

International Plant Nutrition Institute Africa Program

Background

Fertilizer use is extremely low in much of the sub-Saharan Africa (SSA) region, and this is one of the main factors explaining lagging agricultural productivity growth. Cereal crop yields have stagnated at less than 1 t per ha over the past 5 decades, despite an increase in food demand by 3-3.5% per year due to a rapidly growing population. At present, chronic food insecurity affects 28% of the 700 million people who live in SSA. At the current trends of population growth, cereal crop productivity must grow by 4% annually or more than double by 2020 to make SSA self-sufficient in cereal production.

Most of the soils in Africa are inherently infertile, and poor agricultural management practices during the past decades have led to a severe decline in their productive capacity. Given the low levels of fertilizer use and poor soils in SSA, fertilizer use must increase if the region is to reverse the current trends of low crop productivity and land degradation. There are renewed efforts to raise fertilizer use in SSA from the current 8 kg to 50 kg per ha by improvement of the marketing, policy and socio-economic environment to increase fertilizer availability at prices affordable to smallholder farmers. However, to realize full agronomic, economic and environmental benefits of increased fertilizer use, the fundamental issues of providing the crops with adequate nutrients under the highly variable soil fertility conditions in SSA must be properly addressed. Soil fertility research in SSA over the past decades has established integrated soil fertility management (ISFM) as pivotal to satisfying short-term nutrient requirement by crops and sustaining soil fertility in the long-term. ISFM encompasses the appropriate use mineral fertilizer in combination with various organic resources, including crop residues, animal and compost manure and legume residues, and manage the limited nutrient resources judiciously to improve the agronomic efficiency of the fertilizer, while avoiding detrimental effects on the environment.

Program Focus

The main focus of IPNI Africa program is to provide leadership and direction in plant nutrition research and development. Working with partners from national agricultural research and extension systems, Universities, International Agricultural Research Systems and other stakeholders, information will be synthesized and research programs developed to encourage fertilizer use within the ISFM framework in ways that are technically efficient, economically rational, and environmentally friendly. Program activities will initially focus on maize based cropping system in the East and Southern Africa sub-humid zone, due to its high potential for agricultural intensification, and will cover both commercial estates and subsistence oriented agricultural systems. The program will also partner with the IFDC West Africa Division to establish research and training activities to enhance profitability and sustainability cocoa and oil palm production in humid zones in West Africa to of these major cash crops through improved nutrient management practices.

Program Focus 1: "Clearing House" for information on fertilizer access and use in Africa

Despite extensive research on the role of fertilizer in improving crop productivity in Africa, much of the information remains fragmented as there has been little effort to consolidate results from wide-ranging studies. As a consequence, evidence for the potential of impact of fertilizers on increasing crop productivity and key management practices that contribute most to yield increases has often been incoherent. To fill this gap, IPNI is collaborating with various research and development institutions to develop a database and information system to collate and analyze data on fertilizer access, use and the potential impact of fertilizer in Africa. Various products will be developed to make the information accessible to various stakeholders in agricultural research and development. Some of the key benefits of the information system will be:

- Development and dissemination of science-based information on the role of fertilizer in sustainable increase in crop productivity and maintenance of soil resource base.
- Highlighting cropping systems that offer good opportunities for intensification.
- Improved understanding of the pathways and knowledge systems necessary to sustainably increase crop productivity in heterogeneous farming systems in Africa.

Program Focus 2: Agronomic research and tools to validate site-specific fertilizer recommendations and BMPs

IPNI will collaborate with various existing projects (nationally and internationally funded) to promote the efficient and responsible use of plant nutrients to increase agricultural production in a sustainable manner. Efforts will be mainly placed on supporting the design, implementation and capture lessons from agronomic trials for refining the general fertilizer recommendations that exist in most regions to site-specific soil, climate and socio-economic conditions. Additionally, simple tools (such as Nutrient Expert for Hybrid Maize) to support extension agents and farmers in making informed decisions on nutrient management will be validated for conditions in Africa and applied widely to develop and promote BMPs that satisfy food and income requirements of various categories of farmers. The program has established linkages with the Alliance for Green Revolution in Africa (AGRA) and the African Soil Information Services project led by CIAT and will backstop their efforts to validate and disseminate site-specific plant nutrient management practices. These efforts will potentially reach millions of farmers in Africa. Through cooperation with Universities in Africa, IPNI will co-supervise Msc and PhD student projects and help to identify priorities for plant nutrition research.

Program Focus 3: Development of material and training programs to promote BMPs

The third program focus will be on innovative and effective transfer of knowledge on best fertilizer management practices to input suppliers, public and private agricultural service providers, extension services and farmers. Working with partners, various IPNI material (including posters, training manuals, handbooks, audio-visual productions etc) will be adapted and new materials specific to Africa developed for different categories of end users. IPNI will together with the Soil Health Program of the Gates Foundation on a project to raise awareness of good fertilizer management and ISFM amongst stakeholders and providing information to improve decision-making by policy makers, extension workers,

input suppliers. This project will also provide an opportunity to contribute to educational curricula to improve effectiveness of University teaching programs.