STARTING FROM SCRATCH
IMPROVING MOZAMBIQUE'S GROUNDNUT HARVEST

War-torn Mozambique is far from an ideal setting for the conduct of badly needed agricultural research. Yet determined efforts in recent years have produced a rare result: an all-Mozambican research team. Work to improve groundnut production is also promising, but the daily threat of attack prevents contact between young scientists and farmers.

Photos: Rhoda Metcalfe

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A grey sky hangs heavily over the patchy acre of groundnuts. Dr R.K. Ramanaiah points down at one rectangular bed of brown earth from which a few leafy stems have straggled up.

"Only 15 plants lived out of the 200 seeds we planted. If none had survived we would have lost this variety," he says.

The field is nurturing hundreds of varieties of groundnuts (also called peanuts) which were collected from around Mozambique and the rest of Africa for a research project for which Dr Ramanaiah is advisor.

Replanting and harvesting the different varieties is not the easiest way to preserve seed samples—but then in Mozambique, a poor Southern African country ravaged by guerrilla warfare and famine, nothing comes easy.

In the first years of the groundnut project, financed by IDRC, the seeds were kept in a cold storage room. To survive, the seeds must be kept at around 4 degrees Centigrade. But frequent sabotaging of electrical power lines around Maputo, the capital, by the guerrillas or "armed bandits" have caused power failures of up to a month. During these blackouts, temperatures in the storage room would creep up to 25 degrees—deadly to seed samples.

Recognizing this problem, IDRC bought the project a diesel generator to fill the electricity gaps. Unfortunately, chronic shortages of supplies and services in Mozambique—for example, no cement to build housing for the generator and, later, no wiring to connect it up to the storage room—have kept the generator silent.

Against this backdrop of supply shortages and widespread violence in Mozambique, the groundnut project has nevertheless made quiet advances since its beginning in 1981. As Dr Ramanaiah points out though, "It isn't hard to advance when you're starting from scratch."

More than 75 percent of Mozambique's population depends on farming to survive and groundnuts are their main source of edible oil. The research project is the first attempt to improve groundnut quality and yields in Mozambique.

Prior to independence in 1975, the Portuguese colonial government directed

The research team has collected hundreds of varieties of groundnuts. Here, a local variety called bebiano has been grown by the government seed company at the researchers' request.

any agricultural monies at improving cash crops such as sugar, cashews, and cotton. "Groundnuts were a poor man's crop—a crop of the peasant farmer—so the Portuguese didn't bother with it," the project leader explains.

Neither did the colonial rulers bother to train Mozambicans in agricultural research. At independence, there was only one Mozambican agronomist in the country and the ranks of laboratory technicians and trained field workers were similarly empty. With a 93 percent illiteracy rate, the general level of education in the country was abysmally low.

Dr Ramanaiah began training from the bottom up. He hired 20 "sons of farmers with experience in the field" and taught them the basic skills of agricultural science such as identifying plant diseases, marking out land, and proper distribution of fertilizer. Of the 20 hired, 10 had a grade four education. "Some of the others signed their names with a thumbprint," the agronomist recalls.

The trainees were encouraged to upgrade their educations at night school and by phase two of the project in 1984, five of the most promising recruits were chosen for further training. Each received an IDRC scholarship for a six-month course in a specialized research area such as seed multiplication, plant breeding, or crop mixing, at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in Hyderabad, India.

Most of the 80 recent graduates in agronomy from Maputo's Universidade de Eduardo Mondlane got their hands dirty in the field for the first time through the groundnut project. By conducting surveys among peasant farmers, the university students were forced to consider the practical needs of the farmers instead of keeping their heads in the laboratory, says Dr Ramanaiah.

Consider an example from Inhambane Province. The red soil is iron-rich and forms a hard crust as the iron oxidizes in the air. If the groundnut variety planted in this soil doesn't have a strong stem, the farmers must beat the earth around the plants in order to pull the submerged groundnuts up through the crust intact. Unless the agronomist has good communication lines with these farmers, he is likely to breed a groundnut with a weak stem and then wonder why the farmers reject it, Dr Ramanaiah explains.

"It is a very hard thing beating the ground for hours to get a few groundnuts," he says. Even the monkeys know enough to jump from a tree onto the soil to loosen the crust before grabbing the nuts and running off, he adds.

Dr Ramanaiah is confident that by the time he returns to India at the end of his contract in 1990 the research team, Mozambican from the lowest skilled to the highest, will be ready to continue on its own.

"And an all-Mozambican research team is a rarity in this country," says the agronomist.

In addition to the training, the project has had one concrete victory. After collecting and testing local and imported groundnut samples, the researchers singled out the most suitable variety for each of the southern and northern halves of the country.

Under the typical farming conditions of no irrigation, pesticides, or commercial fertilizers, a local groundnut variety called bebiano was found to be the best choice for southern farmers. It yields at least one tonne per hectare in a good year and 0.5 to 0.7 tonnes per hectare in a dry year. This is 10 to 20 percent better than the major varieties imported from South Africa.

The real challenge to the researchers was convincing the government seed company that the bebiano variety was superior. "It took us six years to get the seed company to multiply the local groundnut variety. It is very difficult to convince people that local is better than imported," Dr Ramanaiah explains. "In my opinion, it will take four to five years before it (bebiano seed) reaches all the private farmers."

Seed multiplication is a slow operation and the National Seed Company does not currently produce enough seed for the entire southern half of the country. The company gives farming cooperatives first chance at obtaining groundnut seed on the agreement that the farmers refund the seed company twice the original quantity after harvest.

For the soils of northern Mozambique, the researchers found that varieties from Senegal and Burkina Faso outperformed Mozambican seed.

The researchers had originally hoped that by the third phase of the project, from 1987 to 1990, they would expand research in three northern provinces creating a nationwide groundnut research program. Instead, the guerrilla war, waged by the South African-backed Mozambique National Resistance Movement (MNR), has forced the researchers to abandon their fieldwork in five provinces and retreat to the security of Maputo City.

In 1983, the groundnut researchers were shocked into realizing the danger posed by the MNR when two project workers disappeared in the southern province of Inhambane while touring farms to buy seed samples. Dr Ramanaiah found the project Land-Rover and two decomposing bodies 15 days later in the bush some 300 kilometres from Maputo. Since then the violence has spread.

The danger of being ambushed along Mozambican roads has become so great in recent years that many foreign governments forbid their employees to travel between cities by car. Maintaining distant research bases under these conditions is too costly and impractical for the groundnut project. "You need to wait 15 days to arrange a plane to take you for a four-hour visit at a research station," says Dr Ramanaiah.

After seven years of training, the research team is at the point where they should be working intensively with the farmers, says the project leader. They should be studying the diverse farming practices and soil conditions, and the farmers' use of draught animals. They should be testing new ideas to improve crop production.

"The farmers are our technicians, their animals are our experimental animals," says Dr Ramanaiah. Or they would be if the researchers could get to them. Like all development projects in the country, the groundnut project is a victim of the war that is so effectively paralyzing development in Mozambique. ■

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