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Pollution and Agriculture

Pollution occurs when something is added to air, water or soil in quantities that nature can't dispose of. It may be natural, such as manure, or man-made, such as pesticides, detergents and fertilizers.

Pollution has always been with us. In recent years, however, a rapidly growing population and the demands this places on our environment have led to a tremendous increase in the problem.

Industry, automobiles and personal carelessness are common causes of pollution. Since we all contribute, we should all work to find solutions. Many people believe our very existence depends on finding these solutions quickly.

Agriculture competes for land with such activities as road building, manufacturing, housing, recreation and forestry. As cities grow larger and populations increase, the competition will intensify. Agriculture will have to produce more food from less land.

Unlike many other industries, agriculture is generally not a major polluter. However, the potential will increase as populations grow and crowd out our farmlands. At the same time, food production will be affected more and more by other sources of pollution.

A great effort must be made to minimize pollution to and from agriculture. Research is trying to correct existing problems while avoiding future ones. We have to find ways in which all of society can live together with a minimum of pollution.

AIR POLLUTION

Agricultural sources

Agriculture is not a major source of air pollution. However, poor practices sometimes cause local problems.

Spraying crops with pesticides on a windy day or with improper equipment can cause chemical drift. This may damage neighboring crops and spread pesticides where they'll do other harm. Care always has to be taken to use the right chemicals, and never on a windy day.

When animal feedlots and poultry houses are close to residential areas, odors sometimes create a serious problem. Improper handling of waste from food processing plants and abattoirs also causes obnoxious odors.

Agricultural refuse gives off smoke and adds to haze when burned. Besides polluting the air we breathe, the smoke can lower visibility on highways. Many areas now have laws forbidding this practice.

Nonagricultural sources

Air pollution has often harmed agriculture in Canada. Owners of identifiable sources of air pollution have paid millions of dollars in damages.

Exhaust fumes from cars and trucks interact with sunlight to create photochemical smog. In some areas, this has damaged crops and trees.

Sulphur dioxide is given off by electric generating stations, some industries, and coal- and oil-burning household furnaces. In high concentrations, this gas is hazardous to humans and can even kill crops and trees.

Fluorides are emitted as gases and dusts from industries such as aluminum, brick and phosphate fertilizer plants. The gases are especially harmful to crops and animals. Gas-collection systems and scrubbers (air purifiers) on smokestacks help reduce possible damage.

Chlorine is produced in the manufacture of caustic soda. In high concentrations, it is extremely dangerous to people and can damage crops and kill animals. Adequate controls exist and the gas usually causes trouble only after accidents or machinery breakdowns.

Many industries emit heavy metals such as mercury, lead, arsenic, cadmium, zinc and selenium. These sometimes find their way into the food chains of plants and animals. We know some of these are harmful, but we still have much to learn about them.

Dusts from other industries, such as cement factories, sometimes cause damage and are a nuisance.

WATER POLLUTION

Agricultural sources

Agricultural operations sometimes contaminate water, but, compared with many industries and municipalities, agriculture is not a major polluter.

Refuse from food processing plants and abattoirs is sometimes dumped directly into waterways. This is not acceptable; it can ruin water for fish, recreation and human consumption. Legislation exists to control this.

Runoff from animal feedlots that gets into waterways can spread diseases, kill fish, increase growth of waterweed and algae and add too much nitrogen. With animal feedlots getting larger, we have to be very careful.

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Washing chemical spray tanks in rivers and dumping empty pesticide containers into waterways can seriously affect aquatic life. Runoff from agricultural land containing high concentrations of pesticides can have the same effect. This is rare, but with the increasing use of pesticides we must use every precaution.

Phosphorous and nitrogen are largely responsible for growth of algae and slimes in lakes and rivers, and for the deterioration of water quality. A study of the Lake Erie basin found that 72% of the phosphorous pollution was from municipal wastes, 4% from industrial wastes and 17% from rural runoff. Much of the 17% comes from nonagricultural sources, such as septic tanks, housing, industrial development and highway construction.

Excessive nitrogen from fertilizers can build up the level of ground-water nitrates. If applied correctly at recommended rates, nitrogen fertilizer should not cause problems. Babies and young animals are most susceptible to nitrates.

Erosion occurs naturally, but it can be decreased or increased by farming methods. Poor methods reduce agricultural productivity, silt up waterways and lakes, and carry phosphorous and pesticides into waterways. Most of the erosion caused by agriculture can be eliminated by using trash cover, strip and contour farming, and by never leaving land unnecessarily bare, especially the slopes next to waterways.

Nonagricultural sources

Chemicals and industrial waste discarded into waterways can make the water unfit for both irrigation and drinking. Laws will eventually make industry remove pollutants from this waste before it is dumped. These pollutants can be removed by settling tanks and chemicals that neutralize or precipitate them out.

Municipal sewage is often discharged into waterways. This can spread diseases that are dangerous to humans and farm animals and stimulate growth of aquatic weeds and blue-green algae, which is poisonous to livestock. When industrial plants add their wastes directly to municipal sewers, the problem becomes even more serious.

Pollution can be lessened by a three-stage sewage treatment. The first stage removes solids, floating scum and grease. The second removes fine suspended material and dissolved wastes. The third takes out nutrients. Other technologies will be needed to remove heavy metals like lead and cadmium. Because of the high cost, few cities have a three-stage treatment plant and some do not even have primary treatment.

SOIL POLLUTION

Soil is the basis of agriculture. All the food we grow for humans and animals depends on it.

Soil receives enormous quantities of man-made wastes. Near cities, it will also become the dumping ground for sludges and other products of new waste-treatment plants.

We have to conserve the quality of our soils, because if we don't, the food we eat will be in jeopardy. With the fierce competition for land that exists today, we must plan for the future; we must decide under what terms we can allow municipal and other wastes to be placed on agricultural, forest and recreational lands.

Agricultural sources

Soil pollution comes from many sources. Agriculture is not a major soil polluter, but some of the practices it uses to increase production do pollute.

The trend in modern farming is towards an ever-increasing concentration of animals, such as in feedlots and broiler operations. This creates a massive waste-disposal problem that is becoming more and more difficult to handle.

The answer seems to lie in recycling these wastes, such as applying them to the land as manure, mixing treated high-protein wastes with animal feed, and extracting the protein biologically for use in animal feed.

In certain areas, long-lived pesticides such as DDT, aldrin and dieldrin have built up in the soil. Although this has seldom caused a problem, some soil insects have developed resistance to them. Also, some crops contain too much of them, and pesticides sometimes build up in the food chain. Alternative pesticides are now being developed.

To increase crop yields, farmers add fertilizers to the soil. These consist largely of salts of the natural soil nutrients, nitrogen, phosphorous and potassium. Fertilizers may contain traces of other elements and care must be taken if these are undesirable.

When applied as recommended, fertilizers do not cause pollution. However, with intensified agricultural production, we tend to use more of these products. Before applying fertilizer, a farmer should make sure it's really needed, through soil analysis, and if so, what type and quantity. Agriculture generally contributes very little to salt accumulation in the soil, although natural salinity affects many hectares of land. However, irrigation can concentrate soluble salts that may curtail or prevent the growth of crops. Improved irrigation techniques, including drainage, lining of canals and land reclamation, can reduce or prevent this problem.

Nonagricultural sources

Our rapidly increasing population is the main cause of soil pollution. Urban sprawl covers land that could be used for farming, and our modern way of life means we each produce more and more waste.

One of the most serious effects of rapid population growth is the indiscriminate sprawling of many cities. Most of these were established near good farmland, which formed the basis of the food supply. As cities expand, this land is covered by buildings, roads and factories and is no longer available to agriculture.

The amount of municipal waste is increasing; each person will soon produce 1 t in a year. Traditionally, cities have used open dumps, incineration and sanitary landfills. Open dumps are no longer acceptable and incineration is itself waste-producing since gases, fly-ash and noncombustible residue must be disposed of.

Sanitary landfills are probably the best traditional method. However, when we consider that they already need about a hectare of land annually for each 25 thousand people, the limitations are obvious. It is evident that methods will have to be found to recycle municipal wastes: composting organic material, reusing paper, glass bottles and scrap metal, and so on.

Industrial wastes have ruined much agricultural land. Mining overburden and wastes, thoughtless disposal of chemical wastes and oil spills are examples.

Automobiles have become a symbol of our way of life. They have also brought many environmental problems, not the least of which is disposal of old car bodies. We've all seen unsightly automobile graveyards dotting the countryside. Efforts are now being made to find practical ways to reclaim and reuse as many of our old cars as possible.

Litterbugs are thoughtless people who disfigure our countryside, highways and parks. Although this seldom affects agriculture directly, it creates an eyesore and is time-consuming and expensive to clean up. Hopefully, public education programs will help. **DON'T BE A LITTERBUG!**

THE GOVERNMENT'S ROLE IN POLLUTION CONTROL

Federal

The federal government does research, advises provincial and municipal agencies, establishes national standards and objectives and makes grants for pollution control. It also coordinates Canada's pollution control activities with other countries. An example of this is the international joint commission that investigates the flow of air and water pollution between the United States and Canada.

Several federal departments are involved in pollution control.

Environment Canada, under the Fisheries Act, controls all coastal and inland fisheries. The act forbids anyone to put a substance harmful to fish in waterways and provides for inspection of fish used as food.

The department is concerned with the health aspects of air and water pollution, how it affects migratory birds and its control. It also establishes national standards and objectives, and cooperates with other federal departments, provincial governments and United Nations agencies to develop national and international policies.

Agriculture Canada registers pesticides and regulates their sale in Canada. It checks agricultural products for possible contamination by chemicals, drugs or pesticides, and carries out research into environmental problems related to agriculture.

The department cooperates with other federal departments, provincial governments and United Nations agencies in developing national and international policy.

Health and Welfare Canada keeps tabs on the nation's food supply, to ensure it is free from excessive pesticides, drugs, fertilizers, industrial chemicals, and other foreign substances. It cooperates with other departments to develop legislation and ensure the safety and purity of our food supply.

Provincial

The provinces have designated departments or agencies to handle pollution problems within their boundaries. Some provinces already have full-fledged departments of the environment and others are working toward this.

Municipalities

Municipalities are mainly responsible for sewage and liquid waste disposal within their boundaries. Some provinces also leave air pollution control to the municipalities.

Large metropolitan areas make for more efficient sewage and storm water disposal systems. However, these are expensive, and grants from federal or provincial governments are often necessary.

THE INDIVIDUAL'S ROLE IN POLLUTION CONTROL

Man has known for a long time that 'spaceship earth' is fixed in size. In the past, we believed it was a place from which we could reap our daily needs and on which we could indiscriminately dump our wastes.

This was all right when we first occupied the earth; our population was small and the materials we used were simply returned to their source once they became waste. Feces, animal bones, worn skins and food scraps broke down very quickly into elements and compounds that again became part of nature's cycle.

As populations built up and technology started giving us vast numbers of new, more durable products, this natural disposal system became inadequate.

Because of the quantity and durability of a lot of modern waste, nature can no longer absorb it efficiently. We are faced with the problem of developing new ways to dispose of it, or even better, to reuse it. We must start thinking of so-called waste as a misplaced resource and work out ways to use it gainfully. For instance, we can compost organic material and recycle such products as newspapers, bottles and cans.

We must realize that man, through his increasing numbers and the way he uses the environment, is responsible for today's pollution problems. Everyone must help solve them; as individuals, we can cut down our daily production of waste whether we are in government, industry, agriculture or just leading our private lives. We have to examine our operations, make changes that minimize pollution, increase research and push for objective legislation. As you can see, pollution is a people problem and it's up to **PEOPLE — that's ALL OF US —** to help solve it.

PUBLICATION 1486 E, available from
Communications Branch, Agriculture Canada,
Ottawa K1A 0C7

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Cat. No. A15-1486/1985E ISBN: 0-662-13728-0
Printed 1972 Revised 1985 6M-3:85

Également disponible en français sous le titre
La pollution et l'agriculture.

