Black Soldier Fly and Your Waste Management

What?

The Black Soldier Fly (BSF) is an insect whose larvae efficiently feeds on and converts organic waste into high - protein biomass and nutrient-rich compost (frass) [11]



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Why?

Category	Description
Pathogen Control and Odor	During waste decomposition, BSF larvae eliminate houseflies by killing pest and suppress unpleasant odors [9]
Waste Reduction	Utilization of BSF larvae reaches up to 60-73% effectiveness in waste reduction leading to reduced pressure on landfills [7]
Organic Fertilizer	Frass from BSF has excellent properties as an organic compositing fertilizer that promotes healthy plant growth and improves soil microbes [12]
Feed Source	Protein and fat content of larvae makes them an optimal food source for farm animals [11] [2]

Photo Credits

1. Marcello Consolo. (2014). *Hermetia illucens (Linnaeus, 1758)* ♂[Photograph]. Flickr. https://www.flickr.com/photos/marcelloconsolo/15018899508/in/photostream/
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How?

Start your Black Soldier Fly Waste management system.

- Deciding on a Waste Source

  Make sure to provide your Black Soldier Fly system with waste such as food scraps, animal droppings and agricultural waste[6] [7]
- Setup a Suitable Environment for Breeding

  BSF reproduces effectively in a love cage when kept in an environment, with temperatures ranging from 27 to 30°C and humidity between 60-70% which support their breeding and egg laying activities [2] [11]
- Add BSF Larvae

  One can obtain BSF eggs or larvae, from suppliers or lure them from the wild into the environment by offering organic baits [9]
- Harvest Larvae

  Larvae reach maturity for harvesting in a span of 10 – 14 days during which they exhibit a behaviour that guides them towards waste disposal areas making the collection process easier [6]
- Let's Utilizer Frass which is the organic material that is left over after the BSF larvae have consumed is known as frass can be used to create fertilizer with nutrients that are beneficial for agriculture [3] [12]

Photo Credits

5. Olorunfemi, O. (2024). Black soldier fly pupae. Mobius Farms.

6. Davis, A. (2024). Black soldier fly love cages. Beyond Forest. https://www.beyondforest.org/post/black-soldier-fly-farming-training-bsf-farming

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Where to go?

To purchase BSF larvae, breeding setups, or for training purposes, visit commercial BSF farms. Goterra which is an Australian food waste management innovator using BSF and they are located in the Australian Capital Territory and Mobius Fram which is also a BSF farm located in South Australia. Finally, the Australian Entomology Society is a body that promotes scientific knowledge on insect farming.

AgriFutures Australia GOTERRA Insect Protein Association of Australia BSF ORGANIC FARMS Mobius Farms

How much will it cost?

Like in home and backyard setups using plastic containers or recycled material, price could range from $20 - $200. More intensive and rudimentary climate control may range from $500 - $2000. Finally, commercial farms with automated business operations can easily exceed $10,000 and as seen in Goterra where a total sum of $18M was raised by investors [15]

Troubleshooting Common Issues

Larvae Low Survival Rate

- You will need to maintain the optimal temperature at 27 – 30°C and humidity (60-80%). This is because BSF perform in these conditions. Additionally, avoid waterlogged conditions because this can result in high mortality [6]
- Overcrowding your BSF stock should be avoided because this leads to an increase in competition for food, water, and space. It is advised that the recommended stocking density of BSF should be adopted in your system [5]
- In as much as our larvae are voracious eaters, we do not want to feed them stale waste as this can harbor pathogens and reduce larval health [7]

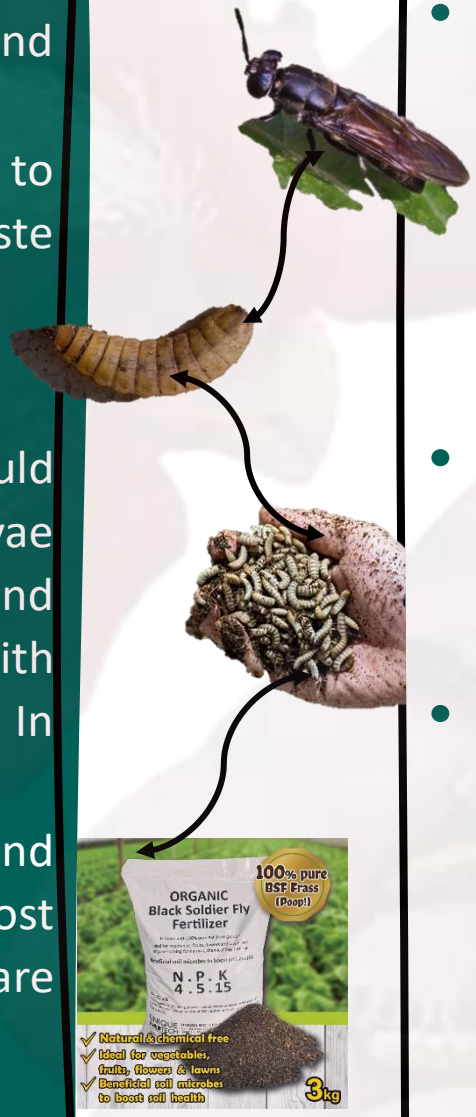
Unpleasant Odor

- Avoid/look out for excessive wet waste as this condition promotes anaerobic decomposition, causing foul smells [16]

- Adding dry organic materials like dry leaves on the top of wet substrates helps to absorb excess moisture and prevents odor [8]
- To prevent odor, build up, you need to regularly remove unconsumed waste from your BSF system [16]

Poor Larvae Growth Rate

- You are what you eat. You should ensure that the substrates your larvae feeds on contain sufficient protein and energy. If necessary, supplement with rich protein material. Garbage In Garbage Out [11]
- Your Larvae are not supertasters and thus, you should avoid substrates most especially kitchen waste that are heavily salted and spiced [10]



Additional Tips

- Larvae are one of nature's best escape artists and given the chance, they will give you an excellent show if you give them the opportunity and you should check for excessive moisture or overcrowding which can trigger migration [14]
- You will be faced with pupation issues and to resolve this, provide a dry area or ramp for mature larvae to self-harvest and pupate outside the waste substrate [1]
- Your larvae are also part of the cycle of life and considering how protein rich they are, it is no surprise they will be preyed on. Therefore, you will need to protect eggs and young larvae from predators by using water barriers or physical barriers around the rearing unit [4]

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