Chocolate Garden

Kraczkowska, Amber (School: Pembroke School)

The purpose of this scientific inquiry, the Chocolate Garden, was to determine the most effective method of composting waste cocoa shell from a local chocolate company. About 20% of the total mass of cocoa beans used in chocolate production ends up as waste cocoa shell. The chemical composition of cocoa shell makes it an ideal composting material. The aerated static pile, static pile, and in-vessel composting systems were compared in this inquiry as they could easily be replicated in a home environment. In phase one, the three systems were constructed and used to compost cocoa shell based feedstock for 47 days where the ambient temperature, feedstock temperatures, and signs of microbial activity were recorded. In phase two, the composts produced were mixed with potting mix and used to grow plants. The number of sprouted seedlings were counted to evaluate the composts' quality and toxicity. The aerated static pile system first entered the active composting stage, produced the most mature compost, and supported plant growth best. Therefore, the aerated static pile composting system is the most effective at composting waste cocoa shell tested. The results have been provided to the chocolate company where they are being used in the development of a cocoa shell recycling system and to support the launch of composting amendment products, reducing the environmental impact of hundreds of tonnes of waste cocoa shell. The aerated static pile composting system was constructed out of easily available materials and can be used by households to effectively recycle organic materials.

Awards Won:

Third Award of $1,000