

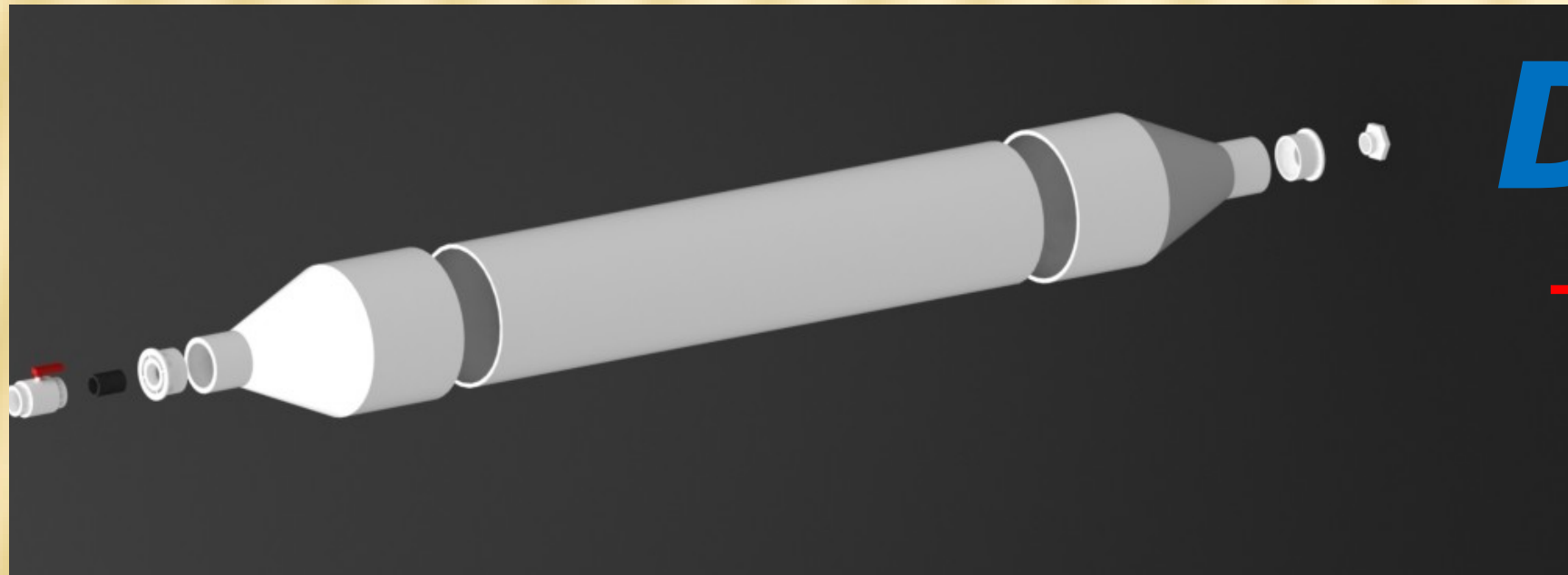
Problem

In developing countries, farmers do not have access to decent seed storage facilities. When farmers try to store their supply of seed, insects and wet climates often **degrade or** destroy it.

Project Goal

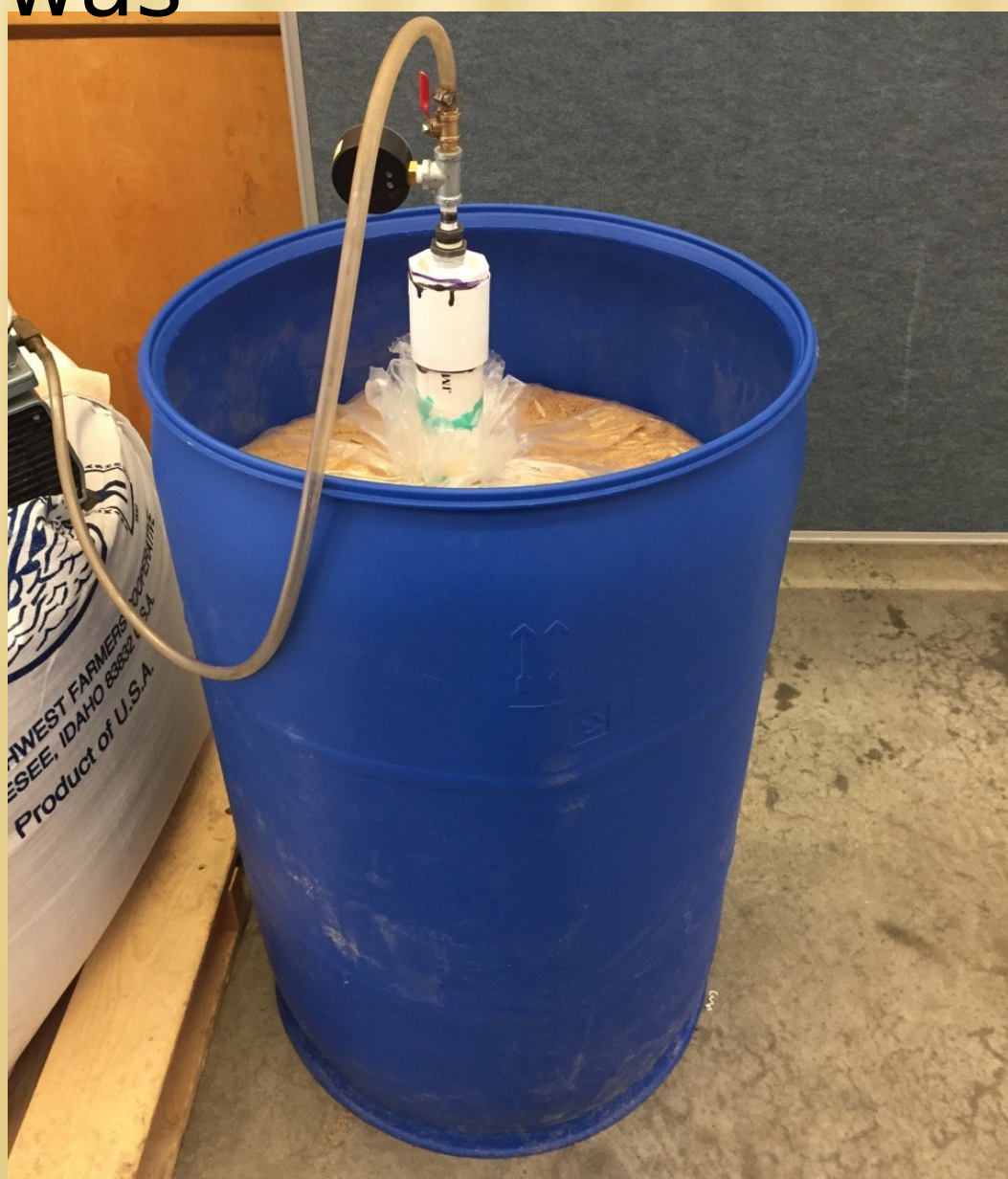
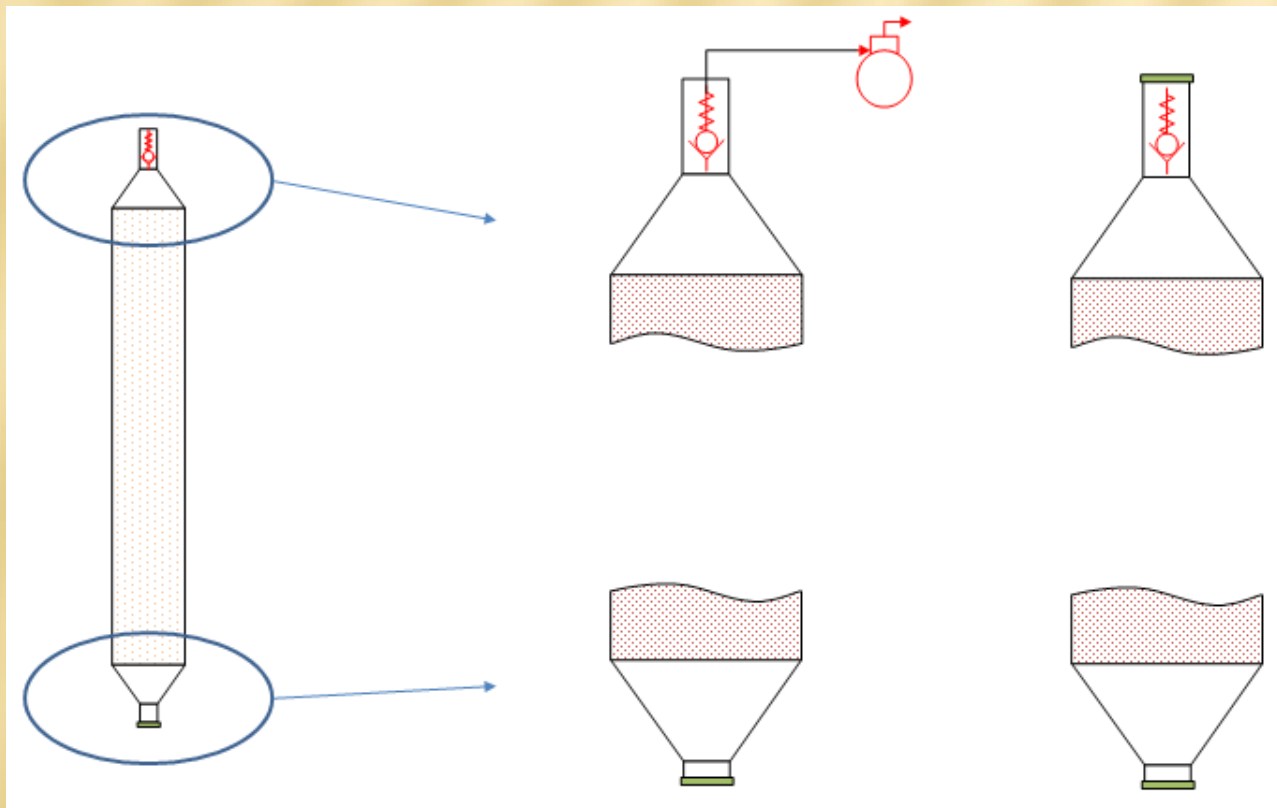
Design, fabricate, and test a capsule that will keep seed dry, protect against insects, be easy to assemble and inexpensive

Goal	Target
Keep seed dry	Less than 12% humidity
Store deed for long periods of time	Minimum of 2 years
Cheap	At most \$250
Easy to assemble	Less than 1 hour
Transported by hand	Less than 200 pounds
Vacuum	Hold at -20 inHg for 3 days
Loading and unloading time	Less than 10 minutes
Storage volume	At least 4.7 cubic feet



Design 1

Too Expensive



Design 2

- Folds in the plastic bag let air leak in **Couldn't hold the pressure**
- Melting the bag together was inconsistent

Design 3

Design 1: PVC pipe and fittings are too expensive

- Total cost for 12 inch pipe is \$1500

Design 2: Barrel structural integrity and leak rate

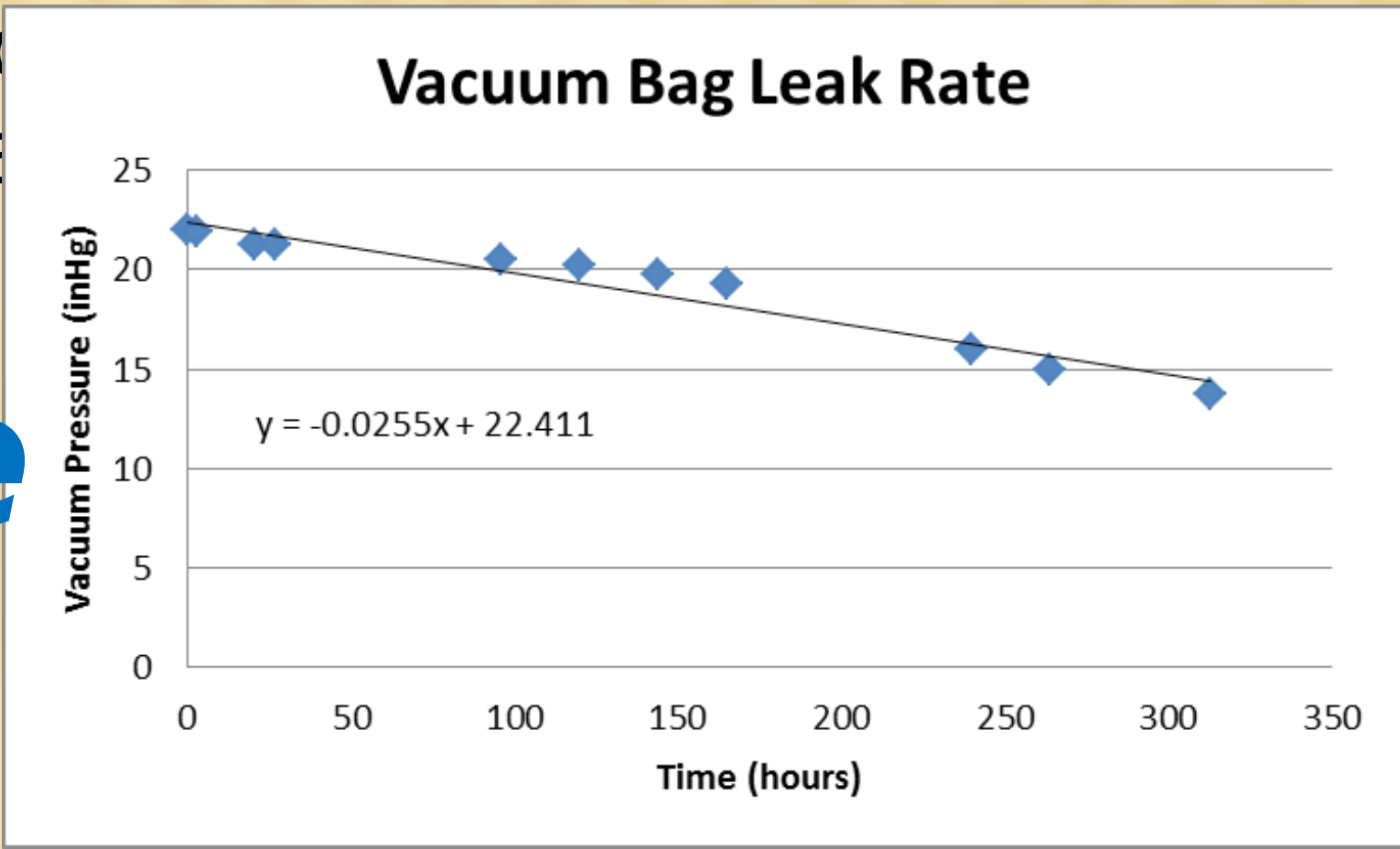
- Barrel deforms too much
- Supports would need to be very strong
- Unsuccessful airtight seal on barrel

Design 3: Trash bag seal around PVC tube

- Folds in the plastic bag let air leak in **Couldn't hold the pressure**
- Melting the bag together was inconsistent

Solution/Final Design

- The bag can be easily opened and closed from one end
- The seal between the bag and valve system is quick and easy to put together without wrinkling the bag
- The leak rate is 0.026 inHg/hour
- The total cost is around \$80 depending on the quality of parts
- Experiments we conducted did not survive past three days



Leak Rate

Final Design

Meet all design goals



Leak rate too high

Special thanks to Dev Shrestha, Steve Beyerlein and Don Tolmie for supporting this project