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The drought of 1988 resulted in sharply decreased yields in the United States and raised concerns about future global supplies of grains. Prospects differ from time to time and from country to country. For part of the world, advances in crop productivity have led in average years to unwanted surpluses. In other regions, especially much of sub-Saharan Africa, production has not kept pace with growth of population.

Great efforts to create new and better cultivars are being made in many countries and are likely to continue for a long time. At present, by far the major effects on production have been achieved through plant selection and breeding. Ultimately powerful techniques of molecular biology will have an impact on the effectiveness of conventional methods of crop improvement.

Enormous resources of biological diversity are available to those engaged in plant breeding. Substantial efforts have been made to collect the thousands of wild varieties of commercially important plants. Specimens have been obtained and are being safeguarded that were found in many ecological niches. In general, the plants native to a particular environment have adapted to it. Their DNA often differs somewhat from plants of the same species growing elsewhere. Some of the characteristics found in plants include sensitivity or tolerance to temperature, to length of day, to soil *p*H, to drought, to excess moisture, to salinity, and to pests. Through plant breeding it is possible to improve yields while breeding for success in adverse environments.

Plant breeding is being conducted in many countries. The beneficial effects of agricultural experiment stations are being amplified by international networking that facilitates exchange of information and breeding stock. The Consultative Group on International Agricultural Research (CGIAR) has been particularly effective. Two of its centers had crucial roles in the Green Revolution involving wheat and rice. With time, the number of centers has been increased from 2 to 13, and many other cultivars are being improved such as cassava, potatoes, and beans.

A major potential contributor to additional food supplies of many less developed countries (LDCs) would be increases in the production of maize. This grain is grown in more diverse areas of the world than any other major crop. It is grown in the humid tropics near sea level, at high elevations in the tropics, and throughout the temperate zone. In the developing world about half the crop is consumed directly by humans. An improvement in the productivity of maize in the LDCs or an expansion in the area of the land on which it could be grown would substantially ease the food problems of many countries. Two of the International Agricultural Research Centers are devoting substantial efforts to these objectives—the International Maize and Wheat Improvement Center in Mexico and the International Institute for Tropical Agriculture in Nigeria. These centers cooperate in maize improvement with scientists in about 100 countries, some of which have extensive national programs. A notable example is Brazil, which has recently announced the release of high-yielding maize that can be grown in the toxic high-aluminum soils of the vast Cerrado plateau. Large areas in Africa with similar aluminum toxicity might also be candidates for related cultivars.

In the advanced countries, efforts of government-sponsored research, much of it at universities, are supplemented by the seed companies. The magnitude of their efforts is substantial. For example, Pioneer Hi-Bred International, Inc., headquartered in Des Moines, Iowa, has 25 maize breeding stations in the United States and Canada. A typical station has 20,000 rows of nursery devoted to development of new inbred lines destined to be parents of hybrid seeds. In addition to the breeding nursery each station has a total of 12,000 to 20,000 test plots of 1 to 10 acres in 10 or more locations to evaluate yields and agronomic behavior. The experimenters are seeking maize hybrids that have stable performance across a number of environments. To identify an elite commercial maize hybrid, testing spans four or more years, with each successive year's testing more rigorous.

This discussion has merely sampled part of the vast global efforts to increase the production of food. The machinery that is in place is our best hope for adequate future supplies in the event of unpredictable vicissitudes of changes in climates.

—PHILIP H. ABELSON