PSU ELDP2- Leaf Stripping machine

Overview

The PSU ELDP2 Moringa Leaf Stripper team is challenged with designing an affordable, efficient solution to stripping leaves from branches of the Moringa plant, a nutritious flowering tree native to many third world countries such as Africa. Currently, when the branches are harvested from the Moringa trees, the leaves are removed by women workers placing the branch between their thumb and index finger and pulling the branch through. This time-consuming job leaves a lot of cuts on the workers’ hands creating hygienic problems. Moringa farms need to develop a more efficient and safer way to separate leaves from the stems.

Objectives

The team’s goal is to build an inexpensive, safe, efficient, and easy-to-build and maintain system that will serve as a model for potential uses in Moringa farms in Africa. Moreover, we aim to develop a prototype that can effectively strip off leaves from multiple branches at the same time. In addition, as the workforce in Africa is mainly women, the prototype will not require too much force to use properly. Considering that there might not be sources of electricity available in some parts of Africa, this design will be a hand crank linked to a gear and chain which drives the rollers.

Approach

- Customer needs was gathered from Sponsor and a contact person from Africa.
- Concept generation and selection was done before building prototypes.
- Several patents were reviewed to gather useful idea for project development.
- Solidworks model was developed.
- A total of 3 prototypes were built.
- Testing was done using some branches and the 2 young Moringa plants provided by the greenhouse in Penn State.

Outcomes

- The final prototype costs $268.18.
- The efficiency of leaf stripping is increased by at least 4 times.
- Hygienic problem is solved.