

## **“OFFICIAL” ORGANO-PHOSPHATE SYNDROME (*OOPS*)**

**The series of defences used to explain why OPs are and always have been safe to use in agriculture and public health by farmers, farm workers and the public and apparently always will be safe**

<b><u>Date</u></b>	<b><u>Response</u></b>
<b>1930s/40s</b>	<b>They don't hurt your health if used in agriculture— but we don't know what they do do.</b>
<b>1950s/60s</b>	<b>OK, they do hurt your health at high levels but they don't cause chronic neurological damage at the levels used commercially.</b>
<b>1960s/70s</b>	<b>OK, the substances can cause neurological damage, even OPIDN with chronic multiple dose exposure but not our kind of product. (Lotti and Johnson 1973)</b>
<b>1960s/90s</b>	<b>OK, our kind of product can cause neurological damage, but not the kind this person got.</b>
<b>1980s/90s</b>	<b>OK, our kind of product can cause chronic neurological damage and at lower levels than previously thought but not at the doses to which this person was exposed.</b>
<b>1980s/90s</b>	<b>OK, our product does cause chronic neurological damage and at this dosage, but this person got their disease from something else.</b>
<b>1980s/90s</b>	<b>OK some of our products/approvals may cause OPIDN but nothing else (Savage et al 1988 on long term effects of acute exposures and neuropsychological effects)</b>
<b>1990s</b>	<b>OK so OPs can cause 'dippers flu' but this doesn't mean that OPs aren't safe to use (Sims et al )</b>

- 1990s** OK, the person was exposed to our product and it did cause neurological damage and did have neuropsychological effects after long term, low level exposures but we did not know about the danger when we exposed them. The study is too limited to be conclusive anyway ( Stephens et al 1995)
- 1990s** OK the Edinburgh IOM studies have shown further well documented neurological effects of OPs especially relating to the autonomic system but there are questions about the clinical significance of this large and well designed study. Let's tell people we are concerned about concentrates and the containers in which they come.
- 1980s/90s** OK, we knew about the danger when we exposed the person but they were affected because they did not read the label, understand the label, did not follow instructions, did not select, did not use, did not store or did not maintain and replace the Personal Protective Equipment
- 1990s** OK, we knew about the danger when we exposed the person but the statute of limitations has run out.
- 1990s** OK, the statute of limitations hasn't run out, but if we're guilty
- we'll go out of business and everyone is worse off.
  - there is no alternative
  - the sheep will suffer if we can't use OPs
  - any bans will breach World Trade Organisation rules
  - we won't be able to produce leather because of hide damage
  - the Government through its independent advisors cleared the products and, for sheep, the government required dipping

# **GUIDELINES ON GOOD PRACTICE IN HEALTH, ENVIRONMENT AND SAFETY MANAGEMENT' identified by WHO Bilthoven (GPHEM) Summer 1998**

## **1. Precautionary principle**

- Burden of proof on manufacturer/ potential polluter to prove a substance is safe  
and not on workers and communities to prove a substance is hazardous
- Recognise limits of scientific knowledge on substance use. Uses science but accepts its limits and involves groups other than scientists
- Rejects sole use of quantitative risk assessments in decision-making

## **2. Preventative Approach**

- prevention is cheaper and more effective than 'managing' or 'curing' problems using **upstream rather than downstream methods such as clean production and toxics use reduction approaches**

## **3. Democratic control**

- involves scientists, policy-makers and regulators, workers, communities and consumers in effective decision-making on hazards and risks.
- provides full access to information underpinned by minimum rights on pollutants release and transfer registers; toxics use reduction plans and labelling

## **4. Integrated and holistic approaches**

- integration of environmental resource management, use and consumption is needed
- use of life cycle analysis and analysis of clean production impacts

## **DATES OF KNOWLEDGE ON DIAZINON TOXICITY**

- 1952 Diazinon first introduced commercially
- 1974 200 cases of neurological effects described mainly involving diazinon poisoning
- 1980 Mice immunotoxicity effects researched. Study offered “no conclusive information on effect of diazinon on the immune system”
- 1980s Metabolites identified in urine of 22 pest control officers causing statistically significant ChE plasma activity (Hayes et al)
- 1985 Californian pest controllers using diazinon had metabolites in urine at mean exposure levels of 2.1mg/day ( Maizlish 1987)
- 1986 Immune effects: thymus weight of rat ( Moon 1986)  
:secondary antibody response mouse ( Moon 1986)  
: hypersensitivity rat ( Moon 1986)  
: non-specific immunity mouse ( Moon 1986)  
: tumours in mice ( Moon 1986)
- 1987 Intermediate syndrome reported for diazinon-exposed workers ( Sennayake and Karelliede 1987)
- 1989 Intermediate syndrome reported for diazinon exposed humans ( Hall and Baker 1989)
- 1980s Early part of the decade , est 30,670 US workers exposed to diazinon ( Howard 1991:218)
- 1984 Risk management and risk assessment of diazinon in various formulations and in various combinations with other chemicals has been presented as relatively unproblematic for humans when used in current formulations and in accordance with label instructions ( IPCS 1998:4)
- 1988 Exposures of pesticide formulators using granules resulted in a range of dermal and respiratory exposures ranging from 0.03mg/day to 1.8mg/day
- 1988 Hen tests used to identify ‘neurotoxic effects’. None identified in 18 tested (Jenkins 1988)

- 1989 US EPA observed that 'no information was found in available literature on the long-term health effects of diazinon in humans' (EPA 1989:255).
- 1990 Intermediate syndrome reported for diazinon exposures ( Samal and Sahn 1990)
- 1994 Rats tested for neurotoxicity. In the test group reversible effects were noted .  
NOAEL set at 2.5mg/kg body wt ( Chow and Richter 1994)
- 1996 20 hens tested for neurotoxicity - delayed neuropathy. No effects observed ( Classen 1996)

## **Regulatory and toxicology standards in humans for diazinon**

The published Government data evaluations of diazinon produced after registration drew on only a very small number of occupational health studies and none relating to sheep dipping. Yet a significant number of published papers and reports indicated occupational health problems for sheep dippers using diazinon throughout the 1980s and early 1990s.

The regulatory process assumes, in the first instance, the accuracy of the data provided by manufacturers. The process further apparently assumes the effectiveness of worker personal protective equipment for applications; takes for granted the health and safety of the application method; and ignores readily available data including photographs of the failure of the control methods to protect agricultural workers from exposures.

## **HAZARD AND RISK AWARENESS OF OPs including diazinon**

1. Barnes. Laws and Key as early as 1957 were flagging up their concerns about diazinon as well as parathion and malathion in terms of operator safety. They state that OPs might 'carry serious risks to the men who apply them' if used like DDT (Barnes et al 1957:41).

2. In 1958 the WHO provided specifications for pesticides used in control of human diseases and indicated that the following precautionary notice should be attached to all forms of technical diazinon, a pesticide widely used in sheep dip:-

“Diazinon is harmful if swallowed or absorbed through the skin. Avoid skin contact: wear natural-rubber gloves and clean protective clothing while using the material, and a respirator when handling concentrates. Wash thoroughly with soap and water after use”. (WHO 1961:62,120,168)

3. Agricultural and veterinary guides to sheep farming contributed to the low perceptions among farmers of the risks of OP poisoning from the 1940s well into the 1990s. Indeed several, in terms of content analysis, reveal a very low priority given to worker health and safety when contrasted with economic aspects of sheep production, sheep welfare and environmental pollution problems associated with OP dips guides (Thomas 1945:69-72; Johnston 1983:122; Upton and Soden 1991:68; Straiton 1992:137). Industry guides to parasites, whilst referring to pesticide formulations to control scab and ticks, omit any significant reference to occupational health and safety (Wellcome nd).

4. Well into the 1990s, the occupational health exposures and effects of sheep dipping in operators remained effectively unexplored by HSE (Niven 1993:3).

## **THE PRECAUTIONARY PUBLIC HEALTH APPROACH**

1. A movement away from restrictive and rigid risk assessment and risk management tools
2. Greater recognition of the problems created by uncertainty and the need to tackle that uncertainty in policy and practice terms
3. The need to act defensively when data indicate problems although data may be incomplete
4. The need to act defensively when there are data gaps in critical areas of toxicology, epidemiology and occupational hygiene
- 4 The need to check out technologies of application with the same commitment as pesticide product development
5. The need to ensure that PPE is as rigorously and appropriately tested in terms of fitness for purpose with AIs and additives
6. The need for greater transparency to be built in to approvals for veterinary medicines
7. The need for more extensive and more effective 'lay' (worker/community) input not only into the regulatory process but also the investigative process thereby enhancing public and workplace confidence. On farms, this could be achieved by roving health and safety representatives and inclusion of farms within health and safety policy provisions of the law.
8. Occupational health aspects of VMD/VPC work to be directed by HSC/HSE. Food safety aspects to go within the FSA.



