Human Urine as a Fertilizer

ECHO Inc.

Dr. Dwayne Ogzewalla is a Professor Emeritus in Pharmacy at the University of Cincinnati, and an agriculture specialist in Costa Rica and Nicaragua. He wrote to us after reading the article about human urine as a fertilizer in *EDN 108*.

"I have used human urine in my garden for the last 25 years. I am collecting it now to use in the next few days. I appreciate your article and find only a few things about which to comment."

"As a male, I find it simple and convenient to use 'urinals.' I keep several in my bedroom so that I do not need to go to the bathroom in the night. As mine are tightly capped there is no odor and I can carry them to the garden where I fertilize appropriate plants. I [make my own urinals] using one liter (quart) plastic jars left over from my purchase of medicine. The empty containers are my urinals. I have six of these so I can store urine for several days and have a gallon or more to use on my garden/orchard at one time. These urinals are easy to wash; I sterilize them every few weeks using household bleach. Gallon plastic jugs are readily available but not easy to use.

"I am aware that a federal agency had gone on record of approving the use of urine in gardens but NOT for application to edible vegetable parts that touch the ground. I would never apply urine to the soil around beets, carrots, radishes, onions, lettuce, etc. I use it as a side dressing around sweet corn; berries on trellises or plants with fruit that does not the soil; trees, shrubs, and vines.

"Fresh urine usually has a distinct but not offensive odor. Leaving it for a few hours or days leads to build-up of large numbers of microorganisms. These organisms will give the urine an offensive odor that is above and beyond the odor from the nitrogenous materials. Stale urine almost always has an offensive odor. This pronounced 'urine' odor may be noticed if too much or too frequent applications are made in the garden. To avoid a build-up of stale urine odor, I use it sparingly and rotate areas of application.

"Urine without treatment is NEVER COMPLETELY SAFE. A certain number of apparently healthy individuals have urinary tract infections and can and do produce unsafe and unhealthy urine. The statement must always be that untreated urine is USUALLY SAFE; it is never COMPLETELY SAFE."

Dr. Ogzewalla commented on the commonly misused statement (also included in the *EDN* article) that urine is sterile. "One statement in the ECHO article is erroneous: '…urine is sterile when it exits a person's body.' The statement would be accurate if it was '…urine is usually safe when it exits…' Sterile means no microorganisms. Safe means no disease organisms. In laboratories, urine samples taken into sterile containers may have low bacterial count but are not sterile. Urine is exposed to microorganisms as it exits the urethra. To keep the count low one may take a urine sample "mid-stream"—but urine is never sterile.

"I will continue to use urine as fertilizer. I will use it safely and effectively."

Dr. Ogzewalla subsequently wrote about a simple trial he undertook after reading the urine article. He commented, "I wanted to demonstrate that sterilized urine would not turn into foul smelling material. I did a tiny study putting freshly produced (nonsterile) urine into 3 sets of bottles. I divided them into 3 groups: (1) urine was left alone as the control; (2) urine was sterilized with heat; and (3) urine was sterilized with bleach.

"The nonsterile control became cloudy in three days with a few bubbles (gas production) and was foul smelling over the next two weeks. Neither of the [bottles containing sterile urine] produced foul smelling urine even after two weeks.

"This agrees with chemistry and experience. I now share the information that foul smelling old urine is due to bacterial growth not to a change in the nitrogen chemistry. Urine as fertilizer need not be accompanied with foul odor if it is used before extensive bacterial growth."

Ken Sylvain in northern Thailand also wrote to us about the use of urine as a fertilizer. He attached photos of bananas that had been fertilized with urine (see *EDN 109* Supplement). Though that was two years ago, and he did not record details, he shared what information he remembered. "As I remember, I basically used one 1.5L bottle of urine (from a collection of at least 3 days) in a 10L watering can—dilution factor of about 6.5. (I had read something about a factor of 10, and decided to go a little heavy.) I watered 'well,' deeply (I believed), basically once a week. Harvest was about a month before the end of our rainy season. I don't recall when I started the urine regime, but certainly it was for most of the lifetime of that particular [banana] 'tree.'

"The result in this head of bananas was impressive in size, in our experience—but although excited by it, we also didn't much like it, since the bananas were just too big!"

Ken commented that they also used urine as a fertilizer in a patch of amaranth. "This was watering from a watering can, followed by plain water to rinse the leaves and plot surface each time—no problem!" [Though the Sylvains experienced no problems, this is not necessarily recommended. It would be difficult to apply the urine in such a way that leaves would be completely avoided. While the risk of disease may be small, it still does exist!]

Sister Alegría of Amigas del Señor Methodist Monastery in Honduras wrote to us after reading the urine article. "What a delight to read the article on human urine as a fertilizer in the July issue. It gave us a lot of useful information (like the content of

phosphate and potassium) and helped us see that we are on the right track, even though we didn't invent the idea ourselves.

"We have used urine for four years, starting with the [patch of soil to which urine from the dry compost toilet is diverted], which soon supported a thriving chaya plant.

"Nothing anywhere else on our land thrived. About a year later, we had access to a soil test kit, which explained a lot. Our soil pH was uniformly 4.5 except in the urine bed where it was 6.0. The nitrogen was also higher in the urine bed. We began emptying our nica (night time urine pot) near plants to fertilize and to buffer the acidity.

"We started out diluting the urine and carefully [avoiding] the foliage. We quickly stopped diluting it because carrying the weight was prohibitive. We live in the humid tropics—lots of rain falls and dilutes the urine for us.

"We have about a two month dry season. During that time we expand the number of plants [to which we apply] the urine [we collect], so as not to build up an inappropriate concentration in one place. We don't know if this precaution is necessary.

"We use fresh urine, full strength. As a consequence, we do not have to deal with ammonia smell. Fresh urine does not have the ammonia smell. It starts smelling like ammonia from sitting around. If it is used fresh, it still smells like it does right when you pee.

"We are not at risk of Schistosomiasis here… .If one of the 'donors' is suspected to have a urinary tract infection, her (or his) urine will be contaminated until the person has completed appropriate antibiotic treatment. Thus, using fresh urine is fine as long as the gardener knows the health status of all of the persons sharing urine. (I say this as a physician, not as a gardener.)" [Ed: This assumes that a person with a problem would be aware of it and/or undergoing the treatment.]

"We began putting urine directly on the foliage of plants in an attempt to dissuade leaf-eating lizards. It didn't work. They ignored the urine and chomped away.

"About one and a half years after beginning use of the dry compost toilet, we noticed the urine smell wafting near the outdoor kitchen. We didn't like that, so after we emptied the night time pot on plants first thing in the morning, we began moving the pot into the toilet to pee into during the day and then took that urine to use as fertilizer for other plants. In this way, we doubled the urine available to put on other plants and reduced dramatically the amount of urine passively entering [the garden area nearest the compost toilet]. This resolved the urine odor. If we had it to do over, we would construct a more extensive [garden area for urine diversion] further from the kitchen.

"We have put full strength, fresh urine directly on coconuts, banana family, guava, moringa, chaya, katuk, suriname cherry, citrus, cashew, papaya, cranberry hibiscus, Malabar spinach, tomatillos, sweet potatoes and pineapples with no negative results and good evidence that they like it.

"When we are ready to plant something new that will receive urine as part of its care, we consider distance from our outdoor living areas and prevailing breeze direction. We learned this the hard way, of course. We don't like the smell of fresh urine."

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