

### Monterrey Institute of Technology: Biotechnology Centre

The *Centro de Biotecnología del Instituto Tecnológico de Estudios Superiores de Monterrey* is a new biotechnology research centre being constructed at the Monterrey Institute of Technology. It will offer advanced degrees in biotechnology and will develop biotechnology for the environmental, agricultural and food processing industries. Monterrey Tech is a leader in private research and is considered to have closer ties with the private sector than any other university.

### National Institute for Agricultural and Forestry Research

The *Instituto Nacional de Investigaciones Forestales y Agropecuarias (INIFAP)* was created in 1985 through the consolidation of several public research units. It funds genetics-related research aimed at the development of better seeds. Its primary focus is on staples such as corn, beans and wheat. The organization's budget has been cut, but it remains the principal public research centre for the development of genetically-engineered seeds.

### UNAM Biotechnology Institute

The *Instituto de Biotecnología* of the *Universidad Nacional Autónoma de México (UNAM)*, National Autonomous University of Mexico, is located at Cuernavaca. The UNAM is the largest university in Mexico and receives approximately 20 percent of all government research funds. Since the devaluation, it has been under pressure to work more closely with the private sector. For example, the institute is working with a German company to develop a drug for cardiovascular problems from the saliva of an insect.

### UNAM Biomedical Research Institute

The *Instituto de Investigaciones Biomédicas* at UNAM maintains a separate biotechnology department. It is conducting research in the fields of antibiotics, food processing and animal feed. In 1993, the institute conducted a total of 300 projects, of which 50 were in the area of biotechnology.

### Autonomous Metropolitan University

The *Universidad Autónoma Metropolitana (UAM)* works in the fields of water treatment and anaerobic reactor systems. It offers degrees in Industrial Biochemical Engineering and Food Engineering. This centre has worked with *CYDSA, Química Mexama, Replamex* and other private companies on projects involving bioremediation of wastewater, residual waste treatment and the production of consumable mushrooms using agricultural waste.

### Research and Advanced Studies Centre of the National Polytechnical Institute

The *Centro de Investigación y Estudios Avanzados (CINVESTAV) del Instituto Politécnico Nacional*, specializes in fermentation research and waste treatment processes, including aerobic and anaerobic water treatment systems. The CINVESTAV operates a pilot plant in Mexico City, as well as a research unit at Irapuato, Guanajuato, which specializes in plant genetic engineering. The centre works mainly under contract for industrial clients.

## FOREIGN TRADE

There are no official statistics describing the magnitude or composition of Mexico's imports of biotechnology products. There are two reasons for this. First, the traditional commodity classifications do not explicitly recognize products based on biotechnology.

## Home-Grown Biotechnology

Mexico's private biotechnology sector is relatively small and focussed mainly on established technologies. Nonetheless, it has been responsible for some interesting applications of indigenous technology.

An example is the use of the African marigold, which is referred to in Mexico by its Aztec name, *cempasúchil*. This ancient flower is best known in Mexican culture for its use in Day of the Dead festivities as an ornament for graves. But thanks to a Mexican-developed technology, the African marigold now serves another important decorative function: colouring chicken meat.

By accident, Mexican chicken ranchers discovered that feed that included *cempasúchil* yielded chicken meat with a light gold colour. This appeals to consumers, because although it is just as lean as other modern chicken, it resembles traditional Mexican chicken meat, which is very fat. Ever since this discovery, the best-selling Mexican chickens have eaten feed supplemented with African marigolds. *Laboratorios Bioquímex*, a leading Mexican biotechnology firm, is now exploiting this biotechnological oddity on a large scale.

Indeed, there is no universally-accepted definition of biotechnology.

The second reason for the lack of data is that the official trade statistics do not include services. Exports of advanced technologies tend to be very heavily service-oriented. This is true even when there is a physical good involved, because Mexican users tend to require considerable assistance in implementing new processes.

## CUSTOMERS

In the short term, the best Mexican customers for Canadian biotechnology products are publicly-financed research institutes as well as government environmental and health care