

UVM Extension Hops Baler



Ian Pfeiffer and Brian Pinand

Advisor: Mike Rosen

Clients: UVM Extension, Heather Darby and Rosy Madden

Baler Goals

Original

- 20-50 lb. bales.
- Ease of construction
- Ease of Use
- Less than \$3000
- Vacuum sealable bales

Evolved

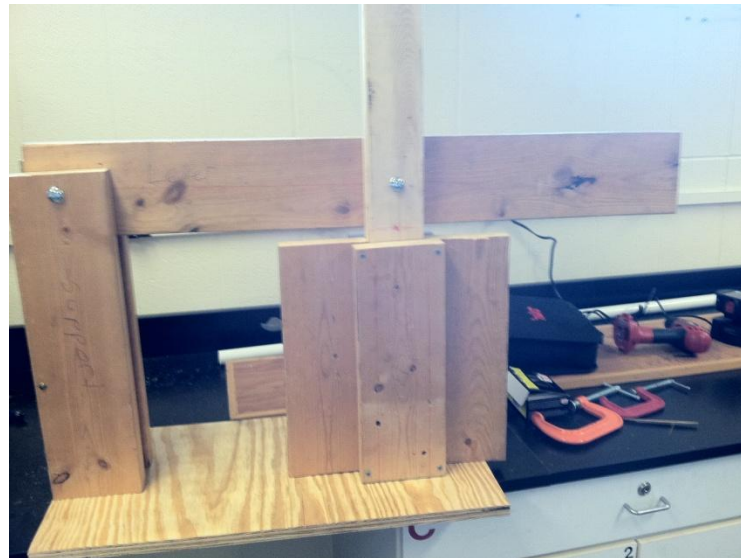
- Based on log splitter
- 15-20 lb. bales.
- Ease of Construction
- Ease of Maintenance
- Storage
- Less than \$1500
- Splitter retains functionality
- Bale of 60" Perimeter

First, Success!

- <http://www.youtube.com/watch?v=Ux93qZwvclo>

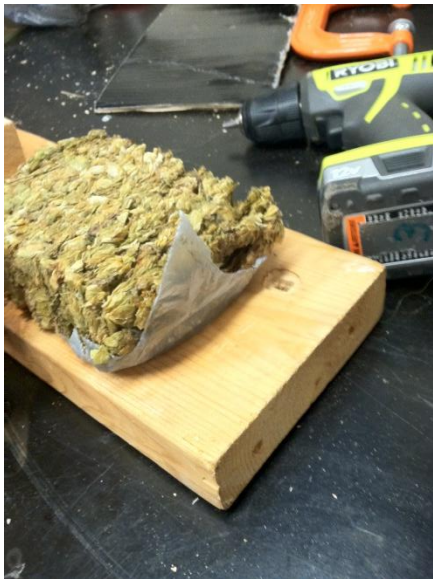
Hops Properties?

- No information on properties of hops under compression
- Went for a final density between 6.5-10 lbs/ft³
- Required compression force is exponential
- Used pressures of up to 60 psi on 1 oz. mini-bale

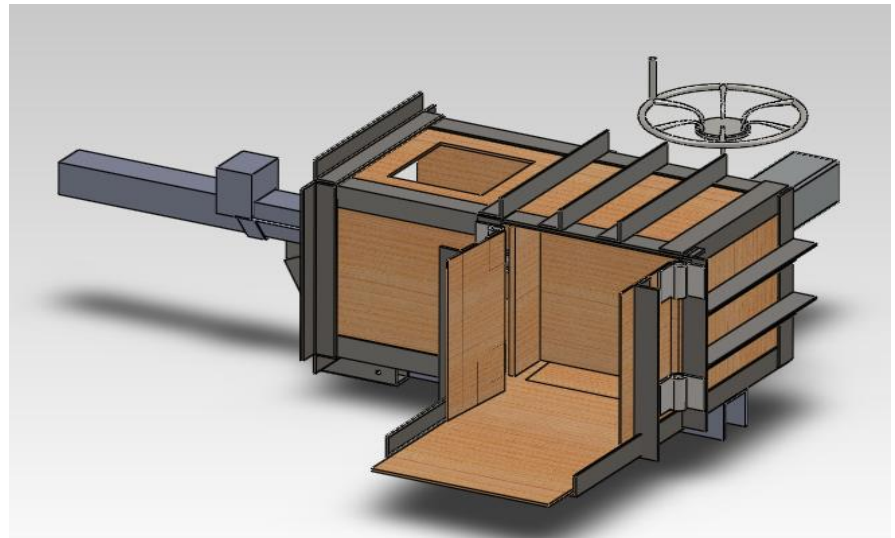
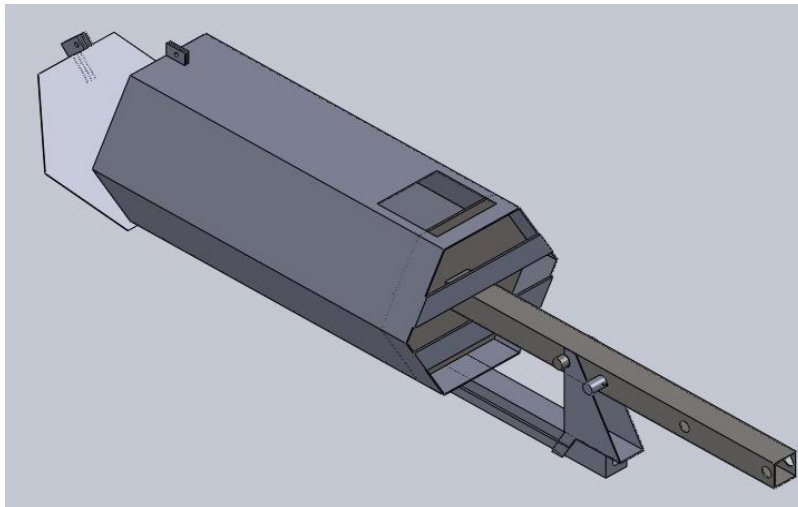
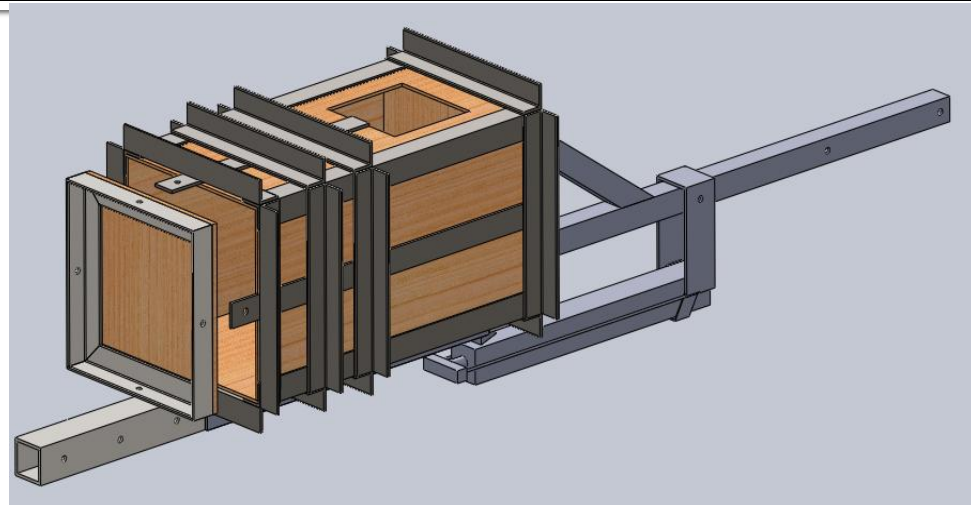
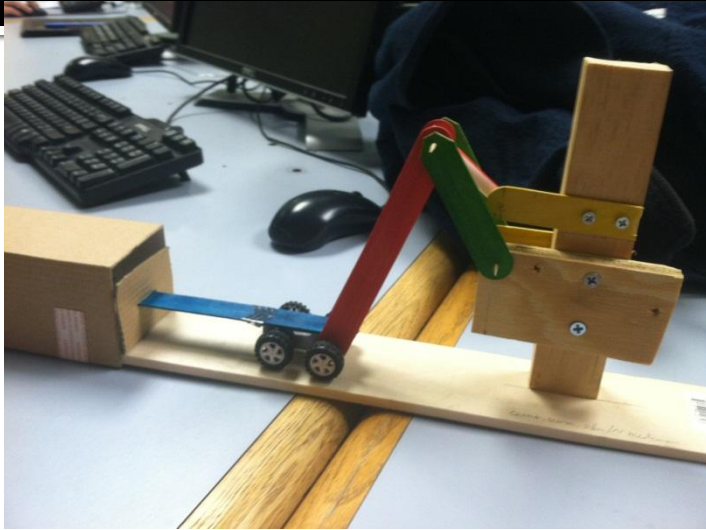


Hops Properties?

- Integrated bagging would be tough
- Found that hops expand in the direction of compression
- Hops have small Poisson's Ratio



Initial Ideas



Features of the Final Design

- Mainly off-the-shelf materials
- Food Grade Plastic and Powder Coating
- Castle Door
- Ejector Guide Rods



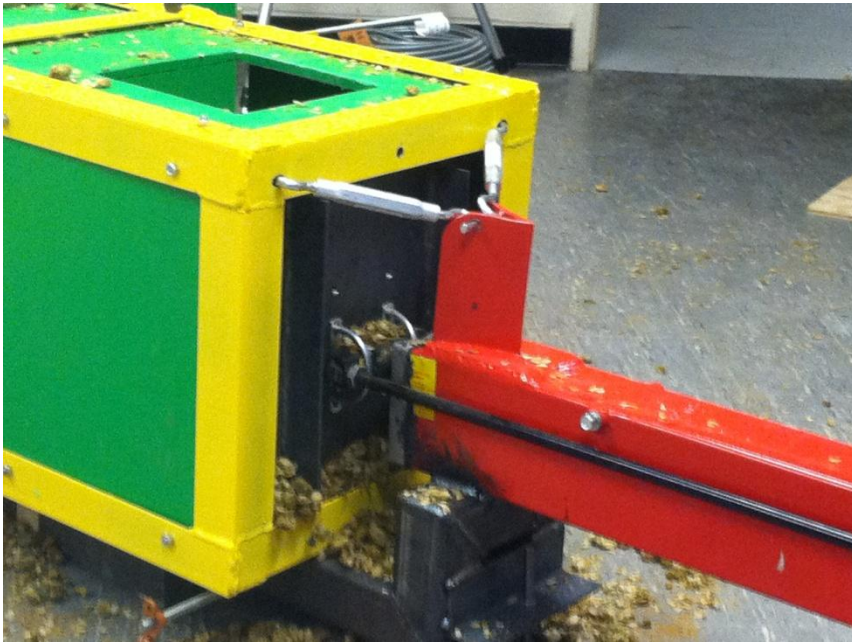
Features of the Final Design

- Ejector
- Log splitter joined to spine



Features of the Final Design

- Turnbuckles
- Mounting For The Ram



Expenses

Date	Location	Amount
5/24/2011	Walmart	15.88
6/17/2011	Sears	422.64
8/23/2011	Home Depot	256.45
10/28/2011	Queen City Steel	39
11/21/2011	Vermont Powder Coating	225
11/26/2011	Tractor Supply	67.43
11/28/2011	US Plastics	175.36
11/30/2011	Queen City Steel	36
12/1/2011	Lowe's	117.09
	Total	1354.85

What's Left To Do?

- Minor improvements
- Test with fresher hops



Questions?
