



A REVIEW

Alternatives to phosphine fumigation in managing stored grain insect pests

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Abstract : Post-harvest losses to food grains are reported to be about 9.33%, out of which 6% has been reported during storage. To check the avoidable losses, fumigation is considered to be the best method. Among the various fumigants, phosphine is used worldwide and is the only option to be used in India due to its easy availability, cheap and free of residue. With the continued usage of phosphine, insect pests that target stored grains are gaining resistance, which is a serious limitation. Due to ozone depletion methyl bromide has to be phased out as per montreal protocol though it is a broad-spectrum fumigant. Sulfuryl fluoride, ethyl formate, carbonyl sulphide, carbon disulphide, propylene oxide, hydrogen cyanide, methyl iodide, and ethane dinitrile are some of the other fumigants that have been found to be promising, but cost is still an issue for developing countries like India. Aside from fumigants, a variety of controlled and modified atmosphere (CA and MA) systems have been developed as substitute to the presently accessible fumigation systems to manage insect pests of stored produce for a longer period of time. Ozone as an oxidant offers a wide range of possible applications in the management of stored grain insect pests, but its corrosive nature poses a significant risk to metals. Where cheap sources of carbon dioxide, nitrogen, or helium are available, as well as appropriately sealed storage structures, MA technology can be well applied. Furthermore, biogas created from cow manure has shown promising results in the management of stored grain insect pests at the farm level. Till some other competent option available, we have to continue with the use of phosphine as fumigant to manage the stored grain insect-pests.

Key Words : Fumigation, Alternates, Controlled atmosphere, Modified atmosphere, Biogas plants, Stored insect-pests

View Point Article : Kaur, Manpreet, Singh, Subash and Sharma, D. K. (2022). Alternatives to phosphine fumigation in managing stored grain insect pests. *Internat. J. agric. Sci.*, **18** (1): 522-534, DOI:10.15740/HAS/IJAS/18.1/522-534. Copyright@ 2022: Hind Agri-Horticultural Society.

Art icle History : Received : 11.08.2021; Accepted : 21.09.2021

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