Permaculture Agriculture – The Transition to a Sustainable Future

“We cannot solve our problems with the same level of thinking that created them.” Albert Einstein.

Permaculture stands for permanent culture. It is an ecological method of design that shapes many practices, including farming.

The term permaculture was first coined by two Australians, David Holmgren and Bill Mollison. However, many of their design ideas were inspired by Masanobu Fukuoka’s sustainable farming methods. The founders of permaculture recognize that a change in farming is needed. A change in culture is needed as well – a change in the way we view the world.

American culture, and indeed Western culture, often sees human beings as somehow separate from nature, that nature is out there and we are in here. Anthropologists don’t necessarily see such a demarcation from us and nature and neither do permaculturists. Not only are human beings a part of nature, it is optimistically believed that we can do more than mitigate our harm to the environment. Through the active implementation of permaculture principles, we can actually improve the environment around us.

A Grassroots Movement

We don’t need negativity to promote change. Negative emotions interfere with creativity. Bill Mollison believes that positive change is more effective from bottom to top, than it is from top to bottom. If we wait for change to come from the politicians, we could be waiting a long time. Change yourself.

Change the way you garden. Change could come from one neighborhood at a time, rather quickly. Permaculturists believe that we must be the change we seek to find in the world.

Permaculture methods are similar in some ways to organic methods of farming, but the differences lie in matters of degree, sustainability, and working within an improved upon ecosystem, instead of trying to work against it. Permaculture doesn’t allow the use of any chemical fertilizers, herbicides, or pesticides, while organic farmers can use a short list of approved chemicals. Permaculture also doesn’t allow the use of motorized machines or plastics as their use is not sustainable in the long term. Despite these prohibitions, permaculture techniques are designed to be less labor intensive than industrial farming.

Working Smart and Not Hard

Permaculture espouses thoughtful planning in place of protracted labor. To this end, Bill Mollison’s book suggests planning from the home dwelling out, with zone zero starting in at the center.

Zone zero would apply permaculture principles in an effort to reduce energy use, efficiently use water, and utilize natural resources such as sunlight. From outside the home, the most labor intensive crops are placed as close to the main dwelling as possible, and a compost pile/bin for kitchen waste and a greenhouse would be nearby. From there in concentric circles, crops and livestock are placed out from the main dwelling. The last two zones are the wild and semi-wild areas used for firewood and as a habitat for wild plants and animals. The placement and contents of zones 2 and 3 are primarily determined by the amount of labor needed to maintain the zones and their relationships to one another. The relationships between different plants, crops, and livestock are carefully

considered in the planning stage of a permaculture farm. It is these relationships of one element to another and their maintenance requirements that determine the design of a permaculture farm.

How Plants Can Benefit Each Other

One such relationship is the symbiotic relationship between leguminous plants and nitrogen fixing bacteria. Leguminous plants are among the best known nitrogen fixing plants, but literally thousands of plants are known to help fix nitrogen into the soil. Many of these nitrogen fixers are not in the legume family. A useful permaculture technique is planting nitrogen fixing plants alongside food producing plants. This is done both with indigenous plants and pioneering plants that are well suited to the area. (With so many thousands of plants that fix nitrogen into the soil, it is a wonder why anyone uses nitrogen fertilizer).

Nitrogen deficiency is one of the most common limiting factors for the growth of crops. Nitrogen fixing trees are the most commonly used nitrogen fixing plants in permaculture designs. Permaculture stresses the need for bio-diversity, so when given the option, using a wide variety of nitrogen-fixing plants is ideal. A large variety of food producing plants also helps to prevent pest infestations.

Natural Pest Control

Pest control in permaculture is achieved without the use of synthetic chemicals due to their destruction of the soil and the destruction of the natural balance. For example, encouraging ladybugs to proliferate in your garden is usually a more successful method of controlling smaller pests such as aphids than spraying pesticides. After all, a ladybug can eat up to fifty aphids in a day.

When insecticides are used to control aphids, two things invariably happen. By a process of selection, the aphids with some inherent resistance against pesticides will survive and go on to breed the next generation of pesticide resistant aphids. Meanwhile, the ladybugs are killed off due to their far greater rate of exposure.

The ladybugs that do survive the initial pesticide exposure will succumb to the poison after eating a number of the surviving aphids. Their exposure increases with each aphid they eat until the amount in their tissues becomes too high for survival. All that remains are pesticide resistant aphids in greater numbers than before because the pesticide application killed off most of the aphids' natural predators.

The goal is to use and encourage beneficial organisms – to have them do the work for you, to work in harmony with the natural order instead of working against it. You can put in ladybug habitats and spray ladybug lure to attract them. When you make conditions favorable for beneficial organisms, you can watch them make themselves right at home in your garden or on your farm. If you need a jumpstart, you can purchase many beneficial organisms online and have them delivered to your door.

Fighting Biology With Biology

In some parts of Australia, grasshoppers are such a problem that the guinea fowl is an absolute necessity. Before choosing a permaculture site, many Australian permaculturists will look for areas where the guinea fowl have chosen to live before buying land. In the outback, they also utilize small ponds dug out by the fruit trees to provide a habitat for tree frogs or rock piles to attract lizards. Both frogs and lizards help eat the remaining pests that the birds miss.

Slugs, grubs and aphids are not necessarily the most challenging pests to most home gardeners and farmers. Ants are

often a more difficult challenge. Not only are they known to bite, they have also been known to cultivate aphids. That’s right, Homo sapiens are not the only farmers in the animal kingdom. Ants have been known to spread aphids to your plants so the aphids can feed on your plants and the ants can then feed on the aphids’ sugary secretions. Ants also occasionally prey on the aphids as well, making it a complex relationship, not really a symbiotic one. Ants secrete a toxin that inebriates aphids and makes the aphids easier to control.

Obviously, two pests in one can be double the trouble. Pouring boric acid over ant hills has been known to slow down ants, but it will not stop them. As soon as boric acid gets wet, it is no longer an effective control against insects. The answer is to fight biology with biology. Beneficial nematodes are one solution a permaculturist might utilize.

Heterorhabditis bacteriophora nematodes are parasitoids that prey on ants and dozens of other garden pests. They are harmless to mammals and other vertebrates. They patrol the soil to a depth of seven inches eating anything they find savory like fleas, weevils, ants, beetles, etc. Again, they can be purchased online.

With careful planning, pest control can also be a task delegated to your livestock. But pest control is only one goal of many. Chickens and ducks are known to eat pests while they fertilize the soil with their waste.

Why placement in a farm or garden matters

In Bill Mollison’s chicken model, he describes four separate elements to a farm that can be used to benefit one another or they can be placed to stand alone without any relationship. His example includes a chicken coop, a pond, a greenhouse, and a forest. By placing all four of these elements next to each other, a beneficial relationship can be realized.

The forest provides shade and forage to feed the chickens.

When the temperature rises with the midday sun, the chickens leave their coop due to the high heat. They find shade and food within the forest. In the forest area, if pests were left unchecked, they could harm the trees and other plants. The chickens' manure also helps to fertilize the forest.

When the chickens are in their chicken coop, their body heat helps to keep the greenhouse warm. The pond placed next to the greenhouse reflects additional sunlight and warmth back to the greenhouse and to the chicken coop.

Placed separately, these aspects of a farm do next to nothing to benefit one another. When placed together, a more harmonious relationship is realized.

How Our Efforts Can Improve the Environment Around Us

Permaculture seeks to reproduce what hundreds or thousands of years of natural processes can do to the soil in a fraction of the time, in a more controlled and productive design than what would be rendered by natural processes alone. Conserving water in a permaculture design is a top priority. All known forms of life need water; life on the farm is no exception. This is typically accomplished by three methods, and when used together, the results are amazing.

The first and most difficult step is to alter how water flows over the land. This is done by altering the contour of the land so that it will retain water. After a rainfall, water will typically flow off of the land and into the nearest stream or river. By altering the contours of the land, water can be retained. This helps provide sufficient water for the plants and the microorganisms in the soil.

Another common technique is to bury wood and/or charcoal beneath the plants. This practice helps to retain water in the

soil, and it retains nutrients for plants that they can utilize as needed.

Finally permaculture uses mulch as a final step in retaining water. When water would otherwise evaporate due to the heat, it is trapped beneath a layer of leaves, pine needles, or other mulch such as wood chips. As the mulch breaks down, it also serves as fertilizer for the plants.

Take a good look at the next wooded area you walk by. I'm willing to bet that things are growing like crazy. The main reason for this growth is the layers of leaves and natural mulch that serve the area by retaining water.

As biological beings we will always impact the environment around us, but a permaculture principle is the notion that instead of having a detrimental impact on the environment, we humans can have a beneficial impact on our environment.

Beyond Organic

Organic agriculture is often described in terms of what it isn't rather than what it is. There is a good reason for this. For far too many organic farmers, the only difference between their farm and a conventional farm is the list of chemicals they are not allowed to use on their crops or the restrictions place on the feeding and care of their animals. To many permaculturists, the strides made by organic farmers, though commendable, are far from adequate. Permaculture can be better described by what it is, rather than by what it isn't.

Permaculture was invented to address the shortfalls of agriculture, to take several steps beyond all-natural, organic farming. The overall idea is to drastically change the methods of production, to promote logical, interactive, natural processes, and to create a healthy, sustainable, permanent culture of productive, truly organic farming.

Our Survival Depends On It

Despite what sci-fi movies often suggest, if we destroy the Earth there really is nowhere left to go. Our survival as a species depends on our ability to live on Earth and not exhaust our resources. A permanent culture is a culture that can survive indefinitely. Changing culture, changing the way in which we view the world, is phenomenally difficult, but our survival as a species is certainly worth the effort.

Further Reading:

- *Can Progressive, Cutting-edge Organic Agriculture Feed Everyone?*
- *How Vertical Gardening Could Help Save the World*
- *DIY Solutions for the Garden*