

The safety level of agricultural worker while working with dangerous chlorpyrifos

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ABSTRACT : Pest and disease control operation has become high in demand. Subsequently, pest and disease needs to be controlled so that crops are kept free from pests and food production is maximized in every agricultural farm. Handling of pesticides has led to serious problems on environment and on pesticide handling agricultural workers. To prevent the operator against exposure to pesticides, the operator should wear the personal protective mask. In actual practice sprayer operators are not using these protective masks for various reasons. Therefore, a study was undertaken to evaluate commercially available five masks for their materials of construction, filtering efficiency (NIOSH 5600 method), comfort while spraying chlorpyrifos (modified Corlett and Bishop ten point scale). The masks were found manufactured using foam pad, single and double layered poly propylene and cotton cloth as filtering materials. For preventing chlorpyrifos from inhaling air, masks with double layered poly propylene with water repellent quality filter (M_3) was found good with an absolute filtering efficiency of 97.3 per cent and actual filtering efficiency of 78.1 per cent. Sprayer operator's opinion indicated that the mask (M_3) was found higher wearing comfort rating (7.16) and higher breathing comfort in mask M_3 (6.54) based on modified Corlett and Bishop ten point scale.

KEY WORDS : Ergonomics, Exposure, Masks, Pesticides, Protection

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INTRODUCTION

The use of pesticides in agriculture is the most common way of controlling pests world-wide. Problems with the use of pesticides are usually worse in developing countries where many products which are banned are still in use. Pesticides may operate through hormonal or genotoxic pathways to affect male reproduction. They may penetrate the blood to potentially

affect spermatogenesis, either by affecting genetic integrity or hormone production. Inhalation exposure is one of the easiest to prevent by wearing readily available adequate personal protective mask and it is generally a cheaper option. Garg (1996) studied five different types of available masks and showed that operator felt uncomfortable in wearing all type of respirators. Lange (2000) stated that inappropriate use of respirators during low exposure concentrations might result in increased incidence and prevalence of disease due to physiological and psychological stress. Caretti *et al.* (2006) stated that significantly decreases in performance of worker were found with increased inhalation resistances. Anne and Susan (2008) surveyed and reported that 75 people were not using any respiratory protection device for spraying due to discomfort of wearing. Keeping the above points in view, studies were conducted to evaluate the regionally available five masks for their as filtering capacity and comfort for workers. The masks were tested at Central labour Institute Mumbai for their breathing resistance.

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