

Richmond, California
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PARAQUAT

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D. B. BARLOW: we any toxicology investigations been done. Ortho interpretation is that this does present a promising approach to the

With reference to your April 10, 1973 memorandum to Dr. Kent, the topic of Paraquat toxicity and importance of discovering an antidote or way to prevent human ingestion was discussed with Dr. J. T. Braunholtz of PPL on his visit with us May 16, 1973. The PPL study did not include children.

Dr. Braunholtz reviewed the status of PPL and IHRL studies.

1. Formulations

- a. Soluble Granules - These have been extensively studied but are thought not to be the answer to prevention of oral ingestion. However, work on this aspect has been deferred primarily due to manufacturing and packaging problems. (Ortho interpretation would be that there is room for further work should other avenues of research not prove out.)
- b. Thixotropic Gel - Good progress had been made towards a formula which will not pour without first vigorous shaking. The formula would be usable in the United Kingdom but not in other parts of the world because it is highly temperature sensitive. Further work continues but with low priority. (Ortho interpretation is that it would be near impossible to develop a single formula usable under U.S. conditions.)
- c. Emetic - The formulated product is already quite a strong emetic; PPL feels this aspect is not worth pursuing. (Ortho discussions with Industrial Bio-Test and SOCAL Industrial Hygiene toxicology consultants confirmed the opinion that further research in this area is probably not warranted.)
- d. Colorant - This has received some emphasis in the past but it shows no promise particularly since any color will probably resemble a soft drink or other common drink of some kind. (Ortho also believes the use of the colorant holds no promise.)
- e. Stench or Odorant - PPL is expending a major effort in this aspect and are cooperating closely with a U.K. government group which originally recommended research along this line. PPL will market

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about 4,000 gallons in the U.K. this year with plans to expand up to 50,000 gallons in 1974. The formula being used contains about 0.5% pyridine base. This was chosen after testing over 100 compounds. The odor does penetrate through plastic jugs but when these are packaged inside of a wax coated case box the odor is contained. PPL does have warehouse studies in progress. When the product is diluted in the spray tank only a moderate odor persists. Crop residue and flavor studies have not been conducted, nor have any toxicology investigations been made. (Ortho interpretation is that this does present a promising approach to the prevention of accidental ingestion of Paraquat. We cannot be highly optimistic since U.S. Poison Control Center records show that 90% of all cases of accidental poisoning involve children under 5 years of age and such children are known to be relatively insensitive to odors. The PPL study did not include children. On the other hand, our files on Paraquat show only 1 child involved out of 5 recorded fatalities. We have in hand samples of the PPL stench product and are making arrangements to obtain from PPL all of the backup information they have. We propose, and PPL concurs, that Ortho establish some independent research which will take into account the things we need to know to register an odorant product, such as residue, flavor, toxicology, OSHA requirements, etc.)

2. Antidote Studies

In the past PPL has supported studies at IHRL with about £ 10,000 Sterling per year. This work was discontinued a year or so ago. This year PPL is spending £ 25,000 to £ 35,000 Sterling with the hire of Dr. Rose, Medical Pathologist, placed at IHRL to specifically investigate antidote research. Ortho is to continue referring to Dr. Swan of IHRL all inquiries from medical and university researchers interested in studying the toxicology of Paraquat or Diquat. (The discovery of a practical antidote for treatment of Paraquat poisoning appears to be our best defense for satisfying Paraquat critics, particularly EPA and the Medical Community.)

LRS/jm
R. D. WESSEL
LRS:sag
cc: J. A. Spence
W. G. Toland
R&D Managers

What do you think?