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Analysis of Nutrient Cover Solutions

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Analysis of Nutrient Cover Solutions

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

Problem Statement

- Develop a cover for a manure holding structure that will effectively reduce the accumulated rainfall inside the structure and increase the per gallon value of the manure

Objectives

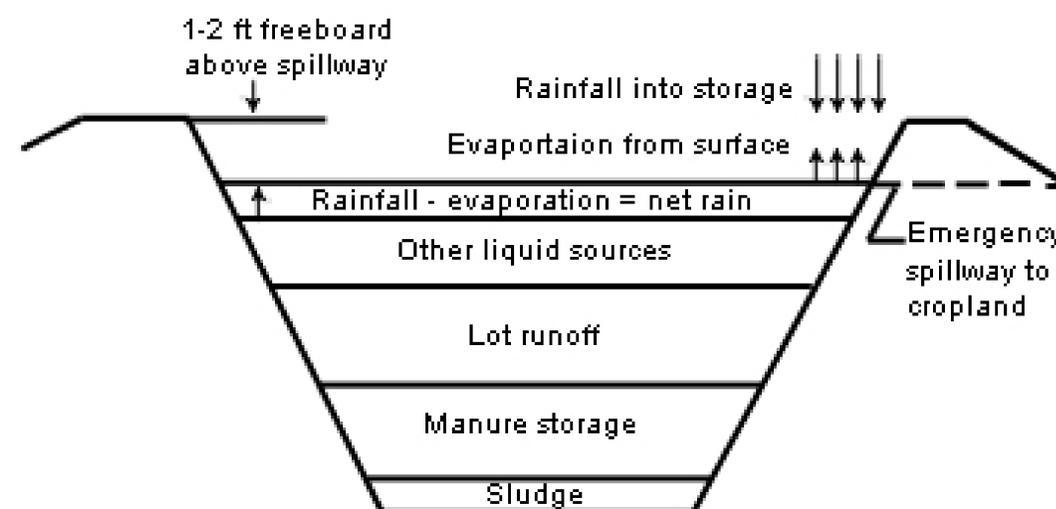
- Identify a feasible design solution to reduce accumulated rainfall in the tank
- Analyze costs of design solutions to determine a cost effective approach for growers

Constraints

- Affordable for farmers
- Materials must be resistant to weather and manure gasses
- Must withstand the adverse weather conditions of Iowa
- Manure in tank must still be able to be agitated for application

Scope

- A feasible nutrient cover solution to be implemented on Iowa swine finishing facilities



Methods

- Define essential project requirements
- Research implemented designs and solutions
- Analyze data on factors affecting cover designs
- Document final proposed solution

Proposed Solutions

- Create a feasible cover design that is effective and meets the growers needs
- Strategic breakdown of cover materials and new design solutions

Major Outcomes

- Develop a cost effective solution that is functional and benefits the farmer and his needs
- Present nutrient cover idea solution to Smithfield team

Benefit to Client

- Increased manure holding capacity in the tank to comply with legal regulations
- Higher per gallon value of the manure for application
- A cover would provide a decrease in odor given off from the manure
- Increase in the value of a production site