



Are farmers willing to use fertiliser products made from bioconversion of livestock waste?

Black soldier fly farming FACT SHEET

Key Points:

- Farmers were generally positive about using BSF technology for waste management
- Farmers are willing to pay more for the BSF-derived fertilisers with higher organic carbon and NPK content
- A granulated product is preferred over liquid and fine particle forms

Introduction

The objective of this study was to evaluate the interest of Australian farmers and their willingness-to-pay for fertilisers or soil improvers derived from bioconversion of agricultural waste, specifically livestock waste, using black soldier fly (BSF) technology.

The research aimed to answer two questions:

- 1) What are Australian farmers' preferences for BSF-derived fertilisers or soil improvers?
- 2) How does willingness-to-pay vary with the characteristics of BSF frass fertilisers or soil improvers?

Methodology

We used a well-established non-market valuation technique known as discrete choice experiments (DCEs). The DCE was implemented using an online survey, which was administered in 2021 targeting Australian cropping and horticulture farmers.

The survey included questions about fertiliser use and attitudes towards Black Soldier Flies. Respondents were also shown six choice sets (see Table 1 for an example choice set). They had to select their most preferred alternative in each choice set. These choices show the implicit trade-offs made between the attributes and their levels. Trade-offs with the cost attribute are used to estimate respondents' willingness-to-pay for the other attributes' levels.

Table 1: An example of the choice set presented to respondents.

	Option 1	Option 2	Option 3	Option 4
FORM	Fine particles	Granules	Fine particles	None of these
ORGANIC CARBON CONTENT (W/W%)	60% (600kg/t)	40% (400kg/t)	0% (0kg/t)	
NPK ANALYSIS (W/W%)	Low (1-5 N, 1-5 P, 1-5 K)	Medium (6-10 N, 6-10 P, 6-10 K)	Very low (0.5-0.9 N, 0.5-0.9 P, 0.5-0.9 K)	
PRICE \$/TONNE	\$1,800	\$800	\$150	
I prefer to purchase	Option 1 <input type="radio"/>	Option 2 <input type="radio"/>	Option 3 <input type="radio"/>	Option 4 <input type="radio"/>



Figure 1. PhD candidate, Sun Kumar Gurung, tends to the pot trials to evaluate the effectiveness of BSF frass fertilisers



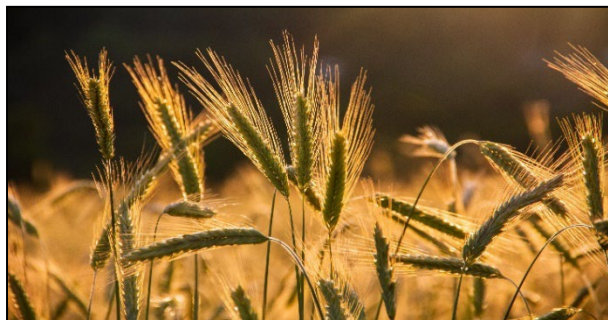


Findings

48 useable responses were collected from farmers located across Australia. Most of the farmers were male with a median age of 43 years, and involved in broadacre farming, mixed cropping-livestock farming, or dairy farming.

Respondent's perceptions

- Most did not perceive BSF-derived products as disgusting.
- Most agreed that using BSF technology to produce products from livestock wastes would be a sustainable alternative to agricultural waste management.
- Most agreed that using BSF technology would improve the sustainability of the agricultural industry.
- All would consider using BSF-frass fertiliser products produced from livestock waste, with some respondents adding that their use would depend on the product's cost, its nutrient analysis, ease of application, or validation of the product through trials.



Respondent's preferences

- Most preferred BSF-derived fertilisers in granulated form compared to liquids or products with fine particles.
- The strongest preference was for BSF-derived fertilisers to contain an organic carbon content of 20% or higher and at least 'medium' NPK analysis (6–10 N, 6–10 P, 6–10 K).

Respondent's willingness-to-pay

- Willingness-to-pay increased with higher organic carbon and NPK content. For example, on average, respondents would pay:
 - \$240 per tonne for a product with 20% organic carbon content.
 - \$430–\$460 per tonne for a product with 40%–60% organic carbon content.
 - \$678 per tonne for a product with 'medium' NPK analysis.
- Respondents who self-identified as 'organic', 'biodynamic', or 'regenerative' farmers were willing to pay more than 'conventional' farmers. For example, these farmers would pay:
 - \$900 per tonne for a product with a 40%–60% organic carbon content.
 - \$1,300 per tonne for a product with a medium NPK analysis.
 - Higher prices for products with a 10%–20% organic carbon content.


Further reading

For more information and access to reports and publications, visit the website or contact a research team member.

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