Objective:

• To construct a device to meter Wet Distillers Grains at a constant rate.

Solution:

• Make a proof of concept application that adds WDGS to an AG-Bagger at constant rate.

Problem Statement:

• There is no efficient way to add WDGS to an AG-Bag system.

Deliverables:

• Working Prototype
• Auto-Cad Design
• Testing Data of Speed vs. Extrusion Angle
Extruding Auger

- One main extruding auger
- Variable pitch auger
  - We used a variable pitch auger to insure that the flighting at the end of the auger is at maximum capacity.
- Dimensions
  - 6 in diameter
  - 8 ft long
  - 6 in to 2 in pitch for 6 ft.
  - 2 in pitch for the final 2 ft.

Extruding Pipe

- Sloping Inlet-to increase constant particle flow
- Dimensions
  - 4’ long
  - 6” diameter
- Where the WDGS enters the pipe with the aid of the variable pitch auger and is extruded out at a constant rate.

Agitating Augers

- Two agitating augers
- Have 16” of flighting with 3” inserts welded onto the flighting to increase particle flow.
- Rotate simultaneously to eliminate bridging of WDGS over the extruding auger.

- Dimensions
  - 6’ long
  - 10” diameter
  - 6” flighting
  - 3’ weldon inserts
Components

• 3.04 cu-in Hydraulic Motors
• 4 Eaton Hydraulic Fittings
• 5 sheets of 4x8 3/4in Plywood
• 2 sheets of 4x8 1/8 in Plastic
• Weld-on Hubs and Sprockets
• 3 feet bar stock with keyway
• 8 ft 6 in PVC pipe

Construction

• Assembled the outside frame structure out of Plywood
• Inserted supports made of plywood to support the shape of Plastic
• Inserted two sheet of plastic
• Placed the Agitation Augers into the device
• Extruding auger
• Attached Hydraulic motors, hubs, sprockets, nipple adapters, and drive chain.
• Total cost was $1,084.

Testing Process

• Speed vs. Angle
  • Speed was in 50 and 100 rpm
  • Angle was for -30 and 30 degrees

• Measurement in lbs/min
  • Scales