
Introductory Remarks

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Introductory remarks

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This Discussion Meeting takes place against a background in which it is often stated that between one-quarter and one-third of the potential harvest of the world's food crops is lost to weeds, diseases and pests, and that another 10–15% is lost during post-harvest storage under poor conditions. Losses are not so large in developed countries, where control procedures are applied more widely and effectively, and where food stores are maintained carefully. The control procedures rely heavily on herbicides, fungicides and insecticides and so evoke increasing concern of a social and environmental nature. The present situation may be summarized in the following quotation from the Report of the Royal Commission on the Environment, *Agriculture and pollution* (Anon. 1979):

We accept that the continued use of pesticides is essential to maintain food supplies and that much care is taken by manufacturers, and through existing control machinery, to ensure safety in use and to minimize adverse environmental effects. We are concerned, nevertheless, about the scale of pesticide use.

There is then little criticism of present-day standards and practices adopted in the United Kingdom, merely a general concern about the future environment of man, and more generally the life of the countryside.

In this situation, we can identify dual aims for the future:

- (1) a need to maintain, and even improve, the degree of protection of our crops, and meat animals, against pests and diseases because world demand for food is increasing continually;
- (2) a need to use the minimum amounts of pesticide chemicals to achieve such protection.

These challenges suggest some directions for future research and development that our speakers in this Meeting will assess, and we shall attempt to answer some of the following questions.

(1) How far can the discovery of even safer pesticides be taken? Will it be possible to emulate in other compounds the highly favourable ratios between toxicity to insects compared with toxicity to mammals that are a feature of the synthetic pyrethroids, and couple such safety with controlled persistence so that the risk of build-up of residues in the environment is minimized?

(2) Is greater species selectivity an attainable goal in pesticides – one that would serve to reduce harmful effects on beneficial organisms?

(3) Will it be possible to exploit compounds exhibiting repellency or anti-feeding activity towards insects in future pest control strategies?

(4) To what extent can spraying techniques be improved to ensure that a higher proportion of the applied chemical reaches the target species and, in consequence, a smaller amount becomes an environmental pollutant?

(5) What are the opportunities for the further development of physical and biological trapping systems, including those using natural behaviour-controlling compounds, as a means of

monitoring pest populations and movements, and providing better forecasts of the need to apply pesticide sprays?

(6) Can we devise strategies that will prolong the effective life of useful pesticides by limiting the rate of development of resistance in insects to insecticides (or of tolerance in pathogenic fungi to fungicides), and so help to avoid a cyclical escalation of applied dose and frequency of spray chemicals?

(7) How can these considerations and the many other biological factors governing the dynamics of host crop–pest relations be best brought together in integrated control procedures for particular crops?

Maintenance of a satisfactory level of crop protection in the future will require the continuation of an efficient agrochemical industry – one called upon to make heavy financial investments and expecting a reasonable minimum return on costs incurred in the discovery, testing (especially toxicological), market assessment and sales of new products. As legislative requirements have multiplied, these costs have escalated, and the situation has been compounded by the diminished likelihood of candidate compounds becoming market leaders. These points will not be overlooked, because several representatives of industry are among our panel of contributors.

REFERENCE (Fowden)

- Anon. 1979 Royal Commission on Environmental Pollution (Chairman Sir Hans Kornberg). Seventh Report: *Agriculture and Pollution*. (Cmnd 7644.) London: H.M.S.O.