PERMACULTURE NETWORK IN MALAWI

Issue # 51: Drought Season is Mulch Season **January-April 2006**

In This Issue

Don't Burn!

Burning your organic matter is like buying fertilizer and dumping it down your chimbuzi!

That's a Lot of Water!

Liters of water required to produce 1kg of food:

Potatoes	500
Wheat	900
Sorghum	1110
Maize	1400
Rice	1910
Soya beans	2000
Chicken	3500
Beef	100,000

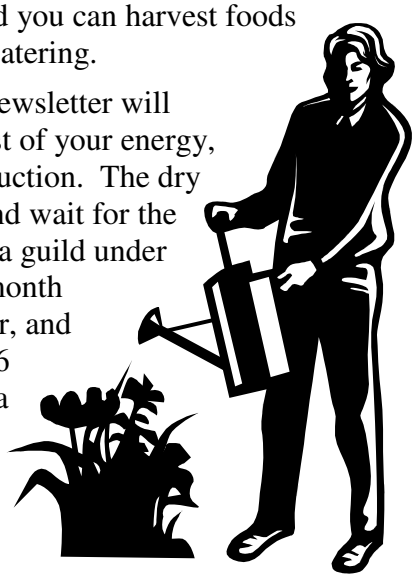
Source:
New Scientist, 1.2.97
www.ibiblio.org

Re-Hydrating the Dry Season

It seems that we've gotten our seasons all mixed up. If a person is using Permaculture principles, the time that they get to relax is during the rainy season. Once your plants are in the ground you get to kick back and allow nature to produce your food and work for you.

Unfortunately, this is when we see most people in Malawi working the hardest…weeding, hoeing, applying fertilizers, spraying chemicals, and ridding their fields of precious organic matter. After harvest, many people spend the rest of the year using up their profits, eating their yields, and waiting for the next rains to come. This, however, is when people who practice Permaculture really start to farm. This is the time of year that we begin collecting seeds, returning all organic matter to the soil in the form of mulch, harvesting excess foods, and making compost piles all over the place. The dry season is a wonderful opportunity for us to get our soil fertility improved. It is the season of "return". We need to repay the kindness that the soil has shown to us throughout the rains. This is a common cultural practice in Malawi: if you get a gift in a bowl, you never return the bowl empty.

This is also the time of year that we start to look at watering some of our plants to help ensure a year-round food supply. If you have been using water conservation techniques such as mulching, water harvesting, and the interplanting of perennial (year-round) plants, then you should be able to minimize your watering and the amount of energy that it takes to maintain your food supply. Many foods don't even need water during the dry season. Things like fruit trees, tubers, and deep-rooted plants such as pigeon peas, *kabaifa, or khungudzu* (types of local beans) will reach maturity during the dry season and you can harvest foods from them with no additional work or watering.



For things that you want to water, this newsletter will discuss ways that you can make the most of your energy, of your watering, and of your food production. The dry season is not a time to sit under a tree and wait for the next rainy season, it is the time to build a guild under that tree. Malawi is blessed with a 12-month growing season, we have access to water, and we have hundreds of foods in all of the 6 food groups that we can be growing on a year-round basis. So let's take advantage of every season that *nature* gives us and eliminate the only season that we as *humans* have created…the "hungry season".

Receive the newsletter electronically

If you would like to join the Permaculture Network in Malawi's e-mail group, or get the newsletter electronically, contact the Nordins at: nordin@eomw.net

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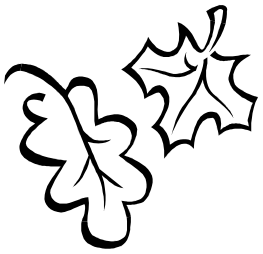
*** Access to yahoo accounts are hard right now, please use all e-mail addresses to reach us!**

Mulching…Nature's Blanket

The following information has been printed from the Natural Resources Conservation Service's website http://www.nrcs.usda.gov/feature/backyard/Mulching.html

Mulching is one of the simplest and most beneficial practices you can use in the garden. Mulch is simply a protective layer of a material that is spread on top of the soil. Mulching:

- protects the soil from erosion
- reduces compaction from the impact of heavy rains
- conserves moisture, reducing the need for frequent watering
- maintains a more even soil temperature
- prevents weed growth
- keeps fruits and vegetables clean
- keeps feet clean, allowing access to garden even when damp
- provides a "maintained" look to the garden



Organic mulches also improve the condition of the soil. As these mulches slowly decompose, they provide organic matter which helps keep the soil loose. This improves root growth, increases the infiltration of water, and improves the water-holding capacity of the soil. Organic matter is a source of plant nutrients and provides an ideal environment for earthworms and other beneficial soil organisms.

Mulch Materials: You can find mulch materials in your own yard! Lawn clippings make excellent mulch. While not particularly attractive for a flower bed, they work wonderfully in the vegetable garden. The fine texture allows them to be spread easily even around small plants. Newspaper, as a mulch, works especially well to control weeds. Leaves are another readily available material to use as mulch. Leaf mold, or the decomposed remains of leaves, gives the forest floor its absorbent spongy structure. Compost makes a wonderful mulch if you have a large supply. Compost not only improves the soil structure but provides an excellent source of plant nutrients.

On the Farm: Farmers use mulches in many ways. Conservation tillage is a common practice that creates a mulch on the soil surface. Unlike the once common practice of plowing all crop residue into the soil, conservation tillage leaves the crop residue on top of the soil. These pieces of maize stalk, straw, or bean stems help protect the soil against wind and water erosion. Maize crops harvested for the grain return large amounts of residue to the soil surface and are more effective in preventing soil erosion than crops with less residue such as soybeans. Research is also showing that leaving crop residues helps hold carbon in the soil and aid in reducing greenhouse gases.

Reduce – Reuse – Repair – Recycle…Water Sources

Many people feel that they don't have enough water during the dry season to grow any food. But is this true? Take a look at every drop of water that you are using. Did your rain gutters and drains direct all your rain water into water harvesting systems or did they channel it all away from your property? Do you have water left over after washing clothes, dishes, the house, or yourself? Is there standing water at the end of your borehole? Is water dripping down beneath your *thandala* (drying rack)? Where does your *bafa* (bathing) water go? Do you have a sink that is letting water run out of your house and into an underground soak-away pit? What do you do with this leftover water? Many people simply let it go to waste by throwing it on bare soil. If we start to use the principles of reduce, reuse, repair, and recycle we see that we can get a lot more use out of the water that we are using.

Reduce: By using things like mulch and compost, we can greatly reduce the amount of water that we are using. Organic matter in our soil acts like a sponge to absorb and hold the moisture in our soil. It also helps to shade the soil from the drying effects of the sun, making our water last even longer. Many people who practice Permaculture only have to water their mulched guilds once a week, whereas their neighbors may be watering their bare-soil raised beds 2-3 times each day! We should also water deeply and evenly. The use of sprinkler systems tend to lose a lot of water to evaporation before it even gets into the soil. Watering cans, buried pot watering, upside-down bottles, and drip irrigation systems all help to get water directly to the plants that need it while reducing waste. This will save you time, money, and energy.

Reuse: All of our water should be reused as many times as possible. If you collected rain water in a catchment tank or container, then this water should be used to help you with your household tasks like washing clothes or mopping floors. Any water remaining from these tasks should then be applied to your mulched guilds. Any standing water such as that found at the end of boreholes and bathing areas should all be converted into "islands of food". Plants will take advantage of the nutrients found in this water and the roots will absorb it so that there isn't any standing water to attract mosquitoes. In the end you will receive nutritious food throughout the year with very little work involved. Remember, you can't eat a pit filled with bricks…well, maybe you could but you'd probably get more nutrients from a papaya or a banana.

Repair: Make sure that you repair all leaking water pipes, taps, and faucets. These leaks may seem small, but they can really add up to a great deal of wasted water over time. One suggestion that has been made is that you can make a community garden at the end of a borehole and sell all the produce. The profits of these sales could be put towards the borehole committee's future repairs and replacement parts.

Recycle: You can recycle old plastic bottles or bicycle tire tubing to help you redirect water drains from your house into your guilds. As long as this water doesn't contain chemicals or human manure, it will be safe to use. Many kitchen drains end up washing away a lot of food scraps, tea grounds, and other bits of organic matter that can help to feed our soil. If these nutrients are flushed into an underground pit it doesn't do much good for helping us to grow more food.

Always Something to Eat with Permaculture!

Chigwada—"The Cassava Tree". Chigwada is a member of the cassava family, but instead of developing an edible tuber, this plant grows into a large tree with edible leaves. The leaves of this tree remain edible throughout the entire dry season (without irrigation) and may also be used as fodder for cows, goats, or rabbits. It is a very easy plant to propagate. Just take a cutting of the tree, plant it about 15-30 cm deep in the soil (depending on the size of the cutting) and then keep the soil around it watered about once a week. If you plant these truncheons during the beginning of the rainy season then you don't even have to do the watering. Just from one tree in our yard this year we cut and planted about 40-50 more trees! That's a lot of food!

Air Potato (Dioscorea species)—This plant is a member of the yam family, but the main difference is that the tuber grows on the vine rather than under the ground. The "potatoes" grow up to 10 cm and may be cooked and eaten just like a normal potato. They also store very well through the entire dry season, so you can eat them right up until the next rains come. Keep them stored in a cool dry area and they will start to sprout when they are ready to be planted again. Once they sprout, simply plant the whole tuber in the ground near a tree or other supporter and watch them climb. Once you have planted an Air Potato, it will continue to grow each year in the same place. It will go dormant during the dry season and then grow again bigger and with more potatoes in the following years. Not only is this a great staple crop, but it's also fun to grow and show other people! (Note: there is a poisonous variety of this plant but the tubers look different with bumps on them and more oval, plus they tend to be much smaller).

Mtowo (Snot Apple)—This indigenous fruit is ready to eat after the rains end. Its fruit grows into small balls that split into five sections when it is ripe. It has an "apply" taste, but gets slimy when chewed. Some people also call this fruit "African Bubblegum". The tree grows easily from seed.

From the Members... Leo Kuwani

Original Home

Nature is our original best home therefore we have to protect and maintain it. We can protect and maintain our original home by:

- Conserving nature—that is "the environment as a whole" by observing nature's laws
- Supplying ground cover
- Avoiding bushfires, overgrazing, and tilling on very steep slopes and close to lakes or river banks
- Avoiding land degradation and deforestation caused by digging the land carelessly and cutting trees without replacing them

Have we thought of our original home? It was free from polluted air, water, and land. The home was as clean as paradise. Everything found around was very useful and beautiful to humans and other living things. Think of how our ancestors lived. They lived in a living home. They had everything around: trees and grasses supported them with fresh air and other things they needed.

We can even think of "living halls" if we can plant trees as our focal points. These are places where we can hold our conferences, meetings, seminars, or sit for a long time without getting tired or bored.

What about the living fences? If we create them made of bricks, are we encouraging land degradation, deforestation, and a poor environment?

These last three are where we can observe the wisdom of nature. Nature never monocrops, plants in a straight line, nor sweeps. Nature is a place where micro climates are, and we can find all living things around. Later these living things assist us in our living systems. Every element assists each other. Think of our homes and communities, do they suit to the wisdom of nature? Let's cooperate with the wisdom of nature so that we do not complain about the outcomes. Join the Permaculturalists, practice Permaculture principles, retain nature's wisdom and you will be rewarded with blessings. Conserve and save Mother Earth as we are organizing our communities using available resources. Bravo! Balanced community means balanced health in our *original home*.

How to Avoid a Drought...Lessons learned by Kristof Nordin

According to the dictionary, *drought* is defined as "A long period of abnormally low rainfall, especially one that adversely affects growing or living conditions." Unfortunately, people who study climate change are predicting that Malawi is *more* likely to face drought and erratic rainfall in the future. Are we preparing for this or are we continuing to just hope for good growing seasons?

Maize…the best choice for Malawi?

Maize originated in Central and South America and was introduced to Malawi in the late 1790's, but it didn't really become the main staple crop until the 1940-50's when it was strongly pushed by Dr. Banda's government. There are many agricultural books that speak of plants like sorghums and millets being the main

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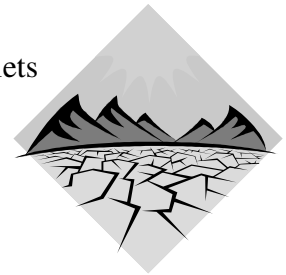
staples. When we ask the grandparents what they used to eat, the main response is "nsima". But when you ask an older person what that nsima was made from you usually get a wide variety of answers such as: millet, sorghum, cassava, maize, green bananas, yam roots, etc. The wide variety of foods that we used to grow and rely on in Malawi have adapted themselves to our growing seasons for thousands of years. They have made it through floods, drought, fires, disease, locusts, and other hard times. They are the strongest of the strong. Maize, on the other hand, was not used to growing here and has had to be adapted (through hybridization and naturalization) over the years to the changing growing conditions. For this reason, maize is often much more susceptible to changes in weather patterns and natural disasters than many of our local plants. Too much rain and the maize fails, too little rain and the maize fails, if the army worms come the maize fails…and on and on, making the "hungry season" even worse every year.

The 2001-2 Hungry Season

The last time we had a bad growing season was 2001-2002. During this time we saw a lot of people complaining of hunger and for various reasons the maize reserves ran short. It was also during this time when we were people were starting to share lessons that they were learning. I remember being in a room with people from all over Malawi. We were sharing our experiences of how bad the "hungry season" was in our areas. Most of the people were saying that it was quite bad—people were begging for food, crime was up, the hospitals were full, etc. Then I remember one person from the Karonga area stood up to speak. He said, "You know what? We should be pretty bad off. We planted our maize and a flood ruined most of the crop. But it was early enough in the season so that many of the people replanted their maize. Then we had a drought that caused the maize to fail again. So we should all be starving, but we aren't. The reason is because people by me still eat nsima made from cassava, we eat rice from the lake shore, and many people also use green bananas and sweet potatoes as a staple food."

This conversation has stuck with me until this day. Just by diversifying their diets with four extra staple crops, the people of the Karonga area were able to make it through a flood *and* a drought whereas the rest of the country was suffering. Did you know that there are about 50 staple foods that we could be growing?



The 2005-6 Hungry Season

Again, we heard reports of widespread drought causing hunger throughout the country. When the rainfall maps were released, however, it was revealed that the majority of the country had actually received 100-125% of the normal rainfall for the year. What the maps didn't show was that the rains were erratic. There were gaps in the rains that affected the year's maize harvests. So was it a drought? Parts of Mozambique had less rainfall than we did, but we were importing maize from them. When asked about this, many people replied, "Yes, but their soil is better." EXACTLY!

Through the use of Permaculture principles, we have been able to improve the soil at our house so much in two and a half years that when all of our neighbors were experiencing a "drought" we didn't have one. By using water conservation techniques such as mulching, composting, and the four S's (stop, spread, sink, shade) we were able to make it through the erratic periods of low rainfall. Even our maize grew well. Organic matter acts like a sponge in the soil, soaking up the water and holding it for long periods of time.

But even if our maize had failed, we still would have had our drought resistant staple crops to eat such as: chilazi (yams), chinkowe (air potatoes), mapila (sorghum), mawere (millet), buye (local potato), coco yams, chinangwa (cassava), mbatata (sweet potatoes), and ntochi (green bananas) that were planted in pits to hold moisture. Not to mention all of the other foods from the rest of the six food groups.

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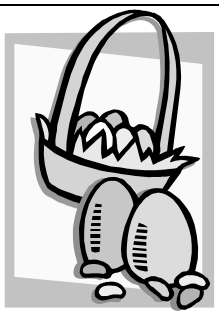
Putting All Our Eggs in One Basket



What happens when a person puts "all their eggs in one basket"? If that basket happens to drop, all the eggs are destroyed. This is very similar to what we are doing in Malawi by basing all of our food needs on one crop—maize; in one season—the rainy season. Each year, the whole country is planted with maize in hopes of a good growing season. But what happens when we really do receive a true drought and not just erratic rains? Kenya this year experienced such a bad drought that cattle were dying and tribal disputes were erupting over the rights to the few remaining water sources. If and when Malawi goes through a drought like that we will see almost all of the maize fail leaving virtually nothing for people to eat. Don't wait for this to happen. Start preparing now for growing and harvesting a wide variety of foods from all the six food groups throughout the year, and not just during the unpredictable rainy season.

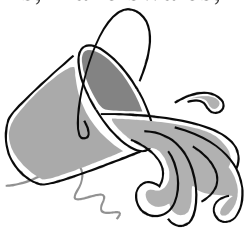
The Dry Season…what can we do?

Mulch—The dry season is a great time to prepare for drought (and floods, and diseases, and pests, etc). Take advantage of this time to cover all your soil with a thick layer of mulch. You can find and use crop residues, grass cuttings, sweeping piles, leaves, market piles, maize husks, vines, bean pods, or whatever natural materials you have access to. The termites and other small insects and animals will break this down for you so that it's ready to use for the next rainy season.

Compost—You can also make compost piles to speed this process up. Using the same type of organic matter that you would use for mulching, simply layer it all together and keep it moist. After about three weeks give the pile a turn, continue to keep it moist, and in about another three weeks it should be ready to apply to your Permaculture guilds. This compost will add nutrients and helpful microorganisms to your soil as well as helping to conserve moisture.

Collect Seeds—Use this time to find and collect seeds from as many different foods as you can. This is the time of year that many plants go to seed. So the next time you are walking through a field, in a forest, or anywhere that local foods may grow, make sure that you collect as many seeds as you can to add to your guilds. Many local plants are extremely drought resistant as well as being able to grow well in depleted soils. This will help to ensure food security throughout the year even when maize may be failing, as well as helping to reduce the amount of inputs you will need to buy to grow your food.

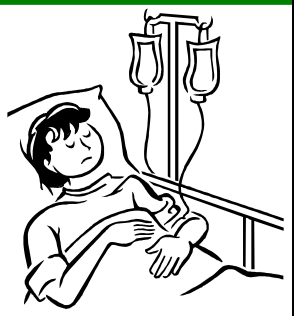
Prepare for water harvesting—Use the dry season to build your systems that will collect next year's rains. Find old containers to catch water from your buildings, build water tanks, make swales, dig pits, create drainage systems that direct water onto your land rather than away from it, reduce your sweeping so the organic matter can help your soil absorb water, plant trees, protect your wells, plant at the end of boreholes.



Use Your Water—Make sure that you are using every bit of available water to grow food throughout the dry season. Reuse all of the water that you use to wash clothes, bathe, wash dishes, and clean the house with. All of this water can be used to irrigate small guilds that can provide you with fresh foods right up until the next rains come. Look around for other areas of unused water such as at the end of boreholes, underneath water taps, outside of bathing areas, and even underneath your dish drying racks. These are all areas that can feed and support food crops and fruit trees.

With just a bit of forward thinking, a dash of preparation, a pinch of creativity, and a large portion of useful plants, we have the recipe for avoiding drought and getting the most out of all of our seasons.

Creating Permanent Organic-Rich Beds



Current maize farming practices in Malawi are causing a number of problems. First of all, there is the over-reliance on a single crop to produce all of our food for the year. This leaves us very vulnerable to things like erratic rainfall, drought, floods, pests, and diseases. It also plays a large part in the problems that we are seeing with malnutrition. Our bodies need about 46 different nutrients to stay healthy and strong. *Ufa woyera* (white maize flour) primarily *only gives us one* of these nutrients—carbohydrate. Without nutrients our bodies don't develop properly and we become weak and sick.

Despite popular belief, food security does NOT mean maize security.

We could import all the maize in the world to Malawi and we'd all be full, but we still wouldn't have a well-balanced nutritious diet. The actual definition of food security means that all people, at all times, have access to the foods that they need to live a healthy life. In order to have true food security, we need to be growing and eating a wide variety of plants from healthy organic-rich soils.

Our current agriculture puts almost all its emphasis on chemically-fertilized maize production. All the other nutritious foods that we *should* be growing and eating, as well as the organic improvement of soil fertility, are an afterthought.

There are hundreds of foods in Malawi for us to choose from that are well-adapted to our growing seasons, grow well without a lot of expensive inputs, and can give us food throughout the year. As we are planning what to grow we need to keep the six food groups in mind: fruits, vegetables, legumes & nuts, fats, animal products, and a wide diversity of staple crops. If we want to eat healthy, we have to grow healthy!

A big problem that our current maize-based agriculture in Malawi has created is called, "**hard pan**". Each year in Malawi, people who are farming maize make a ridge and then a pathway and then another ridge and another pathway, etc. all the way through their entire fields. During the growing season, people are walking up and down these pathways preparing planting stations, applying fertilizers, weeding, harvesting, etc. The following year, the ridges are moved to where the old pathways were and we walk up and down the new pathways where the old ridges were. All of this walking up and down in our fields compacts the dirt to the point that the water from the rains can no longer penetrate and sink down deep into our soil. For the last 50 years or more then we have been moving the same tired soil back and forth and compacting entire fields. Combine this problem with the problem of removing all the organic matter from the fields, and we have a real water crisis!

Studies that have been done now show that there is actually a dry layer of soil below our maize fields that is not receiving water anymore. This means that even during the rainy season our water table is continuing to drop causing boreholes, wells, and rivers to run dry very quickly. The excess water that isn't sinking into our soil is running off into streams and rivers causing flash flooding, destruction of infrastructure, loss of crops, and a great deal of other problems. Plants and young trees that are not able to penetrate through the dry layer of soil will dry out quickly and die during the dry season.

So what can we do? There are always solutions. and with Permaculture these solutions are not just a temporary fix, but rather permanent systems that continually renew themselves and get healthier each year. The diagrams below are an example of one of these solutions. It is adapted from the ideas and work of a man named Francis Shaxson. Mr. Shaxson lived and worked in Malawi in the area of agricultural research for over 20 years, and then left to do similar work in other parts of the world. He currently resides in the UK. The diagrams below show how you can take a typical field and eliminate the problem of "hard pan", while at the same time increasing your soil fertility, increasing your crop production, increasing the amount of productive land you are using, and also increasing your food *and* nutrition security.

Figure 1—This picture shows one of the problems of our current agricultural practices known as "hard pan". Due to the compacted dirt in fields, the water from the rains runs right into our pathways and out of our fields before the soil has a chance to absorb it. This runoff washes away valuable topsoil, leaches nutrients, causes erosion, carries away fertilizer, and leads to flooding of low-lying areas. *(Continued on next page)*

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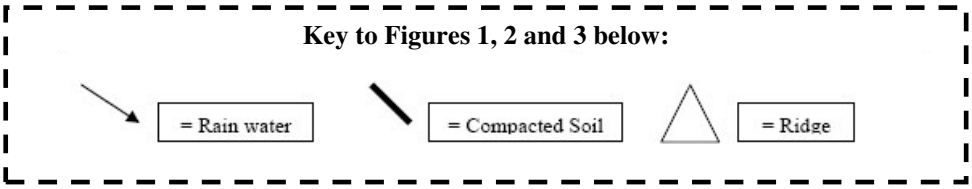
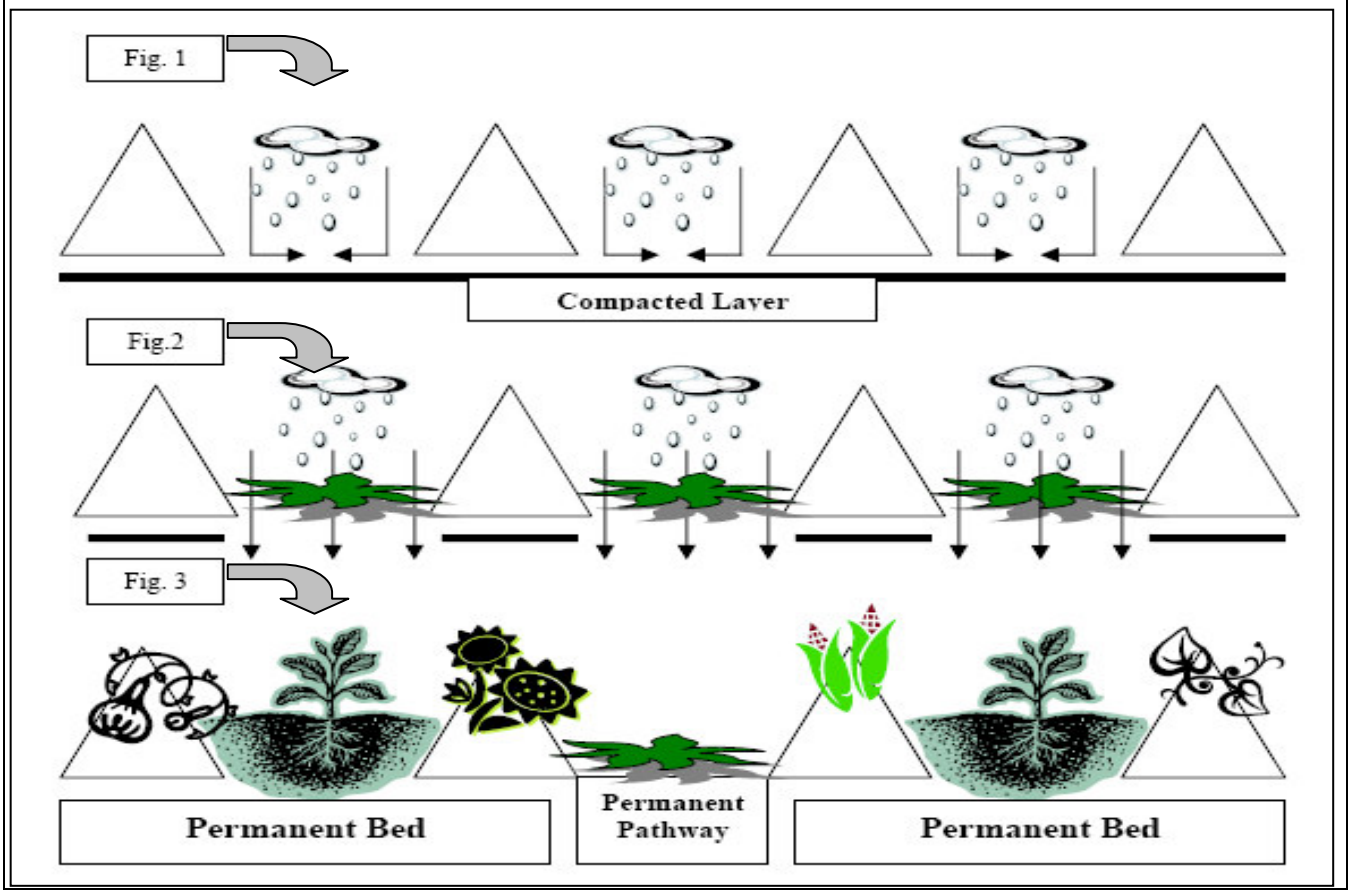
Figure 2—In the second picture, we see how we can start de-compacting our soil and bringing back its natural nutrients. This can be achieved by leaving organic matter in the pathways. Any organic matter can be used: green plants that have been removed from the ridges, leaves, harvest residue, sweepings, etc. Leave this organic matter in the rows and it will break down into compost. This will attract beneficial insects, such as: termites, worms, millipedes, ants, etc. that will open up your soil for you without digging. The decomposition of this organic matter also releases nutrients into the soil that the plants will be able to use as the rains filter them down into the earth.

Figure 3—This picture shows how to eliminate half of the pathways ensuring that the soil in your field stays "breathable" and continually avoids the effects of "hard pan". This creates *permanent* organic-rich beds that will help to ensure that crops get all the nutrients they need for proper growth as well as helping rain water to sink into the soil without causing runoff. This also puts more of your field into production since every other pathway is now converted into useful farmland. You also create permanent pathways, so the beds that you are using for food production will never be walked on again. The pathways and beds should continue to receive organic matter, allowing them to absorb rainwater and reducing the effects of runoff, making them even better than the year before. These beds should be intercropped with a variety of staple crops such as: maize, millets, sorghums, cassava, sweet potatoes, etc. As well as nitrogen-fixing legumes such as: pigeon peas, beans, nzama, groundnuts, etc. And then the rest of the food groups should be incorporated in appropriate places as well: vegetables, fats, fruits, and animals.

Our Experience: We achieved Figure 3 in one growing season on a 16-row field. We chose to grow 2 types of millet (Mchewre and Mawere), cassava, several types of legumes (pigeon pea, ground beans, lablab (khungudzu)), and many types of local vegetables (pumpkins, okra, leafy vegetables) and fruits (sorrel, melons). Give it a try for yourself, starting small if you like, then building up as your confidence and amazement grows!





Free Fertilizer...without subsidies or vouchers!

Reprinted with permission (slightly edited). Ron Williams is a Freelance writer as well as being a Horticulturist and a Rehabilitation Therapy Aid at a Psychiatric Hospital in Brisbane, Queensland, Australia. He writes ezines for wz.com. He runs his own Website called Bare Bones Gardening http://www.geociites.com/impatients63 . He also owns a discussion group about Australian Gardening, called Austgardens at http://www.groups.yahoo.com/group/austgardens

Free Urea-Based Fertilizer

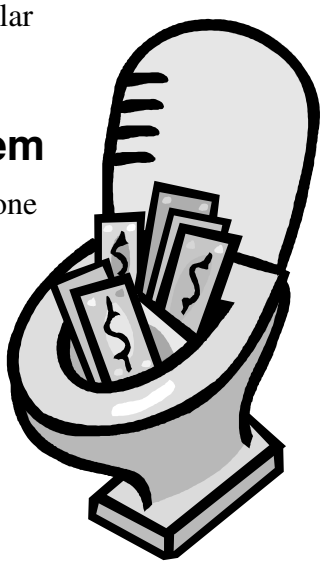
Human urine makes an excellent high nitrogen liquid fertiliser for most plants. Dilute it 10 to 1 and pour it over and or round fast growing plants once a week to push along rapid green growth.

Studies indicate that each person's waste fluids can provide enough nitrogen, phosphorous and potassium to grow a year's supply of wheat and maize for that person. According to some studies, human waste can be an even more effective fertilizer than animal manure.

Urine, which comprises 90 percent of human waste, contains about 80 percent of our waste's fertilizer value. It can be applied to field crops without treatment because it is generally sterile. By the way, "fresh urine" does not contain any bacteria, unless the person has a urinary tract infection, so you could even use it to wash out wounds without causing any infections.

Human urine can be used as an alternative to chemical fertilizer to reduce pollution in air, water and soil and help avoid or control other environmental hazards which surface due to the use of chemical fertilizer, Human urine contains nitrogen, phosphorous and potassium at a much higher ratio than in commercial fertilizers and is environmentally safe to use.

If you want to use urine to fertilize your gardens, keep in mind that when urea becomes ammonia, it also becomes volatile and part of it strips into the air. Both ammonia and nitrates are also very soluble and if not picked up by plant's root systems can enter groundwater with the irrigation water. So it would be best to keep gardens moist but not over watered, but these are similar problems faced by people who use other forms of fertilizers.



Problems urine causes in the current flush system

- Most toilets use between 50 and 100 litres of water daily to flush away one to 1.5 litres of human excrement.
- Urine is the largest contributor of nutrients to waste water, estimated as 50% of phosphorus and 80% of nitrogen.
- The high level of nutrients in sewerage runoff leads to the consequent growth of algae, resulting in the lack of oxygen and the death of plants and animals on rivers, estuarine and sea beds.

Problems Chemical Fertilizers cause

Serious environmental hazards are often associated with the use of chemical fertilizers. In industrialized countries, for example, indiscriminate use of these substances has polluted water supplies. Dangerously high levels of chemicals have been reported in nearly one-fourth of Europe's groundwater supplies.

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Advantages of Urine as a Fertilizer

Urine	
Carbon	11-17%
Nitrogen	15-19%
Calcium	4-6%
Potassium	3-5%
Phosphorus	2-5%

One advantage in using urine as a fertilizer is that much of the urine is available in ideal chemical forms: nitrogen is in the form of urea (ammonia/ammonium which is present at concentrations of approximately 3.5 g/l), phosphorus as superphosphate and potassium as an ion. Urine is almost free from heavy metals - for example, cadmium - because even if we ingest them, they will tend to bind to the liver and kidneys, making the urine much lower in such contaminants than commercial fertilizers.

Urea outside the body quickly becomes ammonia and will be oxidized by special bacteria (called nitrifiers) into nitrates. All these 'reactive' nitrogen sources can be used to form amino groups for new amino acids, thus then being made into proteins. So make other steps to encourage the soil life in your garden, for example, things like mulching, etc.

- It helps conserve pure or town drinking water
- Reduces the rate and amount of chemical fertilizer runoff into the groundwater and surrounding waterways
- Reduces the amount of sewerage runoff
- Reduces nutrient build-up in waterways and estuaries and oceans
- Reduces your gardening costs, because of less reliance on buying chemical fertilizers.

Uses of Diluted urine

Probably best used for non-edible plants, green manure crops and fruit orchards, though there is some usage being noted for edible crops. Apply in under fruiting plants, not onto foliage and fruits.

Diluted urine is also a good additive to a compost pile. Urea also helps break down lignin, accelerating the decomposition of woody materials. On the other hand, urine from somebody with a urinary tract infection or from unknown sources should probably be pasteurised or put in a long-term compost pile (of a year or longer) before it is used on food crops.

When using a urine fertilizer in container plants, a 10:1 (water: urine) ratio can quickly burn plants in medium to small containers because of the salt and urea build-up, even at a 15:1 dilution rate is very strong for the medium to small containers. While at 20:1 you can use it more frequently (once or twice a week) with good benefits and little danger.

Unfermented urine can supposedly be sprayed as a fungicide. Indigenous people in south eastern Mexico claim that the use of urine as a fungicide was a traditional Mayan practice. However there needs to be a lot more research as to the validity or not of their claims.

While in Korea, they spray the undiluted urine as an insecticide, but again I do not know of any research to prove or disprove their claims.

So why not get out there, and help the environment by assisting in reducing the nutrient flow into the natural ground water and water ways, while saving yourself a bundle in fertilizer costs.

Permaculture Network in Malawi

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Next Issue's Theme:
Nutrition through the eyes of Permacutlure