Project (in Indonesia)

Posted by Urani - 04 Dec 2012 15:14

My name is Urani N.H, and my partner Ratna Mutyasari. We are from Indonesia. And now we are in eleventh grade at Semesta Bilingual Boarding School Semarang, Indonesia.

We are participate in Indonesian Science Project olympiad (ISPO). we have already had one topic, "Struvite from Animal urine and seawater". But actually we'll change Mg with Seawater because percentage of Mg in seawater 4%. and our target is Farmers. that is so impossible if we make with Mg, that will make outcome for the farmer more than before.

but, we have some problem in this experiment :

1. What should we do with the rest of urine?

2. How could we make our product have high quality?

3. How to make the urine doesn't smelly?

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Re: Project

Posted by JKMakowka - 04 Dec 2012 18:10

Double check your figures again, seawater definitely does not contain 4% Mg. Maybe of the salt that is included, 4% are Mg ones, but I hightly doubt that would be sufficient for struvite precipitation. Do you have a source that claims the opposite?

Edit: en.wikipedia.org/wiki/Seawater -- Mg content 0.13%, however 3,7% of the total salt content as I guessed.

Besides that, mixing the manure with seawater will pollute the remaining effluent with salt, thus making it unsuitable for discharge into anything other than the sea (and the created struvite fertilizer might contain too much NaCl too).

Sorry to be pessimistic about it, but if it was so easy to produce struvite without Mg it would be done already.

Concerning the smell of urine: it mainly starts smelling when bacteria break down the urea and ammonia

is formed.

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Re: Project
Posted by Urani - 06 Dec 2012 09:04

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so, what can i do for my research?

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Re: Project
Posted by canaday - 09 Dec 2012 13:49

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Dear Urani,

First, I want to congratulate you for taking on such an important and challenging topic for your student project.

Can you give us more bibliographic support for your original idea?

How did you formulate that very creative idea?

I would suggest that there is a great deal to investigate in simpler, low-tech ways to fertilize with urine.

If you want to combine urine with seawater, why not just fertilize shrimp or fish ponds directly with urine. One of the biggest inputs for shrimp farming is nitrogen, in one form or another, to promote the growth of algae. Urine would fulfill this need, with a much lower load of heavy metals, etc., compared to the chemicals currently used. Plus, it is my understanding that no human disease can be transmitted via urine in saltwater. Schistosomiasis, for example, requires the urine of the infected person to go into fresh water, where certain snails live.

Another important field of research is how to most simply give people's urine to the terrestrial plants that can put it to good use. G. Sridevi (of India) showed in her PhD dissertation that a banana plant can be well fertilized with 63 liters of human urine during its roughly 1-year life cycle. Since that is roughly one person's urine over 2 months, I suggest that perforated hoses, buried 10 cm under the soil, could easily, immediately and automatically distribute one person's urine to 6 banana plants by gravity. It also seems more beneficial for the soil and the plants to distribute the urine in small amounts fresh every day, rather than in big, periodic pulses fermented, as the soil bacteria that break down the urine can become well

populated in a fairly steady state. Fruit trees could also be experimented with, and I suggest planting a variety of species to see which do best with urine fertilization. I have made such perforated hoses for distributing urine here in the Amazon for years and they do not plug, if done right. Let me know if you want instructions on this.

I hope you find these ideas useful and that your project is a great success.

Please keep us informed of your advances.

Best wishes,

Chris Canaday

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