How to Convert Human Waste into a Safe Garden Compost Fertilizer

An Updated Modern Scientifically Safe Procedure that Replaces the
Ancient Oriental Unsafe "Night Soil" Method of Recycling Human Waste.

Preface

If any of the following events should occur:

1. a peak oil crisis or a World War that results in a significant reduction in the transportation of food, or
2. commercial fertilizer becomes scarce or extremely expensive, or
3. unemployment increases significantly and many families are forced to grow their own vegetables, or
4. there is a local, national, or worldwide famine,

then the following information would be extremely valuable to everyone who has a vegetable garden. The following information would allow a family to safely and economically enrich their garden soil **every year** in order to provide a continuous harvest of fresh vegetables.

Danger

"Night Soil" is untreated human waste mixed with garden soil. Do **not** use untreated human waste in a garden area. Human waste contains harmful microorganisms that are fatal to humans.

Introduction

All human waste originally came from the earth. And all human waste will eventually be converted back into the earth. If this process is properly controlled then the harmful microorganisms inside human waste will be destroyed and the resulting compost can be safely used to replenish the nutrients in garden soil. Compost is one of nature's best mulches and soil enhancements. It may also be successfully used **instead** of fertilizer. Compost helps to aerate and loosen clays soils. It also helps sandy soils retain their moisture.

The Indoor Toilet Bucket (originally called a "Chamber Pot")

Any 5-gallon or 6-gallon bucket with a tight fitting lid may be used as an indoor toilet bucket. An ordinary toilet stool seat can be attached to the top of this bucket to make it easier to use.

After a person has deposited human waste (poop and urine and toilet paper) into the toilet bucket, sprinkle a little sawdust, or crumbled dry leaves, or dried grass clippings, or chopped brown pine needles, or shredded paper on top of the waste to help control the odor. Then replace the bucket lid to keep the smell inside the bucket.

The Compost Pile

Periodically transfer the contents of the toilet bucket to an outdoor compost pile that is a reasonable distance from your home but close to your garden area. Immediately cover the human waste on the compost pile with a layer of dried leaves, or shredded brown pine straw, or dried grass clippings, or shredded paper. You should use approximately the same amount of covering material as human waste. This will keep the odor under control and it will help keep the heat trapped inside the compost pile. Rinse or clean the toilet bucket and then return the empty toilet bucket to its normal location inside your home. Then immediately wash your hands.

Other Compost Pile Materials

Other desirable items that could be added to the compost pile include crushed egg shells, fruit and vegetable peels, used coffee grounds and filters (2% nitrogen), used tea bags, kitchen scraps, apple cores, fireplace ashes, shredded junk mail, shredded cardboard, garden weeds, and the shredded vines and shredded stalks from garden plants after harvesting the vegetables (such as corn stalks, bean vines, and tomato vines). Always chop or shred any large items into smaller pieces. Farm animal manure from grass eaters is also good if it is at least one-week old.

Do **not** add lime, bones, meat, dairy products, cooking grease, cat or dog droppings, disposable diapers, clothes dryer lint (synthetic fibers), paper with color pictures (potential heavy metals), walnut leaves, diseased plants, or poisonous plants (poison ivy) to your compost pile. (Note: Lime may be added to your garden soil but **not** to your compost pile.)

Alternate your compost covering materials and use a variety of different items. In other words, alternate the use of dried leaves, dried grass clippings, brown pine straw, and shredded paper. Spread each material into a relatively even layer across the top of your pile using a garden rake or hoe that is only used for this one purpose. Try to have approximately the same amount of brown materials (low nitrogen) as green materials (high nitrogen) inside your compost pile. **Green** refers to new or fresh items (freshly cut grass clippings, green pine needles, green leaves, fresh kitchen waste, and all types of fresh manure). **Brown** refers to old or dried items (month old dried out grass clippings, brown pine needles, dry leaves).

Compost Pile Size and Shape

A good size for a single compost pile is 3 feet in diameter and 3 feet deep. Once the pile gets to this size you should start another compost pile nearby.

Carbon/Nitrogen Mixture Ratios

The microorganisms that decompose materials into compost require carbon, nitrogen, water, heat, and oxygen. **Carbon** is used to provide energy. **Nitrogen** is used to form cell structures. As the tiny microorganisms consume these nutrients they produce heat inside the compost pile. The tiny microorganisms need approximately 30 times more carbon than nitrogen (or 30:1). Successful decomposition will take place if the carbon/nitrogen ratio is anywhere in the range between 20 to 40 (or 20:1 to 40:1). Whenever you add a material that has a low ratio, you should also add a material that has a high ratio at the same time. Paper, sawdust, and wood ashes should be used in moderation because they have extremely high ratios. Pine straw needles should be chopped or shredded. Tree leaves are one of the best materials you can use to cover human waste because they are widely available and they are easily collected with a ordinary garden rake. However, variety is the key to success because each material brings its own unique blend of other nutrients to the compost pile. For example, grass clippings contain approximately 3.5% Nitrogen, 0.75% Phosphorus, and 2.5% Potassium, and they can be easily collected during the warm months when dried leaves may not be readily available.

Approximate Carbon/Nitrogen Ratios for Different Compost Materials

Ratio	Compost Material	Ratio	Compost Material
15:1	Kitchen Food Scraps	35:1	Fruit Waste
16:1	Human Waste	60:1	Leaves
17:1	Grass Clippings	60:1	Corn Stalks
20:1	Cow Manure	80:1	Straw
25:1	Horse Manure	85:1	Pine Needles
25:1	Vegetable Waste	170:1	Paper
26:1	Oak Leaves	400:1	Sawdust

Water Requirements (and the Top of the Compost Pile)

Do **not** let the compost pile get too dry or too wet. Either extreme is not good for the normal composting process. The moisture level inside the pile should be about the same as a wrung-out sponge. If you wear a rubber glove and you withdraw a handful of compost from inside the pile, and you squeeze it tightly then you should be able to extract one or two drops of water.

If you live in a **wet climate** with good rainfall then your compost pile should have a round domed shaped top to help shed rainwater. However, if you live in a **dry climate** with minimum rainfall then your compost pile should have a concave bowl shaped top to capture and diffuse rainwater into the compost pile.

Temperature Requirements

During the **summer months** periodically check the temperature **inside** the compost pile.

The easiest way to determine the temperature inside your compost pile is to use a special compost thermometer with a 20-inch stem. Or you could use any thermometer with a stem, such as an instant-read meat thermometer, but you must reserve that thermometer for this one specific application. If your thermometer has a 6-inch stem then dig a small temporary 14-inch deep hole in the compost pile and push the stem of the thermometer into the bottom of the hole to take a reading. Then remove the thermometer and fill in the hole.

The optimal **temperature** range for rapid **decomposition** is between 90ºF to 140ºF (32ºC to 60ºC). If the internal pile temperature drops below 90ºF (32ºC) then the normal decomposition process slows down significantly. If the temperature rises above 140ºF (60ºC) then **all** the microorganisms in the pile will die, including the beneficial ones.

Fortunately the harmful microorganisms in human waste are destroyed at temperatures between 131ºF to 140ºF (55ºC to 60ºC) or slightly higher. But the beneficial microorganisms that facilitate the compost process are not destroyed until the temperature exceeds 140ºF (60ºC). Therefore the pile should be "turned" if its internal temperature exceeds 140ºF (60ºC).

After the **final batch of human waste** has been added to the compost pile and the pile is approximately 3 feet in diameter and 3 feet high, then pile temperature management becomes extremely important. If the temperature inside the compost pile can be kept at 131ºF (55ºC) or above for **at least three consecutive days** then all the harmful microorganisms **inside** the pile will die. To kill the microorganisms on the **outside** of the pile, the pile must then be "turned" over with a shovel so the outside of the pile is now on the inside of the pile, and a minimum internal pile temperature of 131ºF (55ºC) must be maintained for **at least three more days**.

After all the harmful microorganisms have been destroyed, then the pile temperature can be allowed to fluctuate anywhere in the range between 90ºF to 140ºF (32ºC to 60ºC) and the pile will continue to decompose properly.

Compost Pile Management and Oxygen Requirements

Manage the human waste compost pile just like any other garden compost pile.

Live Earth Worms: Worms are extremely beneficial to have inside your compost pile. Therefore if you find some earth worms in your garden soil then you should carefully transfer them to your compost pile and they will multiply.

Safety: Tools and equipment used on the compost pile should **not** be used anywhere else. As a health safety precaution you should wear rubber gloves, and you should wear a face dust mask when turning your compost pile to prevent the inhalation of any fungi or mold spores that may be present in your compost. When you are finished remember to wash your hands thoroughly.

Oxygen and Moisture: Do **not** cover your compost pile with a sheet of plastic because it will deprive your pile of necessary oxygen and moisture, and your pile may get so hot it will kill the beneficial microorganisms that are necessary to properly decompose your compost materials.

Turning the Pile: Once a week during the **warm summer months** wear rubber gloves and use a pitchfork or shovel to move (turn) the entire pile a short distance to the side so the previous **top and outside** of the pile are now on the **bottom and inside** of the pile. This will add fresh air into the pile so the aerobic bacteria can more easily facilitate the composting process. It will also help to control the odor of the pile and it will shift any freshly laid insect larvae from the outside of the pile to the inside of the pile where they will be destroyed. If possible, turn the compost pile when the internal pile temperature drops below 90ºF (32ºC) or rises above 140ºF (60ºC), or if the pile begins to stink. As the composting process nears completion the internal pile temperature will remain below 90ºF (32ºC) even after the pile has been turned and it will continue to gradually get cooler and cooler.

Summer Temperatures: Under ideal conditions the internal compost pile temperature can reach 150ºF (66ºC) or higher during the warm summer months. When the compost pile temperature gets above 140ºF (60ºC) the beneficial compost microorganisms begin to die. However, any unusual rare exotic harmful microorganisms that might also be present will also be destroyed. Turning the compost pile when its temperature gets too high will bring its temperature back down to an acceptable level.

Winter Temperatures: The compost pile will be relatively inactive during cool and cold weather and if it is simply left alone it will continue to decay slowly and gradually into usable compost.

Waiting Period: Sometime after adding the **final batch of human waste** to a compost pile, the internal pile temperature must be kept at or above 131ºF (55ºC) for at least six consecutive days. After all the harmful microorganisms have been destroyed, the pile should then be allowed to naturally decompose for **at least one-year** before using the compost in a garden area. This means you will need to have at least two or more compost piles so you can add fresh human waste material into a new compost pile while the old compost pile matures. After one-year when the compost process is complete the compost will consist of humus that can be safely used to enrich the soil in a garden plot that can be used to grow vegetables for human consumption.

Finished Compost Characteristics: The compost process will be complete when the compost has a uniform crumbly texture, a dark-brown color, and it has a pleasant slightly sweet aroma like fresh top soil. If you can **easily** recognize large pieces of your original covering materials, or pieces of food scraps, then the composting process is not yet complete.

Final Caution

If the internal compost pile temperature **cannot** be kept at 131ºF (55ºC) or higher for at least six consecutive days during the summer months, then the compost will contain microorganisms that are fatal to humans. Therefore the minimum internal pile temperature is critical to the success of this process. Higher temperatures are better but a temperature lower than 131ºF (55ºC) is unacceptable.

If you are **not** sure if the temperature inside your compost pile was high enough during the summer to destroy all the harmful microorganisms, then fully cook any garden produce from your garden and do not eat any of your garden vegetables raw. Fully cooking their garden produce is the procedure many oriental countries currently use to avoid serious health problems when they use "Night Soil." (Note: In most cases these oriental countries do not follow the above instructions and they simply discard their human waste directly into their garden areas. This is **not** a safe way to utilize human waste and you should **never** be tempted to follow this unsanitary method even if it does has a history that is several centuries old.)