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Techniques for Insect Detection in Stored Food Grains: An Overview

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Abstract

Insects cause a major loss in stored food grains. Besides, pestilential activities of insects in stored food grains affect the marketability as well as the nutritional values. Early detection and monitoring of insects in the stored food grains become necessary for applying corrective actions. Visual inspection, probe sampling, insect trap, Berlese funnel, visual lures, pheromone devices etc., are some of the popular methods largely used in commercial granaries or grain storage establishments. Of late, electronic nose, solid phase micro-extraction, thermal imaging, acoustic detection, etc. have been reported to be successful in detecting insects. The capability of in-situ early detection, monitoring, cost, reliability, and labor requirements are the major factors considered during for selection of the method. Detection of hidden infestation, whose population may be many times higher than the free-living insects is an important concern to mitigate the losses in bulk storage warehouses, so as to enable the early actions for fumigation or to dispose off the grain. This paper reviews some of the widely used detection methods for early detection of insects' pestilential activities in stored food grains as well as some of the novel technologies with an emphasis on acoustic method, which has a good commercial potential.

Highlights

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