



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

## Multi-Crop Thresher Fabrication



## Training Proposal Packet

Kerry Clark ([clarkk@Missouri.edu](mailto:clarkk@Missouri.edu))



## Build it Local

Many smallholder farmers in the tropics do not have access to durable and affordable harvest equipment such as crop threshers. Imported threshers are often too costly and too large and cumbersome for small farmers, are not designed for rough field conditions, or end up in the scrap pile if repair parts cannot be located or fabricated.

Creating a **local, skilled workforce** for the fabrication of small to medium sized threshers can solve many of the problems of availability and affordability that prevent smallholder farmers from scaling up production.

**Locally-made also means locally-repaired and serviced.** Local fabricators can listen to customer concerns and customize equipment to the needs of the individual or groups of end-users.



*Local artisans and welders quickly create and maintain threshers for their communities.*



*The SIL multi-crop thresher can easily be manufactured, maintained, and retooled to specific local needs.*

See a video of the multi-crop thresher at <https://www.youtube.com/watch?v=36lD2x2i1Wl>

## Our thresher:

- Threshes multiple crops including maize, soybean, beans, rice, sorghum and millet
- Can be transported from field to field with a motorcycle, oxen, truck, or tractor
- Has been field tested in African conditions
- Uses heavy duty materials (4mm in heavy wear areas)
- Produces near zero machine loss of grain (compared to 5-50% with commercially available threshers)
- Does not break seed when threshed at normal moisture levels and proper engine speed
- Is designed for service providers
- Return on investment in one season with maize



### The Thresher

The multi-crop thresher was designed by a Ghanaian fabricator and has been extensively field-tested by both SIL and farmers. It shells maize in the husk and threshes soybean and rice with little to no grain loss or breakage. Interchangeable concave sieves make it usable for multiple crops. It can thresh maize, soybean, rice, sorghum, millet, cowpea and common beans.

The machine threshes soybean 40 times faster than traditional stick beating and helps reduce drudgery and increase productivity for smallholder farmers.

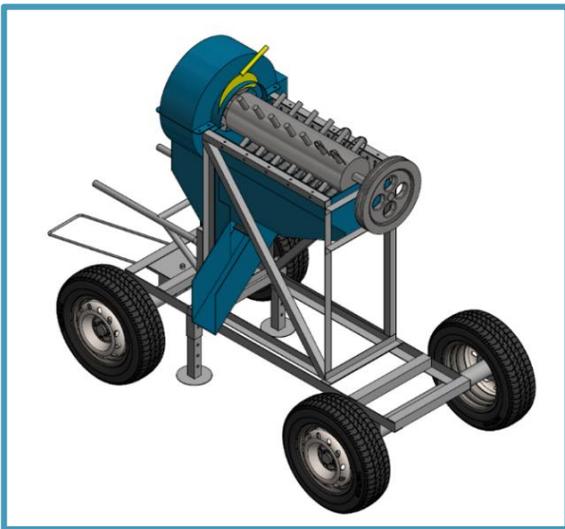
The multi-crop thresher is sized and priced for purchase and use by mid-sized farmers or **service providers** for smallholder farmers. It can be powered with a diesel engine or through a tractor power take-off.

The thresher can shell 2000 kg of maize per hour so at full capacity can show a return on investment in one season with maize. The SIL multi-crop thresher sells for \$2,000-\$3500, depending on local materials costs.



SIL trains local fabricators to build the thresher, which helps build industry and jobs. During the hands-on training, a fabrication manual is provided to each participant and each training includes one copy of a vinyl template that can be checked out to participants for development of durable metal templates. Additional templates can be purchased from the Ghanaian company SAYeTECH (<http://sayetech.io/>).

SIL developed the thresher design and the training program because of the difficulty in finding good equipment in Africa and the lack of designs available for local fabricators. The SIL designs are open source and freely available, however training is needed to assure high quality fabrication.



*The thresher design features easy-to-use controls and the machine can be transported by motorcycle.*





### The Trainers and Trainees

Train-the-Trainer Workshops are led by SIL researcher Kerry Clark (below, left) and SIL training partners and lead engineers Imoro Sufiyanu Donmuah, Hakim Abdul-Karim (below) and Jeffrey Boakye Appiagyei.



The fabrication training workshop is designed for technical and vocational school staff, local artisans, welders, machinists and others who are interested in developing and maintaining threshers for local communities. In addition to the thresher fabrication, attendees receive training on business development, product pricing, customer service and how to tailor the machine to local settings and community needs.

Fabrication training workshops require 6-8 days and can be conducted at a welding workshop or educational facility where there are multiple welding plants and tools needed for fabrication.

### Follow-Up Support

The SIL team actively engages in a variety of follow-up support activities after workshop completion.

These can include:

- Develop and deliver training for end-users
- Publicity and assistance with finding demonstration opportunities
- Integration into a train-the-trainer network
- Data collection
- Monitoring and evaluation
- Quality control and development of production standards

### Cost

SIL uses a sliding scale for trainings from \$0 to \$10,000.

The in-country host funds the training facility, materials, and trainee costs. Total cost depends on number of machines made at training and number of trainees.

The Feed the Future Innovation Lab for Soybean Value Chain Research is USAID's only comprehensive program dedicated to soybean technical knowledge and innovation. Our international team of tropical soybean experts provide direct support to researchers, private sector firms, non-governmental organizations, extensionists, agronomists, technicians and farmer associations tasked with soybean development.

Contact SIL at [soybeaninnovationlab@illinois.edu](mailto:soybeaninnovationlab@illinois.edu)

