Improving Old MacDonald's Farm

Protecting streams from "fruited plains"

Amber waves of grain ... above the fruited plain. you probably recognize these phrases from "America the Beautiful" from singing them over and over throughout grade school. The grain and the plains are still out there. In fact, the United States has about 315 million acres of agricultural land producing an enormous supply of food and other products.

Unfortunately, those plains are also producing a whole lot of pollution. A recent national Water Quality Inventory found that polluted runoff from agricultural activities is the leading source of water pollution in rivers and streams. Plus, it is the second-largest cause of pollution in wetlands, and a major factor in polluted lakes, estuaries, and coastal shorelines, as well as unclean groundwater. In fact, 31 states contribute pollutants from agriculture and other sources to the Mississippi River, resulting in an area of low oxygen in the Gulf of Mexico called the Dead Zone.

One important source of water pollution caused by farming activities is called *sedimentation*. Sedimentation occurs when wind or water runoff carries soil particles and dumps them into a nearby lake or stream. Too much sediment can cloud the water, which reduces the amount of sunlight that reaches aquatic plants. It can also clog the gills of fish or smother fish larvae.

Another source of pollution is animal waste. By keeping animals such as hogs and cattle within small areas or lots, farmers can feed and care for those animals more easily than if they were allowed graze. However, these small areas can become overloaded with animal waste. Check out these manure totals in the United States in 2015:

- Beef cows – 952 billion pounds
- Dairy cows – 442 billion pounds
- Hogs – 220 billion pounds
- Chickens – 151 billion pounds

Added together, these animals produced nearly ***one billion tons*** of waste in just one year!

Runoff can carry this waste into nearby lakes or streams, bringing with it dangerous bacteria and viruses if heavy storms come through or if the waste systems break down. When Hurricane Floyd flooded much of eastern North Carolina in 1999, some waste lagoons burst, sending tons of animal waste into areas inhabited by people and into water sources used by people.

It's not just animals, though. Chemicals in pesticides, herbicides, fungicides, and fertilizers can also cause water pollution. Pesticides, herbicides, and fungicides are used to kill pests such as crop-eating insects and to control the growth of weeds and fungi. Fertilizers are used to feed crops and make them grow faster and healthier. Unfortunately, chemicals used to kill bugs and weeds can also damage other things. These chemicals can enter and contaminate water in several ways—through use and overuse in or around the water, from runoff, or by the wind. And their effects can be deadly. The chemicals can kill fish and other wildlife, poison food sources, and destroy the habitat that small animals use to hide from predators.

Hog farms produced 220 billion pounds of manure in a single year.

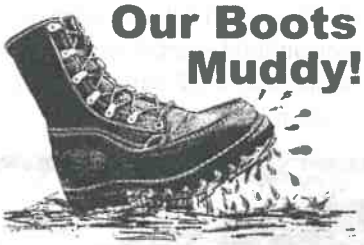
Let's Go Surfing Now!

Learn what you can do to prevent pollution in your watershed

www.epa.gov/nps/nonpoint-source-what-you-can-do

EPA has developed a web site on how you can help prevent pollution in your watershed. Be sure to check out the fact sheet on managing:

* *Sediments and nutrients*
* *Animal feeding operations and grazing*
* *Irrigation and pesticides*



Let's Get Our Boots Muddy!

Join a 4-H Club

The 4-H program, administered by the Cooperative Extension Service of the U.S. Department of Agriculture, state land grant universities, and county governments, emphasizes projects that improve the four H's—head, heart, hands, and health. Many clubs focus on erosion control and water quality. Check out the 4-H web site at www.4-h.org.

In some cases farmers use animal waste as fertilizer, and even though it's natural, if used incorrectly it can do terrible damage to water resources. In fact, it can cause eutrophication, or algae buildup, which depletes the oxygen aquatic organisms need to breathe.

Fencing off natural streams from cattle will reduce sedimentation and nutrient pollution.

The bad news is that erasing these forms of pollution entirely is practically impossible. The good news is that there are steps farmers and ranchers can take to reduce the amount of pollution that comes from farms and ranches. For starters, they can reduce the amount of soil erosion and sedimentation by 20 to 90 percent by using soil conservation practices. One way to keep the soil in place is to make sure as much soil as possible has something growing in it or placed on it (like mulch). Plants and their roots help anchor the soil, keeping it in its place.

Pollutant runoff from animal manure can be controlled by a good waste management system. A well-run system can limit runoff and stop waste from seeping into underground water supplies. These systems typically contain manure in ponds or tanks that are designed to prevent spills and leaks. Also, if managed correctly, much of the animal waste can be used as fertilizer. Farmers who carefully spread the animal waste over their fields can accomplish three goals: feed their crops, get rid of much of the stored manure in a useful way, and reduce the need for chemical fertilizer. However, farmers need to conduct soil tests to ensure they are using only as much fertilizer as the crops can use.

Similarly, farmers can limit the damage of pesticides, herbicides, and fungicides. By doing some research into the soil makeup, the climate conditions, and the pest history of their farms, farmers can choose the most effective and most environmentally friendly methods to control pests. Although pesticides are the most common method used to control pests, many farmers use integrated pest management (IPM). IPM involves using a combination of pest-resistant crops, pesticides, and natural predators such as lady bugs to reduce pesticide use. Plus, certain chemicals work well with certain crops. Matching pesticides, herbicides, and fungicides to all of these specific elements of farming means that farmers will also lower the amount of the chemicals they use. And of course, less use results in less contamination of water sources.

Career Corner

A *producer* is a farmer who grows crops or raises poultry or livestock for food.

An *extension agent* works with producers and communities to help them be more efficient and environmentally friendly.

An *agricultural scientist* studies farm crops and animals and develops ways to improve their quality and quantity with less labor, control pests and weeds more safely and effectively, and conserve soil and water.