

- assistance in the remediation of surface, subsurface, and contaminated aquifers and the destruction of recalcitrant pollutants

Research on biotechnology applications to improve the environment through removal of hazardous wastes or pollutants is a significant component of the pollution prevention approach. To support this goal, some government research has dealt with the development and use of biotechnology in pollution prevention through "in pipe" technologies and in alternative, less energy-intensive and more efficient production processes.

Information exchange on environment and biotechnology is generated through a national network, BIOQUAL, administered by Environment Canada and the National Research Council. BIOQUAL explores and promotes research and development of biotechnology applications in the pollution control and waste treatment sectors. This research is conducted through institutes such as the Biotechnology Research Institute, the National Water Research Institute, the St. Lawrence Centre, and the Wastewater Treatment Centre. Individual projects often receive support from industry and government.

Provincial governments are also actively involved in research and development on applying biotechnology to the environment. For example, the Quebec biomass recovery centre spends \$3 million annually, through industry and university co-operative agreements, to design and improve biological processes for organic waste treatment.

Governments and leading environmental industries have also co-operated to establish three national environmental technology advancement centres. They serve Canada's growing environmental industry. These centres will assist firms in research and development, business and market planning, and technology demonstration and transfer.

Research on biotechnology applications related to agriculture, forestry, fisheries, and mining is carried on by various government agencies and universities. The Medical Research Council is encouraging collaboration on areas of environmental and human health in biotechnology through a joint university-industry program.

On an international level, Environment Canada, along with Industry Canada, the Environmental Bio-Industries Council of Quebec, and the Industrial Biotechnology Association of Canada, has recently created a network of Canadian companies specializing in bioremediation. This network is currently pursuing market and technology transfer opportunities in Latin America and the Asia-Pacific region. Other biotechnology-related grants to developing countries through CIDA continue.

## **Protection and Maintenance of Environmental Quality**

Protection of environmental quality related to biotechnology products and processes requires the involvement of all sectors of society and benefits from the use of an assortment of tools. To this end, Canadians have developed an assortment of regulatory tools.