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**FATE AND EFFECTS OF PESTICIDES USED IN
VEGETABLE PRODUCTION ON THE
ENVIRONMENT:
Survey on Pesticide Usage in Vegetable Production**

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Project Title: Fate and Effects of Pesticides used in Vegetable Production
on the Environment

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Subtitle: Survey on Pesticide Usage in Vegetable Production

1. Background:

The benefits impacted on agricultural production by pesticide usage all over the world are very high as these chemicals increased the yield of many crops through the control of serious crop pests.

However, as early as 1945, scientists were concerned about the fate and behaviour of organic pesticides in the environment. Forrest et al (1946) found several toxic metabolites of DDT in soil systems. Other workers also established that these chemicals could have detrimental effects on the environment and on public health.

Thus pesticides may affect biodiversity by their toxic effects on non-target organisms. This may create an ecological imbalance by causing the populations of preys to increase when their predators are eliminated through the toxic effects of pesticides.

Furthermore, pesticide residues may enter food crops, and water and these when taken by humans, may accumulate over a period of time and cause health problems (Amengor, 1993).

Many advanced countries have been monitoring numerous pesticides in water and food. Furthermore, selective pesticides are used in these countries, and limits are set for all pesticides in drinking water. (Amengor 1993)

A workshop organised by FAO (FAO 1989; 1991) revealed that a very wide range of pesticides are freely available on the African market. It also showed the occurrence of unacceptable practices as far as pesticide distribution and usage are concerned.

There is a growing increase in pesticide use in the growing vegetable production industry in Ghana. The need for monitoring is obligatory in order to assist policy formulation and technical advice. This survey therefore aims at determining the various pesticides used in vegetable production and also pesticide management in vegetable production.

2. Method

Areas visited are Akumadan, Agogo, Amoano (Bekwai district), villages around Kumasi (Ashanti Region); Awisa (beyond Wenchi) and Bechem (Brong Ahafo Region). These are areas where tomato, egg plants, okra and cabbages are cultivated intensively.

Farmers were randomly picked and interviewed using standard questionnaires. Farmers were interviewed in town and on the farm. Between five and ten farmers were interviewed in each town and on each vegetable. 40% of farmers interviewed in each town were women. The sample size was a good representation of farmers in each town and women were included to eliminate gender imbalance as women play an important role in African agriculture.

The questionnaire sought to find out the following:

- (i) Pesticide types used in the production of tomato, egg plants, cabbages and okra.
- (ii) Mode of pesticide application and the types of equipment employed.
- (iii) Protective clothing used in pesticide application.
- (iv) Transport, storage and packaging of pesticides.
- (v) Waste disposal (Empty pesticide containers etc).

3. Results and Discussion

i) Pesticide Types

Different types of crops require different types of pesticides for effective pest control and maximum public health protection, but the survey showed that a wide variety of pesticides are used indiscriminately in vegetable production. Pesticides in use include karate, dithane, kocide, cocobre, DDT, unden, actellic, applied singly or as a cocktail of several of these. Choice is dependent also on cheapness.

The survey revealed that farmers do not seek advice from any experts but rather depend on their fellow farmers (mostly) and sometimes on pesticide sellers, for advice. Some farmers claimed to be more knowledgeable than the extension workers of the Ministry of Food and Agriculture (MOFA) as far as pesticide management is concerned. Thus the extension workers did not have much influence on most farmers.

Unden, a pesticide designed to be sprayed on cocoa pods is freely used in vegetable production. Considering the tender testa of the tomato

and other vegetables, one could just imagine the health risk posed by the continuous use of this pesticide in vegetable production

(ii) Pesticide Application and Equipment

The wide range of pesticide applications and the diversity of local circumstances usually require special application equipment for different pesticides and different climatic conditions but the survey revealed that knapsack sprayers (manual and motorised) are the only equipment used in vegetable production. Koeman et al (1992) stated that if spraying is done with insufficient skill, watery solutions or incorrectly adjusted equipment, a good percentage of the pesticide may end up outside the target area. Thus with limited application equipment for the numerous pesticides used in vegetable production one may presume that a good quantity of pesticide goes outside the target area.

Farmers determine their own concentration of pesticides to be applied. In some cases, a cocktail of pesticides (3 or 4 different types) is used in a single spraying. Farmers start spraying right from the nursery till harvesting. Spraying is done either weekly or biweekly depending on the farmer's own perspective of the pest problem.

Many farmers still use DDT in vegetable production although this pesticide has been banned (FAO 1989). DDT, being less expensive but relatively ineffective has to be sprayed continuously for three days to achieve the same effect as other pesticides. Nevertheless many farmers prefer to use it for economic reasons. One can then imagine the quantity of DDT that is being deposited in the environment.

Farmers, however, confessed that DDT is hard to come by as compared to the other chemicals. This could probably be due to control measures being taken by governmental agencies.

(iii) Protective Clothing

Pesticide absorption through the skin depends on the surface area of the skin exposed, the temperature and humidity. The high ambient temperature of the tropics therefore favours pesticide absorption (BAA, 1985). Hence the protection of the skin during pesticide application should be of prime importance. However, although most of the farmers have heard about the importance of the use of protective clothing, there is a high apathy towards its use. Not a single person among the farmers interviewed had any standard protective clothing. All went to spray in a pair of trousers, a pair of bathroom slippers

and a long or short sleeved shirt (mostly of cotton material). No nose mask is worn. Farmers thus stand a very high risk of pesticide inhalation. It is not surprising, therefore, that several incidences of pesticide poisoning during spraying, resulting in unconsciousness have been reported by the farmers.

(iv) Transport, Storage and Packaging

Pesticides are transported together with other food items. In many cases, the chemicals are stored in the same room in which the farmers either store their food or in their bedrooms.

Once purchased, the farmers transport the chemicals to the farm either in polythene bags or in buckets. Some still use those buckets for bathing or other household activities.

(v) Waste Disposal

Empty pesticide containers were either thrown into the bush or left on the farms. Some were kept for future purchase of pesticides (reused).

4. Conclusion

A wide range of pesticides are used in vegetable production in Ashanti and Brong Ahafo Regions. Pesticide application is not regulated in any way. Farmers depend more on the latest information from each other rather than from extension staff. This indiscriminate use and management of pesticides poses a health threat to the farmers and consumers as well as a threat to the environment.

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