

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 (Cnidoglanis 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.

5th Annual
Talk given to Conference

5 OCT 72

2

Pesticide Levels in Wildlife

Two main groups of pesticides to which we are interested

i) O.P.s - Parathion, Malathion, Dithionos
Diazinon, Bidrin

ii) large groups (50,000 - 1959)

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

iii) O.C.s - DDT, dieldrin, endrin, lindane
chlordane, endosulfan

- Although many have low acute toxicity,
long time to breakdown + have subtle effects

eg Thyroid
in reproduction
- eggshell weakness

In 1971 programme to monitor pesticide levels in 50 bird dis-
ses commenced

Collected samples - O.P., O.C., analysis

Programme objectives

a) provide info on distribution of pesticides in env. ^{status?}

b) identify + delineate areas of high contamination

May also be used

a) monitor trends in pesticide levels from year to year

b) determine success or otherwise of steps to reduce
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 DDE or DDM) 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 DDE, and from less than 0.001 ppm to 0.1 ppm dieldrin.
- 3) High DDE levels are associated with high dieldrin levels (the highest levels of DDE 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. eg. Highest levels were found in the intensive crop production areas of Embayabot, Trilpotom, Penikun and Pemberton. DDE and dieldrin are used extensively in these areas for pest control.

~~Having identified areas of highest contamination
next step is to look more closely at these
areas. Pesticides being used~~

Highest Contamination — Old River Area.
— DDT used with Parathion to control *Heliothis*
cotton pest — *Heliothis*
— ~~insects~~ once per week → 2-3 days
— application rate → 34 lbs/acre
— estimated
— *Heliothis* larvae 60 x dose before spraying
— August — 2000s at Komomua — *Heliothis*
collected 25 species ^{50 birds} ~~concentrating on region~~
— some still at GCC every analysis.

Help — freshly killed species of birds, partic.
regions should be frozen & sent
to me with details
— notes written already lying.

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. Ebell (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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