

ENVIRONMENTAL ISSUES



Eutrophication

Eutrophication is the enrichment of an ecosystem with chemical nutrients, normally by compounds that contain nitrogen or phosphorus. Eutrophication is considered a form of pollution because it promotes plant growth, favouring certain species over others. Health-related problems can also occur if eutrophic conditions interfere with the treatment of drinking water.

When a system is enriched with nitrogen, plant growth is rapid. When the number of plants increases in an aquatic system, they can block light from reaching deeper. Plants also consume oxygen for respiration, and if the oxygen content of the water decreases too much, this can cause other organisms such as fish to die.

Agricultural runoff which makes its way into the water supply of an area results in eutrophication, which may cause the uncontrollable growth of algae. This is called an algal bloom. These blooms can discolour the water, clog fish gills, or even be toxic, and can accumulate in the food chain. Despite the impacts, there are a number of ways of preventing eutrophication from taking place. Cleanup measures can directly remove the excess nutrients such as nitrogen and phosphorus from the water. Creating buffer zones near farms, roads and rivers can also help. These act as filters and cause nutrients and sediments to be deposited there instead of in the aquatic system. Laws relating to the treatment and discharge of sewage can also help to control eutrophication.

A final possible intervention is nitrogen testing and modelling. By assessing exactly how much fertiliser is needed by crops and other plants, farmers can make sure that they only apply just enough fertiliser. This means that there is no excess to run off into neighbouring streams during rain. There is also a cost benefit for the farmer as unnecessary fertilisers are not added.

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Eutrophication of fresh water





Source: Research Group of Wastewater Treatment and Purification

Soil degradation

Soil degradation is when soil deteriorates because of human activity and loses its quality and productivity. It happens when soil loses its nutrients, or its organic matter. It also happens when the soil structure breaks down, or if the soil becomes toxic from pollution. Simply, it is the breakdown of soil particles.

Degradation is not the same as soil erosion, which is when the soil is washed or blown away by water or wind. Soil erosion is common when trees are cut down. and then it rains, so the soil is moved somewhere else (sometimes to the sea/ocean/river). Trees and their root systems keep the soil in place and thus prevent soil erosion.

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Topsoil as well as farm fertilisers and other potential pollutants run off unprotected farm fields when heavy rains occur.



Source: Wikimedia Commons

Studying Fertilisers to Cut Greenhouse Gases

November 18, 2009 By Dennis O'Brien

Agricultural Research Service (ARS) scientists have found that using alternative types of fertilisers can cut back on greenhouse gas emissions, at least in one part of the country. They are currently examining whether the alternatives offer similar benefits nationwide.

Nitrogen fertilisers are often a necessity for ensuring sufficient crop yields, but their use leads to release of nitrous oxide, a major greenhouse gas, into the atmosphere. Fertiliser use is one reason an estimated 78 percent of the nation's nitrous oxide emissions come from agriculture, according to Ardell Halvorson, a soil scientist at the ARS Soil Plant Nutrient Research Laboratory.

Halvorson compared nitrous oxide emissions

from maize fields treated with either a conventional nitrogen fertiliser (urea) or either of two specially formulated urea fertilisersone with "controlled release" polymer-coated pellets, and the other with inhibitors added to "stabilise" the urea to keep more of it in the soil as ammonium for a longer period.

In a two-year experiment at Fort Collins, he collected the emissions using static vented chambers, similar to small "pillbox" structures placed over the soil. He chose a "no-till cropping system" because it is known to reduce carbon dioxide emissions. He found that the controlledrelease fertiliser cut nitrous oxide emissions by a third, and that the stabilised fertiliser cut them almost in half.

This news article was obtained from the website www.physorg.com. Learners - if you use any part of it you need to write it in your own words and include the following in your reference list: O'Brian, D. 2009. Studying fertilisers to cut greenhouse gases. [Online]. Available: http://www.physorg.com/news177778629.html. [1 July 2010].