



TEN YEARS OF N2AFRICA

The rise of legumes in Africa

Ken Giller has worked on improving the cultivation of legumes by small-scale African farmers for 10 years. His approach has brought significantly bigger yields and incomes to over half a million farmers. Now the project is coming to an end. 'If a method is good, it spreads amongst farmers.'

TEXT ALBERT SIKKEMA PHOTO GEORGINA SMITH / CIAT

‘We had a formula,’ says Ken Giller, professor of Plant Production Systems. ‘Leguminous crops plus *Rhizobium* bacteria fix nitrogen from the air, giving you a natural fertilizer. That is a big advantage. Together with fertilizers such as phosphate and potassium, it ensures a good yield. We had successfully tested this for the project in small-scale experiments, and then we rolled it out through N2Africa.’ For 10 years, Giller promoted the cultivation of these legumes – beans such as the common bean, soyabean, peanut and chickpea – among small-scale African farmers, with the aim of improving their food production. The main funding came from the Bill and Melinda Gates Foundation, which contributed 52 million US dollars. The project worked to ensure that farmers in 11 African countries gained access to seed of new varieties of grain legume crops. As well as seed, the project helped to organize the supply chain so as to ensure access to the necessary fertilizers and the appropriate *Rhizobium* bacteria for fixing nitrogen. Preliminary studies were done in every country to see which crops would be the best choice to match local needs and habits, the climate and the soil composition. Studies were also done to find out which *Rhizobium* strains would be most effective.

IMPROVING SALES

Poor agricultural infrastructure was a bottleneck for the project. The seeds, inoculants and artificial fertilizer that the project supplied and tested were not widely available in rural Africa, and sales outlets for the legumes were poorly developed. The project teams in the 11 African countries therefore sought the cooperation of dozens of local partners to help improve the marketing and distribution system.

Most of the farmers the project reached, about 600,000 in all, benefitted from the N2Africa formula. Many of them had never worked with bacterial inoculants and talked of a ‘magic black powder’. In combination with good management – early sowing, and weeding – the formula produced significant-

ly higher yields and incomes in 80 per cent of cases, says Giller.

And so N2Africa achieved good results with half a million African farmers. Yet Giller is reluctant to call it an unqualified success, ‘because it didn’t work everywhere.’ Not all farmers managed to get better harvests with the N2Africa treatment, and it was not clear why that was.

YIELD GAP

Giller’s group set up trial plots everywhere with four sections: one for the crops alone, one with the crops and bacterial inoculants, one with the crops and artificial fertilizer, and one with all the relevant inputs. Broadly speaking, the trial plots with all the inputs produced the highest yields. But something odd happened too. ‘In theory, you get the biggest increase in yield on the plots with low soil fertility, where the yield gap – the difference between the actual and the potential yield – is biggest. But that is not what came out of our tests.’

After extensive analysis, the researchers found two more causes of the variation. Firstly, the cocktail of good seeds, inoculants and phosphorus didn’t work at all on about 10 per cent of the plots. ‘Some soils were so exhausted that nothing would grow on them,’ says Giller. Secondly, the variation in yield turned out to be related to the way the plot had been treated in the past. This meant some fields had more micro-nutrients, potassium and magnesium available than others, and that had an effect on the yield too.

80 per cent of the farmers benefited from the method

The funding from the Gates Foundation has stopped now, so N2Africa is over. But in a way, it is not, says Giller. ‘If a crop or a practice is good, it goes on spreading among the farmers.’ He points to research by the Knowledge, Technology and Innovation chair group on the distribution of new seed in Africa. If a farmer gets hold of better seed, he passes it on to an average of 4.5 more farmers. ‘Based on the 600,000 farmers we reached directly, the N2Africa method probably reached up to 2.5 million African farmers.’

And on top of that, says Giller, N2Africa worked with 30 to 40 local partners in every country, including national research centres, radio stations, and seed and artificial fertilizer producers. Those partners may continue to spread N2Africa’s methods. ‘If we want to measure the impact, we should take another look in five years’ time.’ ■

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‘RELEVANT CONTRIBUTION’

The Institute of Development Studies (IDS) in the UK evaluated the claims made by the N2Africa project, on the basis of interviews with small-scale African farmers in Ethiopia and Ghana. The IDS reported that N2Africa made a relevant contribution to expanding soya cultivation in northern Ghana. In Ethiopia, N2Africa made a key contribution to the production and supply of inoculants and to making farmers more aware of these nitrogen-fixing bacteria.