

NITROGEN: THE DARK SIDE OF A CRITICAL PLANT NUTRIENT

by Vera Strader

It is said that the ocean begins at our front door. In other words, what we do in our homes and gardens can affect the waters hundreds, even thousands, of miles away.

In the 1960s, escalating manufacturing and use of synthetic fertilizers resulted in a steep rise in air and water pollution. Soil nitrogen in excess of that used by gardens and crops proved to be especially troublesome.

THE DILEMMA: Nitrogen is an essential element, a protein component in all living bodies, and vital to plants. Farmers and home gardeners alike rely on nitrogen to help our plants grow and crops to better produce. However, in our eagerness, we often apply more than is needed and negatively impact soil health by depleting (killing off) beneficial organisms and earthworms.

Broken down by soil microbes, excess nitrogen also becomes a bad actor in the atmosphere and in water.

Nitrogen (and phosphorous) feed the growth of algae, which deplete oxygen levels in surface waters. Fish and other aquatic life die from lack of oxygen and toxins make water unsafe for human contact and consumption. Areas of “dead” water can result, such as that in the Gulf of Mexico and in California estuaries.

Polluted groundwater can create sickening levels of nitrate in drinking water. Increased atmospheric nitrous oxide, a powerful greenhouse gas, traps heat and contributes to global warming. Nitrous oxide also destroys stratospheric ozone which protects the planet from harmful ultraviolet rays.

Researchers at Russel Ranch, a University of California experimental farm near Sacramento (<http://asi.ucdavis.edu/front-page>), are studying nitrogen’s movement through soil. Reducing runoff from both irrigation and natural rainfall is essential for managing nitrogen pollution. Another tool being assessed is cover-cropping which can capture leftover nitrate while suppressing weeds and protecting vital soil organisms.

USE FERTILIZER WISELY: Decrease, even eliminate the need for commercial fertilizers by applying compost and aged barnyard manure instead. In addition to nitrogen, these materials supply an entire array of other slowly-utilized nutrients necessary for plant growth.

When using commercial fertilizers, rely on those that are less concentrated or slow-release. These fertilizers allow time for plants to utilize nutrients before washing away. (Commercial fertilizers are clearly labeled with three numbers representing the percentage of nitrogen (N), phosphorous (P) and potassium (K) found in the package.)

Organic fertilizers such as blood meal, cottonseed meal, fish emulsion, and seaweed extract also provide nitrogen in lower concentrations. Follow label instructions and do not exceed the recommended application rate. More is not better!

ADDITIONAL STRATEGIES: Use drip irrigation, soaker hoses, or low-volume mini-sprinklers to assure that landscape water soaks in rather than running off. Avoid watering walkways and other hard surfaces.

Reduce runoff with pervious pavers, stepping stones, or gravel; plant a rain garden; install a roof garden. Catch roof runoff in rain barrels or other catchment devices; later water your yard with this stored water.

Mulch with fallen leaves, wood chips or gravel to lessen irrigation needs. Leave lawn clippings in place, which then break down lessening both fertilizer and water needs.

Grow more plants native to our region. Natives rarely require any fertilizer at all and are usually drought tolerant once established.

The manufacture of commercial fertilizer has revolutionized farming. In efforts to feed an expanding global population, tons of nitrogen fertilizer are produced each year. This process is powered by natural gas, a fossil fuel. Shipping requires yet more fossil fuel. These concerns, along with damaging soil, water and air consequences, are powerful arguments for using all fertilizers with care.

Read more about agricultural nutrient pollution at <http://www2.epa.gov/nutrientpollution/problem>.

Vera Strader fertilizes and enriches the soil in her garden with homemade compost plus aged chicken and horse manure.