



Soybean cells and alfalfa leaf protoplasts have undergone cell fusion on an experimental basis. Frame I shows the mixed cells; frames II and III, the fusion process; and frame IV, the day-old hybrid cells.

of such bacteria in the surrounding soil, the implications for nitrogen-hungry cereal crops that now depend on chemical fertilizers would be far-reaching.

PLANT CELL FUSION

Scientists are attempting to circumvent nature's constraints on sexual reproduction across species lines through cell fusion, a new technique for producing plant hybrids. Successful fusion could result in an increase in world food production through the introduction of new plant types capable of growing in presently hostile environments.

A group of scientists working at the Prairie Regional Laboratory of the National Research Council in Saskatoon, Saskatchewan, have assumed the leadership role in cell culture research in Canada. They have achieved fusion between widely differing plant species, such as brome grass and pine trees. However, few true hybrid cell formations have been produced, and the identification and isolation of the new cells present a continuing challenge.

Once a new hybrid has been formed, the next, and perhaps most critical task, will be morphogenetic research on the development of the plant to maturity. The group's expertise in morphogenesis already has been called upon by Canada's International Development Research Centre to deal with the mosaic disease afflicting cassava plants, whose food products are a basic commodity for more than 300 million people in the humid tropics of Asia, Africa and Latin America. The scientists cut off disease-free, growing shoot tips of a plant, cultured the cells and induced their growth into mature plants, thus developing a method for providing healthy stocks of the plants.

FOOD AID AND DEVELOPMENT PROGRAMS

As the world's largest grain exporter and as a major source of technical expertise, Canada plays a key role in helping meet the food needs of under-nourished populations, both through direct food aid and through programs to enhance production capacities within developing countries.

Two basic variables affect demand for food: population and income. During the 1960s the world food problem was perceived mainly in relation to population growth, with the focus on the developing nations, and world grain production succeeded in outpacing population growth. In the 1970s rapid global population growth has remained a primary element in expanding food demand. However, rising affluence, accompanied by rising expectations and purchasing power, has created a second claim on world food resources. A doubling of food production will be required by around the year 2000 in order to keep up with the projected demand.

Although future demands for food can be roughly estimated, food production is difficult to evaluate. Unpredictable factors, such as weather, advances in agricultural technology, prices and the market, come into play. Substantial increases in global food supplies will necessitate an accelerated expansion of indigenous food production. Increased food production will require responsible planning, innovative approaches and collaborative efforts among the governments of both developed and developing nations.

Canada is the largest per capita donor of food aid in the world. During the last ten years, Canada's food aid program totalled more than \$1.2 billion, and it is expanding. At the World Food Conference in November 1974, Canada pledged an average of one million tons of cereal grains annually for the years 1975, 1976 and 1977. A substantial amount is being channelled through the United Nations World Food Program, which Canada helped develop and to which it has continually increased its contributions.

In addition to wheat, Canada's food aid has consisted increasingly of high protein items, such as dried milk, cheese, fish, rapeseed and rapeseed oil. A new product composed of wheat flour and milk powder has been supplied on an experimental basis to Ghana, Nigeria and Senegal.

Responding to new realities and priorities following the food crisis of 1972 to 1974 and the energy crisis of 1973, the Canadian government reoriented its aid policies in its *Strategy for International Development Cooperation 1975-1980*. The Canadian International Development Agency (CIDA) is responsible for implementing the new strategy, which is targeted