

THE SAWDUST TOILET

Simple methods of collecting humanure and composting it are sometimes called cartage systems or bucket systems, as the manure is carried to the compost bin, often in buckets or other waterproof vessels. People who utilize such simple techniques for composting humanure simply take it for granted that humanure recycling is one of the regular and necessary responsibilities for sustainable human life on this planet.

How it works is a model of simplicity. One begins by depositing one's organic refuse (feces and urine) into a plastic bucket, clay urn, or other non-corrodible waterproof receptacle with about a five gallon (20 liter) capacity. Food scraps may be collected in a separate receptacle, but can also be deposited into the toilet receptacle. A five gallon capacity is recommended because a larger size would be too heavy to carry when full. If five gallons is still too heavy for someone to carry, it can be emptied when half-full.

The contents of the toilet are kept covered with a clean, organic *cover material* such as rotted sawdust, peat moss, leaf mould, rice hulls, or grass clippings, in order to prevent odors, absorb urine, and eliminate any fly nuisance. Urine is deposited into the same receptacle, and as the liquid surface rises, more cover material is added so that a clean layer of organic material covers the toilet contents *at all times*.

A lid is kept on the toilet receptacle when not in use. The lid need not be air-tight, and a standard, hinged toilet seat is quite suitable. The lid does not necessarily prevent odor from escaping, and it does not necessarily prevent flies from gaining access to the toilet contents. Instead, the cover material does. The cover material acts as an organic lid or a "biofilter"; the physical lid (toilet seat) is used primarily for convenience and aesthetics. Therefore, the choice of organic cover material is very important, and a material that has some moisture content, such as rotted sawdust, works beautifully. This is not kiln-dried sawdust from a carpenter shop. It is sawdust from a sawmill where trees are cut into boards. Such sawdust is both moist and biologically active and makes a very effective biofilter. Kiln-dried sawdust is too light and airy to be a 100% effective biofilter. Furthermore, sawdust from wood-working shops may contain hazardous chemical poisons if "pressure-treated" lumber is being used there. It seems that present-day carpenters are more than willing to expose themselves to the chemical hazards of poison-soaked lumber, which contains cancer-causing chemicals. There is no need for composters and gardeners to duplicate such unwise exposure.

I use rotted sawdust as a toilet cover material because it is a readily available, very inexpensive, local resource which works well. I used to haul a free load home from a local sawmill every so often in the back of my pick-up truck, but now I just have a fellow with a small dump truck deliver me a load every year or two. I have the sawdust dumped in a

pile in a corner of my backyard adjacent to my compost bins where it can remain exposed to the elements and thereby slowly decompose on its own, as rotting sawdust makes compost more readily than fresh sawdust. The sawdust itself doesn't cost me anything, but I usually have to pay about five dollars to have it loaded onto the dump truck and another twenty-five to have it hauled. This is an expense I'm happy to pay every year or two in order to ensure for myself a functional compost toilet system. I would speculate that many other cellulose-based materials or combination of materials would work as a toilet cover material, including perhaps ground newsprint.



"I found myself on an organic farm in Thailand...I and some other volunteers made handy use of your book. Instead of shitting in a pit and covering, we decided to make good use of 'the waste.' Could not have done it, however, without the information you provided. So yes, even in the remote parts of Thailand, your efforts have made their effects. We used easy-to-get rice husks instead of suggested sawdust - works brilliantly!" R.M. in Thailand

"I've been using lately well-rotted leaf mold to cover deposits in the five gallon bucket - and find this a fantastic cover for absorbing all odors - better than when I used sawdust." J.W. in CT

In the winter, an outdoor pile of sawdust will freeze solid. I have to layer some hay over mine and cover it with a tarp in order to be able to access it all winter. Otherwise, feedsacks filled with sawdust stored in a basement will work as an alternative, as will peat moss and other cover materials stored indoors.

The system of using an organic cover material in a small receptacle works well enough in preventing odors to allow the toilet to be indoors, year round. In fact, a full bucket with adequate and appropriate cover material, and no lid, can be set on the kitchen table without emitting unpleasant odors (take my word for it). An indoor sawdust toilet should be designed to be as warm, cozy, pleasant, and comfortable as possible. A well-lit, private room with a window, a standard toilet seat, a container of cover material, and some reading material will suffice.

AMERICAN YARDS AND ENGLISH GARDENS

In the United States, a "yard" is a grassy area surrounding a house; the term is equivalent to the English term "garden." That grassy area may contain trees, shrubs, or flowers. If it is located in front of the house, it is called the "front yard." Behind the house, it is the "back yard." Beside the house, it is the "side yard." An American "garden" is a plot of vegetables, often located within the yard. An American garden can also be a flower garden or fruit garden; some American gardens contain flowers, fruits, and vegetables. In

the UK, the green area around a house is called the "garden," whether it contains vegetables, flowers, or nothing but mowed grass. English homes do not have "yards." So the term "back yard composting," translated to UK English, would be "back garden composting."

SAWDUST TOILET VITAL STATISTICS

One hundred pounds of human body weight will fill approximately three gallons (.4 cubic feet, 693 cubic inches, or approximately 11 liters) in a sawdust toilet per week - this

volume includes the sawdust cover material. One hundred pounds of human body weight will also require approximately 3 gallons of semi-dry, deciduous, rotting sawdust per week for use as a cover material in a toilet. This amounts to a requirement of approximately 20 cubic feet of sawdust cover material per one hundred pounds of body weight per year for the proper functioning of a sawdust toilet. Human excrement tends to add weight rather than volume to a sawdust toilet as it is primarily liquid and fills the air spaces in the sawdust. Therefore, for every gallon of sawdust-covered

excrement collected in a sawdust toilet, nearly a gallon of cover material will need to be used.

When the bucket is full, it is carried to the composting area and deposited on the pile. Since the material must be moved from the toilet room to an

outdoor compost pile, the toilet room should be handy to an outside door. If you redesigning a sawdust toilet in a new home, situate the toilet room near a door that allows direct access to the outside.

It is best to dig a slight depression in the top center of the compost pile and deposit the fresh material there, in order to keep the incoming humanure in the hotter center of the compost pile. This is easily achieved by raking aside the cover material on top of the pile, depositing the toilet contents in the resulting depression, and then raking the cover material back over the fresh deposit. The area is then immediately covered with additional clean, bulky, organic material such as straw, leaves, or weeds, in order to eliminate odors and to entrap air as the pile is built. The bucket is then thoroughly scrubbed with a small quantity of water, which can be rain water or graywater, and biodegradable soap, if available or desired. A long-handled toilet brush works well for this purpose. Often, a simple but thorough rinsing will be adequate. Rain water or wastewater is ideal for this purpose as its collection requires no electricity or technology. The soiled water is then poured on the compost pile.

It is imperative that the rinse water not be allowed to pollute the environment. The best way to avoid this is to put the rinse water on the compost pile, as stated. However, the rinse water can be poured down a drain into a sewer or septic system, or drained into an artificial wetland. It can also be poured at the base of a tree or shrub that is designated for this purpose. Such a tree or shrub should have a thick layer of organic material (biological sponge) at its base and be staked or fenced to prevent access to children or pets. Under no circumstances should the rinse water be flung aside nonchalantly. This is the weak link in this simple humanure recycling chain, and it provides the most likely opportunity for environmental contamination. Such contamination is easy to avoid through considerate, responsible management of the system. Finally, never use chlorine to rinse a compost receptacle. Chlorine is a chemical poison that is detrimental to the environment and is totally unnecessary for use in any humanure recycling system. Simple soap and water is adequate.

After rinsing or washing, the bucket is then replaced in the toilet area. The inside of the bucket should then be dusted with sawdust, the bottom of the empty receptacle should be primed with an inch or two of sawdust, and it's once again ready for use. After about ten years, the plastic bucket may begin to develop an odor, even after a thorough washing. Replace odorous buckets with new ones in order to maintain an odor-free system. The old buckets will lose their odor if left to soak in clean, soapy water for a

lengthy period (perhaps weeks), rinsed, sun-dried, and perhaps soaked again, after which they can be used for utility purposes (or, if you really have a shortage of buckets, they can be used in the toilet again).

Here's a helpful hint: when first establishing such a toilet system, it's a good idea to acquire at least *four* five gallon buckets, with lids, that are *exactly the same*, and more if you intend to compost for a large number of people. Use one under the toilet seat and two, with lids, set aside in the toilet room, empty and waiting (save the fourth as a back-up). When the first becomes full, take it out of the toilet, put a lid on it, set it aside, and replace it with one of the empty ones. When the second one fills, take it out, put the other lid on it, set it aside, and replace it with the other empty one. Now you have two full compost buckets, which can be emptied at your leisure, while the third is in place and ready to be used. This way, the time you spend emptying compost is almost cut in half, because it's just as easy to carry two buckets to the compost pile as one. Furthermore, you potentially have a 15 gallon toilet capacity at any one time (20 with the extra bucket), instead of just five gallons. You may find that extra capacity to come in very handy when inundated with visitors.

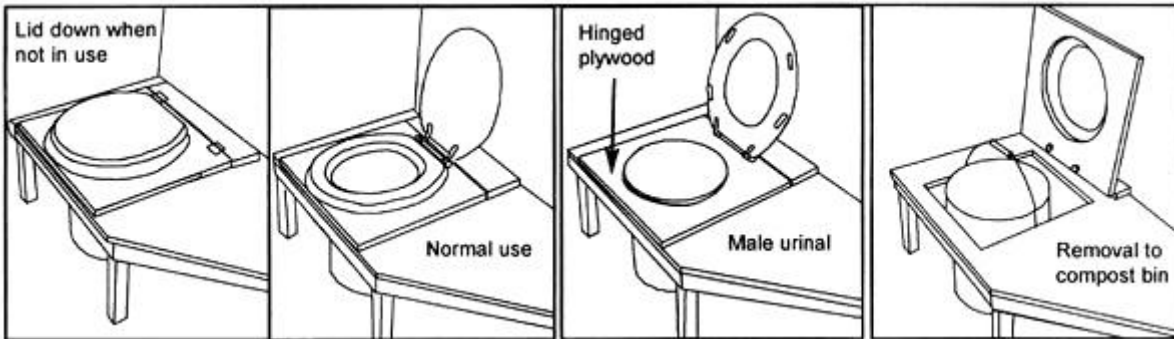


Figure 8.1

SAWDUST TOILET WITH HINGED SEAT

The above diagram shows a simple sawdust toilet permanently built into a toilet room. The compost receptacle (bucket) sits directly on the floor. A standard toilet seat is attached to an 18" square piece of plywood, which lifts up on hinges to allow easy access when removing the compost material. Bucket setback from the front edge of the plywood is 1&1/2". Height of top surface of plywood is 1/2" lower than height of bucket. Bucket protrudes through cabinet to contact bottom of toilet seat ring. Plastic bumpers on bottom of toilet seat ring are swiveled sideways so as to fit

around bucket. Actual toilet shown below.





Figure 8.2
SAWDUST
TOILET
WITH LIFT-
OFF TOP

Toilet at
left came
with
directions
mounted
on the
wall.

DIRECTIONS FOR SAWDUST TOILET:

- 1. MAKE YOUR DEPOSIT**
- 2. COVER WITH SAWDUST**
- 3. HAVE A GREAT DAY ~ ENJOY!**

Why should all of the buckets be exactly the same? If you build a permanent toilet cabinet (seat), the top of the bucket should protrude through the cabinet to contact the bottom of a standard toilet seat. This ensures that all organic material goes into the container, not over its edge. Although this is not usually a problem, it can be with young children who may urinate over the top of a bucket receptacle when sitting on a toilet. A good design will enable the bucket to fit tightly through the toilet cabinet as shown in Figures 8.1, 8.2, and 8.4. Since all plastic buckets are slightly different in height and diameter, you will have to build your toilet cabinet to fit one size bucket. You should have extra identical ones when backup capacity is needed to accommodate large numbers of people.

It is much better to set a full toilet receptacle aside, with a lid, and replace it immediately with an empty one, than to have to empty and replace a full one while someone is waiting to use the toilet. There are some things in life we would all like to avoid: you have no money in the bank, your gas tank is empty, you're out of firewood, your pantry is bare, the sun's not shining, the dog has died, and "nature calls," but the shit bucket's full. Put some harmonica music to that last sentence and you'd have "*The Shit Bucket Blues*." One can avoid singing that tune by properly planning and managing a sawdust toilet system.

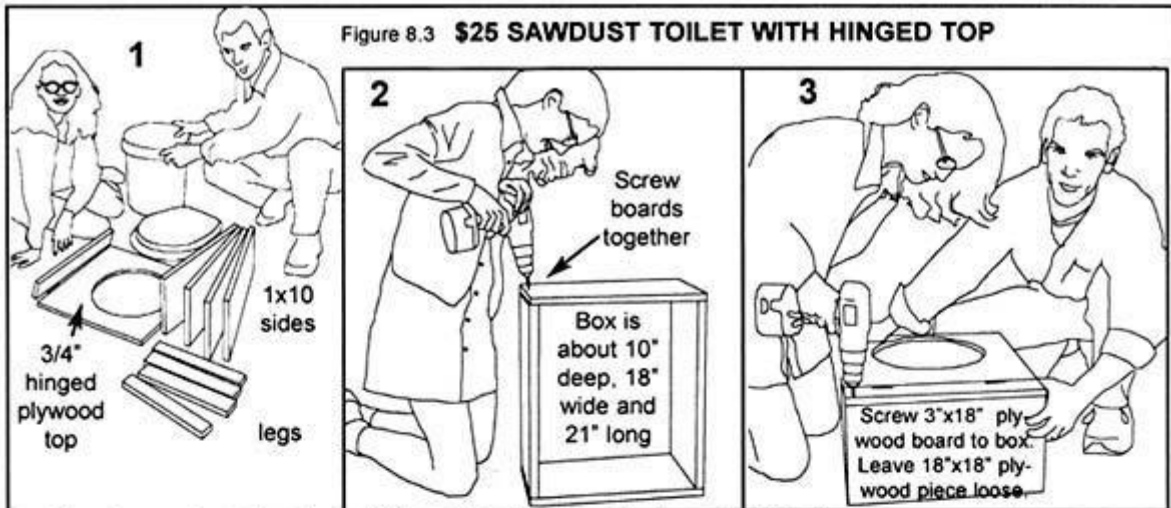
Theoretically, with enough containers, a sawdust toilet system can be used for any number of people. For example, if you are using a sawdust toilet in your home, and you are suddenly visited by thirty people all at once, you will be very happy to have empty containers ready to replace the ones that fill up. You will also be very happy that you will not have to empty any compost containers until after your company leaves, because you can simply set them out of the way in the toilet room as they fill up, and then empty them the next day.

Experience has shown that 150 people will require four five gallon containers during a serious party. Therefore, always be prepared for the unexpected, and maintain a reserve toilet capacity at all times by having extra toilet receptacles available, as well as extra cover material. Incidentally, for every full container of compost material carried out of a toilet room, a full, same-sized container of cover material will need to be carried in.

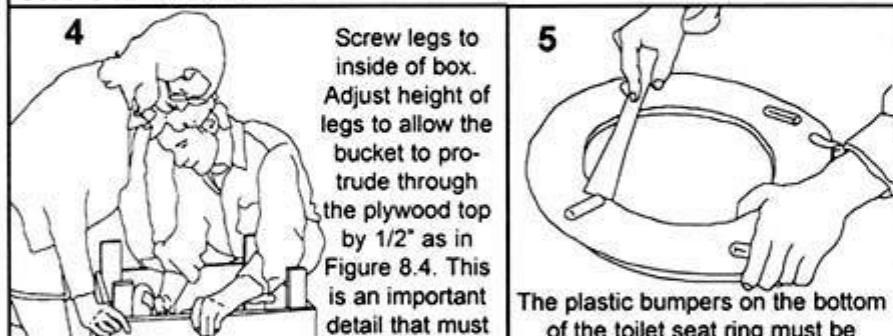
Expecting five hundred people for a major gathering out in the woods? Sawdust toilets will work fine, as long as you keep enough buckets handy, as well as adequate cover materials, and some volunteers to manage it all. You will collect a lot of valuable soil nutrients. Which brings to mind a verse created by a friend and sung to the tune of "Old Joe Clark" at one of my own gatherings, here paraphrased:

***"He feeds us lots of party food,
and calls it appetizers.
But we know what he's going to do,
He'll make it fertilizer!"***

Figure 8.3 \$25 SAWDUST TOILET WITH HINGED TOP



A hinged sawdust toilet box will be 18" wide by 21" long. Get (2) boards 3/4"x10"x18", (2) 3/4"x10"x20.5", (2) hinges, (1) piece of 3/4" plywood 18"x18" and another 18"x3" and hinge them together. Cut a hole in the larger plywood to fit the top of a five-gallon bucket, set back one and one half inches from the front (as in Figure 8.4). Get four five-gallon buckets that are identical. Get (4) 3/4"x3"x12" legs. Get one standard toilet seat.



Screw legs to inside of box. Adjust height of legs to allow the bucket to protrude through the plywood top by 1/2" as in Figure 8.4. This is an important detail that must

The plastic bumpers on the bottom of the toilet seat ring must be



Adjusted toilet seat ring

The advantages of a sawdust toilet system include low financial start-up cost in the creation of the facilities, and low, or no energy consumption in its operation. Also, such a simple system, when the refuse is thermophilically composted, has a low environmental cost, as little or no technology is required for the system's operation, and the finished compost is as nice and benign a material as humanure can ever hope to be. No composting facilities are necessary in or near one's living space, although the toilet can and should be inside one's home and can be quite comfortably designed and totally odor-free. No electricity is needed, and no water is required except a small amount for cleaning purposes. The compost, if properly managed, will heat up sufficiently for sanitation to occur, thereby making it useful for gardening purposes. The composting process is fast, i.e., the humanure is converted quickly (within a few days if not frozen) into an inoffensive substance that will neither attract rodents nor flies. In cold winter months, the compost simply freezes until spring thaw, and then heats up. If the compost is unmanaged and does not become thermophilic, the compost can simply be left to age for a couple of years before horticultural use. In either case, a complete natural cycle is maintained, unbroken.

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