

The Exploitation of Aflatoxin Contaminated Peanut and Pumice for Developing Organic Compost for Crop Production

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Annually, substantial amount of peanut seed which was contaminated with aflatoxin at higher than 20 ppb has normally been eradicated by burning. It is of dual benefits in both economic and environmental point of views if one can further detoxify, develop and exploit this contaminated seed for agricultural purposes. One possible way for utilizing this organic waste is to further develop and use it in the form of organic fertilizer such as by composting it with some relevant conditioning substances.

Five samples of contaminated peanut seed containing 780 ppb of aflatoxin was mixed separately with each of the following 5 conditioning substances, i.e., peanut hull, bagasse, coconut fiber, grounded corncob and pumice at the ratio of 5 to 1 by volume. Each mixed media was then decomposed in an aerated bin. Thereafter the end of the decomposing process, the composting materials from all 5 treatments were then air-dried and kept in plastic bags. Aflatoxin residue and physical appearances were eventually measured. By pot testing, these five finished composting products were mixed with grounded sandy clayloam soil at the ratios of 1 to 20 and 1 to 5 by volume and use as plant growth medias for chinese cabbage which was used as a plant indicator. Plant growth and aflatoxin contamination were determined at harvest.

Comparatively, the most appropriate method for decomposing aflatoxin contaminated peanut was the mixing of this composting material with one-fifth of pumice by volume. With this composting procedure as compared to other treatments including a control (soil only) and a check (chemical fertilizer at 0.7 g/pot), the merits of this pumice treated technique were the shortest decomposing time required-16 days, and also the acquisition of the highest relative weight of the produce-52.55%, the lowest aflatoxin residue-129.2 ppb, the least stink property and also possessed fairly acceptable physical appearances. Moreover, Chinese cabbage planted in this mineral soil that was mixed with the pumice-treated compost grew more vigorously than plants treated with other soil mixed materials. Noteworthily, Chinese cabbage planted in all growing medias were freed from aflatoxin contamination.

References

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