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Separation of Nutrient Solids and Liquids in Swine Manure

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Separation of Nutrient Solids and Liquids in Swine Manure

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

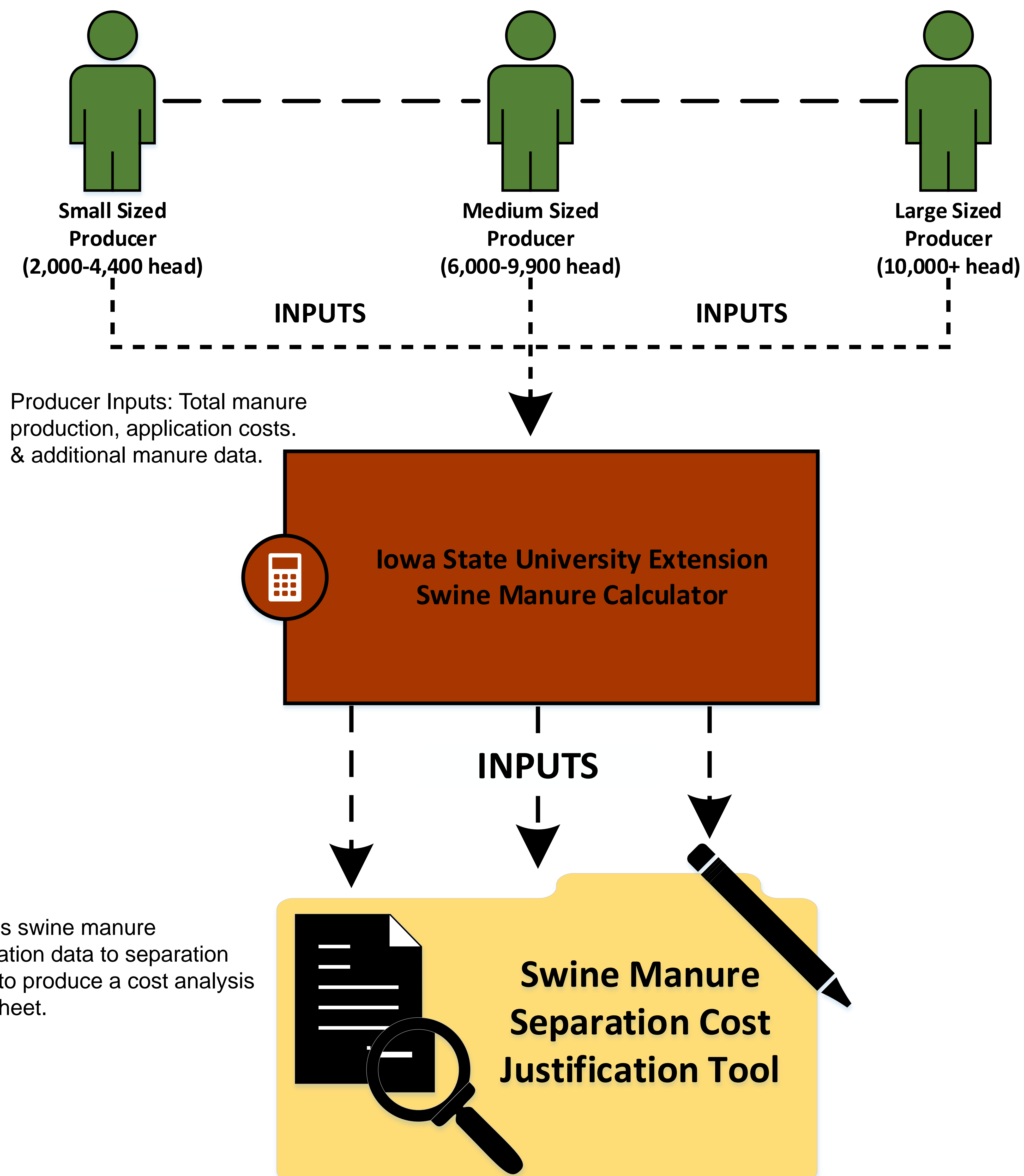
- A cost justification spreadsheet for any producer to analyze their costs in relation to manure separation and application.

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.