

Title Treatment of an empty fumigation chamber using the Degesch phosphine generator.
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Abstract

A trial fumigation was conducted on an empty fumigation chamber using the Degesch phosphine generator. The Degesch phosphine generator is a device for the rapid production and injection of phosphine gas into structures requiring fumigation. The generator is positioned outside the structure where it generates phosphine by reaction of Magtoxin granules, a high-assay magnesium phosphide product, with water. This reaction is carried out inside the generator under an atmosphere of carbon dioxide. The phosphine (PH₃) is then pumped from the generator into the structure through a recirculation system. The generator produces a non-hazardous, aqueous slurry (pH 7) of magnesium carbonate which requires disposal. The carbonate contains less than 0.001% unreacted phosphide. A fumigation chamber with a volume of 2633 m³ (93 000 ft³) was dosed at a rate of 1.1 g PH₃/m³ (32 g PH₃/ft³). This dosage corresponds to a theoretical concentration of 800 ppm PH₃. A concentration of 800 ppm was reached in the chamber approximately 52 minutes after injection of phosphine began. Phosphine concentration measurements were made at the bottom, middle and top of the structure over a 96-hour fumigation. Some advantages of the Degesch phosphine generator are: rapid production of high concentrations of phosphine; lower labour requirement for application, retrieval of spent fumigant, and disposal; ease of redosing or adding back phosphine; generation of phosphine gas is not dependent on ambient temperature or humidity; application may be started and stopped at any time; multiple fumigations can be conducted from a central location using a gas distribution system; worker exposure during application is virtually eliminated; may be used with the J-System, a patented method for the recirculation of phosphine gas, to obtain uniform distribution of phosphine throughout the treated commodity; and can serve as an alternative to methyl bromide.