



A Nobel laureate's vision

of hands-on, multidisciplinary agricultural training


Norman E. Borlaug always considered himself a teacher as well as a wheat scientist. Working in Mexico in the early 1960s, he trained more than 100 young researchers from North Africa, the Middle East, and South Asia. When they returned home, they took Mexican-bred wheat seed with them and became members of an international wheat fraternity and a testing network for wheat seed. When famine struck South Asia in 1964 and 1965, Dr. Borlaug's former trainees had already tested Mexican wheat varieties and high-yield production practices, and they knew that they fit

local production conditions and could revolutionize cereal production. The Green Revolution in South Asia in the second half of the 1960s derived in no small part from the tireless efforts of these scientists, and it subsequently spread throughout much of the developing world, saving more than a billion lives.

Today, several thousand agricultural scientists – men and women from more than 50 countries – are proud to describe themselves as Borlaug “students” or “hunger fighters.” Over his 63-year career, Dr. Borlaug

travelled to more than 100 countries and spoke directly to more than 500,000 students and ordinary citizens, explaining the challenges and complexities of world food production. He always made a point, when he could, of visiting farmers and agricultural scientists in their fields.¹

1. Braun, HJ. Norman Borlaug's Legacy and the Urgent Need for Continuing Innovative Wheat Technology. Proc. 8th Int. Wheat Conf. and BGRI 2010 Technical Workshop, 2010, St. Petersburg, Russia. Czech J. Genet. Plant Breed., 47, 2011 (Special Issue): S3-S5. <http://www.agriculturejournals.cz/publicFiles/48939.pdf> (Accessed 16 May 2017)



“No matter how excellent the research done in one scientific discipline, its application in isolation will have little positive effect on crop production. What is needed are venturesome scientists who can work across disciplines to produce appropriate technologies and who have the courage to make their case with political leaders to bring these advances to fruition.”

– Dr. Norman Borlaug

In his Nobel Peace Prize acceptance speech in 1970, Dr. Borlaug described the training program he started in the 1940s.

"An in-service [intern] training component was added to the research program to train a new generation of Mexican scientists while they were assisting with the development of the research program," he said. "Provision was also made for fellowships to enable the most promising of these young scientists to study abroad for advanced degrees, hopefully in preparation for positions of leadership in Mexican agriculture." Successful as the program was, training in its first 3 decades 550 young scientists, Dr. Borlaug realized that much more was needed. "The Mexican experience indicated that one of the greatest obstacles to the improvement of agriculture in the developing countries is the scarcity of trained people," he explained. "This experience indicated clearly that training is a slow process. Where no corps of trained scientists exists — as was the case in Mexico 27 years ago and remains the case in many countries of Asia, Africa, and Latin America today — it requires 18-25 years to develop enough competent research scientists and educators to meet a country's needs."

Dr. Borlaug recognized the vital role of international agricultural research centers in providing such field-oriented scientific training.

"The international centers are in a unique position to contribute to practical or internship-type training in all of the scientific disciplines affecting crop production," he observed in the same speech. "This type of training is particularly valuable for young scientists from the developing countries because it prepares them for initiating research work upon return to their native country and will also be of value if they subsequently continue their education at the graduate level."

For Dr. Borlaug and his team, training new scientists was as important as the germplasm enhancement that created new wheat varieties. His commitment to training, especially in the field, was such that all staff members were enjoined to participate in the in-service training

program. In addition — as recalled by Jesse Dubin, a plant pathologist who worked with Dr. Borlaug for almost 25 years and is a founding contributor to the Borlaug Training Foundation — breeders, pathologists, and trainees all worked together to inoculate wheat nurseries with rust, as did Dr. Borlaug himself and Glenn Anderson, the CIMMYT director of research.

"They selected plants together, diagnosed the rust, harvested, and graded seed," explained Dr. Dubin. "This helped create an *esprit de corps* among trainees and CIMMYT that was important for international cooperation. He was especially

concerned that young scientists needed to realize the importance of field work in the production of good wheat varieties."

Dr. Borlaug saw firsthand that, in most countries he visited, most of the scientists he met were well versed in theory but rarely experienced in the field. Further, many lacked the multidisciplinary breadth needed for research to succeed.

"He knew from experience," Dr. Dubin added, "that if you were out on the firing line alone somewhere, being an expert in only one discipline was not going to serve you or the program."

Norman Borlaug's personal commitment to training young scientists bought the world some time in its quest to advance agricultural productivity at a pace that at least matched population growth.

"In my Nobel lecture," he recalled in 1997, "I suggested we had until the year 2000 to tame the population monster, and then food shortages would take us under. Now I believe we have a little longer."

Today, though, we again have a dearth of field-oriented scientists, and yet we face challenges even more daunting than population growth alone. Climate change, dwindling natural resources, and entrenched poverty all demand solutions that require applied scientists who know the field, listen to the plants, and are willing to take risks to drive forward the great leaps we need in science and policy to ensure sustainable food security worldwide.

The Borlaug Training Foundation is committed to carrying forward Dr. Borlaug's legacy and to advocating for high-quality field-oriented scientific training. Such training is fundamental to successfully grappling with a future challenged by climate change and food insecurity.



Colorado State University



Borlaug
Training
Foundation

1170 Campus Delivery
Colorado State University
Fort Collins, CO 80523-1170
www.borlaugtrainingfoundation.org
info@borlaugtrainingfoundation.org
[@BorlaugTraining](https://twitter.com/BorlaugTraining)