Front Side:

Combine Clean Grain Elevator Demonstrator

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Summary:

The Clean Grain Elevator project was an opportunity for future and current students to learn about how the clean grain system works on a combine along with the sensors.

Project Impact:

This project will also allow students to see the overall functionality of a clean grain elevator in a demonstration setting without having a combine at their disposal. This adds another marketing aspect to the ABE department at Purdue. It could possibly be of interest to students that are curious about precision ag equipment.

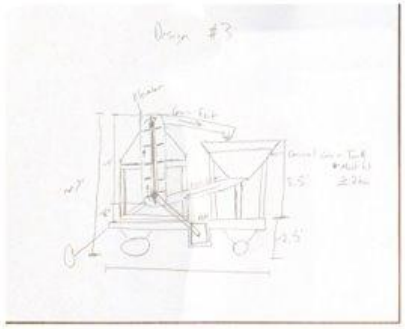
Data:

Data Collection for Clean Grain Elevator				
Bushels/ac	Collection time (seconds)	Volume Calculated	Volume Collected	% Error
200	10	2182	2093	4.08
250	10	2727	2588	5.1
300	10	3273	3112	4.92
350	10	3818	3654	4.3

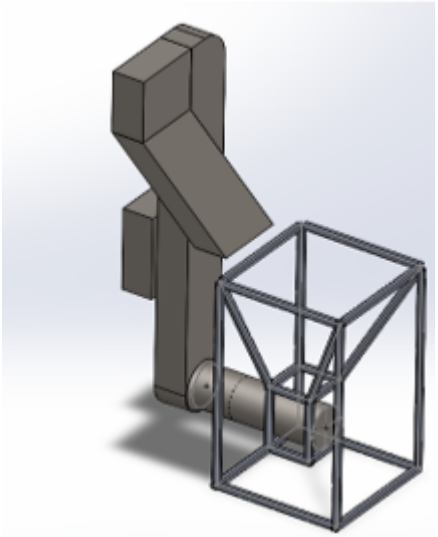
the team conducted a test to see if the system could handle 4 different yields. As shown in the table above, a volume was calculated and that was compared with the volume collected. The team then provided a percent error to compare the results collected to those calculated.

Design And Development:

The project started with a rough hand drawn sketch as shown below to lay out the principle design that we would improvise.



From the sketch and calculated adjustments we were able to construct a more sophisticated model with realistic measurements and proper 3D layout.



Final Design Model:

Technical Specs

- 6 feet tall
- 1 hp electric motor
- 5 bushel grain holding
- Single step pulley

Design Features

- Custom grain bin
- Portable trailer base
- Plexiglass safety and view covers

Conclusion:

The team was able to successfully manufacture a working prototype that can continuously flow corn. This system opens up opportunities to study the movement of grain as well as the operations of the yield plate and moisture sensor.

Inside Info: