Acid rain pollution

Acid rain is a great problem in our world. It causes fish and plants to die because earth’s rainwaters are contaminated. It also causes harm to people as well, because we eat fish, drink water and eat plants that are polluted by acid rain. It is a problem that we must all face together and try to get rid of. However, acid rain on it’s own is not the biggest problem. It causes many other problems such as aluminum poisoning. Acid Rain is deadly.

Acid rain is polluted rain. The pollutants go up to the atmosphere and when it rains it brings the pollution down with it. Sulfur dioxide and nitrogen oxide are the gases that form the acid rain. When these gases mix with moisture it can make rain, snow, hail, or even fog. The scientific term for acid rain is acid deposition that means when the acid is taken from the air and is deposited on the earth. Major industries, coal burning factories, power plants and automobile engines are the main sources of sulfur dioxide and nitrogen oxide that cause acid rain. Volcanoes and forest fires also causes sulfur dioxide and nitrogen oxide. Some of the many problems that come from acid rain are the killing of many plants and underwater life in thousands of lakes and streams around the world. It strips forest soils of nutrients and damages farm crops.

Acid rain can also corrode stone buildings, bridges, and priceless monuments. Acid rain can also be harmful to humans because acid rain kills the crops and fish we eat, ruins homes, and the acid can release lead in the pipes and the lead could go into our drinking water. It is hard to determine where acid rain may fall next, because the wind from a polluted area could carry pollution to another area and the acid rain could fall there. The regions affected more by acid rain are large parts of eastern North America,

Scandinavia, and central Europe. In many of places acid rain isn’t a problem because some soils can neutralize the acid and it doesn’t affect the crops. Areas more sensitive to acid rain is in the western United States most of Washington all of Oregon, sections of California and most of Idaho.

Maine, New Hampshire, Vermont and a large section of northeast Canada. The soil in these places can not neutralize acid rain deposits, then the nutrients are stripped which means the crops in those places may not survive. The Black forest is a mountainous region in Baden-Wurttemberg, in southwestern Germany. The valleys are fertile and make good pastureland as well as providing good soil vineyards. No forest region is showing serious effects of acid rain. Many trees are dying, the forest lost masses of needles, leaving them with sparse, scuffing crowns. Their major industries are Lumbering wood, manufacturing toys and cuckoo clocks. Winter sports and mineral springs attract tourists.

Acid rain can damage and ruin soils by stripping the soils nutrients. But some soils can neutralize and weaken acid deposits that fall from the sky. These soils are called alkaline soil, also called a base. In 1838 the German chemist Justus von Liebig offered the first really useful definition of an acid, namely, a compound containing hydrogen that can react with a metal to produce hydrogen gas.

Soil is formed when rocks are broken up by the weather and erosion and mixed with organic matter from plants and animals. The term soil generally refers to the loose surface of the Earth, made from solid rock. To the farmer, soil is the natural medium for growth of all land plants. The rocks that make

up soil could be acid, neutral, or alkaline, another name for a base. Limestone and chalk are rocks that are formed from tiny shells that are rich in calcium. Alkaline is made up of calcium. When acid rain falls on alkaline soil the calcium makes the acid become weaker or neutralize. Farmers put lime (a very strong alkaline substance) and special fertilizers in there soil neutralize the acid in the soil on a regular daily basis.

In general, soil structure is classified as sandy, clay, or loam, although most garden soils are mixtures of the three in varying proportions. A sandy soil is very loose and will not hold water. A clay soil is dense and heavy, sticky when wet, and almost brick hard when dry. Loam is a mixture of sand and clay soils, but it also contains large quantities of humus, or decayed organic material, which loosens and aerates clay soil and binds sandy soil particles together. In addition, humus supplies plant nutrients. Then, soil structure can be improved by digging in compost, manure, peat moss, and other organic matter.

Parts of western United States, Minneapolis, northeastern North America and east and north Canada are places in North America where soil is more sensitive to acid deposits then any other places. Many factors, including the soil chemistry and the type of rock determine the environments ability to neutralize the acid deposits from the rain.

Soils naturally contain small amounts of poisonous minerals such as mercury, aluminum, and cadmium. Normally, these minerals do not cause serious problems, but as the acidity of the soil increases, chemical reactions allow the minerals to be absorbed by the plants. The plants are damaged

and any animals that eat the plants will absorb the poisons, which will remain in the animals' body and can hurt them or even kill them. The harmful minerals can also leach out of the soil into streams and lakes where they can kill fish and other types of living creatures. The problem gets even bigger and bigger when pollution dumps more minerals in the soil. For example, in some parts of Poland vegetable crops have been found to contain ten times more lead than is considered safe.

Some plants need and require soil, and the farmers do not want lime to be put in there soil. If acid requiring plants, such as some types of shrubs, are put in alkaline soil those plants are very likely to start to look yellow and very sickly very soon. Even if the water you give to the plants came from limestone strata it could neutralize the soil. Continued use of some types of fertilizer may be cause the loss of acidity, too. If the soil does not have enough acid in it, it may be made more acidic by the application of alum, sulfur, or by adding gypsum to the soil. To add more acid to the soil you can also lift the plants and replace the whole bed to a depth of nine inches with acid soil. It is not easy to make neutral soils acid. Sulfur is the most commonly used to increase the soils acidity, but it acts very slowly.

So acid rain is good for some plants in some places with alkaline soil because some of the plants want acid. Some acid requiring plants are several popular shrubs, including azalea, camellia, gardenias, blueberries, and rhododendron. Soils can be acid, alkaline, or neutral. The amounts of alkaline and acid in the soil influence the biological and chemical processes that take place in the soil. Highly alkaline or acid soils can harm many plants. Neutral soils can support most of the processes.

Florida’s sandy soils are naturally acidic, but the soil is easily changed from acid to neutral or even a base (base is alkaline soil) by the small amounts of lime and calcium that come from tiny shells often found in the

Florida’s sandy beaches.

When acid rain falls from the sky it gets into the soil. The plants only have time to absorb and store the water when the soil is wet. Then the leftover water in the soil evaporates back into the sky where it becomes water vapor, forms into clouds, and gets ready to rain again. It is the same thing with acid rain. The acid doesn’t stay in the soil. The acid evaporates back into the sky.

Penologists are scientists who study the soil. They classify the soils according to the characteristics of a polypedon. There are ten groups of soils; they are Alfisols, Aridisols, Entisols, Histosols, Inceptisols, Mollisols, Oxisols, Spodosols, Ultisols, and Vertisols. Alfisols develop under forests and grasslands in humid climates. Aridisols occur in dry regions and contain small amounts of organic matter. Entisols show little development. Histosols are organic soils. They form water-saturated environments, including swamps and bogs. Inceptisols are only slightly developed. Mollisols develop in prairie regions. They have thick organically rich topsoil. Oxisols are the most chemically weathered soils. They have a reddish color and occur in the tropical parts of the world. Spodosols contains iron, aluminum, and organic matter in their B horizons. They form in humid climates. They are moist, well-developed, acid soils. Vertisols form in subhumid and arid warm climates. They make wide, deep cracks during the dry season.

Other soil groups are the tundra, podzol, chernozem. Tundra soils have dark brown surfaces and darker subsoil’s than in arctic regions that are underlain by permafrost. The soils can be farmed if they are well drained and permafrost is absent or deep-lying. Podzol soils are moderately to strongly leached soils in forests and in humid regions. They are not naturally very productive for agriculture. Chernozem soils (from Russian for “ black earth”) have a dark surface layer underlain by more lightly colored soil. They typically develop under grasses while the temperate is cool. Subhumid climates are highly productive, although they require fertilizers after a long use.

Acid rain is a serious problem with disastrous effects. Each day this serious problem increases, many people believe that this issue is too small to deal with right now this issue should be met head on and solved before it is too late. In the following paragraphs I will be discussing the impact has on the wildlife and how our atmosphere is being destroyed by acid rain.

CAUSES

Acid rain is a cancer eating into the face of Eastern Canada and the North Eastern United States. In Canada, the main sulphuric acid sources are non-ferrous smelters and power generation. On both sides of the border, cars and trucks are the main sources for nitric acid (about 40% of the total), while power generating plants and industrial commercial and residential fuel combustion together contribute most of the rest. In the air, the sulphur dioxide and nitrogen oxides can be transformed into sulphuric acid and nitric acid, and air current can send them thousands of kilometers from the source.

When the acids fall to the earth in any form it will have large impact on the growth or the preservation of certain wildlife.

NO DEFENSEAreas in Ontario mainly southern regions that are near the Great Lakes, such substances as limestone or other known antacids can neutralize acids entering the body of water thereby protecting it. However, large areas of Ontario that are near the Pre-Cambrian Shield, with quartzite or granite based geology and little top soil, there is not enough buffering capacity to neutralize even small amounts of acid falling on the soil and the lakes. Therefore over time, the basic environment shifts from an alkaline to an acidic one. This is why many lakes in the Muskoka, Haliburton, Algonquin, Parry Sound and Manitoulin districts could lose their fisheries if sulphur emissions are not reduced substantially.

ACIDThe average mean of pH rainfall in Ontario's Muskoka-Haliburton lake country ranges between 3. 95 and 4. 38 about 40 times more acidic than normal rainfall, while storms in Pennsylvania have rainfall pH at 2. 8 it almost has the same rating for vinegar. Already 140 Ontario lakes are completely dead or dying. An additional 48 000 are sensitive and vulnerable to acid rain due to the surrounding concentrated acidic soils.

ACID RAIN CONSISTS OF….?

Canada does not have as many people, power plants or automobiles as the United States, and yet acid rain there has become so severe that Canadian government officials called it the most pressing environmental issue facing the nation. But it is important to bear in mind that acid rain is only one segment, of the widespread pollution of the atmosphere facing the world.

Each year the global atmosphere is on the receiving end of 20 billion tons of carbon dioxide, 130 million tons of suffer dioxide, 97 million tons of hydrocarbons, 53 million tons of nitrogen oxides, more than three million tons of arsenic, cadmium, lead, mercury, nickel, zinc and other toxic metals, and a host of synthetic organic compounds ranging from polychlorinated biphenyls (PCBs) to toxaphene and other pesticides, a number of which may be capable of causing cancer, birth defects, or genetic imbalances.

COST OF ACID RAIN

Interactions of pollutants can cause problems. In addition to contributing to acid rain, nitrogen oxides can react with hydrocarbons to produce ozone, a major air pollutant responsible in the United States for annual losses of $2 billion to 4. 5 billion worth of wheat, corn, soy beans, and peanuts. A wide range of interactions can occur many unknown with toxic metals. In Canada, Ontario alone has lost the fish in an estimated 4000 lakes and provincial authorities calculate that Ontario stands to lose the fish in 48 500 more lakes within the next twenty years if acid rain continues at the present rate. Ontario is not alone, on Nova Scotia’s Eastern most shores; almost every river flowing to the Atlantic Ocean is poisoned with acid. Further threatening a $2 million a year fishing industry.

THE DYINGAcid rain is killing more than lakes. It can scar the leaves of hardwood forest, wither ferns and lichens, accelerate the death of coniferous needles, sterilize seeds, and weaken the forests to a state that is vulnerable to disease infestation and decay. In the soil the acid neutralizes chemicals vital for growth, strips others from the soil and carries them to the lakes and

literally retards the respiration of the soil. The rate of forest growth in the White Mountains of New Hampshire has declined 18% between 1956 and 1965, time of increasingly intense acidic rainfall. Acid rain no longer falls exclusively on the lakes, forest, and thin soils of the Northeast it now covers half the continent.

EFFECTSThere is evidence that the rain is destroying the productivity of the once rich soils themselves, like an overdose of chemical fertilizer or a gigantic drenching of vinegar. The damage of such overdosing may not be repairable or reversible. On some croplands, tomatoes grow to only half their full weight, and the leaves of radishes wither. Naturally it rains on cities too, eating away stone monuments and concrete structures, and corroding the pipes which channel the water away to the lakes and the cycle is repeated. Paints and automobile paints have its life reduce due to the pollution in the atmosphere speeding up the corrosion process. In some communities the drinking water is laced with toxic metals freed from metal pipes by the acidity. As if urban skies were not already gray enough, typical visibility has declined from 10 to 4 miles, along the Eastern seaboard, as acid rain turns into smog’s. Also, now there are indicators that the components of acid rain are a health risk, linked to human respiratory disease.

PREVENTIONHowever, the acidification of water supplies could result in increased concentrations of metals in plumbing such as lead, copper and zinc which could result in adverse health effects. After any period of non-use, water taps at summer cottages or ski chalets they should run the taps for at least 60 seconds to flush any excess debris.

STATISTICSAlthough there is very little data, the evidence indicates that in the last twenty to thirty years the acidity of rain has increased in many parts of the United States. Presently, the United States annually discharges more than 26 million tons of suffer dioxide into the atmosphere. Just three states, Ohio, Indiana, and Illinois are responsible for nearly a quarter of this total. Overall, two- thirds of the suffer dioxide into the atmosphere over the United States comes from coal-fired and oil fired plants. Industrial boilers, smelters, And refineries contribute 26%; commercial institutions and residences 5%; and transportation 3%.

The outlook for future emissions of suffer dioxide is not a bright one. Between now and the year 2000, United States utilities are expected to double the amount of coal they burn. The United States currently pumps some 23 million tons of nitrogen oxides into the atmosphere in the course of the year. Transportation sources account for 40%; power plants, 30%; industrial sources, 25%; and commercial institutions and residues, 5%. What makes these figures particularly distributing is that nitrogen oxide emissions have tripled in the last thirty years.

Acid rain is very real and a very threatening problem. Action by one government is not enough. In order for things to be done we need to find a way to work together on this for at least a reduction in the contaminates contributing to acid rain. Although there are right steps in the right directions but the government should be cracking down on factories not using the best filtering systems when incinerating or if the factory is giving off any other dangerous fumes. I would like to express this question to you, the public: WOULD YOU RATHER PAY A LITTLE NOW OR A LOT LATER?

As the century past, the industrial society kept advancing. However, many advantages of the industrial society bring us also has a down side. One of the adverse effects of industrialization is acid deposition due to power plant, fossil fuel and automobile emissions. Acid rain is the popular term but the scientists prefer the term acid deposition. Acid rain can have adverse effects on the environment by damaging forests or by lowering the pH of the lakes and making the water too acidic for many aquatic plants and animals to live.

The father of acid rain research is an Englishman named Charles Angus Smith who suggested in, 1852, that sulfuric acid in Manchester, English, was causing metal to rust and dyed goods to fade. One source that causes acid rain is fossil fuel. Fossil fuel has many usage in our society. Such as to power electric power plants, industrial boilers, smelters, businesses, schools, homes and vehicles of all sort. These various energy sources contribute 23. 1 million tons of sulfur dioxide and 20. 5 million tons of nitrogen oxides to our atmosphere worldwide. When fossil fuels are ignited like oil and coal, they Release carbon dioxide, a so-called greenhouse gas that traps heat within the earth’s atmosphere which causes global warming that is taking place right now. Also, it releases sulfur dioxide, nitrogen oxide and various metals (mercury, aluminum) that are released into the atmosphere that react.