

Methyl iodide: a potential fumigant for post-harvest and quarantine disinfestation

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DOI: 10.5073/jka.2010.425.167.325

Abstract

Since the phase out of methyl bromide for post-harvest treatments, there is a lack of alternatives for many uses. Moreover, in the European Union methyl bromide is also banned for quarantine treatments since the 18th March 2010. That is why it is urgent to find and develop new fumigants because physical methods and/or contact insecticides cannot always replace all the capabilities of a fumigant (effectiveness, diffusion through the commodity, quick treatment...). A new fumigant that could replace methyl bromide for several uses is methyl iodide. This fumigant is already registered in the USA for soil disinfection and Japan for soil, timber and chestnut treatments.

Methyl iodide was studied in LNDS on some fields: grain, alfalfa seeds and timber disinfections. For grain disinfections, the study highlights the good results of methyl iodide after fumigations of infested wheat against the rice weevil: *Sitophilus oryzae* (L.). A CTP as low as 100 g.h/m³ is sufficient to kill all the stages (eggs, larvae, pupae and adults) of this pest at 10°C. This fumigant could replace methyl bromide also for quarantine treatments to control the stem and bulb nematode *Ditylenchus dipsaci* (Kühn) in alfalfa seeds. After fumigation with an exposure time of 24 hours, and concentrations of 20, 30, 40, 50, 60 and 80 g/m³, the results show that the efficacy of each fumigation at 15°C, is almost equivalent to that of methyl bromide. This fumigant could be also a potential fumigant for the pallet and wood packaging disinfections under the ISPM n°15. Preliminary work shows that its diffusion through pine wood seems to be a good solution for the substitution of methyl bromide, with a time necessary to penetrate 8 cm of timber just a little bit longer than that for methyl bromide.

Keywords: Methyl iodide, *Sitophilus oryzae*, Alfalfa seeds, *Ditylenchus dipsaci*, Timber disinfection