

THE USE OF HERBICIDES IN AGRICULTURAL PRACTICES IN MUBI REGION

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Abstract

Farmers all over the world are waging war against insects and weeds as they struggle to produce bountiful crops to meet increasing demand. The most effective weapon to fight this war is by the use of herbicides. In spite of the benefits of using herbicides, research has shown that their use can have negative impact on human health and the environment. A rapid appraisal via questionnaire administration and personal contact with key stakeholders (users of herbicides and suppliers) and literature search were the main instruments employed for this work. Out of 152 questionnaires received 76 per cent affirmed that they use herbicides on their farms. None of the respondents was aware of any future consequences of herbicide exposure on health. It was gathered during the study that the main reason for using herbicides is to control weeds. Herbicides frequently used in the region are the ones that contain active chemicals such as, Paraquat dichlorin, Glyphosate and Atrazine. Poor handling of herbicides has increased the risk of contamination in the environment thereby posing serious health hazard. As a result of the increased use of herbicides in the region, more studies need to be conducted to ascertain the levels of contamination of toxic chemicals (dioxin) in water and soils of the region.

Introduction

Herbicides are chemicals that kill or inhibit the growth of unwanted vegetation such as weeds in crops or lawns. Herbicides can be classified into two (2) groups according to how they act and what they kill. They are selective and nonselective herbicides. Selective herbicides kill only certain types of plants, whereas nonselective herbicides kill all vegetation (Raven et al, 1998). They are mainly produced in order to check the problems of weed infestation faced by farmers as they cultivate their crops. These problems are responsible for crop losses, which affect the farmer's output. Weeds on the other hand, are pests that are undesirable competitors, parasites, or predators that affect the productivity or output expected from a harvest (Daniel and Edward, 1998). The major agricultural pests are insects, weeds, nematodes, bacterial and viral diseases, rodents and birds. Insects are not part of the major pests that attack crops; in fact, weeds are the major problem faced by farmers in terms of potential crop loss. There are about thirty thousand (30,000) species of weeds, and in a year a typical farm is infested with between ten to fifty (10-50) weed species (Daniel and Edward, 1998).

Herbicides have the potential of reducing the amount of crop loss through competition with weeds. In spite of the benefits of herbicide application to farmers, its usage is not without problems. Research has shown that most herbicides contain dioxins, which have negative impact on human health and the environment. They can also affect the biodiversity of an ecosystem by killing non-target organisms. Several herbicides present clear risk to birds and are expected to be causing mortality on a frequent and routine basis (Muineau, 2002). Herbicides, do not only kill weeds but can also kill other organisms. Glyphosates which is a popular herbicide was discovered to be "extremely lethal" to amphibians (Chee, 2005). Organisms do not have to be killed to be negatively affected by herbicides. The stresses of carrying herbicides in their body make organisms more vulnerable to other diseases or stresses in their environment. (Raven et al, 1998). Some herbicides contain chemical compounds that are extremely toxic and persist in the environment. The persistent nature of some chemicals makes them to accumulate in the environment causing threat to humans and other organisms. The accumulation of these chemicals for long period makes them enter the food web and are also known to affect other organisms for which they are not intended (Charles, 2005).

Herbicide Drift as an Environmental Problem

Herbicides do not stay where they are applied, but tend to move through the soil, water and air, sometime long distances. Mobility of herbicides and other pesticides in the environment is also a problem for humans. All herbicides can drift as spray droplets, but some herbicides are sufficiently volatile to cause plant injury

from drift of vapour (fumes) (Ndsu, 1993). Drift can contaminate drinking water as it moves into rivers and other water sources. Fishes for example, can be affected by herbicides that were applied to agricultural lands Kilometers away and that are washed into rivers and streams by rain. When the concentration of herbicides is high in water it may kill fishes and if the concentration is low the fishes may suffer undesirable effects such as bone degeneration (Raven et al, 1998). The contamination of water ways by herbicides can damage the balance of the aquatic ecosystem.

Implications of Exposure to Herbicides

Herbicide applicators and farm workers bear the brunt of acute and chronic exposures, especially in developing world. The number of people harmed continues to rise, despite efforts to curtail acute exposures (Murray and Taylor, 2000). Exposure to herbicides can damage human health. Pesticide poisoning caused by short-term exposure to high levels of herbicides can result in harm to organs and even death. Long-term exposures to lower levels of herbicides can cause cancer and also disrupt the human endocrine (hormone) system (Raven et al, 1998; Charles, 2005). A person with mild case of pesticide poisoning may exhibit symptoms such as nausea, vomiting and headaches. The cases of acute poisoning have risen from about five hundred thousand (500,000) per year in 1972 to an estimated twenty five million (25,000,000) in the early 1990s (Levine and Doull, 1992). This figure is still rising in the developing world. In a research conducted in India by Gupta (2000), it is shown that "fifty one per cent (51%) of food commodities are contaminated with pesticide residues and out of these, twenty per cent (20%) have herbicide residues above the maximum residue level acceptable by world standards. Many health and environmental costs of intensive pesticide use have become starkly apparent. Therefore, care is needed in the use of herbicides in order not to accept the short-term gain at the expense of our health and damage to environment (Eddleston et al, 2002).

The use of herbicides is rising in most developing countries and this is bound to create negative impact on the environment and health of the people. Therefore, this study assesses the use of herbicides in agricultural practices in Mubi region. The study is hoped to be useful to ecologist, health workers, and users of herbicides and will also generate interest for further studies on the effects of herbicides on the health of humans and the environment.

The Study Area

Mubi region lies between latitude 9°30' and 11° 00' north of the equator and longitude 13°00' and 13° 45' east of the Greenwich meridian. It has a land area of 4,728.77 Km² and a population of 759,045 in 2003 (Adebayo, 2004). The region consists of five (5) local government areas namely: Madagali, Maiha, Michika, Mubi-North and Mubi-South (Fig. 1). These local government areas form the Adamawa north senatorial district. It is geologically located within the North Eastern Basement complex of Nigeria and belongs to the highland relief region of Adamawa State. Its elevation ranges from 400 metres to 1500 metres above sea level and it is mainly drained by River Yedzeram. The region has its lowest temperature in January (12.7°C) and its highest temperature in April (37 C). The mean annual rainfall ranges from 900mm to 1050mm.

Methodology

Two sets of questionnaires were administered to farmers and dealers of herbicides in Mubi. One hundred and fifty two (152) questionnaires were administered to farmers and twenty (20) to the dealers of herbicides in Mubi Town. The dealers were selected based on their experience of not less than four (4) years in the business of selling herbicides. Simple statistical methods were adopted in analyzing the data collected. The secondary data were collected from both published and unpublished materials.

Results and Discussion

The Use of Herbicide by Farmers

The questionnaires collected from farmers revealed that majority (76%) of the respondents use herbicides on their farm. Table I shows the percentage of respondents that use herbicides on their farms.

Table 1: Use of Herbicides by Respondents

Response	Number of response	Percentage
Yes	116	76
No	36	24

Source: Fieldwork



g1: Mubi Region

During the study it was discovered that herbicides account for about 80 percent of pesticides used in the study area. It is used not only on farms but also around residential houses and public places to clear grasses. This has made the use of herbicides popular in the region. The study shows that, 75% of the respondents have experienced one form of health problem or the other as a result of exposure to herbicides. Some of the health problems enumerated by respondents include; diarrhoea, vomiting, headache, fever and catarrh. None of the respondents is aware of any long-term effects of herbicide exposures to human health. Research has shown that some of these chemicals contain dioxins that are harmful to human health and to the environment. (Chee, 2005; Raven et al, 1998; Andrew, 1981).

The reasons given by 86% of the respondents on why they use herbicides on their farms was to increase the output- that is by decreasing the level of damage by weeds- while 38% indicated that they use herbicides-in order to reduce the costs of labour incurred during weeding. The dealers of herbicides that were sampled based on the years they spent in the business revealed that the demand of herbicides more than doubled every year "between "the years 2002 and 2007. This shows that the use of herbicides is increasing every year in the region and this increase means increase in the likelihood of these chemicals getting into our food web and water sources. Mubi region, being a catchment area to many rivers will continue to be an important area where its activities will affect lives downstream. Poor handling of herbicides in the region will mean contamination of streams and the aquatic animals including fish.

The study showed that, the type of herbicides used in the region is determined by price. Therefore, the people are not mindful of the health or environmental hazards these chemicals may cause but how cheap the price of the herbicides. This can be tied to poverty and ignorance. The irony of the situation is that the old and dangerous chemicals are cheap and readily available (Charles, 2005). The common types of herbicide used in Mubi region are shown in table 2.

Table 2: The Common Herbicides Used in Mubi Region

Type	Brand name	Active ingredient
Nonselective Herbicide	Gramazone	Paraquat Dichlorine
S	Roundup	Glyphosate
S	Bret P-20	Paraquat Dichlorine
S	Dragon	Paraquat Dichlorine
S	Vinash	Glyphosate
S	Slasher	Paraquat Dichlorine
/	Dizmazone	Paraquat Dichlorine
^	Glycel	Glyphosate
-/	Weed kill	2,4-D Amine
s	Wipe out	Glyphosate/isopropylamine
/	Premium paraquat	Paraquat Dichlorine
•/	Runner set	Glyphosate
Selective Herbicide	Atrazine	Atrazine
^	Pendiline	Pendimethaline
^	Grancombi	Pendinielhaline
^	Proper care	Aluchlo
^	Ultrachlor	Butachlo

Source: Fieldwork

From the information gathered, the study found out that the most frequently used herbicide is the one containing paraquat dichlorine as its active ingredient followed by the ones containing Glyphosate. Among the selective herbicides, Atrazine is the most frequently used in the region, this may be due to the type of crops cultivated by the people of the region.

Conclusion

The use of herbicides in the region has been increasing every year and this will consequently affect the health of the people and damage the environment. The study shows that more and more people in the region are abandoning the old tradition of agricultural practice of crop cultivation that is free from the use of chemicals. The use of herbicides can be hazardous to the environment and human health. Another problem of herbicide use in the region is the careless handling of these chemicals by users. Poor handling of herbicides can increase the risk of contamination in the environment thereby posing serious health hazards. Because of the increased use of herbicides in the region, more studies need to be conducted to ascertain the levels of contamination of toxic chemicals (dioxin) in water and soils in the region. The fact that herbicides are known to accumulate in the environment, destroy non target organisms and cause cancer and other degenerative diseases increases the need for these chemicals to be handled and used with caution. In order to reduce the risk of exposure to herbicides, most toxic compounds that have adverse ecological impacts should be phased out. Long term and safe solution to herbicides contamination will rest on proper design and management of agricultural systems, which will in turn, enhance biodiversity and bio-control. The use of lower-risk chemicals and at the proper time will minimize human exposure and reduce the rate of poisoning by dangerous chemicals.

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