

Black soldier fly larvae composting reduced weed seed emergence

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Black soldier fly (*Hermetia illucens*) larvae (BSFL) composting is biotechnology used for organic waste management. BSFL composting has multiple benefits. One of the major benefits is that it generates value-added byproducts such as animal feed, biogas, biofuel, and frass fertilizer, which incentivizes a circular bioeconomy. However, there is little information on how BSFL composting affects weed seed germination. We designed an experiment to evaluate the effect of BSFL on weed seed germination of six weed species including barnyardgrass (*Echinochloa crus-galli*), common ragweed (*Ambrosia artemisiifolia*), giant foxtail (*Setaria faberi*), ivyleaf morningglory (*Ipomoea hederacea*), redroot pigweed (*Amaranthus retroflexus*), and velvetleaf (*Abutilon theophrasti*). Our results showed that the average weed seed germination of two nontreated controls treatments was 21% for barnyardgrass, 28% for common ragweed, 15% for giant foxtail, 41% for morningglory, 1% for redroot pigweed, and 48% for velvetleaf. However, the germination in all treatments with BSFL significantly reduced the germination of all weeds to $\leq 1\%$, except for velvetleaf. Potential causes of the high weed seed germination reduction include high moisture developed by the BSFL composting because of the type of feed used and carbon dioxide and ammonia generated during BSFL composting. We believe that the seeds' characteristics, such as a thick seed coat, may interfere with the potential of the BSFL composting process. In conclusion, black soldier fly larvae composting effectively reduced weed seed germination and is biotechnology that will enable increased productivity of farming.