Awareness and promotion

Alongside any work to promote the FOT there will be an ongoing campaign to demystify fertilizer use. Farmer mobilization needs to be well planned and organized to be effective and reach more smallholder farmers. Building awareness and demand amongst farmers for the FOT is relatively straightforward for radio/TVs based on farmers’ endorsements, word of mouth, and building in visits to successful farmers was pointed as an effective approach. It is therefore essential to build demand through the expansion of a delivery network: demand and supply need to be grown simultaneously.

Public and Private extension services, such as the community knowledge workers in Uganda, can also go a long way in changing the mind set of the farmers in Uganda on fertilizer use. Farmer Field School, where village based experiments/trials could be conducted with, and by, the farmers, would work well in cascading awareness and demand and supporting a culture of the right use of fertilizer amongst smallholder farmers in the context of BFMP.

Public and private extension services are important, but so are other government agencies in the mobilization of smallholder farmers; for example, locating the FOT within the plans for state fertilizer subsidy.

If all advice services, public and private, can be encouraged to use an approach based on the FOT, smallholders will have coherent and consistent messages. Currently different providers often provide different and sometimes contradictory advice on fertilizer application. Joint training of the extension staff and also private extension service providers would help build greater cohesion but this will only succeed if it has full policy backing.

There is an opportunity to increase awareness of FOT through the CABI-supported Plantwise plant clinics that are being implemented in almost all of the OFRA countries. Ideally, farmers want all their farming problems to be addressed in one sitting/visit, rather than pie-cake solutions. Already there has been awareness creation on the FOT at plant clinics. There was a general feeling by the intermediaries that a lot of work can happen on the FOT use at the plant clinics if well-coordinated. One extension worker suggested that plant doctors could also be trained on FOT usage.

The FOT can be further integrated into the input supply chain by bringing in agricultural loan institutions. The FOT helps profit maximization and as a mini business plan to convince the bank to advance the loan if it has full policy backing.

Conclusions and recommendations

There is a growing appreciation of FOT as an innovation in agriculture to address the problem of fertilizer application by the resource poor farmers among the extension workers in Uganda. This suggests a replicable model that could be applied elsewhere in sub-Saharan Africa where majority of farmers are small-scale with minimal purchasing power.

In Africa fertilizer application has been a major challenge, compounded by limited financial resources to purchase enough fertilizer. In Africa fertilizer application has been a major challenge, compounded by limited financial resources to purchase enough fertilizer. The FOT can be an important as a decision making tool as it guides the farmer in choosing the most profitable nutrient-crop combination based on the prevailing farming conditions that season.

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Promotion and awareness creation calls for investment including in training and support materials and materials for a promotional campaign. The FOT will require further refining the tool to ensure it continues to meets farmer’s needs, including new crops.

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Links with additional information

2. Uganda work positioned to make fertilizer use more profitable for poor farmers http://bit.ly/1m1Sr6d
4. The fertilizer use optimizer solver and macros programming manual http://bit.ly/1juAgY

Monograph series:

The monograph is part of a series of four published in July 2015 and based on case-study research and focus group discussions in Uganda.

Monograph 1: Fertilizer Optimization Tool, an innovation for resource poor farmers in Africa

Monograph 2: Institutionalization of the Fertilizer Optimization Tool, a key ingredient to sustainability lessons from Uganda

Monograph 3: Farmers start appreciating the benefits of using the Fertilizer Optimization Tool in guiding fertilizer application in Uganda

Monograph 4: Fertilizer Optimization Tool: From the community knowledge and extension workers perspective in Uganda (following-up on trained intermediaries)

These monographs can be downloaded from www.africasoilhealth.cabi.org

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Overview

About four million households in Uganda survive on farming and a significant proportion live below the poverty line and suffer food insecurity. The presently poor soil fertility plays a part. This is exacerbated by deficiencies in nitrogen (N) and phosphorus (P) and other biophysical factors, leading to soil fertility depletion.

Achieving significant change requires greater use of inorganic fertilizer supplemented with soil and water conservation and organic nutrient supplementation. This will provide productivity and yield increases but how can resource-challenged smallholder farmers be supported to make this change?

Excellent agronomic responses to fertilizer application have been demonstrated and reported for many crops, verifying that fertilizer N and P use is effective for increasing crop yields in Uganda. This has positive implications for food security and farm profitability. Despite all these findings and low crop yields, farmers’ adoption of fertilizer and other integrated Soil Fertility Management (ISFM) technologies is still very low.

The intervention

The Optimizing Fertilizer Recommendations in Africa (OFRA) project has been funded to address the problem of poor farmers who cannot afford to implement current fertilizer recommendations. The project builds on the Alliance for a Green Revolution in Africa, Soil Health Program’s funding in 2009 when a prototype Fertilizer Optimization Tool (FOT) was developed as a decision support tool to guide farmers in fertilizer investment. Additional investment in 2013 added more nutrient response trials and a comprehensive search of legacy data leading to more crops being added to the FOT.

The FOT is a milestone in agriculture, helping farmers optimize returns on fertilizer investment. The tool selects the best crop-nutrient combination based on maximizing the return on investment. It is highly beneficial to smallholder farmers for whom the cost of borrowing is very high: in April 2015 the Bank of Uganda increased the central business interest rate to 12 percent, so borrowed money has to work hard.

The intervention has been beneficial to smallholder farmers for whom the cost of borrowing is very high, due to insecurity. The inherent poor soil fertility plays a part. This is exacerbated by deficiencies in nitrogen (N) and phosphorus (P) and other biophysical factors, leading to soil fertility depletion.

Planning and designing the FOT roll out

Once FOT technology is developed and tested, the roll out stage is done using the technology transfer pathways to the end users. In Uganda, these pathways include the existing government extension agencies, private sector innovation, NGOs and various farmer organizations; agro input dealers as well as NGOs active in agriculture which have an extension arm. These agencies require initial training tailored to ensure that they understand the potential of the FOT and can introduce it to farmers.

In Uganda over 500 government extension staff from National Agricultural Advisory Services (NAADS) and over 50 NGO Community Knowledge Workers (CKWs) were initially trained in different regions in Uganda to roll out the FOT in 2014/2015. However, this was not as successful as hoped due to restructuring of state extension in Uganda.

Community knowledge and extension workers FOT story for Uganda

To learn from the Uganda experiences in using and adapting FOT to various uses both by the intermediaries and by the resource-constrained smallholder farmers, the extension workers consider the FOT as a decision making tool for the farmers (helps farmers in choosing the most profitable enterprise). They also identified additional functions including advocacy for fertilizer use and given the FOTs ability to demonstrate potential returns on investment, it could play a key role in financial institutions reviewing loan applications from farmers to buy fertilizer and inputs.

The extension workers and community knowledge workers say that the FOT is a useful tool which makes their jobs easier, they suggested the tool needs some additions to enhance its applicability. The questions farmer typically ask about fertilizer are:

i. What fertilizer do I apply?
ii. How much in terms of quantity should I apply?
iii. On which crops should I apply?
iv. Where do I get the fertilizer?

Although the tool answers the first three questions, we need to ensure that they are linked to the sources of this important input. Many farmers state that the reasons they do not use chemical fertilizer in their farms is that they are either not available in the local agro-shops or they are not in the places that the farmers can afford.

The intermediaries consider the mobile phone app version of the FOT as more suitable than a computer based version. However, challenges in using the app include poor network coverage in some areas and lack of sufficient airtime to load the calculations given the poorly supported extension services. Sustainable model of commercial availability of airtime needs to be considered when rolling out the tool in other countries; options for enabling the tool to work offline will go a long way in addressing this challenge.

In Uganda, interviews with Tororo district extension officers revealed that they have used FOT to arrive at estimates of the quantities of fertilizer each farmer needs to augment the government subsidized fertilizer. At the district level the number of farmers is known as is the quantity of fertilizer supplied by government each season. The districts are able to calculate the shortfall for farmer needs for the season and advise the farmer what he/she needs to invest for the season, based on FOT approach recommendations.

Key considerations while rolling out FOT in OFRA countries

The Uganda FOT experience can provide lessons for roll out in the other 12 OFRA countries. Focus group discussions with more than 50 extension and community knowledge workers revealed various areas where the FOT could be enhanced.

FOT enhancements

Increasing climate uncertainty has resulted in African farmers diversifying their crops to mitigate risks of complete crops failure. The FOT will therefore need to be enhanced with new and different crops to support this farmer-led innovation.

In addition to the piloted Mobile app version of FOT, there are two versions of the FOT an Excel platform on a computer, and a paper-based version. There was unanimous agreement by the CKWs and government extension workers that the training on all three was important to ensure that they do not at any one time get stuck in their extension/farmers advisory services. The initial duration for training the intermediaries should be enough and refresher training should be planned thereafter to ensure that they really grasp the concept and also to give room for them to share experiences.

Supporting the extension service through provision of relevant communication materials for the FOT was considered as critical to rolling out FOT in any OFRA country. The development of an FOT help guide will help extension workers making quick and effective interpretation of the outputs to the advice the farmer. The guide should explain how the figures are generated. This guide should also capture the application methods, spacing and other questions that farmers are likely to ask extension workers in relation to fertilizer and crop management in general. Gradually all of this guidance should appear on the screen as a prompt.

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