

**T**wenty years after winning the Nobel Peace Prize for the plant breeding work that saved millions of lives in Mexico and Asia, Norman Borlaug's focus is on Africa. Although he has accomplished much, Borlaug, 76, won't rest. There's no time for it in a world overrun by famine and no better place for the ultimate test of his skills than the Dark Continent.

Despite the lifelong efforts of agricultural scientists, Africa has made little headway in combating starvation. In Sudan, the Kansas of the continent, this year's famine threatens four million to eight million people. Another three million have been put at risk by Ethiopia's civil war.

Each day 40,000 children die of hunger-related causes, many of them in Africa, according to Bread for the World. In Ghana, 42% of the children are underweight; in Somalia, 65%; in Tanzania, 48%.

**Man-made hunger.** Yet Borlaug knows there's enough food and technology to feed everyone on the globe. It's politics impeding agriculture and food shipment—stupidity resulting in starvation.

"We seem to want to store bombs rather than food," he says. "There are a lot of hungry people, more now than in the 1960s. It's a battle, but we haven't won the war. We can hold it for three to four decades. We haven't done much about changing it. The population monster is out of hand."

If anyone can help, Borlaug can. In his view, feeding everyone on the planet is a starting point for solving virtually all international problems. When he was presented the 1970 Nobel Peace Prize, Aase Lionaes introduced him by saying, ". . . more than any other single person of this age, he has helped to provide bread for a hungry world. We have made this choice in the hope that this will also give the world peace."

It's a hope that's perhaps naive, but it's also a necessary one for functioning in the modern world. Alleviating hunger and human misery in food-deficit countries is not only essential, he wrote in 1985, but failure to wipe out starvation will contribute to worsening social and political unrest worldwide. That "will adversely affect not only developing nations but almost certainly the affluent developed nations as well," he says.

Sitting in a small office on the second floor of a stark modern building at

Texas A&M University, where he now spends about four months a year, Borlaug ponders why the world's leaders don't set out to solve the most obvious problems of all: food production and distribution and population growth.

"For the 800 million Third World people who all too often have empty stomachs, shirtless backs, roofless houses, no medical care, who are unable to educate their youngsters to find a better way, the outlook is pretty grim," he says. "We've made no progress on that front.

"We're adding a billion people every 10½ years. We're all concerned about the environment, but the gains made there will all be eroded away in a few decades unless the human population situation is changed. All the effort to change the environment is insignificant in itself unless we come to grips with the population monster."

Considering today's world situation, it sounds unlikely. But Borlaug has long fought the unwinnable fight. For those familiar with his story, his whole life has a legendary quality, as though he was pulled to greatness by some invisible hand and set upon the earth just for this.

Born into a family of Norwegian-American farmers, he grew up at Saude, Iowa, in the hilly northeastern part of the state. Spurred to curiosity by his grandfather Nels, whom he considers a natural-born rebel, he learned to question assumptions many people make about life, and he grew to love the land.

Nels told him, "That's where you find God—in the soil, in growing things," and he never forgot it.

A star high-school athlete despite his small size, Borlaug, by a virtual miracle of chance, wound up at the University of Minnesota, where he was an outstanding wrestler. After flunking an entrance exam, he was banished to the general college and only after considerable personal effort allowed to major in forestry.

Intending to live life as a forester, Borlaug changed directions only when Depression-era cutbacks eliminated an Idaho job he had already landed. Jobless and married, he took the only path offered at the time: graduate school, studying plant pathology under the renowned E.C. Stakman at Minnesota.

After getting a Ph.D., Borlaug went to work for Du Pont, heading a biochemical group. He researched a num-

PHOTO: DENNIS BRACK, BLACK STAR

# THE GRAIN BRAIN

NORMAN BORLAUG  
FATHER OF THE  
GREEN REVOLUTION  
FIGHTS LOSING  
ODDS IN AFRICA

By Charles Johnson



**PREMIER WHEAT BREEDER** Norman Borlaug, 76, still works to transplant his green revolution to Africa. But political strife and a "population monster" are frustrating his efforts.

ber of ag products, including DDT. In 1941, he tried volunteering for the army but was rejected because his work was considered vital to the war effort.

In 1944 he took a job as plant pathologist with the Rockefeller Foundation in Mexico. Encouraged by Vice President Henry Wallace, the foundation set out to solve Mexico's food problems. Borlaug started working with wheat in the Bajio, an area of rich fields fertilized by volcanic ash.

Right away, he was in trouble. "For two to three years I thought, 'What a decision, what a mess,'" he says. "I had a son born with spina bifida about that time, and he lived his whole life in a hospital. It was a pretty miserable life for us then. I thought I had played everything wrong. I wanted to get a variety going that would withstand rust, then say to hell with it and leave."

With virtually no equipment, Borlaug roughed it everywhere he went. "Mud was so bad we got stuck every time we took a truck anywhere," he says. "I carried a sleeping bag and camping equipment and fishing tackle and a gun to get my own food. I could survive pretty good and not be frightened of it. My time spent in forestry helped with that."

Results, slow at first, started snowballing. He developed a rust-resistant wheat and still couldn't leave the place. With dwarfing genes taken from Japanese varieties, he bred a short-stemmed wheat that could stand even with heavy fertilization. Yields soared.

**Enormous gains.** Breeding in two areas at different latitudes made a unique wheat that could grow from Morocco to India. The secret was eliminating photoperiod sensitivity. "He bred wheats that utilize about the same number of days to maturity regardless of whether the hours of daylight are lengthening or shortening. Wheat thus bred can be adapted within a range, north and south, of perhaps 5,000 miles instead of the customary 500," writes Don Paarlberg in his 1988 book, *Toward a Well-Fed World*.

Borlaug's wheats are now credited with providing the essential daily calories for 315 million people. From 1960 to 1966, India averaged 11 million metric tons of wheat yearly. In 1989, the yield hit 54.4 million metric tons.

Borlaug went to work for the International Maize and Wheat Improve-



PHOTO: MIKE BOYATT

**GRAIN PRODUCTION IN THE NILE delta is barely keeping pace with the population. Most African countries already suffer mild to serious malnutrition, including four million to eight million people in Sudan this year.**

ment Center in Mexico, where he still spends much of his time. He also works with the Global 2000 Foundation, a group affiliated with former President Jimmy Carter, is trying to improve African food production.

In the first six months of 1990, Borlaug made five trips to Africa to oversee various projects. "I don't do much in-field research any more," he says. "I'd like to. I miss it."

Traveling to Third World nations puts him in the midst of political unrest. As a Nobel laureate, he's a potential target when on the road. On one occasion he narrowly escaped being kidnapped by terrorists.

"I never go looking for trouble, but it's all around," he says. "I like to work isolated from the political arena, but when things get jumpy and the government wants to put a bodyguard behind me—I'm no good with a guy standing next to me with a machine gun—I go somewhere else. And where there's social strife, I never give a press conference until the day I leave the country."

In that sort of climate, food production often kneels before political and social considerations, to Borlaug's disgust. He's continuing his Mexico-based project of training local scientists in multiple disciplines necessary to produce food crops.

"I've tried to be an integrator of cross-disciplines," he says. "If you just work with the variety alone, nothing happens. You have to know how to restore fertility to the soil, the proper seed population, planting date, soil moisture, weed control, insect control, proper harvest and storage, all of it, or you're lost out there. That's the technological package."

He knows changing lives is part of changing agriculture in the Third World, and that's the toughest part. "You're dealing with the psychology of change," he says. "You want little farmers to see what's possible. You're dealing with something more important than money. They've got power if they can

organize themselves. I get there and say, 'By God there's going to be change or something is going to happen.'

"You have to have a package that will at least double the yield, and very often triple or quadruple it. You've got to set the prices right. You modify the social structure and work with young people and try to retrain them."

**Emotional environmentalists.** Accused of basing the Green Revolution on commercial fertilizers and agricultural chemicals, Borlaug loses patience with those he calls emotional environmentalists. "All this confusion about chemophobia is something I've thought a lot about the last few months. Looking for zero biological risk is a bunch of nonsense," he says. "People need to look at the problem and the solution and not get bogged down in little things."

Having spent most of his life in the Third World, Borlaug finds that his thoughts often conflict with the culture around him here at home. At Texas A&M, where he teaches a course each fall now, what he sees sometimes baffles him.

"I've spent the last 46 years in developing countries, where life is very different," he says. "The standard of living here is so high. What bothers me is that the people take it for granted, as though it's their birthright."

That's all part of the vision, though. If a child in America, can sit down to a nice meal in a good house surrounded by pleasures, why can't a child in Ghana or Benin do the same? Borlaug will spend his remaining years working for those Third World children.

"Work is the best medicine God gave mankind," he says. "Trying to stay active is a pretty good tonic. A lot of things still need to be done." ◀