



An International Center
for Soil Fertility and
Agricultural Development

Success Story

Managing Soil, Water and Nutrients for Maize Based Cropping Systems in Eastern Africa

IFDC continues to collaborate with the International Maize and Wheat Improvement Center (CIMMYT's) maize program in eastern and central Africa in strategic crop and soil management research. This research is focused on on-farm evaluation and dissemination of stress-tolerant maize varieties from CIMMYT's regional germplasm improvement projects. Additionally, the research involves the development, evaluation and dissemination of agronomic practices that enhance the productivity of this germplasm including integrated management of inorganic and organic nutrients in maize-based cropping systems, and soil moisture conserva-



tion technologies for maize cropping systems in dry areas. IFDC's soil fertility specialist/maize systems agronomist based with CIMMYT's team in Nairobi, Kenya, conducts research in close collaboration with CIMMYT scientists and agronomists and scientists of national agricultural research systems (NARS) in countries forming part of the East and Central Africa Maize and Wheat (ECAMAW) Research Network. This research is funded by the Canadian International Development Agency (CIDA) and Bundesministerium für Wirtschaftliche Zusammenarbeit (BMZ).

Elite varieties of CIMMYT's low nitrogen and drought-tolerant maize germplasm have been tested by over 700 farmers on their own farms under their own management in small 4-6 plot so-called "Baby" trials. Farmers also had the opportunity to see the potential of these varieties when planted in their community by NARS researchers with optimal fertilizer management in "Mother" trials. The "Mother-Baby" trials serve the three-fold purpose of evaluating advanced new varieties under diverse conditions, exposing farmers to new varieties, and incorporating their criteria and evaluation in the selection process. Based on this exposure and farmer feedback, several new varieties have entered the national certification process in Kenya for release.

To help farmers gain the most from these drought and infertile soil-tolerant varieties, IFDC and CIMMYT work with NARS scientists to test and disseminate cultural practices that improve soil fertility and conserve soil moisture. During the past 3 years, trials by network scientists in Ethiopia, Uganda, Tanzania, and Kenya have tested grain legumes, green manure/cover crops, animal manures, and composts in combination with inorganic fertilizers in over 250 on-farm and on-station trials. Locally adapted green manure species have been identified and tested in different systems with maize (intercropping, relays and rotations) and in comparison with fertilizer nitrogen sources. Depending on the degree of growth suppression and the duration of follow-on growth possible after the maize harvest, intercropped or relayed green manures had either little or substantial effects on maize yields in the following season. The effects of green manures rotated with maize had more consistent and substantive effects on subsequent maize yields with increases as much as 385%, or 2.5-3.0 t/ha, on farmers' fields. Based on this research, ECAMAW scientists began promoting "Best Bet" systems on farmers' fields in 2002 using low-N tolerant maize varieties to take greater advantage of the N derived from legume components in the system.