Outdoors Agricultural Insecticides Pose worth Global Risks and Espousal of Safety Practices among Farmers

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Abstract

This article summarizes the outcome of the peer review of the risks on the active substances and the representative formulations evaluated on the basis of the representative uses of insecticides. A toxic insecticide is any substance or mixture of substances intended for preventing, destroying or controlling any insect pest, including vectors of human or animal disease in or on their bodies, as well unwanted species of insects causing harm or otherwise interfering with the production, processing, storage, transport, or marketing of food, agricultural commodities, wood, wood products or animal feedstuffs. Next to these intended effects, insecticides may also have adverse health effects for human beings. The main adverse health effects are difficulty in breathing, headaches, neurological or psychological effects, irritation of skin and mucous membranes, skin disorders, effects on the immune system, cancer, and reproductive effects. The manifestation of these effects depends on the type of insecticide, toxicity level and duration of exposure. Researchers have also examined studies involving outdoor pesticides, such as insecticides, herbicides and fungicides, but the results are much less consistent. There has been a statistically significant association between outdoor exposure to herbicides and all types of childhood cancer combined, as well as childhood leukemia specifically. Insecticides have the solution to control insect problems, so, use of granular insecticides baits and a good granule spreader can ensure accurate and even applications throughout the entirely affected area. For reducing insecticide exposures, try to get rid of insect pests without chemicals, if using insecticides follow the safety directions, do not buy more insecticides than needed, and store or dispose of insecticides properly. Someone should not dispose of insecticides in the garbage and never pour poisons down the drain or sewerage. Prior to purchase, read and make sure to understand and follow the label directions as it contains important information on ingredients, precautions, security equipment, first aid, environmental hazards, use directions, storage and disposal**.** Also, it is dangerous and illegal; to not follow the directions on the label and be sure that the product can be used on the pest to which farmers want to manage and in the place want to use it. Overall, the consumption of low-fiber, fat-rich and calorie-rich diets, along with the use of alcohol, pose a much, much greater threat to human health than chemical residues in our food.

Keywords: Chemical, Pollution, Risk assessment, Pesticide, Insecticide

1. Introduction

Pesticides are materials used to manage pests such as insects, rodents, weeds, molds and germs. There are numerous chemical compounds that fall under the heading of pesticides with most commonly utilized types being herbicides, insecticides and fungicides. Simply, a pesticide is a carefully tested combination of substances that kills or lessons, the threats from weeds, insects and fungus, respectively. Pesticides come in various forms, including sprays, liquids, powders,

granules, baits and foggers (total release aerosols). Their advantages include the in the fact that public can keep insects off from plants, stores or for personal protection, while, farmers use chemicals generally for the crop protection reasons. Because both natural and manmade insecticides are designed to manage living thing insect pests, they can be harmful to peoples and the environment, especially when these are used, stored or disposed of improperly. Disadvantages are that the poisons can get into the food that peoples eat and gain entry in their body system and also it is not very good for the environment (particularly in soil and water.). All of these illnesses are derived from entirely different sources including clothing, routine home or school maintenance, lawn care application and tap water, but these all have one thing in common use of insecticides (Vanbergen, 2013; Sarwar, 2015 a; 2015 b).

For decades outdoor insecticides have been the answer to deliver a nuisance-free lawn, fruitful garden and field crops. Farmers have benefited from the use of sprayed herbicides lessening erosion from over-tilled land, and the spreading of deadly epidemics like typhus, malaria and dengue that have been prevented by the use of insecticides. Additionally, countries historically unable to defend against infestation are now able to prevent devastation of crops, so appreciations go to the invention of these chemical compounds. However, the uses of insecticides would continue to be a hot issue in environmental circles. Without a toxicologist or chemist, it may be difficult to accurately interpret and comprehend the effects of their chemical ingredients (Goulson, 2013; Sarwar, 2015 c; 2015 d).

Eventually, however, these chemical compounds have been discovered to be a fatal source interrupting food chains and resulting in the deaths of many living creatures. Although many insecticides have been eventually banned from or limited in use within the some global states, their impacts have already been made severe. Resultantly, an acknowledgment is to their stability along with soil, plant, water and animal absorption, and the presence of these chemicals continued to be passed on. Scientists and Activists have issued warnings provoking to manufacturers, food processors, farm bureaus and government officials, for laying of the foundation for the debates over insecticides usage that continue today. Lately, many concerns have been developed over children's and pet exposures to insecticides, both within the home and in commercial and educational facilities. When tracking pesticides outdoors, inhaling airborne sprays, working or playing in a freshly sprayed lawn or accidental consumption, the pets and children are more likely to be at risk. Due to their size, they are not only much physically closer to the distributed insecticides, but their bodies, including children who are not fully developed yet, are unable to eliminate or resist toxins making them much more vulnerable to poisoning. There are many grassroots organizations that have begun to bring issues of insecticide poisoning in children and adults for the attention of government administrators to fight human's exposure to toxic chemicals in all arenas and continue to support this movement (Tariq et al., 2007; Fenske et al., 2005).

Regardless of the overwhelming amount of case studies, research, reports and statistics relating to the negative effects of insecticides, these are continue to be utilized. Within our modern and technologically advanced society, convenience can often override concern, and important health and environmental issues can get swept under the rug. Public must remember that the burden falls on the consumer to become informed and take the steps towards positive change. Even adopting careful measures to prevent chemical poisoning and unwanted exposure, the fight against insecticide contaminations might continue to be a process of education and activism. The general public receives no training on the careful use of insecticides and often fails to follow label directions, wherein applying a product contrary to label directions is illegal. Exposure from

use of illegal insecticides and common misuse can be as close as right next door or even within the boundaries of the homes, schools and playgrounds. And peoples must not overlook the fact that food, water and air are possible transporters of chemicals back to our habitat. But, taking the time to read labels, inquire about regulations and investigating commercial building and educational facility policies, interactive assistance and political policies must exist. Now is the time to take a second look to do our homework and educate ourselves about what we put on our lawns today that will ensure a greener tomorrow and healthier future for our families and environment (Pereira et al., 2009; Sarwar et al., 2014; Sarwar et al., 2015).

Fruits and vegetables are known to protect against heart disease and cancer. They are rich in vitamins, minerals, fiber, and health-promoting phytochemicals. However, many fruits and vegetables tests are positive for pesticide residues, with about one-third of them showing up with multiple residues. Research reveals that prolonged exposure to pesticide residues may increase the risk of various cancers and neurological problems and impair the immune system. Unfortunately, sufficient data on the reproductive effects and other chronic effects are lacking for most pesticides. At present, there are forty-five pesticides approved for food use that are known or suspected to cause cancer, carcinogenicity ability to cause genetic mutations, and less than 40% have been adequately tested for their potential to cause birth defects. For the average consumer, there is little data available on dietary exposure to a particular pesticide over a period of time, making it very difficult to link pesticide exposure with a specific health problem (Bolognesi, 2003).

There are a number of reports of adverse reproductive and developmental effects in wildlife resulting from heavy exposure to pesticides, dioxins and other environmental contaminants. Evidence is there that pesticides cause harm to human health, and the peoples who are exposed through their work, such as farm workers and other persons handling pesticides and herbicides, face the greatest risks. For example, leukemia and cancers of the lymphatic system are more common among workers who for many years have applied phenoxy herbicides along railroads, electrical lines or in agricultural settings. Lung cancer rates are elevated among pesticide applicators, while liver cancer and leukemia rates are elevated among farm workers. The incidences of lymphatic, genital and digestive tract cancers correlate with a higher than average herbicide use. Pesticides, along with dioxin and other environmental contaminants may act as endocrine disrupters and interfering with hormonal action and body functions. This makes them possible risk factors for hormone-related cancers such as prostate and breast cancer (Gomes et al., 1999; Martínez-Valenzuela et al., 2009; Zyoud et al., 2010). Occupational exposure to pesticides often occurs in the case of agricultural workers in open fields and greenhouses, workers in the pesticide industry, and exterminators of house pests. Exposure of the general population to pesticides occurs primarily through eating food and drinking water contaminated with pesticide residues, whereas substantial exposure can also occur in or around the home (Yassin et al., 2002; Damalas and Eleftherohorinos, 2011; Sarwar, 2015 e).

The most of farmers do not follow the instructions before applying them and also use extremely hazardous chemicals, for example, the waiting period observed by most growers after applying insecticides is less than four to five days, where as it should be at least two weeks depending on the chemical. Insecticide residue analysis has revealed that fruit and vegetable samples examined contained a high degree of residues of pesticides making them inedible. Vegetables including tomato, chilli, cauliflower, eggplant, potato, cowpea and bottle gourd have been found to contain 45 percent pesticide residues, and such vegetables are not fit for consumption and their sale might banned until these are free from harmful deposits. The least contaminated items with

insecticides include onions, garlic, corn, cabbage, broccoli, green peas, carrots, spinach, sweet potatoes and blueberries. On an average, the fruits noted for being the most heavily contaminated with insecticides are guava, ber, strawberries, cherries, apples, grapes, raspberries, apricots, pears, peaches and nectarines. Insecticides tend to accumulate in fatty material, and hence for that reason, fatty meats, fish and dairy products may have higher pesticide residue than the low-fat products. The wax coating on cucumbers facilitates the retention of the insecticides used on cucumber (Ecobichon, 2001; Dale and Polasky, 2007).

2. Minimizing Insecticide Risks

The following particular guidance is proposed to be taken into account to manage the risks identified on the basis of the representative uses of insecticides:-

2.1. Choosing the Right Formulation

The first decision to make when selecting an insecticide is what formulation to use, which is the way the pesticide's active ingredient is mixed with inert ingredients to make it convenient and effective to use. Factors that influence the choice of formulation include cost, convenience in mixing and using, effectiveness against target pest and safety to non-target individuals. The farmers might be aware of the most important types of insecticide formulations and how they should be used (Urech, 1999; Smith et al., 2008).

2.2. Canned and Frozen Foods

The washing and treatment process to prepare fruits and vegetables for canning or freezing removes or destroys most of the pesticide residues. For example, 80-90% of the benomyl residue (the fungicide suspected of causing birth defects) is removed when apples are made into applesauce and when tomatoes are converted into tomato juice. There are a number of ways that can minimize our individual exposure to pesticides. Firstly, eat a variety of foods and this can lessen our exposure to any one pesticide. Secondly, fruits and vegetables should be properly washed or peeled before eating, and fruits and vegetables with edible peels can be cleaned by scrubbing with a brush. Researchers have substantially reduced the pesticide residues on popular fruits and vegetables by washing in a dilute solution of dish detergent (1 tea spoon per gallon of water), and then rinsing in slightly warm water. The outer leaves of vegetables (lettuce and cabbage) should be discarded since these are the ones most contaminated portion. Thirdly, one can buy organically grown produce; however, an organic label does not guarantee that the produce is truly organic. The federal government should continue working towards developing universal standards for what constitutes an organic food production (Isin and Yildirim, 2007; Muller, 2002; Harris and Gaston, 2004).

2.3. Outdoors Insect Vectors Habitat Reduction

Insect vectors such as fleas and bud bugs live only in warm, moist areas that are protected from direct sunlight and heavy rain or irrigation, and have under frequent visits from host animals. Wearing knee-high white socks, check for fleas in likely places, if fleas are present these may jump onto human legs. These spots can then be exposed to sun through mowing or pruning, or

simply flood the area periodically. Clean outdoor pet shelters by laundering any bedding and vacuuming inside thoroughly. Seal off any outdoor hiding places where pets or other furry animals may sleep. Manage pet resting spots to prevent fleas from establishing a population in home yard. Outdoor sprays can drift away and pose a risk to non-target wildlife such as bees or other beneficial insects. In addition, insecticides used in outdoor flea control products have become less effective due to widespread vector resistance (Sarwar, 2015 f; 2015 g; 2015 h).

3. Integrated Pest Management

For helping to prevent or reduce the hazards of insecticides, the farmers are using a variety of Integrated Pest Management (IPM) techniques to maximize profitability. The IPM is built on an understanding of crop production and the biology of weeds, diseases and insects, collectively known as pests. The IPM encourages use of compatible crop production and crop protection tactics to keep pest populations below those causing economic injury while protecting against hazards to humans and the environment. These tactics include cultural, mechanical, biological and chemical control options. Effective use of IPM techniques can affect water quality by minimizing or eliminating the need for chemical pest control. Use of IPM contributes to optimal crop health and improved net-profitability of crop production. Healthy crops, in addition to producing more harvestable product, use fertilizer more efficiently leaving less residues (especially nitrate) in the soil profile after harvest, are more competitive with weeds and less dependent on herbicides for weed control, and return more organic matter to the soil (Baker et al., 2002; Way et al., 2002; Sarwar, 2012; Sarwar, 2013; Sarwar, 2014; Sarwar and Hamza; 2013). Some examples of how IPM practices can help to protect environment quality by minimizing insecticide uses are following:-

3.1. Crop Monitoring

Monitoring fields regularly for insect pests helps to evaluate crop conditions and detect problems early. Timely field visits provide information to better meet real crop needs, avoid unnecessary crop losses and help in eliminating unnecessary insecticide use. Crop monitoring, for example, can provide information to refine pest control programs, identify needs for disease resistant hybrids, or detect activities of a significant insect pest. Keeping records of field visit information also helps to optimize management decisions by documenting problems for future reference. Scouting of fields can help further to determine what pest problems farmers may have and what conditions exist in your fields.

3.2. Hybrid and Variety Selection

Crop varieties selected for their yield potential, adaptation to local conditions and disease resistance help to optimize net profit. These attributes also influence, among other factors, crop health affecting nutrient use efficiency, competitiveness with weeds and tolerance of insect pest damage. These factors contribute to water quality protection by minimizing the need for insecticide uses and reducing the risk of unused nutrients, especially nitrates, being left in the soil profile.

3.3. Date of Planting

Date of planting can influence several key field crop pest problems such as management in seeding and maturity stages. Adjusting of planting and harvesting dates can sometimes help to avoid certain insect infestations, reducing the need for chemical control. But adjusting planting and harvesting dates can backfire if farmers do not think out about it carefully. Late planting of corn can increase the damage by cutworms and second-generation corn borers, but it can decrease damage by first-generation corn borers, seed corn beetles, seed corn maggots, wireworms, and corn rootworm larvae, however, corn root worm beetles lay more eggs in late-planted corn.

3.4. Crop Rotation

Crop rotation has a number of agronomic benefits including yield advantages associated with the 'rotation effect'. Crop rotations provide opportunities for managing broadleaf and grass perennial and annual weeds and disrupt the life cycles of a number of important insect pests. For example, continuous corn fields may be at risk from corn rootworm damage if last summers average number of worm beetles per plant are greater than 1 western worm beetle or 2 northern worm beetles or if corn rootworm induced lodging is observed. Those fields scheduled for corn again this year after late planted corn the previous year are at high risk from corn rootworm. Rotation out of high risk fields eliminates the need for using a corn rootworm insecticide.

3.5. Pesticide Application

Crop monitoring provides information to tailor pest management based on actual need, thus enhancing environmental and economic benefits and enabling judicious pest control. Where monitoring detects pest problems which warrant insecticide use water quality is protected by adhering to safe pesticide use procedures including proper mixing, handling, calibration, application, storage and disposal practices. Recommended practices include selecting pesticides that are registered for the specific pest, strictly following of pesticide label instructions including personal safety and environment precautions, preventing of spills while mixing and loading, avoiding of back siphoning while filling sprayers, calibrating insecticide application equipment before use, mixing only that amount of pesticide which is needed, never rinsing insecticide application equipment near wellheads, ditches, streams or other water sources, and triple rinsing or pressure rinsing insecticide containers before disposal or recycling.

3.6. Soil-Pesticide Interactions

When deciding on insecticides, consider efficacy, appropriateness and the potential risk of materials leaching or running-off fields. Some important soil properties which affect pesticide movement are texture, permeability and organic matter. A number of insecticide chemical properties also affect potential risk of leaching or surface runoff. Among the most important are insecticide degradation rates, soil adsorption, water solubility and volatility. Using these factors, keep in mind that application rate and many additional factors can affect insecticide movement including field slope, soil moisture, weather conditions, and others.

3.7. Organic Farming

Some fruit and vegetable growers in a numbers of communities have been shifting towards organic manure due to widespread awareness about the risks of using insecticides to boost production. However, the mindset of the other farmers is also changing now as a result of the action launched by the government policies against insecticide uses in farming. But, it has created a widespread awareness among them about the ill effects of insecticides. As a result, they have started cutting down on the use of chemicals in their fields. As farmers have been educated by government about the negative effects of insecticides on human health, and to produce organic manure and applying it, they are shifting towards organic manure, and insecticide use has been dropping. But, now they use chemicals only if these are really required and also ask to government technicians to help before applying to crop (Magkos et al., 2006).

4. Conclusion

The conclusion in the final column of the article arising from the consideration and discussion narrates that insecticides include any substances used to kill, control or repel pests. We use pesticides almost every day, from ant and roach sprays for the kitchen, to pest killers for the plant, storage, lawn, and mildew cleaners for the bathroom and mosquito repellents in and outdoors. Pesticides have become a widely accepted way to keep our fields, homes and gardens relatively insect pests-free. Integrated pest management activities are part of a sound crop management program. Careful planning helps to protect water quality by identifying long and short term production practices which contribute to crop performance and help to avoid pest problems. Many crop production practices such as proper site selection, seed bed preparation, nutrient balance and pH, planting depth, and other activities can greatly affect risk of pest damage, and are important factors in optimizing crop health and growing season success.

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