

## Nutrient Cycling: “Close Your Energy Loops; Waste = Food”

Compiled by: Marisha Auerbach [queenbee@herbnwisdom.com](mailto:queenbee@herbnwisdom.com)

“In former times, alchemists tried to turn ordinary materials into gold. Modern society is inclined to laugh at the very idea, but is itself based on something foolish; to take pristine natural resources and turn them into pollution. It is kind of alchemy in reverse.” -Peter Harper & Dave Thorpe

### Greywater

Greywater is household wastewater from the sink, shower, and washing machine drains- but not the toilet. This water may contain traces of dirt, food, grease, hair, and household cleaning products. Depending on your preferences, it can be reused in a variety of ways including: in the the toilet, washing machine, to water house plants, and in the garden.

**Phosphate based detergents** are pollutants when released into rivers, lakes, and estuaries. In the home garden, they contain important nutrients that can be channelled to the plants that need them most.

**Sodium based detergents** are often recommended for systems on the grid. Sodium will harm the soil structure and cause a hardpan crust to develop.

#### Greywater Guidelines

1. Don't store greywater for more than 24 hours.
2. Minimize contact with greywater.
3. Observe the percolation rate of your soil. Aid absorption rates by building mulch basins.
4. Keep your system as simple as possible. Avoid pumps and filters that need maintenance.
5. Plan to use gravity when possible.
6. Match your plant nutrients and irrigation needs with the amount of greywater they'll receive.
7. Avoid using perforated pipes and other materials that may tend to clog up.

### Living Machines

**Living machines** provide biological wastewater treatment, mimicking the functions in nature of a wetland ecosystem. Aquatic and wetland plants, bacteria, algae, protozoa, plankton, snails, clams, fish, and other organisms are used in the system to provide specific cleansing or trophic functions. In temperate climates, the system is housed in a greenhouse to enhance the rate of biological activity. Living machines were developed by John Todd.

### Composting Toilets

“The cause of the exhaustion of soil is sought in the customs and habits of the townspeople, ie in the construction of water closets, which do not admit of a collection and preservation of the liquid and solid excrement. They do not return in Britain to the fields, but are carried off by the rivers into the sea. The equilibrium in the fertility of the soil is destroyed by this incessant removal of phosphates and can only be restored by an equivalent supply.”-Justus von Liebig, in a letter to the Prime Minister of Britain

#### Composting Toilet Guidelines

1. Keep it dry. Add carbon after each deposit
2. Don't pee in it. Too much nitrogen causes odors.
3. Pathogens are killed by the combination of high pH and the inhospitable dry environment.
4. Wastes are broken down by micro and macroorganisms.
5. Compost humanure for one year at 104°-122° Fahrenheit (40°-50° Celsius)
6. Apply to trees, shrubs, cut flowers.
7. Do not apply to leafy green vegetables.