Maseca 50th Anniversary Celebration

COMMENTS BY

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May 13, 1999
Polyforum Siquieros, Mexico City

A Tribute to Maseca

I am delighted to join in Maseca's celebration of its first 50 years of operation. Maseca is a remarkable success story of Mexican entrepreneurship and vision, which fills me with satisfaction and pride. In particular, I want to congratulate Roberto Gonzalez Barrera and his family, the Board of Directors, and the entire Maseca staff who have led the company to the premier position that it holds today.

Since Grupo Maseca began operations in 1949, it has sought to modernize the traditional maize dough and tortilla method through the development and introduction of the maize-flour method of producing tortillas. This industrially efficient process, which is now used to process some three million tons, has brought significant benefits to the Mexican family.

The benefits of Maseca's products and technology have also spread to other countries, first into Central America in early 1970s and then in 1976 into the U.S. market. Today, it is the world leader in the production and marketing of maize flour and tortillas, with more than half of its sales coming from operations based outside Mexico.

The recent Maseca investment to establish a new tortilla and maize-snack plant in England to serve the European Union will permit improvements in freshness and quality of your products, as well as lower costs.

I also have noted with interest the rapid progress of Molinera de Mexico, a joint venture established in 1997 with Archer-Daniels-Midland (ADM), which has quickly become the third-largest wheat flour producer in Mexico.

ADM's experience in wheat and basic-grain processing—and its global logistical and manufacturing base—suggests that wheat-based products will be an important business growth factor for Grupo Maseca in future years.

I came to Mexico in 1944 and have been working ever since to raise the productivity and production of wheat and other basic food crops in many countries of Latin America, Asia, and Africa. I guesss I am one of the few here today whose career in Mexico actually predates Maseca's founding, by five years! In this life-long quest, I am deeply grateful to Mexican farmers and to my many scientific colleagues—in agricultural research, teaching, production, and processing—for their dedication and support, especially in wheat improvement, but also in other crops as well. Together we have helped to feed growing populations, not only in Mexico, but also in many other parts of the world.

Agricultural Modernization and Feeding the World

The invention of agriculture--some 10,000 to 12,000 years ago--heralded the dawn of civilization. It began with rainfed, hand-hoe agriculture, which evolved into a animal-powered, scratch-tooled agriculture, and finally into an irrigated agriculture along the Euphrates and Tigris rivers that for the first time allowed humankind to produce food surpluses. This permitted the establishment of permanent settlements and urban societies which, in turn, engendered culture, science and technology. The rise and fall of ancient civilizations in the Middle East and Meso-America were directly tied to agricultural successes and failures, and it behooves us to remember that this axiom still remains valid today.

I am now in my 55th year of continuous involvement in food production programs in developing nations. During this period, I have seen much progress in increasing the yields and production of various crops, especially the cereals, in many food-deficit countries. Clearly, the research that backstopped this progress has produced huge returns.

Yet, despite a more than tripling in the world food supply during the past three decades, the so- called 'Green Revolution' in cereal production has not solved the problem of chronic undernutrition for hundreds of millions of poverty-stricken people around the world, who are unable to purchase the food they need, despite its abundance in world markets, due to unemployment or underemployment.

In 1998 global food production of all types stood at about 5 billion metric tons of gross tonnage and 2.5 billion tons of edible dry matter. Of this total, 99% was produced on the land--only about 1% came from the oceans and inland waters, even though 70 percent of the earth's surface is covered with water. Plant products constituted 93% of the human diet, with about 30 crop species providing most of the world's calories and protein, including eight species of cereals, which collectively accounted for 66% of the world food supply. Animal products, constituting 7% of the world's diet, also come indirectly from plants.

Had the world's food supply been distributed evenly, it would have provided an adequate diet in 1998 (2,350 calories, principally from grain) for 6.5 billion people—about 500 million more than the actual population. However, had people in Third World countries attempted to obtain 30% of their calories from animal products—as in the USA, Canada, or the European Union countries—a world population of only 2.7 billion people could have been sustained—less than half of our current global population.

These statistics point out two key problems of feeding the world's people. The first is the complex task of producing sufficient quantities of the desired foods to satisfy needs in environmentally and economically sustainable ways. The second task, equally or even more daunting than the first, is to distribute food equitably. Here, **poverty** is the main impediment to equitable food distribution, which, in turn, is made more severe by rapid population growth and continued adherence to low-yielding food production systems.

During the 1990s, world population has grown by 800 million, and then again by another one billion people during the first decade of the 21st century. A medium projection is for world population to reach 6.2 billion by the year 2000 and about 8.3 billion by 2025, before hopefully stabilizing at about 11 billion toward the end of the 21st century.

At least in the foreseeable future we will continue to rely on plants--and especially the cereals--to supply virtually all of our increased food demand. Even if current per capita food consumption stays constant, population growth will require that world food production increases by 2.6 billion gross tons between 1994 and 2025. However, if diets improve among the destitute, estimated to be 1 billion people living mainly in Asia and Africa, world food demand could increase by 100 percent—from 4.7 to nearly 9 billion gross tons—over this period.

While there are still some vast areas to bring into production in South America (especially the Cerrados) and in parts of Africa, much of the projected increases in food supply will have to come from land currently in production. Fortunately, there are many improved agricultural technologies—already available or well-advanced in the research pipeline—that can be employed in future years to raise and improve the stability of crop yields, especially in the low-income food deficit countries where most of the hunger and poverty exist.

Sub-Saharan Africa—A Region Bypassed in the Green Revolution

The most frightening prospect of food insecurity is found in sub-Saharan Africa, where the number of chronically undernourished could rise to five hundred million people if current trends of declining per capita production are not reversed. Despite formidable development challenges, many of the elements that worked to bring a Green Revolution to many parts of Asia and Latin America during the 1960s and 1970s will also work in sub-Saharan Africa. An effective system to deliver modern inputs--seeds, fertilizers, crop protection chemicals--and to market output must be established. If this is done, Africa can make great strides toward improving the nutritional and economic well-being of Africa's downtrodden farmers, who constitute more than 70 percent of the population in most countries.

Since 1986, I have been involved in food crop production technology transfer project in sub-Saharan Africa, spearheaded by the Nippon Foundation and its former Chairman, the late Mr. Ryoichi Sasakawa, and enthusiastically supported by former U.S. President Jimmy Carter. Our joint program is known as Sasakawa-Global 2000 (SG 2000), and currently operates in 12 African countries south of the Sahara.

The heart of these projects is a dynamic field testing and demonstration program for major food crops. Although improved technology—developed by national and international research organizations—had been available for more than a decade, for various reasons it was not being adequately disseminated among farmers. Working with national extension services during the past 13 years, more than one million demonstration plots (usually from 0.25 to 0.5 ha) have been grown by small-scale farmers. Most have been concerned with demonstrating improved technology for maize, sorghum, wheat, cassava, and grain legumes.

Virtually without exception, the yields obtained by participating farmers on these demonstration plots are two to three times higher—and occasionally four times higher—than the control plots employing traditional methods. Only rarely have plot yields failed to double that of the control. Hundreds of field days attended by tens of thousands of farmers have been organized to demonstrate and explain the components of the production package. In project areas, farmers' enthusiasm is high and political leaders are now taking much interest in the program.

From our experiences over the past decade, I am convinced that if there is political stability, and if effective input supply and output marketing systems are developed, including a viable agricultural credit system, the nations of sub-Saharan Africa can make great strides in improving the nutritional and economic well-being of their desperately poor populations.

Quality Protein Maize

Let me turn now to one particular scientific research achievement which I believe has great nutritional potential, no only as a human food but also as an animal feed. Quality protein maize (QPM) is one of the most unheralded research achievements in plant breeding of the past three decades. This nutritionally superior maize has much higher levels of lysine and tryptophan than traditional maize, and consequently has protein quality approaching that of skim milk. It has distinct nutritional advantages over normal maize, especially for monogastric animals, including humans. QPM is especially important as a food for mothers and as an infant weaning food.

It has been 35 years since the nutritional importance of the Opaque 2 gene was discovered at Purdue University. Nevertheless, it has taken three decades for the benefits of this to begin to reach commercial production in several countries. Even more inexcusable, it has taken 15 years since it should have become apparent—to any imaginative plant breeder—that the genetic variability and methods were available to convert the originally inferior yielding soft Opaque 2 grain types into hard endosperm high-yielding and disease and insect-resistant types that are competitive with the best conventional varieties and hybrids.

While most crop research institutions quickly became disillusioned with the multiple defects of the original soft endosperm Opaque 2 materials, an interdisciplinary research team at CIMMYT—involving plant breeders, pathologists, entomologists and biochemists—painstakingly corrected the

many defects to produce high-yielding hard-endosperm varieties and hybrids, with grain type and yields comparable to the best conventional maize materials, and with higher protein quality coming as a plus.

Sadly, when CIMMYT's QPM program was poised to make impact, a lamentable decision was taken in 1993 to discontinue research and development work. With the exit of CIMMYT, only a few QPM research programs continued, most notably in Brazil, China, and South Africa.

Through the SG 2000 program, we began working in 1990with national maize researchers in Ghana to develop high-yielding, disease and insect resistant QPM varieties. This culminated in the release in 1994 of an outstanding QPM variety, Obatanpa, which is now the most widely grown improved maize variety grown in Ghana.

Do the success of QPM in Ghana—and the wishes of CIMMYT maize breeders to re-enter QPM research and development—we were able to convince SG 2000's donor organization, the Nippon Foundation of Japan, to providing funding to CIMMYT to restart in its QPM improvement program in 1996. Since then, a new generation of QPM hybrids, which show great promise, are beginning to flow to farmers.

I am particularly pleased that, Mexico—the home of QPM research and development—is now aggressively pursuing its introduction among farmers. Several new hybrids were recently released by INIFAP, and the Secretary of Agriculture, Ing. Romárico Arroyo, has set a target of 2.5 million ha to be planted with QPM within the next 3-4 years. Bravo! But this will bring on the production of large quantities of high quality seed.

Closing Comments

Since Neolithic man—or most probably woman—domesticated the major crop and animal species some 10 to 12 millennia ago, agriculture has been a struggle between the forces of natural biodiversity and the need to produce food under increasingly intensive production systems.

Thanks to advances in science during this century—which is when the population bomb really went off—global food production has kept ahead of population growth and, in general, become more reliable. Through the application of a continual stream of productivity-enhancing technology—all along the food chain—the real price of cereals and other food products has

declined steadily, which has especially benefited the poor, who spend a much larger portion of the available income to feed their families.

Twenty-nine years ago, in my acceptance speech for the Nobel Peace Prize, I said that the Green Revolution had won a temporary success in man's war against hunger, which if fully implemented, could provide sufficient food for humankind through the end of the 20th century. But I warned that unless the frightening power of human reproduction was curbed, the success of the Green Revolution would only be ephemeral. I now say that the world has the technology—either available or well-advanced in the research pipeline—to feed a population of 10 billion people, without damaging the environment.

The more pertinent question today is whether farmers and ranchers will be permitted to use this new technology. Extremists in the environmental movement from the rich nations seem to be trying to stop scientific progress in its tracks. Small, vociferous, well-funded, and highly effective anti-science and technology groups are slowing the application of new agricultural technology, whether developed from biotechnology or more conventional breeding methods.

I am particularly alarmed by those elitist environmentalists who seek to deny small-scale farmers of the low-income countries—and especially those in sub-Saharan Africa—access to the improved seeds, fertilizers, and crop protection chemicals that have allowed the affluent nations the luxury of plentiful and inexpensive foodstuffs. While consumers in the affluent nations can certainly afford to pay more for the so-called "organically" produced foods, the one billion chronically undernourished people of the low-income, food-deficit nations cannot.

In closing let me share with you my greatest wish before I die—to see quality protein maize grown on millions of hectares around the world, and especially to see this great research achievement finally benefit Mexican society. I believe that Grupo Maseca can play a key role in making this dream a reality, and humbly ask for your support and cooperation.

Thank you and God bless all of you in your important work.