



## Team 29: Harvest Cleaning Simulator

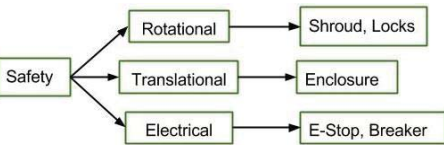
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### Background:

The CH570 Sugar Cane Harvester utilizes a chamber and an extractor fan to separate trash from product. Due to the inconvenience of field testing and the inaccuracy of computer modeling, John Deere is in need of an indoor simulator that can be ran in a controlled environment to collect experimental cleaning data. There is currently no other simulator like this used in industry.

### Objectives

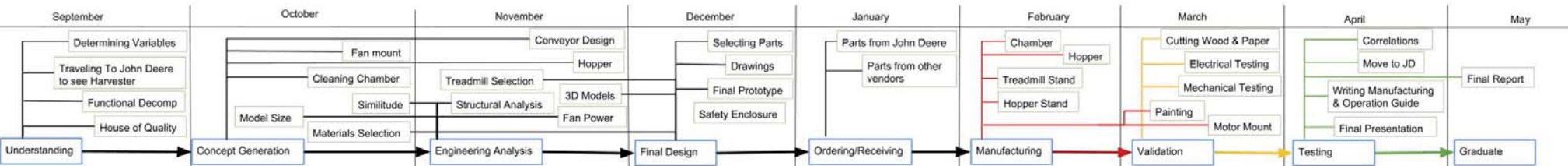
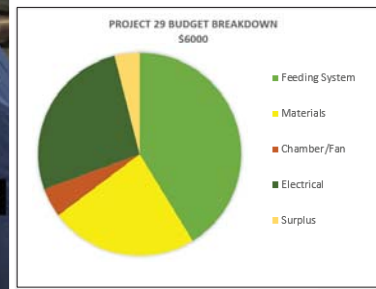
- 1 Design and build a scaled simulator of CH570 cleaning chamber that operates within the same concepts with variable settings.
- 2 Create a reusable sugar cane and leaves replicate.
- 3 Run lab tests in the simulator to find relationships between variables within the chamber system and the cane loss vs cleanliness.



### Comparison of CH570 to Harvest Cleaning Simulator



Test	Description	Success Criteria	Test Results
Motor Power Draw	Ensure Power Draw is as expected	P<1300W	Max: 370 W
Fan Speed	Verify fan operates within correlated simulation speeds	400 to 1800 RPM	Operates up to 2600rpm
Harvest Input Rate	Harvest enters chamber at varying rates	Up to 7 lbs/s	Verified and Recorded
Harvest Entrance Speed	Verify the belt moves at correlated speeds	Up to 15 ft/s	Verified up to 17fts
Linear Actuator	Actuator moves at consistent speed as weight is added	12 sec for each weight, 0- 100 lbs	Verified
Reset Time	Determine time to reset between simulations	Reset takes less than 2 hrs with 2 people	Verified under 1 hour
Material Mixing	Determine rotations need to mix thoroughly	Cane=74%, green=10%, brown=26%	5 rotation per 25lbs material



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