From: Ryan Harb <iamharb@gmail.com>
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Subject: Changes needed in our food system
Attach: Changes needed in our food system.doc

To whom it may concern,

I am writing to express my opinions about the current industrial food system. To start, we must begin with the soil. Soil matters. Most everything we eat depends on soil (either directly or indirectly) to survive. Soil becomes less able to support plant and animal growth when there is a decline in levels of available moisture, available nutrients, and biological activity" (Cummings, 1999). Our modern method of farming (monoculture) is a prime example of why we have this decline in soil quality.

Farmers certainly care about their soil but at the same time are they driven by profit (short-term thinking) to provide for themselves and their families. It needs to be more well-known by farmers and average consumers that monoculture is detrimental to the soil. In addition, everyone must know that improved soil health leads to higher quality foods. It is equally essential that we have an educated population: people who know about polyculture's role in long-term soil health.

Modern agriculture is producing a tremendous amount of low-quality produce (International Ag Labs, 2009). As a result, people are not getting the amount of nutrients they need. "Most people consider eating a carrot a healthy thing to do. If that [supermarket] carrot, however, is poor quality at say 3 brix, it does not confer the expected health benefit that it would if it was 18 brix" (International Ag Labs, 2009). Foods that are nutrient dense are also called high brix foods.

Monoculture, although extremely effective at producing large quantities of food, also "produces environmental problems by altering the delicate balance of natural eco-systems (Ann, 2008). Numerous examples can be found to support this in scientific literature. In Nigeria where cassava planting is common, it was found that,

"Soil erosion varies significantly between cassava planted in polyculture and monoculture. The results from monitoring soil loss on six run-off plots show that soil erosion increases when traditional cassava polyculture is changed to monoculture practices. Moreover, the traditional cassava planting practices, found to be highly successful in reducing soil erosion under polyculture, are less effective when used in monoculture." (Odemerho and Avwunudiogba, 1993).

Other studies (Kowal, 1970a, b) compared the differences in soil loss on land used for monoculture growing versus land where polyculture was implemented. "…Crops grown in monoculture, especially under traditional farming methods in the tropics, generated more soil loss than when grown in polyculture (Odemerho and Avwunudiogba, 1993). Not only is soil loss more significant in monoculture sites but crop performance tends to be lower as well.

"Soils from barley monoculture and from crop-rotation plots of three long-term field experiments were tested for their effects on barley growth in the glasshouse, using plant growth tubes. Test plants of young barley developed significantly shorter and thinner root axes when grown in soil from monoculture plots than when grown in soil from crop rotation plots…" (Ollson and Alstrom, 1996).
Although "the difference in shoot growth was only small," the results still showed that soil from the monoculture plots becomes less healthy over time.

The solution to low food quality and long-term soil health is polyculture. But how do we amend the soil that is currently polluted, compacted, eroded and degraded? Surprisingly, grassroots efforts (more so than the scientific community) seem to be making the largest strides when it comes to creating solutions for regenerating the soil.

What is Sheet Mulching?

Sheet mulching is a fast, labor saving and multipurpose landscaping technique that improves soil health. "Instead of pulling out sod, tilling or digging the soil… sheet mulching builds the soil on top of what's already there": be it grass, brownfield or an otherwise unproductive piece of land (Nowak, 2005). It is a no-till gardening method that requires only three layers of materials: "compost", "barrier", and "mulch." Layering these materials has numerous benefits:

- It improves soil health by retaining nutrients and water in the soil.
- It suppresses weed growth, thus reducing labor and maintenance costs (compared with bare soil culture).
- It adds organic matter to the soil and creates an optimal environment for plants to grow.

Additionally, it, "Encourages favorable soil microbial activity… [and] it improves plants vigor and health, often leading to improved resistance to pests and diseases" (Elevitch and Wilkinson, 1998).

Sheet mulching is often used to transform unproductive lawns into prolific edible forest gardens. This describes the current project that is underway in Amherst, Massachusetts. A plot of land approximately 1/8 acre in size (5000+ square feet) was sheet mulched during September and October, 2009. Pictures and a description of this process can be found at the following link: http://harbblog.blogspot.com/2009_09_01_archive.html

There is no one right way to go about sheet mulching. The compost layer can consist of any organic material that holds moisture: peat moss, leaves, grass clippings or compost are most often used. It can also be spread directly onto the base (ground) as the first layer, or it can be the middle layer (the barrier being the first layer and mulch on the top.) The barrier should be any unmarked paper-based product (newspaper and cardboard are used most often). Lastly, the "mulch" (top) layer should consist of more organic matter (straw, leaves, grass clippings, wood chips or garden "waste") which holds in moisture. The arrangement of layers may cause results to vary, but sheet mulching is known to improve soil quality no matter what the order.

Sheet mulching is just one way to improve soil health which leads to healthier foods and healthier human beings. Growing food for the masses on a few massive farms cannot continue if we want to have true food security. There is a local movement happening but more of this needs to happen. Growing food on numerous small lots (yards, public greenspaces, etc.) is how to solve this problem. Planting in polyculture, not monoculture, will keep our soil healthy over the long-term.

IMPLICATIONS:

Remediating soils and producing high brix foods comes with numerous implications. On a local scale, communities will strengthen, families (on average) will spend more time together and there will be an abundance of local, healthy food. On a global scale, the implications go even further. To simplify, I have separated global implications into four categories: socio-economic, environmental, political and individual health.

A. Socio-Economic & Environmental Implications:

Widespread sheet mulching efforts has the potential to change our entire industrial food system. Small-scale edible forest gardens would almost certainly strengthen the local economies. An abundance of healthy foods would drive down prices, thus making it easier for low-income communities to afford local produce (if many people adopt the technology). Social inequity is a major problem and localized food production could begin the long journey to the very root of the problem.

Environmentally, the implications to local healthy food are tremendous. There would be a far lesser demand for fossil fuels because: 1) Transportation would be less, with more food being produced locally, and 2) Heavy machinery and food processing would be less frequent due to smaller, more prevalent farms and gardens. More localized food production would also address the issues of global warming, peak oil, acidification and so on. Biodiversity would also increase.

Additionally, the population as a whole would be much healthier thanks to these nutrient dense foods. "Good quality produce in typical supermarkets is hard to find and excellent quality is a rare find indeed. As a result of this we find a large portion of our population struggling with chronic health problems" (International

Ag Labs, 2009). I predict that an increased amount of high brix foods on the market would reduce these chronic health problems. The government could then spend less money on healthcare and more money on other important issues such as education, renewable energy, and social inequality.

Political and Health Implications:

Stronger local communities have the ability to impact our current political process in a large way. Corporations have a lot of power and people are currently taking back some of that power with this local high brix foods movement. Growing food everywhere (not just on large monoculture farms) means everyone gets fed. World hunger can essentially be solved if everyone decides to transform their grass lawns and public greenspaces into polyculture gardens.

I also foresee this local high brix food movement improving both mental and spiritual health. Nature would be looked upon more as something to respect, not take for granted. People would become more connected to nature if they were more directly involved with the food production and distribution system. Families could spend more time working together (in gardens) and less time apart (working jobs to pay for food.)

SCOPE AND LIMITATIONS:

Soil remediation can and should be done worldwide. Sheet mulching is the easiest way to accomplish this providing the materials and skills are readily available. The technique is extremely adaptable (in terms of materials) which makes it ideal for most parts of the world. The "compost", "barrier" and "mulch" layers can be manipulated and experimented with to determine the best results for a particular region.

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Thank you for reading this.

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