

DEPARTMENT OF FISHERIES AND FAUNA — WESTERN AUSTRALIA

PESTICIDE RESIDUES IN THE ENVIRONMENT.

The Department has recently instituted a program to investigate contamination of wildlife by pesticides. The program has three main areas of concern.

1. MONITORING OF TERRESTRIAL CONTAMINATION.

Specimens of the Western Magpie (Gymnorhina dorsalis) have been taken from numerous localities within the South West Land Division. Selected tissues have been analysed for organochlorine and organophosphate content. By this means the general extent and level of contamination has been determined. Areas of relatively high contamination have been identified.

2. MONITORING OF ESTUARINE CONTAMINATION.

It is intended to use the Estuary Cobbler (Chidoglanis macrocephalis) to monitor contamination of estuaries by pesticides. Systematic sampling has not yet commenced.

3. ORD RIVER IRRIGATION AREA.

Twenty-four species of wildlife likely to accumulate high levels of pesticides have been sampled. These samples have yet to be analysed.

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## 2 Pesticide Levels in U.S.A.

Two main groups of pesticides in which we are interested

i) O.P.s - Parathion, Methylparathion, Disulfoton,  
Diazinon, Bidrin.

ii) Large groups (50,000 - 135,000)

- although having high toxicity, however  
breakdown readily have no residue problem

i) O.C.s - DDT,滴滴涕, dieldrin, endosulfan, heptachlor  
heptachlorane, endosulfan.

- although may have low acute toxicity,  
long time to breakdown + have substantial effects  
3) Toxins  
to metabolism  
- possible mutagens.

In 1971 program to monitor pesticide levels in soil had the  
following aims:

Collected samples - 20, 0.0 - 1000 m<sup>2</sup>,  
Program objectives

a) provide info on distribution of pesticides - east.

b) identify & delineate areas of high contam.

May also be useful

a) monitor trends - pesticide levels from year to year

b) determine success or otherwise of steps to red.  
contamination.

To date, 44 of the specimens collected have been analyzed for residue of organochlorine pesticides.

For each specimen, both liver and muscle tissue have been analyzed.

Results are as follows.

1) DDT (as DDT or DDD) and dieldrin residues have been found in all tissues analyzed.

2) Liver tissue concentrations are generally higher than those of muscle and range from less than 0.001 ppm to 6.32 ppm DDT, and dieldrin less than 0.01 ppm to 0.1 ppm dieldrin.

3) High DDT levels are associated with high dieldrin levels (the highest levels of DDT and dieldrin were found in the same animal.)

4) Levels found in particular specimens reflect the intensity of use of these pesticides at the site of collection. e.g. highest levels were found in the intensive crop production areas of Bonnybrook, Tri-Porton, Lennox and Pomerton. DDT and dieldrin are used extensively in these areas for pest control.

~~Having collected tissues of highest contamination  
and trying to look more closely at these  
areas. Probes deeply into ground~~

Highest contamination - Old River area.

- DDT used with Parathion to control Myrmecophilus cotton pest - Heliothis
- treated once per week  $\rightarrow$  2-3 days
- application rate  $\rightarrow$  36 lbs/acre
- $\rightarrow$  unpublished
- Heliothis adults 60% dose before sprayed
- August - 2000 ft. <sup>stems</sup> at Kinnaroma - buffaloberry collected 25 species consisting of Agropyrum
- harm still at 600 early stage.

Hel. - freshly killed adults of birds, parrot.  
wings should be frozen and sent  
to me with skeletons

- moths would already dying.

THE DIRECTOR:

I recently discussed the question of time involved in pesticide residue analysis with Mr. Houghton, Chief of Division, Food, Drugs, and Toxicology in the Government Chemical Labs. and Mr. Ebelt (one of the analysts). On the basis of our magpie sampling programme where we have taken muscle and liver samples only, 30 individual tissue samples (or the equivalent of 15 birds) per week would be the limit for one man. At this rate and assuming that capital items at the Chem Labs were not limiting, the employment of an additional analyst to do ~~pesticide~~ residue analysis for our work only could allow for a maximum throughput of approximately 1,000 samples per year.

We have submitted approximately 250 samples for analysis since the beginning of January, the majority (approx. 200) being submitted since May. We also have another 100 samples in storage which have not been submitted for analysis.

It is easily appreciated that any practicable residue monitoring programme which we could sustain under these conditions will be limited. The major difficulty arises at the point of analysis.

In my opinion the magpie sampling programme can provide us with data on distribution and level of residue contamination, and should be expanded to cover the whole of the agricultural areas of the State. I believe Victoria is also using magpies as indicator species for this purpose.

To obtain adequate sample coverage of this area would require collection of 3-400 birds per annum. On the basis of sampling carried out so far by Mr. McWhirter these could be collected over 40-50 working days in the field (i.e. 8-10 weeks). The collection of samples is quite practicable from our point of view with our present staff but if we are to consider this work then there appears to be a need for an additional analyst in the Chem Labs to cope with the volume of work which will be required.

It is my suggestion that we should be able to assist Mr. Houghton to prepare a submission for the P.S.B. so that an additional analyst could be employed for this purpose.

  
R. Prince.  
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