Separation of Nutrient Solids and Liquids in Swine Manure

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Client: Smithfield Foods (Smithfield Hog Production), Algona, IA

Problem Statement
- Producer’s want to provide transportation of solids and increase the available storage capacity of a storage system by separating nutrients produced in a shallow pit, external storage swine facility.
- Producers transporting manure to fields don’t want to pay to transport slurry that is 95% water.

Scope
- A cost justification spreadsheet for any producer to analyze their costs in relation to manure separation and application.

Objective(s)
- Determine effectiveness of current leading separation methods in correlation with associated costs.
- Justify optimal separation methods dependent on producer size & manure management plans.

Constraints
- Producer approved Budget
- Cost of Separation and Application (not to exceed producers budget)

Methods Researched
- Analyzing and creating a cost analysis for each separation method
  • Screw Press
  • Gravity Screen
  • Pressure Screen
  • Centrifugal Force
  • Hydrocyclones

Proposed Solutions
- Create a cost justification spreadsheet that producers can access to calculate the cost of separation for their specific operation size.
- Tie in the cost of manure application calculation sheet created by Tom Olsen.

Major Outcomes
- Create a Swine Manure Separation Cost Justification tool that allows producers to see if manure separation is feasible based on the size of their operation

Benefit to Client
- Improve hog manure transportation efficiency to decrease transport/application times.
- Increase nutrient application efficiency through concentration and separation of manure.

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