Human-Powered Peanut Thresher for Small-Scale Zambian Farmers

Alex Caine, Oscar Castro, Cody Lange, and Ashley Wilkey

**BACKGROUND**

This project is a continuation in the development of a previous ME 491 project by Adam Lyman. His team created a bean thresher that is currently being prototyped in Zambia. Our team was assigned the task of developing a peanut thresher for small scale farmers in Zambia. The thresher needed to be created by manufacturing interchangeable parts that could be used in the already existing bean thresher.

**PROBLEM**

- 81.1% Northern Zambia province lives on less than $1.25
- 49.7% have adequate food provisions.
- 63.7% earn an income through agriculture.
- 57.2% of Households in the Northern Province grow peanuts.

**OBJECTIVES**

- Modify existing bean thresher for peanuts
- Optimize to achieve highest output
- Currently: By hand 1 kg/hr
- Goal with Mechanization: Create and run an experiment to test validity of interchangeable drum design

**EXPERIMENT**

**Threshing Variables**
- Drum Surface
- Concave Surface
- Distance between concave and drum
- Surface speed

**PROCEDURE**

1. Screw Surface on Concave and Drum
2. Adjust Speed Dial and use the Tachometer to find the desired speed +/- 10 RPM
3. Run 2 cups of peanuts through Thresher
4. Sort out good and bad quality into cups
5. Hand thresh unthreshed peanuts
6. Weigh the sorted groups in grams
7. Record Data

**RESULTS**

Quality is very important for the Zambian farmers to be able to sell the groundnuts in the marketplace, and make a profit.

**CONCLUSIONS**

Quality is very important for the Zambian farmers to be able to sell the groundnuts in the marketplace, and make a profit.

**FUTURE IMPROVEMENTS**

- Mechanized platform to further improve production rate for peanut threshing
- The length of the concave that threshes and its clearance can also use further experimentation.
- There are many other types of surfaces to be explored.

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