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Agriculture: Why is Everyone Sick?

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America's Founders

The founders of America were farmers for the most part. Benjamin Franklin in 1769 wrote of three ways by which a nation may acquire wealth. He wrote, "The first is by War..This is Robbery. The second by Commerce which is generally Cheating. The third by Agriculture the only honest Way."

Andrea Wulf wrote, "Franklin believed firmly in America's ability to survive. America would rise, Franklin wrote to an old friend in Britain in September 1775, because 'it will itself by its Fertility enable us to defend it. Agriculture is the great Source of Wealth and Plenty. By cutting off our Trade you have thrown us to the Earth, whence like Antaeus we shall rise yearly with fresh Strength and Vigour.'"

George Washington, the nation's first leader, "was so obsessed with manure and the improvement of the soil that he was actively seeking a farm manager who, 'Midas-like' could 'convert everything he touches into manure as the first transmutation towards Gold.' He was so innovative in his agricultural methods that many regarded him as 'the first farmer in America." The photograph below is modern day Mount Vernon maintained as it was in George Washington's day.

How is it that America at its founding could produce the likes of George Washington, Thomas Jefferson, John Adams, James Madison, and Andrew Jackson? Why is it that many modern leaders appear to be dunces by comparison? Part of the difference was in the amazing Christian education these individuals received, but those teachers also had wonderful raw material to work with. America was a land with the richest virgin soil on earth. The founders of this country were incredibly well-nourished. Sadly, that wonderful soil has been allowed to deteriorate for the most part. It has been sprayed with pesticides and herbicides and laden with imbalanced artificial fertilizers. Few people today come close to obtaining the quality of food the founders of America set on their table on a daily basis.

Reference:

Wulf, Andrea, *Founding Gardeners*, New York: Alfred A. Knopf, 2011, 5,10, 33.

Introduction

Agriculture and the art of growing things has been a part of my life from the time I was a child. I grew up on a ten acre farm at the intersection of Willow and Herndon roads in Clovis, California. My father rather unsuccessfully raised cattle, pigs and chickens. Most of our neighbors were also involved in agriculture in one form or

another.

While I was in graduate school in Dallas, I selected a portion of the back yard of Salesmanship Club Boy's Camp where I worked and grew vegetables. Here I dealt with heat and humidity, tree asps, brown recluse spiders, scorpions and nasty chiggers which burrowed themselves into the skin on my legs.

Later I would raise chickens and rabbits in Lafayette, CA. When I moved to Lake of the Pines near Auburn, California, I battled the deer which were protected within the confines of the lake. I saw the damage gophers and skunk could do.

In 1985 I purchased my current home which has proven to be one long agricultural experiment. The property is planted with dozens of fruit trees including aprium, pluots, apricots, jujubee, figs, persimmons and peaches. I also grow vegetables, grapes and berries. The photographs on this and the next page are produce grown in my own yard.

I do regular tours of the garden and those who visit are usually amazed at how much produce can occupy such a small space.

Feed the Soil

The topsoil around my house was removed when the home was built. To grow things I had to begin building the soil. Initial production of crops was very poor due to the poor condition of the soil.

Over the past quarter century I have added literally tons of organic material to the soil. This has been in the form of mushroom compost, horse and chicken manure, wood chips, leaves and grass clippings. The topsoil is now satisfactory.

One of my major efforts has been to add trace minerals to the soil. One of the products I have used is Sea-90 which is basically a sea salt. I have also used liquified kelp and fish and leaf mold to mineralize the soil.

Agricultural Issues

Many of America's most serious toxicological and nutritional issues are associated with the developments which have taken place in agriculture in the last 100 years.

One of the most significant issues was the introduction of a monochemical herbicide program focused around glyphosate (Roundup). Glyphosate was patented by Stauffer Chemical Company in 1964.

In the 1970's Monsanto Company patented Roundup, the use of glyphosate as an herbicide. The patent expired in 2000. In 2007 approximately 200 million tons of glyphosate were used in agriculture. More recent figures are not available because the U.S. Department of Agriculture stopped updating its database in 2008.

The controversy over glyphosate centers around Don Huber, a scientist who has been a thorn in the side of Monsanto since he was hired to research their genetically modified products more than 20 years ago.

Huber has charged that glyphosate is associated with reduced micronutrient uptake by plants resulting in increased susceptibility of these plants to disease. Monsanto has gone after Huber with a vengeance.

Monsanto charges that no "reliable" studies substantiate Huber's claims. Monsanto likes to pick and choose its research data. Dr. James E. Rahe, Professor Emeritus, Department of Biological Sciences, Simon Fraser University in Burnaby, B.C., wrote, "The published research from my lab done during the 1980's and 1990's showed that glyphosate (Roundup) causes increased susceptibility of dicot species to infection by root rot fungi such as pythium and fusarium."

Monsanto keeps a tight lid on research on their genetically modified crops. Farmers contracts prohibit sharing even a handful of seed with a laboratory. The company will not make seed available for study by those who might produce negative information about genetically modified crops. Monsanto also takes scientists to court who attempt to take any independent research public.

France's highest court ruled in 2009 that Monsanto was guilty of false advertising when they claimed that Roundup was "biodegradable" and "left the soil clean." Huber argues

Strawberry Guava

that the product is not readily biodegradable and can damage future crops planted in treated fields.

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Herbicide Tolerance

About 75% of genetically modified crops are engineered for herbicide tolerance. Most of these crops are classified as Roundup Ready. Roundup ready crops have the ability to detoxify glyphosate which blocks the synthesis of amino acids and weakens plants so they succumb to fungal infections.

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Castle, Linda A., et al., Discovery and directed evolution of a glyphosate tolerance gene, *Science*, May 21, 2004; 304:11

A Weak Immune System

When the human immune system is compromised with increased susceptibility to disease, we call it AIDS. Many are concerned that weakening the immune system of plants will lead to the development of new pathogens or increased expression of older pathogens.

Fungal contamination has a long history. Alexander Fleming found a fungal toxin growing on cantalope and other foods called penicillin in 1928. This proved to be a boon for mankind because penicillin can kill other bacteria which are more dangerous to humans.

Another fungal or mycotoxin is LSD derived from the ergot fungus on grains. LSD contamination of grain is believed by many to have been responsible for the hallucinations associated with the Salem witch trials.

Many animal feeds are contaminated with zearalenone mycotoxin. Zearalenone is a natural byproduct of the fungus Fusarium roseum. It has powerful estrogenic properties. The natural product leads to decreased fertility, abnormal estrus cycles, and reduced milk production in dairy herds. Many farmers routinely feed reproducing animals more expensive mold-free feed. They are switched to less expensive mold contaminated grains when they are fattened for market.

Don Huber's concern is that a weakening of the immune system of plants increases the likelihood of contamination of plant products by fungal organisms and fungal toxins.

Fungal toxins in animal bedding can make animals sick. Fungal toxins in animal feeds accumlate in the fat of the animals and are passed on to those who eat them. Huber writes, "Caution has been expressed in using straw and chaff as bedding for pigs or roughage for cattle because of mycotoxin levels that far exceed clinically significant levels for infertility and toxicity. This also poses a health and safety concern for grain entering the food chain of humans."

While pathogens can become elevated in crops treated with glyphosate, beneficial organisms can be harmed by use of the chemical according to Huber. He writes, "Glyphosate is a potent microbiocide and is toxic to earthworms, mycorrhizae...reducing microbes that convert insoluble soil oxides to plant available forms...nitrogen-fixing organisms...and organisms involved in the 'natural,' biological control of soil borne diseases that reduce root uptake of nutrients."

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Chelating Agent

Another of Huber's concerns is the chelating activity of glyphosate which tends to render minerals unavailable to plants and animals. Some chelating compounds bind to only a single or a few metal species. Glyphosate is a broad-spectrum chelating agent.

Huber maintains that plant uptake and translocation of key minerals is reduced up to 80% by commonly observed "drift" rates of glyphosate (less than one fortieth of the herbicidal rate).

The chelating activity of glyphosate is suggested by a feeding study with pregnant rats. Skeletal alterations were observed in the offspring in a dose related manner. At the highest level of intake, 1000 mg/kg there was a 50% mortality rate and 57.3% of the fetuses suffered with skeletal alterations. The chelating activity of glyphosate can affect both plant and animal health.

Huber observes that "It is not uncommon to see Cu, Fe, Mg, Mn, Ni, and Zn deficiencies intensify and show in soils that were once considered fully sufficient for these nutrients" after application of glyphosate.

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Elephant Heart Plum

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DROUGHT TOLERANCE

Huber argues that the reduced vitality of plants resulting from engineering to make them Roundup resistant reduces water use efficiency and makes the crops more susceptible to drought stress. This decreased hardiness of the plants contributes to what Huber calls "yield drag" or reduced crop production from genetically modified crops.

Drought has seriously affected the cotton crop in India. Nearly 200,000 farmers have committed suicide since 1997. The crop failures have been attributed to drought and global warming or climate change.

What is often overlooked is the change in the cotton seed resulting from Monsanto's sales of genetically modified cotton seed. Monsanto engineered Bt toxin, a pesticide, into the cotton to increase yields by killing insects that try to feed on the cotton.

In practice the cotton has not worked well. India's growing season is characterized by an intense monsoon season followed by months of drought. The native cotton was selected to grow and thrive under these conditions.

The new heavily advertised cotton seed cost much more than traditional seed. The farmers could not replant seed either. They were chained to Monsanto's seed supply. Farmers had to take out loans to be able to afford the seed.

Crop failure and reduced yields have become a serious problem for subsistence Indian farmers. Boxes of genetically modified cotton carry a warning label that the seed should only be used in irrigated fields. Unfortunately, the warning is in English and few Indian subsistence farmers can read. Monsanto's own studies show that 95 percent of Indian farmers have expenditures greater than their income.

Monsanto is apparently aware of the issue of reduced drought tolerance. They have developed a corn which is supposed to be drought resistant. Unfortunately, the Union for Concerned Scientists concluded the corn provided no improvement in water efficiency.

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