Highlights
CIAT in Africa

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The Highlights series summarises research results and policy implications from the work of CIAT and its partners in Africa

Scaling up improved fallow technology

In Uganda over 60% of the land is under cultivation with declining fallow length and increasing periods of continuous cultivation. This has greatly reduced crop yields, in addition to increasing pest and weed problems. The fallow period has reduced from about 10-12 years of secondary forest fallow in the early 1980s to 3-5 years at present, with the number of crop cycles between a 10-12 year fallow increasing from 2-3 to 4-7 during the same period. Smallholder farming systems in this region comprise of many plots of varying production potential, e.g. fertility levels, slope of the land, pest and disease pressures. Therefore, management options need to be developed and scaled up to meet the biophysical and socio-economic conditions and needs of farm households.

Figure 1. Location of project in Uganda

Exchange and networking

In 1999, the Africa 2000 Network, TSBF, CIAT and ICRAF introduced the use of multipurpose legume cover crops as short duration fallows in Tororo District, eastern Uganda to address soil productivity constraints. Species initially introduced in two sub-counties of Kisoko and Osukulu were *Mucuna pruriens, Canavalia ensiformis, Tephrosia candida, Lablab (Dolichos), Crotalaria grahamiana, Crotalaria Paulina, Crotalaria ochroleuca* and *Sesbania sesban* (Figure 1). About 40 farmers were involved in on-farm testing and verification of best-bet legume cover crop (LCC) species.

Demonstration plots were used for teaching during farmer group meetings and exchange visits. On-farm participatory evaluation and selection of the species that farmers wanted to evaluate on their own farms then followed.


Figure 2. Farmer-to-farmer extension of LCC technology.

Sustainable seed systems

To ensure quick seed multiplication and sustainability of seed supply, farmers were required to return twice the amount of seed received for distribution to other farmers. Training of farmers and extension personnel was a key activity in 2001 to ensure that appropriate information was given to farmers and for scaling out the technologies (Figure 2).

More people, more quickly

Over 30 farmer groups in the two sub-counties were trained in use of the legume cover crops. Over five seasons from 1999 to 2001, there was an exponential rise in the number of farmers evaluating the different species (Figure 3). The majority

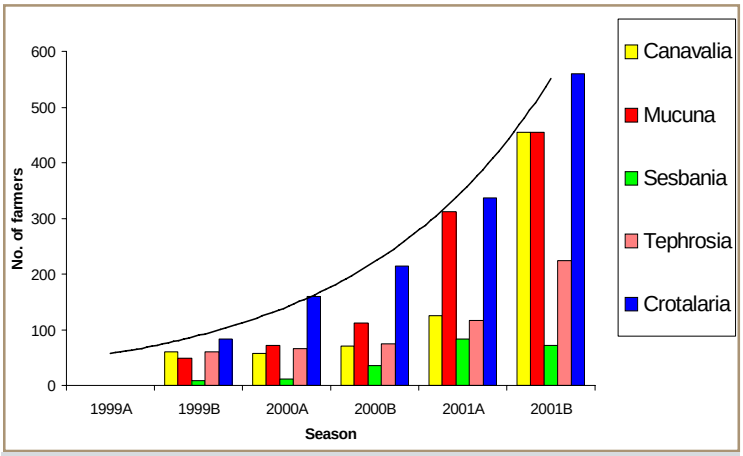

Figure 3. Numbers of farmers evaluating LCC options.

(65%) are evaluating one type of legume species, with *Crotalaria* (*grahamiana*, *pancilla* and *ochroleuca*) being the most abundant (36%) fallow species.

Tracing impact

Geo-referencing was used to locate farmers and establish the spatial distribution pattern of legume fallow species used, crop/fallow management (e.g. intercropping) and socio-economic factors influencing their adoption. Figure 4 shows the distribution of farmers evaluating the LCC options at the end of 2001. The sizes of the dots represent groups of farmers, either 0-50 farmers or 50-100 farmers using each species.

Species that produced high biomass in a short time and showed drought tolerance were preferred (*Mucuna* by 25% and *Canavalia* by 15% of farmers), as they provide good ground cover and suppress weeds, including the notorious couch grass and Striga. They are disliked, however, for producing dense biomass that can harbour snakes and wild cats (which eat their chicken) and are perceived as unsuitable for planting near homes.

The erect species (*Tephrosia*, *Crotalaria* and *Sesbania*) were favoured for relay and intercropping, as they are considered to be easy to manage and require less labour for incorporation or biomass transfer. The majority of farmers (87%) grew these species in sole stands instead of relaying or intercropping them. The common intercrop combinations include: banana/Canavalia (45%), cassava/Mucuna (21%), banana/Mucuna (20%) and coffee/Mucuna (9%).

Conclusions

Scaling up is expanding the project's effects from pilot stage to a wider domain by communicating options that people use in making their decisions. The LCC technology and approach used here is simple, cheap, and adaptable and can be easily be incorporated within existing NGO, government and other programmes.

Our findings indicate great potential for improved fallows with smallholder farmers in these areas of low soil fertility. The choice of legume cover crop technology and niche areas for production have led to refinements in research and in the extension messages being promoted. Future adaptive research should view the biophysical and socio-economic factors that were previously seen as constraints to adoption of this technology as properties of the system and should be incorporated into research design.

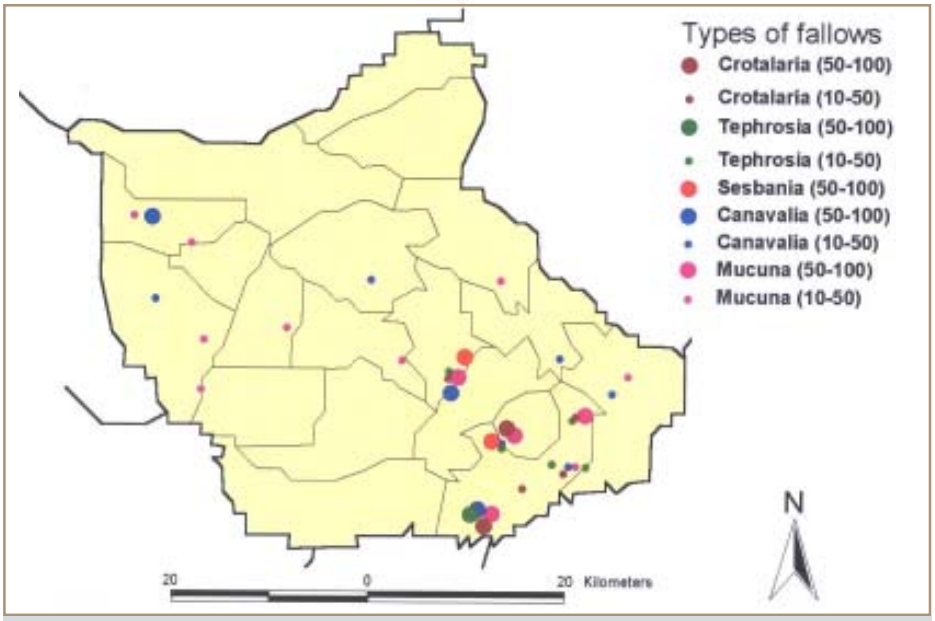

Figure 4. Distribution of farmers in Uganda using improved fallow species.

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