

## Local Foods Connection Farm Work Spring 2008

**Sustainable Agriculture:** addresses the ecological, economic and social aspects of agriculture. To be sustainable, agriculture can operate only when the environment, its caretakers and surrounding communities are healthy. – Leopold Center for Sustainable Agriculture at Iowa State University.

The terms below examine the ecological imbalance of agriculture

**Soil Degradation:** the loss or destabilization of the soil ecosystem. The main process responsible is erosion, by which soil is removed through physical or chemical processes. Physical processes include wind blowing soil away and water carrying soil into a stream. Chemical processes include the addition of chemical inorganic fertilizers, like ammonia, to the soil. The reduction of organic content of soil leads to its weakening and degradation.

Conventional agriculture exacerbates soil degradation through a variety of practices:

- Row cropping
- Tillage / herbicide application between plantings
- Intensive grazing
- Monoculture planting (see below)

**Pesticide Treadmill:** the effect of the “arms race” that is often waged between a particular pest and the conventional farming establishment. A chemical used to control a particular insect or weed will have success only for a limited time. Eventually, the plant/animal will evolve a resistance mechanism for that chemical. Once this happens, the pest will return with great abundance. This will require the conventional farmer to utilize a different form of the pesticide, usually one that is more toxic and unnatural.

**Eutrophication/Dead Zone:** an increase in nutrient levels in a particular ecosystem, and the resulting increase in primary productivity that occurs afterwards. In agriculture today, we typically provide a large excess of nutrients and fertilizers to our fields, and they are often applied in a manner which encourages runoff into surrounding streams and water bodies. Additionally, our farming practices (drain tiles, absence of buffer strips, and farming of hilly terrain) make it more likely that the increased amount of the nutrients we add to the soil will eventually wind up in the water bodies surrounding our fields.

When this large influx of nutrients enters a water body that is typically nutrient-deficient, the bacterial and algal populations in the stream will grow rapidly – this is “primary productivity” and eutrophication. Unfortunately, when these bacteria and algae grow so quickly, they also consume a great deal of oxygen in the water body. This loss of oxygen can make the water uninhabitable for fish and other wildlife. This process can be seen on a large scale in the Dead Zone, which is the term for the area where the Mississippi drains into the Gulf of Mexico.

All of our Midwestern farm fields drain into streams, which eventually drain into the Mississippi, which carries this huge input of nutrients all the way down to the Gulf. The Gulf is a marine area which is normally very nutrient deficient, so the algae and bacteria go crazy at the mouth of the Mississippi when they get all of these nutrients, growing and multiplying and consuming all of the oxygen that was normally available for fish, shrimp, and other marine life. These “Dead Zones”, the areas where fish cannot live anymore because of this oxygen deficit, are expanding every year.

**Monoculture vs. Crop Diversity:** Conventional farming typically consists of hundreds/thousands of acres of land planted with an identical crop, such as a “monoculture” of corn and soybeans. This process evolved because it was thought to be the most efficient way for large scale, mechanized farming operations to practice agriculture.

However, there are problems associated with planting large areas with a single crop. In the case of corn, which extracts a large amount of nitrogen from the soil, plantings can cause the land to become nitrogen-deficient very rapidly, which necessitates the addition of nitrogen inputs as fertilizers. Also, having a large area planted with a single crop is an ideal way for fungus, insects, and weeds to grow and proliferate – if they can find a way to infect that particular crop, these parasites spread like crazy!

**GMOs:** (genetically modified organism) typically refers to crops, and in some cases animals, which have had their genetic makeup altered through modern human intervention. Modern scientists attempt to manipulate the genome of a plant or animal in a laboratory setting.

Traditional hybridization of plants and animals has occurred for hundreds of years through careful breeding of animals and selection of which varieties of crops to plant. These processes occur slowly and give the natural ecosystems plenty of time to respond to our changes.

Nations throughout the world are concerned about genetically modifying plants and animals, and growing them on a large scale, because we often don't know what the unintended effects will be on our earth's ecosystem. The potential for unintended mutations of new genes, or migration of this new DNA to different species, has many countries and groups of people calling for a temporary or permanent halt of introduction of GMOs into food systems, at least until more thorough studies can be performed.

**Community Income and Environmental Pollution:** Low-income communities often bear a disproportionate share of the environmental and health-related consequences of our actions. This often occurs as a result of the NIMBY (Not In My Back Yard!) syndrome that causes people to protest when environmentally-destructive activities, such as a mining operation, is planned for their community. Often, the community with the most financial resources is best able to determine the location of unwelcome industries like these, which means that they typically end up located where people don't have the financial power to fight them.

- GMOs in developing nations
- low-income families eating cheaper, less-healthy food
- intellectual property rights and seed genetics

Suggested Readings:

Leopold Center for Sustainable Agriculture website, part of Iowa State University:  
<http://www.leopold.iastate.edu>

[Unsettling of America: Culture and Agriculture](#), by Wendell Berry

[Sand County Almanac](#) by Aldo Leopold

[Broken Heartland: The Rise of America's Rural Ghetto](#) by Osha Gray Davidson

[Seeds of Deception: Exposing Industry and Government Lies About The Safety of The Genetically Engineered Foods You're Eating](#) by Jeffrey Smith

[The Fatal Harvest Reader: The Tragedy of Industrial Agriculture](#), edited by Andrew Kimbrell

[Manifesto on the Future of Seeds](#) by The International Commission on the Future of Food and Agriculture