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

SIL'S MULTI-CROP THRESHER

Low-cost, locally-produced, small-scale mechanization for African smallholder farmers

Manual threshing of crops is a very labor and time intensive process that results in high human energy expenditure and high labor costs. This is especially burdensome to women who make up the majority of the labor force when it comes to threshing. Manual threshing often results in grain spillage, grain breakage and incomplete separation of the grain from the chaff.

The Soybean Innovation Lab (SIL) recognized the need for mechanized crop threshers to relieve the burden of stick threshing and increase productivity. Designed by a Ghanaian fabricator, the SIL Multi-Crop Thresher 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.

SIL's multi-crop thresher is 80% faster, requires only 2 operators, and reduces postharvest losses by 35%.

SIL's Multi-Crop Thresher can handle soybean, maize, sorghum, cowpea, millet, rice, and common beans.

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. The SIL multi-crop thresher is locally-made from locally-sourced parts and sells for $2,000-$3,500, depending on local materials costs. The SIL designs are open source, providing free access to CAD plans and operator manuals. However, training is needed to assure high-quality fabrication.

The Soybean Innovation Lab's locally sourced multi-crop thresher is sustainable, creates jobs among African youth, and advances regions into value added manufacturing and agro-industrial development. By creating a local, skilled workforce for the fabrication of the low-cost, locally-produced, multi-crop thresher, SIL is addressing the challenges of availability and affordability that prevent many smallholder farmers from scaling up their agricultural production. Locally-made also means locally-repaired. Local fabricators listen to customer needs and can customize equipment for individual or groups of end-users, and can provide maintenance and repair services locally. SIL has trained over 140 fabricators since 2016 across Burundi, Ethiopia, Ghana, Malawi, Rwanda, Tanzania, and Uganda.

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The Soybean Innovation Lab offers customized training workshops in multi-crop thresher fabrication. 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.

SIL teams with in-country development organizations to provide training and to develop a correlated program of technology adoption and scale-up. The in-country host must develop and implement a viable plan to support the trained manufacturers by connecting them with potential buyers such as service providers or farm cooperatives.

Fabrication training workshops require 6-8 days and can be conducted at a welding workshop or educational facility. Workshops include training on business development, maintaining manufacturing quality and training and educating end-users of machines on operation and maintenance. Each machine produced by the newly empowered fabricators has the potential to serve 200 farmers and reduce two weeks of stick threshing per acre of crop to four hours labor.

Trainees in Rwanda reviewing the math skills necessary to tailor the threshers to local settings.

SIL has trained over 165 fabricators since 2016 in 9 countries across Sub-Saharan Africa.

Engaging with local artisans ensures that fabrication is local, which keeps oversight of equipment and repairs close by and ongoing. Businesses that build equipment have a vested interest in making sure that the equipment is used properly, has a long, functional life, and is appropriately designed for customer needs.

Want to learn more about the SIL Multi-Crop Thresher or host a training?

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The Soybean Innovation Lab (SIL) is a Feed the Future Initiative working to improve food security and nutrition around the world. SIL is a team of technical soybean experts that provide evidence-based innovations, tools, and technologies across the value chain to enable sustainable livelihoods through profitable soybean production and utilization across Sub-Saharan Africa.