

N2Africa

Putting Nitrogen fixation to work for smallholder farmers in Africa



N2Africa increases the nitrogen inputs from biological nitrogen fixation (BNF) to improve food and nutritional security of smallholder farmers, enhance soil fertility and establish new value chains around grain legumes.

The N from N2Africa

Nitrogen (N) is an essential nutrient for plant growth. N_2 – nitrogen in its gaseous form – forms almost 80% the atmosphere. Yet, it is inaccessible for most plants. Leguminous plants can use N_2 from the surrounding air through a symbiosis with rhizobia bacteria. Rhizobia interact with the legume root and form root nodules in which N_2 is fixed into ammonium, a form of nitrogen that plants use for their growth.



The legume yield

The yield of a grain legume depends on the interaction between the genotype of the legume, the genotype of the rhizobia, the environment and the management of the crop and field; $(G_L \times G_R) \times E \times M$ in short. For the specific legumes, such as soybean and chickpea, matching rhizobia are not naturally abundant in the soil. Inoculating soybean and chickpea seed with rhizobia bacteria is therefore essential for nitrogen fixation.

N2Africa on the farm

N2Africa offers various technologies to enhance legume yields and the inputs from nitrogen fixation following the $(G_L \times G_R) \times E \times M$ interactions. All technologies fit in the diverse smallholder farming systems of sub-Saharan Africa. We work with soybean, cowpea, common bean, faba bean, groundnut and chickpea; the major grain legumes.

Grain legume technologies that farmers use include:

- Improved varieties
- Rhizobial inoculant
- Phosphorus fertilizer
- Optimal plant densities
- Optimal intercropping patterns
- Staking methods for climbing bean



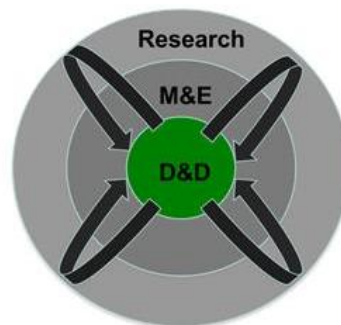
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Ghana, Nigeria, DR Congo, Rwanda, Kenya, Uganda, Tanzania, Ethiopia, Malawi, Zimbabwe, Mozambique



Development to research

N2Africa is a *development-to-research* project. Each year thousands of farmers experiment with the N2Africa technologies and adapt them to their own needs. This ‘development and dissemination’, or ‘D&D’, forms the core of N2Africa. Extensive ‘monitoring and evaluation’, or ‘M&E’, of these small trials allows data to flow into research. We then tailor and adapt ‘best fit technologies’ at the field-scale into a set of locally relevant options and principles. With the rhizobiology research we identify the best matching rhizobia strains for different grain legumes.



National expertise is the ultimate goal

N2Africa’s ultimate goal is to build strong national expertise in grain legume production and research in each project country. The first keyword here is capacity building. We train young scientist to lead legume research in the various countries. In addition, training of all key stakeholders – from farmers to traders, development workers in extension and NGOs – builds the necessary capacity for a continuous and independent improvement of technologies.

Public Private Partnerships

The other keyword is partnerships. Development partners embed the N2Africa technologies in their agricultural programs for a continuous dissemination of knowledge on grain legumes. Public-private partnerships allow for a stable supply of agricultural inputs such as seed, fertilizer and inoculant, and link farmers to output markets.



Grain legumes in the African smallholder system

Grain legumes are an important component of smallholder farming systems. They contain essential amino acids, B vitamins, iron, calcium and zinc, and are therefore essential for a healthy diet. The residues can be used as high quality feed for livestock or compost and surplus grain can be sold. Through better legume yields N2Africa hopes to improve the food and nutritional security and farming income from smallholders. Because legumes are often women’s crops there are also possibilities to strengthen the role of women in society.

