Improving Potato Production in Mexico: John S. Niederhauser and Rockefeller Foundation-Sponsored Research during the 1950s and 1960s.

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John S. Niederhauser was an important scientist and administrator in the Rockefeller Foundation's Mexican Agricultural Program (MAP) from the 1940s through the 1960s. In 1943, the Rockefeller Foundation and the Mexican government established a program to improve agricultural production in Mexico. The MAP originated much of the agricultural practice and procedure that became known as the "Green Revolution." From 1961 to 1972, Niederhauser directed the Inter-American and International Potato Improvement Programs headquartered in Mexico. For his contributions to the improvement of agricultural production, he was awarded the World Food Prize in 1990.

Born on September 27, 1916 in Seattle, Washington, Niederhauser grew up in Menlo Park, California. He traveled to the Soviet Union in 1935 and he spent a year at

the Timiryazev All-Union Academy for Agricultural Sciences in Moscow under the sponsorship of the famous plant geneticist, Nicolai Vavilov. In 1936, he returned to the United States to attend Cornell University. He graduated in 1943 with a Ph.D. in plant pathology and began working on increasing potato production in New York.

In 1946, Niederhauser went to Mexico to join the newly formed MAP as a plant pathologist to work on the diseases of corn, wheat, and beans. During this period, he also began the study of potato production in Mexico. Through this work he would make important contributions to biology, plant pathology, and agricultural science, and his study of potato culture would define his career for decades to come.

One of Niederhauser's scientific contributions was the development of potato varieties with resistance to late blight disease, caused by the fungal pathogen *Phytophthora infestans*. This pathogen has been responsible for many potato disease outbreaks around the world, including the infamous Irish potato famine during the 1840s. During his research, Niederhauser discovered that the source of the pathogen responsible for the Irish potato famine came from Mexico. More importantly, Niederhauser followed up on the earlier work of both Vavilov and one of his Cornell professors, Donald Reddick, when he discovered many wild inedible potato species in Mexico that possessed a durable field resistance to the late blight fungus. Using these resistant lines he began breeding work which resulted in a collection of commercially useful disease resistant potato varieties, enhancing successful potato production not only in Mexico but worldwide.

Niederhauser helped train numerous Mexican plant pathologists who went on to research and teach the next generation of agricultural scientists in Mexico. The pathologists in his lab made discoveries that produced groundbreaking knowledge about

the sexual reproduction of *P. infestans*. Niederhauser had established numerous cooperative agreements with university and government laboratories overseas, and these connections helped his staff rewrite the biology of the most devastating pathogen on potatoes.

Niederhauser's work over the next several decades focused on the improvement of potato production and agricultural research in many developing countries. In 1971, Niederhauser was instrumental in the establishment of the International Potato Center (CIP) in Lima, Peru. Throughout the 1970s, he traveled the world assisting in the creation of national potato programs tied into the CIP network.

In 1978, Niederhauser helped create the Regional Cooperative Potato Program (PRECODEPA) in Mexico, Central America, and the Caribbean. This cooperative program eventually grew to include 12 countries and spawned similar programs in other parts of the world. PRECODEPA's structure was implemented specifically to give equal power to all the members and diminish the role of a potential overarching authority such as CIP. Many of the member states had small or nearly nonexistent potato improvement programs, but all remained equals in the organization. Funding came largely from the Swiss government, so no member provided the bulk of the funding and therefore none could demand the bulk of the influence.

In the 1980s, Niederhauser continued to push his commitment to developing economies, whether in the northern hemisphere or elsewhere. He worked to improve cooperation between agricultural scientists in Poland and their colleagues in Mexico, the United States, and elsewhere with the development of CEEM (Cornell-Eastern Europe-Mexico). He also worked with several American universities such as the University of California – Riverside and the University of Arizona, where he was a professor and

frequent graduate advisor, on projects dedicated to improving the lot of subsistence farmers around the world.

Perhaps closest to his heart was the organization he helped to found in response to the worldwide threat caused by the "escape" of the A2 mating type of *Phytopththora infestans* in the late 1970s. This increased the likelihood of genetic combination in *P. infestans* populations and raised the chances that any potato field could host multitudes of different races. Added to that danger was the fact that sexually produced oospores could overwinter in cold northern fields and trigger blight epidemics in temperate zones earlier in the growing season than ever before. Niederhauser's efforts resulted in PICTIPAPA (*Proyecto Internacional Cooperativo de Tizon Tardio de la Papa*) or the International Cooperative Potato Late Blight Project. This organization acted as a clearinghouse for increasingly timely research information about the organism that causes late blight of potato.

In addition to his efforts in potato development and late blight research, Niederhauser also worked through popular venues to spread the word about the value of the potato as a food source. He sat on the Board of Directors of the fledgling Potato Museum. He often spoke to groups of schoolchildren and helped them set up small gardens where they could grow potatoes for themselves. He was also very interested in the use of recycled automobile tires as soil containers to create small potato plots, particularly in urban settings.

Beyond an interest in Niederhauser's general scientific and organizational contributions, my research at the Rockefeller Archive Center was focused on how his potato research in Mexico compares with the ecological-based criticism of the Green Revolution that has appeared over the last several decades. Scholars such as Cynthia

Hewitt de Alcantara (*Modernizing Mexican Agriculture*; 1976), Andrew Pearse (*Seeds of Plenty, Seeds of Want*; 1980), Bruce Jennings (*Foundations of International Agricultural Research: Science and Politics in Mexican Agriculture*; 1988), Deborah Fitzgerald (*Exporting American Agriculture: The Rockefeller Foundation in Mexico: 1943-1953*; 1994), and J.H. Perkins (*Geopolitics and the Green Revolution: Wheat, Genes, and the Cold War*; 1997) have tended to categorize the research of the Rockefeller Foundation in Mexico and elsewhere as supportive of large landholders at the expense of peasant farmers and as ignorant, sometimes even destructive of local, sustainable agriculture. Preliminary evidence suggests that Niederhauser's research on potatoes, however, was specifically designed to create a useful food source that could be grown by small farmers who did not have recourse to eco-damaging pesticides or expensive, imported seed and fertilizer.

The Rockefeller Archive Center contains many records that are invaluable to research on Niederhauser. Of particular use is the Rockefeller Foundation Archives, Record Group 1. Projects, Series 300D (South America-Natural Sciences and Agriculture), 323 (Mexico), 331D (Peru-Natural Sciences and Agriculture), containing important correspondence, internal reports, publications, and grant information; and Record Group 6 Field Offices, Series 6.13 Mexico, 1943-1965, which contains informative correspondence, financial records, annual reports, and officers' diaries. There also are photographs attached to these files located in the general Rockefeller Foundation photograph collection. In addition, the Rockefeller Foundation Agricultural Program Oral History Interview with Niederhauser (RG 13/-003) is very useful.