

Survey of pesticide application on products of plant origin in Albania

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Abstract

Pesticide use can damage agricultural land by harming beneficial insect species, worms, and soil microorganisms. Many studies have reported high concentrations of pesticide residues in vegetables, more than maximum residue limits.

In Albania, the use of pesticides began many years ago, and today, their use has significantly increased. The aim of this study is to report on the attitudes and practices developed by vegetable growers regarding pesticides applications on crops. We use online data collection forms to gather information from farmers in order to evaluate the need for training courses on pesticide use, and to appraise how well farmers are educated on the impact pesticides have on humans and the environment. The survey was conducted from May to November 2015 and geographically spanned many cities such as Tirana, Durrës, Vlora, Saranda, and Elbasan. It shows that more than 40% of vegetable growers received some training for pesticide use, but over 85% of them need training on diagnosis and timely intervention tactics in order to be more effective in protecting plants. About half of them read the pesticide label, but most labels have incomplete information and/or are evasive. The presented study indicates that pesticides application in the survey area represents a potential risk for the environment, farmers and consumers.

Keywords: Pesticide, survey, human and environmental risk

INTRODUCTION

The use of pesticides in Albania began many years ago. Consequently, the risk of residues remaining in the food consumed is still a concern (Chun O. K., 2002). Pesticides contain different kinds of active reagents, which in turn, are the basis of how pesticides are classified. These active reagents may have unpredictable effects on pests not specifically targeted by the pesticide. Some pesticides are more persistent and may reside in our environment for a long duration. When pesticides are applied on crops, pesticides can be absorbed into the soil, edible elements, and water. Through different routes, pesticides can act on humans via oral ingestion, dermal penetration, and inhalation (Hameed, 2013). The best way to resolve pest problems is through prevention; however, growers are often too busy or negligent, and use pesticides to resolve problems.

After pesticides are applied to crops, they may interact with plant surfaces, may be exposed to the environmental factors (such as wind and sun), and may be washed off during rainfall. Pesticides can be absorbed by the plants' surface, enter the plant transport system (systemic), or stay on the surface of the plant (contact) (Keikotlhaile B. M., 2011). In order to reduce exposure to highly hazardous pesticides and their health impacts, WHO has established different actions that should take place during handling, storage, use, elimination, and replacement of pesticide use. Guidance and legal frameworks on the use, management, and trade of pesticides, including highly hazardous pesticides, as well as proper storage and handling, are available from international organizations and international conventions; these should be implemented globally (WHO, 2003). Danger of exposure always exists whenever pesticides are handled. The greatest risk to the applicator occurs when handling and applying highly toxic materials and in mixing and loading pesticide concentrates. Wearing protective clothing, when applying pesticides, can reduce the risk of pesticide poisoning because it reduces the chances of exposure (Johanningsmeier J. S. 2002).

Pesticides classified as extremely hazardous or highly hazardous by FAO and WHO, are restricted or banned entirely in developing countries. From long-term studies, the exposure even in small doses, there are observed health problems such as immune-suppression, hormone disruption, reduced intelligence, reproductive abnormalities and cancer (Cara, M 2010). Incorrect and uncontrolled use of PPPs may cause great harm to people, animals and the environment. Agricultural experts have been constantly trying to develop new technologies of healthy food production including the development of PPPs which would be friendlier to people, animals and the environment. (Česnik H. B., Špela Velikonja B., Gregorčič A., 2011)

MATERIAL AND METHOD

This survey was conducted from May until November 2015 and spanned geographically many cities in Albania: Tirana, Durrës, Vlora, Saranda, and Elbasan. The survey form contained 40 questions and it was distributed randomly to farmers growing vegetables in greenhouses and in fields. The form was made also available online where it can be filled by farmers or phytopharmacists (the link below: <http://goo.gl/forms/2eYfjfG3lK>).

Most of the farmland around Tirana and Durrës is used for cultivating food crops and fruit trees. The same applies to Vlora and Saranda, where farmers cultivate citrus trees. The survey included questions regarding the types of pesticides farmers use on their crops, equipment used for spraying, protective tools used during treatment of crops, and intoxication accidents during application. In this area, fertilizers, fungicide and insecticide are mostly used. The temperature throughout the months surveyed is fairly stable averaging 30°C in May, 35°C in August and 23°C in November. The soils have sandy, clay, gravel, and alluvial soil characteristics.

RESULTS AND DISCUSSION

The farmers who took the survey were male, on average 45 years old. Pesticides are sold in the market by phytopharmacists, some of them educated on plant protection, but phytopatologists are educated and trained on diagnosing plant disease and recommending measures to ensure better plant protection. However, farmers do not take the diagnosis of plant prescription by phytopatologist, but rather rely on using pesticides without performing sufficient analysis apriori. The result of this survey shows that 83.3% of farmers are interested in training courses on pesticide use, and most of them (59.1%) require training on timely diagnostication of crop diseases in order to prevent damage to crops. Half of them (50%) want to have deeper information on plant protection products, information of hazardous effects, and potential health risks. Only 22.7% of farmers are interested on how pesticides affect the environment, which is unfortunate because the environment is as important as human health. When asked if they have had received information as part of public awareness activities related to the safe use of PPPs, 52.6% responded that they had never participated or received such information, and 31.6% showed interest in accessing such information.

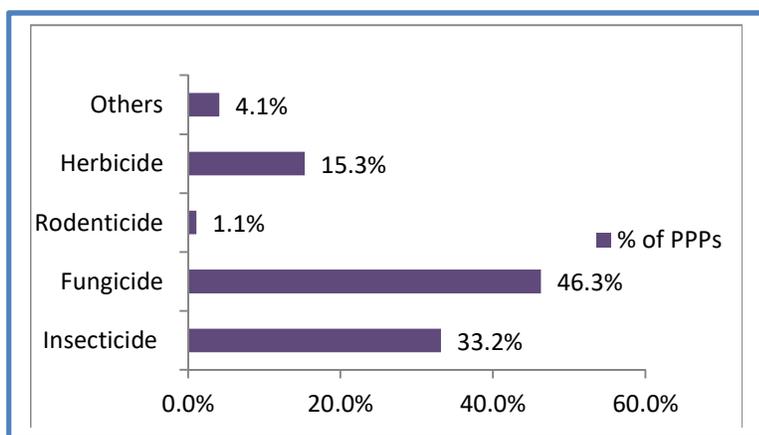


Fig 1. Type of pesticides used by farmers

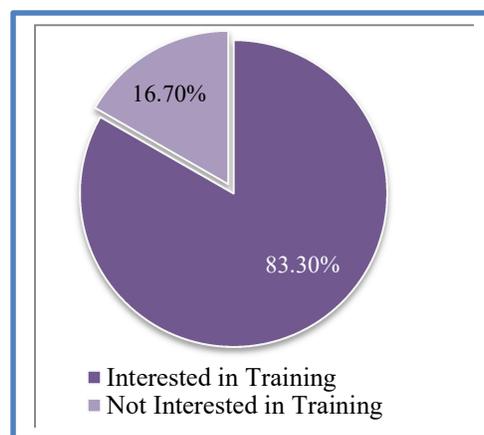


Fig 2. Interest in Training

Fig. 1 above shows that insecticide (33.2%) and fungicide (46.3%) are the most commonly used pesticides by farmers, followed by Herbicide (15.3%) and Rodenticide (1.1%). Farmers were quick to point out that after pesticide application on crops flies and mosquitoes would be absent from crops for nearly one week, a fact that reinforces the adverse effects on the environment.

Fig. 2 shows that 83.3% of the farmers were interested in receiving more training and education courses on application with pesticide.

Many farmers claim that they use personal protective equipment (PPE) during application of pesticides. However, because of low income levels and high prices of PPE, many farmers cannot purchase the equipment needed. Most farmers lack protective wear, and only sometimes use gloves

and/or eye protection, and/or mist respirators. We surveyed farmers on the use of PPEs in order to gain insight on how or if PPEs are used during pesticide application.

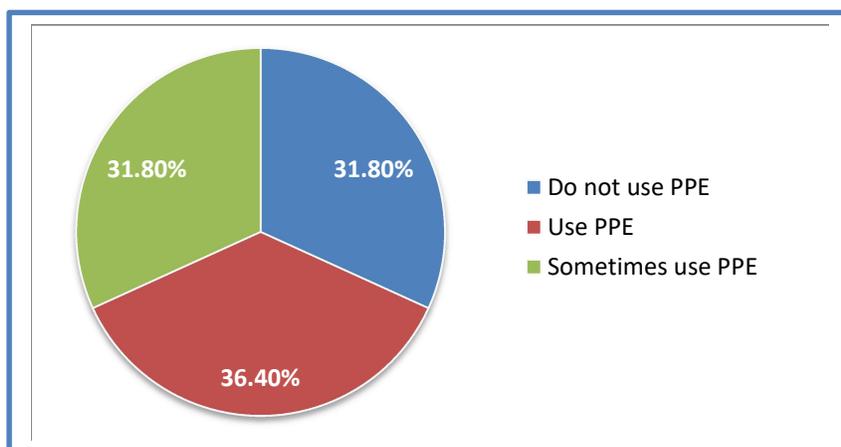


Fig 3. Use of Personal Protective Equipment (PPE) by farmers

Fig. 3 above summarizes the answers to our survey questions regarding the use of PPEs during pesticide application. Only 36.40% admitted to not use any personal protective equipment. Additionally, those who use them sometimes have insufficient knowledge about protective equipment and the benefits to avoid pesticide exposure. We also found out that most interviewed farmers throw in the common garbage bin the containers of products of plant protection (PPP), which could still have some leftover residues in them. Some chose to burn the containers as a means of disposing the leftover pesticides, whereas others preferred to apply the full amount of the pesticide mixture in the fields.

CONCLUSIONS

This study shows that vegetable and fruit growers do not use pesticide in accordance with the current legislation. Often, they do not wear protective equipment during application or mixing pesticides. Training, brochures, or labels (in the Albanian language) with additional information on pesticide application are needed for farmers. Low income levels among farmers as well as the lack of education on the benefits of using protective equipment during pesticide application, and the high price of PPEs are the main reasons PPEs are not used consistently. Men are more vulnerable to the unsafe use of pesticides than women since they are the ones who generally take on the task of applying the pesticide to crops. After spraying, farmers indicated similar adverse effects such as vomiting, eye irritation, and dermal irritation. While there is some awareness among the farmers regarding how pesticides should be handled and their effects on crops and environment, a greater effort to bolster awareness should be undertaken by governmental institutions, universities, and media, so that everyone benefits in the long run.

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