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Quality Control of Pesticides in Developing Countries

by

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The need for quality control of pesticides in developing countries arises from certain changes in the profile of pesticide manufacture in recent years and from safety considerations.

Some years' ago, when the majority of pesticides were protected by patent, the primary manufacturers often formulated the pesticides at the point of manufacture and shipped these as concentrates requiring only dilution with simple materials for application. On those occasions when the technical product was shipped to a developing country, the primary manufacturer ensured that the product was formulated, under technical control at least. Very little manufacture was carried out in developing countries, except of DDT and HCH.

As more pesticides have entered the commodity market, the number of primary manufacturers has slowly increased in both developed and developing countries. This has resulted in technical products which do not always meet specifications, and a tendency for the private sector in many developing countries to set up formulating plants to take advantage of the more competitive prices of non-commodity products. Countries also may encourage the establishment of such plants since there is usually a saving of hard currency to be expected.

Safety considerations also favour the establishment of national formulation plants for more hazardous products. Most accidental poisoning cases involve formulations in Classes Ia, Ib and the top of Class II of the WHO Recommended Classification of Pesticides by Hazard[1]. Clearly, both occupational and other hazards of these formulations would be diminished by dilution of the products down to an ultimate ready-to-use form. However, this safety measure is precluded by the additional cost of transport of dilute formulations, particularly from the primary manufacturer. The closest to the application point that final formulation can take place, the more these costs can be reduced to a feasible level.

Therefore, from both points of view future development will probably include the establishment of more national or provincial formulation plants, but these will each need to be properly constructed and managed, with some degree of quality control in every case.

Apart from the need for quality control laboratories in formulating plants, which may be private or governmental, most developing countries have a need for a national laboratory. These have two main functions, which are to some extent now carried out by forensic laboratories in some developing countries. The first is related to pesticide registration and the prevention of fraud. There is a need for verification of stated concentrations of pesticides in formulations and an assurance that stated active ingredients have not been replaced by others which may be cheaper but are sometimes more hazardous.

The second function is the checking of formulations which have been stored for more than two years to ascertain whether they can be used efficaciously and safely for their intended use.

An argument can be made that many developing countries need such pesticide quality control laboratories before they need pesticide residue laboratories (except for agricultural exports). Although there are many similarities between the two types of laboratory, it is difficult to operate them under the same roof unless entirely separate facilities are provided for the handling of pesticide formulations. Residue analysis is otherwise likely to be upset by unintended residues.

With the proliferation of quality control facilities in developing countries the question arises as to the need for quality control of quality control laboratories. Starting in the days of the Perrine laboratory and continued by the chemical laboratory training group in the School of Public Health, University of Miami, such a scheme has operated for many years. However, it would be difficult to envisage any single organization as a reference centre on a global basis since it could happen under ideal conditions that well over 200 laboratories would be concerned. Therefore, the need is for regional reference centres to act both as training centres and to maintain and distribute analytical standards throughout the region, as well as acting as a clearing house for information.

The formation or designation of such centres has already been advocated for some years by WHO[2] and by FAO with regard to agricultural chemicals, without any success. This is partly due to a lack of interest at regional level, although this is not true for all regions. In some regions, informal arrangements with developed countries have ensured that major problems have been solved, but this has depended on samples being sent to the developed country (or to VBC) for analysis. This does not help the developing country, except to solve the immediate problem which may at its root be political rather than analytical in many of these cases.

The questions to be considered therefore, are as follows:

(a) Is there in fact a need for quality control for the reasons outlined above?

(b) How can countries be persuaded of the need to the extent that they will ask for assistance for the establishment and maintenance of laboratories?

(c) Would the regional type of reference centre be adequate and should these be governmental or academically based? In considering any role for international organizations, the limitations of their resources should be borne in mind.

References

1. WHO Recommended Classification of Pesticides by Hazard, unpublished document VBC/86/1.

2. Report of Expert Committee on Chemistry and Specification of Pesticides, WHO Technical Report Series No. 699 (1984), p.11.

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