

Biosolids: A Valuable Resource Benefits Lancaster County Farmers and Taxpayers

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The Biosolids Land Application Program is eight years old. The first truckload of treated municipal wastewater residuals was delivered to crop fields in Lancaster County May 1992. A lot has changed in the last eight years. Eight years ago, we called these treated residuals *sludge*, but now the accepted terminology is *biosolids*. The word *biosolids* has become so commonly used to describe treated wastewater solids, it can be legitimately used when playing Scrabble because it is found in the newest dictionaries.

What hasn't changed is the value of this land application program to the citizens of Lincoln and Lancaster County. We are only beginning to understand the real value of biosolids to the cooperating crop producers that use this material to fertilize and enrich their soils.

The options cities have for disposing of wastewater residuals are limited. If the City of Lincoln did not have a Biosolids Land Application Program, disposal in the Bluff Road Landfill, a licensed facility, would be required. Since the beginning of this program in 1992, more than 208,000 tons (about 26,000 tons/year) have been diverted from the landfill. When farmers use biosolids as a fertilizer, landfill space is saved and can



"Biosolids is being applied to an on-farm experiment conducted by UNL Agronomy Department at Wally Hansson's field in northern Lancaster County, 1996."

be used for other waste. Years can be added to the life of the landfill, which is very expensive to build with today's environmental regulations. At the current tipping fee of \$17 per ton, the land application program has saved Lancaster County taxpayers more than \$3.5 million.

Recent research conducted by the University of Nebraska Agronomy Department and supported by the City of Lincoln, has provided biosolids application recommendations for corn and sorghum. This study has shown biosolids provide a significant amount of nitrogen to several subsequent crops after the initial application. On average, a one-time biosolids application increased yields by 33 percent in the year applied, and by 21 percent, 14 percent, and nine percent, respectively, in the next three years. About \$55 and \$31

worth of nitrogen fertilizer was required to produce equivalent corn and sorghum yields over the same four year period of this study. This would translate into nearly \$400,000 in nitrogen fertilizer savings for cooperating farmers over the past eight years had they all grown irrigated corn.

In addition to nitrogen, biosolids also contains phosphorus, potassium, copper, zinc, and sulfate, as well as, numerous trace elements. Many Lancaster County soils can be deficient in these nutrients, especially phosphorus and zinc. In fact, many of our cooperating farmers are using biosolids, not so much for the nitrogen, but for the other nutrients that it contains. According to recent fertilizer prices, if farmers were to buy these nutrients from their local dealer (P, K, Cu, Zn and

SO₄), they would cost \$6.53 per ton (that's a whopping \$196 per acre at the application rate of 30 tons per acre). The phosphorus alone is worth \$5.63 per ton of biosolids.

While the nutrient value alone of biosolids is considerable, it is likely that the organic matter in biosolids is of even greater value. Biosolids is an organic amendment similar to animal manure in its ability to improve soil structure and water permeability of the heavy clay soils commonly found in Lancaster County.

Based on findings from this study, UNL agronomists Achim Doberman and Darren Binder have made suggestions as to biosolids application rates and provided guidelines for the frequency of repeated applications to prevent nitrate accumulation in subsoil. Results of this research have already been used to fine-tune biosolids application rates by cooperating farmers.

The Biosolids Land Application Program is an example of how a beneficial use of a waste material can be used to save the taxpayers' money, improve soil, save farmers' money, and increase the yield of their crops—all at the same time. This is a valuable program.

For more information about how biosolids can improve your soil, contact the Lancaster County Extension Office, 402-441-7180 and visit with Barb Ogg or Dave Smith.

Nutrient	lbs/ton (as is)	\$/lb	\$/ton (as is)
Nitrogen	17.5	\$0.16	\$2.80
Phosphorus (P ₂ O ₅)	22.5	\$0.25	\$5.63
Potassium (K ₂ O)	1.1	\$0.14	\$0.15
Sulfate	1.4	\$0.16	\$0.22
Copper	0.3	\$0.80	\$0.24
Zinc	0.3	\$0.96	\$0.29
Total			\$9.33

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