

Mr. Chairman, Honorable Abraham Ribicoff, and Members of the
Senate Finance Sub-Committee on International Trade

At the outset, I will provide your committee with some insight into my background and experience. This experience has influenced, in part, my point of view on a number of important social, economic and political problems of the developing nations and my interpretation of how these issues impinge upon relations between the U.S.A. and the developing nations, and especially with that of our next-door neighbor to the south - Mexico.

My name is Norman E. Borlaug, I am a production-orientated agricultural research scientist. I was born and reared on a small Iowa farm, and studied forestry and agricultural sciences at the University of Minnesota.

As a farm youth, I experienced the disastrous impact of the economic depression of the 1930's on American agriculture and on the social fabric of our nation. These shocking experiences left a deep impression, and probably in large part, subsequently influenced my decision to seek a career in agricultural research and production in food-deficit developing nations.

I have lived and worked for the past 35 years, outside of the U.S.A., assisting developing nations improve their agricultural production. As part of my responsibilities, I have been involved in: 1) the training of large numbers of young agricultural scientists from many nations; 2) the development and implementation of interdisciplinary research programs involving plant breeding, agronomy, plant pathology, entomology and cereal technology designed to develop improved technological practices capable of increasing agricultural production when widely applied; 3) devising effective programs for the transfer of the new improved technological practices to farmers; and 4) serving as an adviser to political leaders, policy makers and planners on policies and procedures that are required to stimulate the adoption of the improved technology by farmers which in turn leads to increased food production.

The History and Evolution of Foreign Technical Assistance Programs
Designed Aid Developing Nations

Most of the public, as well as the majority of the political leaders, in affluent countries, take food abundance for granted. The United States is blessed with a highly productive efficient agriculture capable of satisfying domestic needs, and, in addition, exporting large quantities of agricultural products, which in recent years have soared above the \$25 billion mark, yet the general public has little comprehension of the importance of agriculture to the economy or of the complexities of agricultural production, which makes this abundance possible. They seem to believe, all too often, that

food is "produced in the super-markets". They have little comprehension of the capital investments, managerial skills, sweat and risks that are involved in producing our food.

Nearly half of the total world population is engaged in food production, the vast majority at a subsistence level. The percentage of the total population engaged in agriculture varies greatly from country to country. In most of the developing African and Asian countries from 70 to 90 percent of the total population is engaged in agriculture, contrasted to approximately 3.8 percent of the population in the United States. Our neighbors Canada and Mexico currently have 5.9 and 38.7 percent, respectively, of their populations engaged in agriculture.

Considering current and anticipated population growth and improvements in per capita food consumption over the next several decades, present world food production must be doubled within the next 40 to 60 years. Unless this is equitably distributed, there will be increasing economic, social and political chaos that almost certainly will affect all nations irrespective of political ideologies and economic systems.

In order to double world food production within the next 40 to 60 years, it will be necessary to greatly increase yield and production in the developing nations where yields, by American standards, are still very low and stagnant. But there is a long gestation period from the time when a nation commits itself to improving its agriculture, until the impact on production is realized. It requires years of interdisciplinary research to develop appropriate technologies suitable for the important ecosystems within a country for each of the important crops and cropping systems. It requires dynamic extension programs to transfer the new technologies from the experimental stations to the farmers fields. It also requires large capital investments in infrastructure as well as effective economic policies and reliable markets that will stimulate the adoption of the new technology by large numbers of farmers.

Over the past three decades, foreign technical assistance programs have been launched to assist developing nations to improve their agricultural production. Within the past 10 to 15 years, a number of countries such as Mexico, India, Pakistan, the Philippines, Turkey, Thailand and Tunisia have realized large increases in agricultural output as a result of these programs. Continuing dynamic research programs and expanded investments in agriculture by governments will be required over the next four decades if increases in world food production are to keep pace with demand.

The Mexican Government-Rockefeller Foundation Agricultural Program -
A Pioneering Effort to Assist A Developing Nation to Improve Its Agriculture

The first foreign technical assistance program designed to assist a developing nation improve its agriculture - namely The Mexican Government-Rockefeller Foundation Agricultural Program - was launched in 1943. This effort preceded by seven years the first United States Government Foreign Assistance Program for Developing Nations, which was perceived and outlined under so-called Point 4 of President Harry Truman's State of the Union Address on January 20th, 1949, and approved by Congress on February 5th, 1950.

I was privileged to have been selected to serve as one of the first Rockefeller staff scientists in Mexico, by Dr. J. G. Harrar, the first Director of the Mexican-Rockefeller Foundation Agricultural Program. I remained a member of this cooperative project, in charge of the wheat program, for 15 years, until 1960 when its mission was completed and the responsibilities for the continuation of the research and production program were transferred to the newly created National (Mexican) Institute of Agricultural Investigations, staffed largely with young scientists who had been trained in the aforementioned program. From 1960 up until July 1979 I served as Director of the Wheat, Barley and Triticale program for the International Maize and Wheat Improvement Center with responsibilities worldwide.

Largely, as result of the success of the Mexican-Rockefeller Foundation Agricultural Program during the 1940's and 1950's, many requests were made by governments of developing nations to the Rockefeller and Ford Foundations for financial and technical assistance to launch agricultural programs similar to the Mexican program. After assisting a number of developing countries to launch similar national agricultural research programs, it became apparent that it was beyond the financial capabilities of the two foundations to meet the growing number of requests for assistance.

Consequently, in 1960 a new approach was made by these two foundations, and with the assistance of the Government of the Philippines, the first international agricultural research institute was established - namely, the International Rice Research Institute (IRRI), in Los Baños, The Philippines. This institute was charged with developing rice research programs that would meet the needs of all developing nations. In 1964 the International Maize and Wheat Improvement Center (CIMMYT) was created with a worldwide mandate for assisting developing nations with maize and wheat research and production with financial support from the Government of Mexico, the Rockefeller Foundation, the Ford Foundation and USAID. Under pressure from governments of developing nations for technical assistance on other crops and livestock problems, the network of International Agricultural Research Institutes has been expanded to twelve centers dealing with the food crops and animal production problems most important to the diets of the world's food-needy people. Currently, the network of international agricultural

research centers is sponsored by the Consultative Group on International Agricultural Research (CGIAR), which includes the World Bank, the Food and Agricultural Organization of the United Nations, the United Nations Development Program and agencies from over twenty other countries. During 1980, some 30 organizations and governments will donate approximately \$120 million dollars to CGIAR in support of the agricultural research being conducted at the 12 international centers.

The research work now being conducted on agricultural problems at the International Agricultural Research Institutes is meant to complement, not substitute, the research being conducted by the national programs in the developing nations. Officials of CGIAR consider that the research work of the International Agricultural Research Centers is highly important for economic development in the developing nations where the vast majority gain their livelihood from agriculture.

There may be some that feel that an expenditure of \$120 million dollars annually on the international research network in support of national agricultural research programs is too large a sum of money. However, when one compares these expenditures with the general expenditures for all types of research worldwide, as is shown in the following table, it pales into a very modest expenditure considering its importance.

Estimated 1979 Expenditures for All Types of Research Worldwide (CGIAR Data)

	<u>Dollar expenditure</u>	<u>Percentage</u>
		<u>Total Research Expenditure</u>
Total Expenditure on All Research Worldwide	\$ 150.0 billion	100%
Expenditure Defense Research	37.5 "	25
Basic Research	22.5 "	15
Non-Military Space, energy research, etc.	12.0 "	8
<u>Agriculture Research</u>	4.5 "	3
(a) Agriculture in Developed Nations	4.28 "	2.85
(b) Agriculture in Developing Nations	220 million	.15

Direct and Indirect Effect of the Mexican-Rockefeller Foundation
Agricultural Program on World Agriculture

The Mexican research program launched in the mid-1940's began to have a significant impact on agricultural production by the early 1950's. Its first major impact was made in wheat production, which more than quadrupled in the period 1950-1970. During the same period large increases in production were achieved in virtually all other basic crops. Moreover, once Mexico achieved self-sufficiency in most basic crops, it began, for the first time, to develop export crops in which it had comparative advantage, such as the winter vegetables and fruits for export primarily to the American and Canadian markets.

The impact of research and its application on Mexican agricultural production was so impressive that when the cooperative program was being phased-out in 1960, the President of Mexico, Adolfo López Mateos, insisted that an international center for maize and wheat research be established in Mexico with financial support by the Government of Mexico. He stated that he hoped such an institute could be established in Mexico so that his country could provide research and training facilities which in part would repay for the benefits received from the Rockefeller Foundation and at the same time would be helpful in improving the agriculture of other food-deficient developing nations. The International Center for Maize and Wheat Improvement (CIMMYT) came into being in 1964, and was destined to play a key role in revolutionizing wheat production in many countries of the next decade.

The development in Mexico in the early 1960's, of the high yielding semidwarf wheat varieties, together with an appropriate production technology that permitted the expression of their high yield production resulted in enthusiastic adoption by farmers and produced a spectacular jump in yield per acre and in national production. This dramatic revolution in yield and production of wheat, which occurred in Mexico, was successfully transplanted to India, Pakistan, and Turkey in the mid 1960's and somewhat later to many other countries. The impact of the Mexican semidwarf varieties and the improved production technology revolutionized wheat production in these countries, just as it had done in Mexico. Wheat production in India and Pakistan has more than tripled since 1966, and Turkey's production has doubled in the same period. These dramatic increases in wheat yield and production, and somewhat later in rice by using high-yielding IRRI rice varieties and improved technology soon became known as the "Green Revolution."

During the past decade Mexico has exported thousands of tons of high-yielding wheat seed to more than 20 countries in Asia, Africa and the Americas, including the U.S. A.

Currently the semidwarf Mexican wheats or their derivatives are grown commercially in Guatemala, Ecuador, Colombia, Peru, Paraguay, Chile, Argentina, Brazil, Spain, Portugal, Italy, Morocco, Algeria, Tunisia, Egypt, Sudan, Kenya, Tanzania, Ethiopia, Zimbabwe, South Africa, Jordan, Syria, Iraq, Lebanon, Israel, Iran, Afghanistan, Pakistan, India, Bangladesh, People's Republic of China, South Korea, U.S.S.R., Canada and U.S.A.

Mexico, during the past 15 years also has assisted many other countries to improve their agriculture. As an example, there has been close cooperation and understanding between the governments of Mexico and the U.S.A. in many programs of mutual interest, including the following:

1. The eradication campaign in Mexico in the 1950's of the Foot and Mouth Disease of Livestock.
2. The Mediterranean Fruit Fly Control Program to prevent the spread of this pest to U.S.A.
3. The Joint U.S.A. - Mexican Eradication campaign against the Screw Worm of Livestock.
4. The Government of Mexico, since 1951, has provided researchers from the U.S.D.A., North Dakota, South Dakota, Minnesota, Montana and Wisconsin with breeding facilities in Sonora, for the growing offseason (winter) nurseries of wheat, barley and triticale. This cuts in half the years required by U.S. scientists to produce a new variety.
5. In times of emergency, such as in the 1950-54 period when serious epidemics of stem rust devastated the wheat-producing areas of the U.S.A. and Canada, land and facilities were made available in Mexico for a winter (offseason) multiplication of seed of the new American wheat varieties, which were urgently needed to provide protection to American wheat farmers.
6. Campaigns against the production and distribution of Narcotics, e. g. Heroin, marihuana, etc.
7. Establishment and development of the Mexican-American Inter-Governmental Legislative Committee - as a vehicle for amicably solving problems of mutual interest to the two countries.

Continuing Problems of Mutual Concern to Mexico and U.S.A.

Over the past several decades there have been a number of problems that have had negative effects on relations between Mexico and the United States. One of the most serious points of contention was that related to

Mexico's water rights (both volume and quality) on the Colorado River. Fortunately, this problem was solved to the mutual satisfaction of both countries during the past administration.

Two problems of importance to the two countries, however, remain unresolved, namely:

1. The problem of large numbers of undocumented Mexican laborers crossing the U.S. border in search of employment.
2. The continuing problems of trade restrictions between the two countries.

On the surface these two problems appear to be unrelated but in reality they are interconnected and impinge upon one another.

The problem of unemployed and undocumented Mexican workers crossing the U.S. border in search of work is a prickly and sensitive issue for both governments. There is no simple solution to this problem.

The Government of Mexico is confronted with a serious and worsening problem of unemployment. This is the consequence of explosive population growth over the past three decades. In 1944 Mexico's population was approximately 18 million; today it is about 69 million and continues to increase at the rate of about 3 percent thereby adding about 2.1 million to the population each year. The government of President José López Portillo is well aware of the seriousness of this problem and has:

1. Launched an energetic national program of family planning to slow population growth to manageable levels. However, even with success in this program, there will be a long lag time before the positive results of this effort becomes apparent, since Mexico's population is a young one with 46 percent of the total, 15 years or younger.
2. Announced plans to greatly expand the capital investment in small - and medium-scale, labor-intensive industries. This is being done to provide more opportunities for employment and is to be financed in a large part from income from petroleum. It will take several years to construct and bring these new industrial plants on stream. Meanwhile there will be no appreciable reduction in unemployment and large numbers of unemployed workers will continue to seek employment wherever it can be found.
3. Attempted to expand the production of labor-intensive export crops, such as winter vegetables and fruits and thereby provide more employment. This effort has been repeatedly frustrated by threats of a U.S. embargo on imports of winter vegetables, especially tomatoes, under the stimulus of a very effective Florida tomato producers lobby.

4. Expanded the public work programs which will provide more jobs, while at the same time improving the nation's infrastructure.

I am convinced that the present Government of Mexico is making a valiant and honest effort to cope with the unemployment problem. Its task is made more difficult by the public's reaction to recurring accounts in the press of abuses to which undocumented Mexican laborers have been subjected by unscrupulous employers in the U.S. A.

It is ironic that while a labor shortage exists in some parts of the U.S. A., and especially in the southwest agricultural sector, a serious problem of unemployment exists in Mexico. It is lamentable that some suitable agreement beneficial to both countries has not been found.

It is my personal belief that the unemployment problem in Mexico and the need for more laborers in the U.S. A. deserves the attention of the highest levels of both governments. This international problem must be solved amicably and promptly, or it will continue to fester and contribute to weakening relations between the two nations.

Mexican-American Trade:

I am a strong advocate of free trade between nations based on the concept of the comparative advantage in the production of goods. This maxim can provide the greatest benefit to consumers, and enhances international understanding.

It should be evident to every American that we live in an ever-more interdependent world. This has resulted from the necessity of all nations to increase their trade in order to obtain the commodities and goods necessary to keep their economies viable and growing.

For example, prior to World War II, the U.S.A. was self sufficient in almost all nonrenewable minerals, including petroleum. Today we import from 80-100% of the following 15 minerals that are vital to our industries: strontium (100%), colombium (100%), mica (sheet-99%), cobalt (98%), manganese (98%), titanium (97%), chromium (91%), tantalium (88%), aluminum (ore and metal-88%), asbestos (87%), the platinum group (86%), tin (86%), fluorine (86%), mercury (82%), and bismuth (81%). Moreover, there is another group of 12 important minerals that we import in quantities ranging from 40 to 80% of our requirements. This group includes: nickel (73%), gold (69%), silver (68%), selenium (63%), zinc (61%), tungsten (60%), potassium (58%), cadmium (53%), antimony (46%), tellurium (47%), barium (40%), vanadium (40%), and petroleum (45%).

The list is growing rapidly. If we were denied the importation of these basic minerals, as we were petroleum during the 1973 OPEC embargo, what would happen to our industrial production? to unemployment? What, as an indirect consequence, would happen to social unrest? In effect, whose lifeboat would we, as a nation, attempt to crawl into to save ourselves? We

are now part of a one-world community whether we like it or not. It is not 1930 but 1979, and the spaceship earth has shrunk.

Sometimes, however, I feel the U.S.A. is acting as a schizophrenic in trade policies with our Latin American neighbors. For example, in 1977 Mexico was our fifth largest buyer of American goods, with a value of \$4.8 billion dollars. During the same year Mexico ranked seventh as a supplier of imports to U.S.A. with a value of about \$4.7 billion dollars. Trade in agricultural products represented only a small part of the total. Agricultural exports to Mexico were valued at \$665 million whereas agricultural imports from Mexico were valued at \$1.0 billion dollars. During 1977 petroleum imports from Mexico were valued at \$856 million dollars, but are expected to increase to \$2.6 billion in 1979.

It is incomprehensible to me that we continue to bicker and irritate our Mexican neighbors over threatening to shut out tomato imports of about \$150 million dollars. Meanwhile, we will rely more and more on Mexico as a source of petroleum and gas.

In the past the U.S.A. has exported both phosphatic and nitrogenous fertilizers to Mexico. In all probability, within the next decade the U.S.A. will become a large importer of nitrogenous fertilizer from Mexico.

But export trade to Mexico will also almost certainly expand greatly in the next five years. Much of it will be sophisticated equipment for the oil and petrochemical industry. There will, however, be increasing exports of corn, soybean and wheat to Mexico as the population growth and increased per capita consumption continue to outpace Mexico's ability to produce these commodities in the quantities required.

American Foreign Policy Toward Latin American Countries

In closing I feel I would neglect my responsibility as an involved American citizen if I did not express my concern for our neglect of an effective positive foreign policy toward the Latin American Republics.

It appears to me that throughout the 35 years that I have lived and worked in Latin America, I have seen our major foreign policy efforts directed toward Europe, the Middle East and Far East. Serious American foreign policy attention and efforts are directed toward individual countries in Latin America only when and where trouble breaks out. It appears to me there is no constructive continuing overall policy. The neglect has often fostered frustration and misunderstanding among our neighbors - all of the Latin American Republics. And while neglect reigns throughout the region, it becomes fertile ground for troublemakers.

September 29th, 1979.