

More Proactive Approach Needed To Rid Public Fears Of 'Mutagenic' Land-Applied Sludge

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LANCASTER (Lancaster Co.)
— If the wastewater treatment industry wants to convince farmers to use land to dispose of properly treated sludge, then a more proactive approach could work wonders to stop ungrounded fears and to rid the public's misconceived "danger" of sludge to the environment.

More than a dozen environmental officials, educators, and agri-industry representatives were told that all sludges should be tested for "mutagenicity" (having materials that can cause mutations in animal and human DNA, a possible precursor to cancer) based on "perceived risk" to the public.

And the wastewater industry could do well to help facilitate research into the use of lime dosages to stem the mutagenicity of sludge, according to Sean M. Furjanic, environmental health scientist.

Furjanic, a graduate research assistant from Penn State University-Harrisburg and a private consultant, spoke Thursday afternoon at the Lancaster Campus of Harrisburg Area Community College (HACC). The seminar was one of several to address HACC's ongoing "3 R's Series" called "The Cutting Edge of Resource Management—Reduce, Reuse, and Recycle."

The "interactive" seminar at Lancaster HACC featured responses by a leader in wastewater treatment, a Pa. Department of Environmental Protection engineer, a district conservationist, and a HACC biology faculty member. They all responded to the issues brought forth by Dr. Katherine Baker, assistant professor of environmental microbiology at Penn

State-Harrisburg.

Working with Baker, Furjanic presented the results of his own research into the use of Quicklime at various doses and under various stringent and sophisticated levels of monitoring to see their effects on mutagens in sludge, otherwise known as "biosolids." The focus was from a biologist's approach rather than a chemist's, according to Baker.

Furjanic pointed out the public's reluctance in some cases to support the land application of biosolids on farmland. In York County a sign reads "Sludge— toxic to life." The county, according to Furjanic, has a few opposition groups that pose a challenge to scientist-educators.

The research looked into the questions: is there an optimal dose of lime that could be used to treat sludge? Could more than optimal rates have an even better effect on controlling mutagens?

It took a lot of effort, but finally Furjanic was able to select four wastewater treatment plant sludges that could support mutagens. It was difficult to find such sludges, since most municipal treatment centers have stringent restrictions on the amount of metals and other environmentally unfriendly materials conducive to supporting mutagens in sludge.

Furjanic tried various ratios of treatment of the Quicklime to sludge and different sludge combinations. He made use of the Ames Test. The sludge extracts were treated with pre-incubated Salmonella bacteria and the growth and progress of the bacteria was monitored. The life of mutagens was monitored.

There were three interesting observations, according to Furjanic, as a result of the research:



The "Interactive" sludge seminar at Lancaster HACC featured responses by, from left, C.D. Vu, engineer with the Pa. Department of Environmental Protection; Dee Walter, HACC adjunct faculty, biology; Don Robinson, district manager, Lancaster County Conservation District; and Jay R. Snyder, Borough of Ephrata environmental resource manager.

1. Dewatered sludge increases in mutagenic activity after 10 days, then slowly declines.

2. Lime/ash and sludge/ash mixes could prove the best stabilizing agents, but material toxicity could be in question.

3. An interesting phenomenon, according to the environmental scientist, was that, one day after the lime ratio was brought to 3.5 parts to 1 of sludge, the sludge "nearly doubled in mutagenicity." It does taper off, eventually — but

after 90 days remains more mutagenic than ordinary dewatered sludge.

The common and most direct finding: a 1 to 1 ratio of Quicklime to sludge, which raises the pH to 11 or higher, works to control mutagenic effects of the sludge. The addition of more lime significantly reduces mutagenic capabilities of dewatered sludge.

One hypothesis was reduced: does increasing dose to 3.5 parts to 1 reduce mutagens? No.

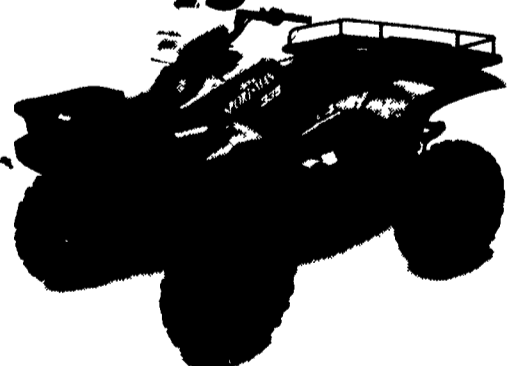
The second hypothesis: is there an optimal dose for treating sludge? There are conflicting results, and more work needs to be done.

Generally, according to the scientist, certain lime doses to dewatered sludge can reduce the mutagenicity of biosolids.

But the "perceived" issue is the very word — mutagens — which cause widespread fear in the public, who have little tolerance for

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