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EDITORIAL

International Agriculture

Agricultural research has been a major factor in great changes in some countries. In the United States a century ago, most people worked on farms. Today only 2% of the population is engaged in farming. The average urban family spends less than 7% of annual income for food. As a result of research, yields have tripled, freeing land for other uses. Further improvements can be expected if efforts are supported.

Billions of people in less-developed countries have been beneficiaries of research conducted on maize and wheat by CIMMYT* in Mexico and on rice by IRRI† in the Philippines. The initial work was supported by the Ford and Rockefeller foundations. Chronic famines in India were forestalled by a Green Revolution that used genetically improved wheat seeds supplied by CIMMYT. Yields of rice in Asia were markedly increased as a result of work at IRRI. Some of the efforts were aimed at pests. The battle with pests is never-ending.

Success of the Green Revolution created a profound impression on potential donors. They wished to be participants in further successes. A loose consortium called the Consultative Group on International Agricultural Research (CGIAR) was formed. A total of about 38 different donor entities came to be involved. Additional organizations were created and tasked to solve food, forestry, and environmental problems. Ultimately, funds for research were divided among 18 organizations. Progress has been steady but not dramatic. Since 1990, "donor fatigue" has set in. Total contributions have decreased. This has led to drastic dismissals of staff at CIMMYT and other institutions that have a continuing record of genetic improvements in cultivars. For example, half of the 1000 or more wheat varieties released in developing countries during the 1980s were varieties imported from CIMMYT. In addition, germ plasm from CIMMYT has often served in breeding programs conducted in developing countries. But at CIMMYT funds available for research on wheat recently totaled only \$6 million.

One of the reasons that small investments could have large effects is that wheat is a crop that thrives in many circumstances. A variety that performs very well in Mexico is likely to do so in Pakistan or India. In contrast, maize is more affected by its environment. Many varieties must be created to be optimal for differing soils and climates. In the United States, hybrids have been created by Pioneer Hybrid and others that have extended the climatic conditions under which maize can be grown successfully. CIMMYT has produced disease-resistant varieties suitable for the tropics, including their acid soils. Local plant breeders in Zimbabwe have created varieties successful in southern Africa.

In addition to the major field crops, other commodity-oriented CGIAR centers conduct research on plants that include cassava, beans, potatoes, groundnuts, millet, sorghum, and cowpeas. The commodity-oriented centers also serve an important function in the collection and storage of seeds or other reproductive parts of their mandated crops. In total, the CGIAR centers maintain a third of the world's plant genetic resources. Each year the centers distribute 600,000 samples of germ plasm.

The developed and many of the developing countries have benefited greatly from CGIAR and their own agricultural research. Their cost of food is now a minimal fraction of their income. Virtually every country that has high-yielding agriculture has high standards of living and has shown a decrease in the rate of population growth. However, large populations in sub-Saharan Africa and in southern Asia live in poverty and hunger. In part, the problem is a result of a rapidly expanding population. In part, the problem is a result of failures of governments. When rural people do not receive fair payments for their crops, they are unable to afford fertilizers. On average, African farmers apply only about one-tenth the optimum amounts. Many of the soils are potentially capable of very high yields. But in desperation, poverty-stricken, hungry rural people destroy moist tropical forests.

Donors—including the United States—should rethink their current policies. They should find gentle ways of inducing African governments to adopt more equitable policies for their rural people. Donors should also restore funding to CGIAR commodity centers and enable them to work more intensely with those who could be helpful in dealing with problems of the rural poor.

Philip H. Abelson

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