

# P17422: A Continuous System for Black Soldier Fly Larvae Composting

## Food Waste

- US generates 35 million tons per year
- Food waste comprises 20% of landfills
- Only 5% of food waste is recycled



## An Opportunity

- Food waste can be composted
- Lower costs
- Lower greenhouse emissions
- Produce valuable soil



## Black Soldier Fly Larvae and Composting

- Eat fruit, vegetables, meats, and carbs
- Self-sustaining population
- Produce valuable byproducts

## Goals

R·I·T



Carbon Neutral by

2030



## Learning about Larvae



- Egg to larvae
- Larvae to composters
- Pupae leave system
- Hatch as flies
- Flies lay more eggs

## Small Scale Studies



Three Visual Layers:

- Larvae in Food
- Food Compost
- Digestate

- Study performed in 2L soda bottles

## Wants and Needs

- Bottom filter
- Removal of the bottom 2 inches of material
- Plastic materials
- 0.5m<sup>2</sup> feeding area
- Feeding height up to 2 feet

## System Mechanism

### Step 1

Drawer is attached



### Step 2

Drawer is pushed through and old is pushed out



### Step 3

Old drawer is removed



## Larvae Capabilities

- 1 Larvae consumes 30mg of food a day
- System will hold 12kg of food larvae
- 400,000 required larvae to consume 12kg a day!

## System Capabilities

- 2 removable drawer
- 2 directions of digestate removal
- 2 traps for pupae collection

## Team:



Team Members:

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Sponsors:

US EPA P3 Award, PI Brian Thorn, Sarah Brownell, Shwe Sin Win