State exceeds 100,000 dry tons per year. More than 85% of the biosolids is land-applied as a source of plant nutrition and organic matter. The WSU research and extension program in biosolids management has played an integral role in the success of land application in Washington State, including developing research-based guidelines and tools for biosolids application rates and nutrient management.

An important success of this program is the Boulder Park project, where biosolids from King County and a number of smaller treatment plants is applied to dryland wheat in Douglas County. More than 50,000 acres spread among 100 landowners and farmers currently participate in the program, although only a portion of that acreage receives biosolids in a given year. The average yield increases exceed 4 bushels per acre.

Another achievement is Tagro potting mix, a successful adaptation of biosolids for urban use. The prototype was developed at WSU Puyallup, and Tagro potting mix now represents 25% of the City of Tacoma biosolids stream. It is commercially marketed throughout Tacoma as a potting medium and garden soil amendment.

A 2012 survey of Northwest Biosolids Management Association members documented that university research and Extension programs completed research that was relevant to their needs, provided tools to interpret research for their customers and community leaders, provided information that helped with product and land application decisions, and helped solve problems in their programs.

A key impact of the compost Extension program is the training of more than 400 compost professionals through the hands-on Compost Facility Operators class. Alumni have gone on to build, manage, operate, and regulate compost facilities and teach others about composting and compost management. A 2012 survey identified long term benefits to previous class attendees. More than 80% of the respondents reported that the hands-on education from the workshop helped them do their job better and improve their product.