

## SOME ASPECTS GOVERNING THE USE OF PESTICIDES ON STORED PRODUCTS IN AUSTRALIA

R. G. WINKS and S. W. BAILEY  
Stored Grain Research Laboratory  
Division of Entomology, CSIRO  
Canberra, AUSTRALIA

Australia consists of six States which have functioned as a Federation since 1901.

Under the Constitution certain powers such as defense and international relations were conferred upon the Federal Government while the residual powers remain with the States. One of the powers not conferred on the Federal Government is that of legislating with respect to agricultural production. Overseas marketing, however, does come within the Federal province. The close relationship between production and marketing is obvious and the need for consultation between the Australian and State Governments on agricultural and marketing matters soon became apparent.

Legislation relating to chemicals used for the control of pests, diseases, weeds, fungi, bacteria, parasites, vermin, predators and physiological conditions in plants or animals is administered under Acts of State Parliament some dating back almost forty years. All States have had effective legislation for over twenty years and much of this has been up-dated several times. In particular, State Departments of Health administer the regulations contained in this legislation which controls the packaging, labelling, storage, sale, availability and recording of substances deemed potentially hazardous to human life or health. The regulations under the Poisons Acts are designed to ensure that hazardous materials are used for legitimate purposes only by persons possessing the necessary skill and knowledge.

Maximum residue limits or tolerances for residues of pesticides in raw agricultural commodities and foods are provided in Food and Drug Regulations of the several States. Because of the complexity of the requirements and the need for uniformity, a Pesticides and Agricultural Chemicals Sub-Committee of the National Health and Medical Research Council of Australia has been charged with responsibility for determining and recommending legal maximum limits for residues of chemicals in food. This Sub-Committee consisting of nine members chosen for their expert knowledge in the field of residue chemistry and toxicology meets four times each year to consider submissions prepared by manufacturers in accordance with an extensive protocol of requirements.

The procedures used by the Pesticides and Agricultural Chemicals Sub-Committees are substantially the same as those used by the Joint FAO, WHO Meeting of Experts on Pesticide Residues.

An extensive list of maximum residue limits has been established. This list reflects the majority of situations where residues could possibly occur in raw agricultural commodities following

approved uses for chemicals.

Maximum residues limits are provided for residues in agricultural commodities of both plant and animal origin and in water. In most instances the limits apply to individual food commodities though there is a tendency to recommend limits for groups of similar raw agricultural commodities. The classification of food groups is basically the same as that recently adopted by the Codex Committee on Pesticide Residues.

Australia being an active member of the Codex Alimentarius Commission has notified its intention to adopt Codex Maximum Residue Limits and to this end has adopted all Codex Maximum Residue Limits at Step 9 for which identical recommendations do not already appear in the Australian list. In doing so Australia recognises that some of the pesticides may not be required for use on the particular commodity under Australian conditions and some of the limits may in fact be higher than would be absolutely necessary to meet Australian domestic requirements.

It is important to note in this context that Australia is primarily an exporting country and its attitude towards residues is conditioned very largely by the requirements of international trade. The inspection of food commodities intended for exports is undertaken by the Australian Government to ensure that exports are of the highest quality, are produced, prepared and packed under the most hygienic conditions and that the goods are marked with proper trade descriptions.

The necessary powers for this purpose stem from the Customs Act (1901-1968) and the Commerce (Trade Descriptions) Act (1905-1966).

Whenever it is necessary to use chemicals such as pesticides in the course of production to achieve the high standard of quality required by overseas markets, it is essential to see that only approved products are used and even then to ensure that directions on the label and in official recommendations are adhered to rigidly. The most appropriate means for determining whether the approved agricultural practice has been followed is to monitor for pesticide residues in the raw agricultural commodities.

The Australian Department of Agriculture which administers the Export Regulations regards pesticide residue compliance as one of the many requirements which must be met to maintain Australia's position in international trade. For almost fifteen years the Department has carried out a continuous survey of residues and for each of the past six years has collected more than twenty thousand samples. These samples are analysed by the laboratory of the Australian Government Analyst for a wide range of residues of pesticides, veterinary drugs and heavy metals. Samples are drawn on a systematic basis so that all regions are covered and commodities from all export establishments are sampled.

The results of the residue analyses are made available immediately for use by state authorities to trace back to the original grower any cases where the residue levels are considered

higher than necessary. Although the number of such cases is extremely small the contact between extension officers and primary producers is valuable in providing a better understanding of the correct use of pesticides.

Corrective measures have had to be taken in a number of instances as in the cases of DDT, BHC, dieldrin and aldrin which were prohibited in 1962 for the dipping of cattle and sheep. More recently it has been necessary to discontinue the use of BHC and organo-mercury seed dressing because a small proportion of farmers continued to feed unwanted seed to animals in spite of repeated warnings. With these exceptions it has not been necessary to take radical steps to control the use of agricultural and veterinary chemicals. This position no doubt reflects the importance of laws which have existed for more than twenty-five years to regulate the sale, labelling and distribution of agricultural and veterinary chemicals.

The foregoing remarks refer to pesticide usage generally in Australia. We would now like to discuss how these policies relate to the use of pesticides in the stored product industries, particularly those concerned with cereal grain. In this regard, most of Australia's cereal production is exported. For example for the year 1973/74, out of a total production of 17.2 million metric tons it is expected that at least 80% will be sold to overseas markets. The largest component of these figures concerns wheat and much of the following is based on the situation that prevails in the wheat industry.

The marketing of wheat internally and externally is carried out by the Australian Wheat Board under Federal legislation. The handling and storage of wheat is the responsibility of a bulk handling authority in each State set up under State legislation. Thus by agreement between these few bodies pesticide application to the entire wheat crop may be controlled. It is important to realise that growers usually do not store wheat in Australia.

To add to this level of control within the wheat industry the Federal Government under its constitutional responsibilities introduced, in 1963, the Exports (Grain) Regulations which prohibit the export of infested or contaminated grain and preclude the loading of grain into infested or contaminated ships' holds.

Within this framework it is relevant to consider the usage of a pesticide such as malathion which has played a dominant role in Australia's ability to meet marketing requirements during the last decade. Malathion was introduced as a grain protectant in the early 1960's and because of the very high standards demanded and because of the effectiveness of this material its usage increased rapidly until, by 1965, virtually all wheat was treated immediately after harvest. This treatment was carried out by the State handling authorities. Consequently it was possible to obtain close control over the rates of application. However, since shipping programmes normally require storage periods in excess of the effective life of malathion a large proportion of the crop required reapplication of the pesticide to maintain adequate levels of

malathion up to the time of delivery to overseas markets. This reapplication frequently occurred just prior to shipment. To ensure that the internationally agreed residue tolerance of 8 p.p.m. was not exceeded, a residue monitoring service was provided by the Australian Government Analyst.

Early results of this monitoring service revealed alarming variations within some States and between States. However, the most significant effect of this was to bring about a substantial improvement in the ability of the bulk handling authorities to apply the material effectively and at the same time to cope with residue requirements. In some States, the bulk handling authorities established their own monitoring facilities which were in addition to those provided by the Federal Government. The primary purpose of this was to enable additional applications to be made as required and in a manner that did not give rise to excessive residues.

By 1967 a marked improvement was noticeable and this trend continued and reached a point where the application of malathion could be carried out with a satisfactory level of efficiency. Unfortunately the development of resistance to malathion has created a situation in which alternative pesticides must be considered. Currently a number of alternative pesticides are being investigated as replacements for malathion. Should a suitable material be found its usage will of course be subject to international requirements. However, in view of our experience with malathion over the past decade and the legislative and organisational framework that now exists, we believe that it should be possible to introduce new materials in a manner that will achieve maximum biological effectiveness at acceptable residue levels.

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