Strides from the Heart of Africa

The phase I of the Consortium for Improving Agriculture-based Livelihoods in Central Africa (CIALCA) project, initiated in 2006, succeeded in (i) characterizing the target areas, (ii) developing and evaluating technologies for improved productivity of banana- and legume-based systems, (iii) promoting improved nutrition and farmer-market linkages, (iv) building capacity, mainly of national system scientists (18 students trained at M.Sc. or Ph.D. level) and farmer groups (130 farmer groups trained), and (v) initiating partnerships to reach scale. CIALCA-I also broke new ground by establishing effective partnerships between institutes of the three target countries, which resulted in successful collaboration, sharing of resources, experiences, and ideas. While CIALCA-I focused most of its activities in specific action and satellite sites—comprising a limited number of households—within each mandate area, CIALCA-II aims at impact in the mandate areas.

Phase II was initiated in 2009. The project's overall goal is to improve the livelihoods of agriculture-based communities in Central Africa by enhancing their capacity to access and efficiently use the resources needed to improve system productivity, resulting in a better income, nutrition, and environment.

CIALCA is enhancing dissemination and adoption of technologies by working with various local NGOs and national agricultural research institutes (NARIs) in the Great Lakes region. In Burundi and DR Congo, the Consortium is working with the following partners: Catholic University of Graben, North Kivu; INERA Mulungu, South Kivu; the University of Kisangani (UNIKIS); the Institut des Sciences Agronomiques du Burundi (ISABU), and the Institut de Recherche Agronomique et Zootechnique (IRAZ). Through such partners and farmer associations, the project undertakes training of farmers and farmer groups on seed multiplication and storage techniques produce processing technologies for better nutrition, group dynamics, and financial management. The project undertakes CIALCA has also implemented activities designed to enhance market access by strengthening farmer groups to enable them organize themselves towards implementation of commercial activities.

CIALCA has successfully developed Integrated Soil Fertility Management (ISFM) technologies. These interventions include options for cassava-legume intercropping, maize-legume intercrops and crop rotation systems, and site-specific soil fertility management recommendations. ISFM on-farm trials initiated by CIALCA-I address key cropping constraints in banana-based farming systems including trials with alternative manure management, the continuation of mulching and zero-tillage practices, options for soil erosion control, banana-legume intercropping, and improved legume germplasm, amongst others.

CIALCA has also set up a Knowledge Resource Centre (KRC), conceived to support and facilitate the achievement of positive impacts. The KRC identifies and activates impact pathways to disseminate new project knowledge and innovative technologies to end-users and stakeholders. CIALCA continues to promote capacity building through sponsorship of students undertaking Ph.D. and M.Sc. degrees.

In this current phase, CIALCA has managed to enhance banana yields in Rwanda by 350%. Though unknown to many, life in the soil affects the way plants grow and mature. Soil organisms such as fungi, bacteria, and protozoa help plants in several of their daily growth functions including recycling nutrients, increasing the rooting density, and stimulating photosynthesis. This forms part of work of the Bioversity International/Tropical Soil Biology and Fertility (TSBF) CIALCA project/Rwanda Agricultural Research Institute (ISAR). Based on identified constraints, arbuscular mycorrhizal fungi (AMF) stimulate plant growth and maturity in a similar manner and contribute to the healthy status of the plants and crops that we see in the field. Mycorrhizal studies are included in the context of alternatives to nutrient use efficiency and integrated pest management (IPM). The AMF are keystone organisms that mediate nutrient cycling and control of soil and root diseases. They enhance plant growth, survival of plants on establishment particularly in low fertility soils, and drought prone environments.

AMF inoculation is beneficial for nursery and field management of tissue culture bananas. Research carried out by CIAT–TSBF scientists in Rwanda showed that inoculation with indigenous AMF strains increased yield at Rubona from 6.4 to 23.02 t/ha. This represents an increase of over 350% in yield gain in low phosphorus (P) soils (P levels ranging from 15 to 21.9 mg/kg) and from 7.6 to 31.4 t/ha in high P level soils (50-80 mg/kg). Banana cultivars differ in their response to AMF with cooking bananas more responsive than dessert bananas. Soil available P level determines response to AMF inoculation with levels of 50-80 mg/kg, giving more benefits to inoculation than soils with lower P levels.

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