'No Known Antidote': Paraquat and it's domestic users in Britain

I'm researching chemicals and the people who used them at home between the 1930s and the 1980s. A great selection of chemical have been developed to make various domestic jobs easier and faster. This talk about a herbicide called paraquat, which Imperial Chemical Industries promised would take the back ache out of weeding. It is part of a case study which focusses on how two products, Gramoxone and Weedol, were used in the domestic environment, even though one of them certainly was not ever meant to be used at home. Over the next twenty minutes, I want to look at who ICI intended to use these products, and the way that the clear boundaries ICI had wanted were manipulated by the users.

Paraquat was developed by a company called Plant Protection Limited, who were a subsidiary of Imperial Chemical Industries (ICI). For simplicity, I will refer to the company as ICI. The herbicide was developed quite rapidly; from an initial observation in 1947, the herbicide was developed in earnest from 1954 with the first commercial product being marketed from 1963. From the start ICI were keen to maximise their market by offering a strong agricultural and a weaker domestic version. Initially, the lower concentration and smaller bottle size was going to be how ICI domesticised the agricultural product. When these plans were submitted to expert committees as part of the Pesticides Safety Precautionary Scheme and the Agricultural Chemicals Approval Scheme, the members were apprehensive about ICI's plans for a less concentrated liquid formulation for home use. Paraquat liquid was corrosive, had been shown to cause skin irritation and cataract as well as acute oral toxicity in animal models, and the committees were concerned that domestic users would not be as experienced as agricultural workers with handling chemicals and could come to harm. Their user was imagined to be naïve with respect to handling chemicals, as the expert committees did not appear to consider what other experience users might have handling diverse chemicals in their daily lives, either at home or at work. They refused to give Weedol clearance until there was more detailed toxological information and directed the company to look at alternative preparations that would avoid handling and potentially splashing or spilling corrosive liquids, so ICI continued work on developing a solid, granular version of paraquat that domestic users could dissolve and apply safely.

The result was pre-weighed sachets of solid pellets containing 5% paraquat, the agricultural version contained 20%, that were dissolved directly in a watering can or sprayer. In this way, domestic users did not have to handle the product to measure it out, and the small amount meant that there should not be any left over granules or liquid to store. This system of delivery satisfied the expert committees and in 1964 Weedol was given provisional commercial clearance. ICI workers were given the preparation to test first, then Weedol was marketed widely from 1965.

If we examine the adverts carried by newspapers for Gramoxone and Weedol we can get an idea of ICI's imagined or idealised users and uses. It might be expected that Gramoxone would not be promoted in everyday newspapers but The Times had an agricultural supplement or special report where this herbicide was advertised.

[show 1964 advert]

This is a testimonial style advert for Gramoxone. The ideal user is pictured, he's willing to try new technologies, using Gramoxone helps him avoid risks to workers and the state of the ground that would be involved in ploughing the difficult field in question, he's making use of the Grassland improvement grant, he's bettering his farm for the long term, he's had better milk yields thanks to better grass and next year he's going to use it again. The information is technically detailed, as are many of the other product advertisements in this agricultural supplement. ICI judged that even with the Times' small circulation figures, through it they would be able to reach farmers and landowners, people who may be in a position to make decisions or form opinions on the practicalities of farming.

[show 1965 advert for Weedol]

This symbol down here, based on the letter A, shows that the product has been approved by the agricultural chemicals approval scheme, something that didn't appear on the agricultural adverts, but gives this domestic product a kind of cachet, or guarantee of effectiveness and also of relative safety, to reassure users that it has been governmentally approved or looked over. Gardeners had been encouraged to look for it on the products they bought, and there had been a bit of a furore in the previous couple of years about a government publication called Chemicals for the Gardener, which promoted this symbol at the same time as recommending the use of chemicals that were known to be quite harmful to wildlife and humans.

[show 1966 adverts]

In these early adverts for Weedol, we aren't shown a full image of the user but we can see some hands in masculine shirt sleeves, trousered legs. No kneeling, no grass stains or mud, using Weedol is clean and easy. Its a domestic or small scale environment, with the product being carefully applied around a cherished plant. We're given a lot of information about its benefits, how and where to apply it as well as what the packaging look like. We're told it's harmless (when used as directed), that it doesn't disturb the soil which would encourage more weeds.

[show 1971 advert]

Where a user is pictured, ICI's idealised user is adult, and male. Although the rhetoric of weeding can be war-like, invoking battles, domination and death, the language of Weedol adverts was restrained in this sense and instead focused on saving time and effort, which is applicable to both men and women. Readers of any gender are included in the advert through the consistent use of the direct address 'you'. The most common image that the user can relate to in the advert, is that of the packaging which they can find in their shop.

In 1970, ICI placed this slightly peculiar advert

[show pin up advert]

Where the woman is surrounded by a variety of ICI garden chemicals, including Weedol. No matter how clean and easy Weedol is to apply, I don't think that she's doing the gardening in this image.

By not featuring a woman applying the product, the overall balance is tipped towards addressing men as the principle likely users of their product.

[show spring spray advert]

In the search for Weedol adverts, I found one for Spring Spray on the same page as Weedol which showed a woman applying the pesticide spray, although it was framed as 'spring cleaning in the garden'.

The title of this talk is 'No known antidote' and as we've been looking at adverts, we have not gained any sense that this could be a potentially dangerous chemical. The frequency that they use the word 'harmless' suggests that maybe there are other products that aren't harmless, or that perhaps that claims that their product is harmful needed to be countered. The adverts hint that the places where you could obtain these chemicals mean that the agricultural variant is not available at any old shop; agricultural merchants and certain registered chemists sold it to people they knew or believed to have a legitimate commercial need for it. Weedol on the other hand, was more widely available in hardware and garden shops, as well as Woolworths.

There was a lot of room for negotiating the wording on labels. ICI were resistant to suggestions that the word 'Poison' should be included on the label, as they did not want potential users to be scared by the word “poison” and put off using their product. They maintained that when users followed the instructions, the product was safe. In 1968, they reworded the labels to include 'Dangerous if swallowed', which is still not as direct. By 1973, the word 'Poison' appeared prominently on Gramoxone bottles. This is related to one of the most important instructions that came with Gramoxone, which was not to put it into an unlabelled bottle. This isolated instruction, without an easily identifiable consequence needed the strong word "poison" to help people follow this seemingly simple rule.

No matter what words were employed on the label, the reception of them depended on the user. If they did notice and read the label, this was no guarantee that workers using Gramoxone would not still take a portion of the chemical for domestic use. As an experienced user, used to handling strong chemicals at work, they may well have felt competent to use the same product at home. Where the problem generally lay was in the presence of other people in the domestic environment who could not be expected to know what the liquid was or the warnings that accompanied the herbicide. Once inside an unlabelled, reused bottle, the herbicide could be given another identity by an unsuspecting, unintended user. The familiar shapes of drinks bottles, an important part of their brand identity, sent out the wrong signals about safe contents when they were reused to store agrochemicals. Bottles of concentrated herbicide found their way into bags, glove compartments, sheds, kitchens and even fridges where they were mistaken for dark coloured drinks: cordial, cola, beer, wine, or sherry, then swigged by curious or thirsty children, teens and adults, with very serious and sad consequences.

News stories invariably conveyed the lack of effective treatment, often deploying the stock phrase 'no known antidote'. This idea grabbed the imagination, and it was sufficiently frightening to be newsworthy, and prompt readers to write letters calling for it to be banned. Arsenic based weedkillers had been fatally poisoning people for much longer, and correspondingly progression and management of poisoning was better understood and accepted. As Bill Boon, one of the inventors of paraquat herbicide, wearily noted, this antidote statement was technically accurate, but it was not unusual as in the true sense of antidote where one chemical neutralises another, very few poisons have an antidote, not even aspirin.

However, it was useful shorthand for expressing the horror and despair that was experienced by victims, their families, and the medics who cared for them. The lining of the mouth and throat could be burned and ulcerated, and the kidneys could also be acutely stressed and permanently damaged. In the lungs, paraquat causes cell proliferation and inflammation, described in newspapers as solidifying, which steadily and irreversibly reduced lung function. Despite doctors' best efforts to deactivate or dilute the chemical in the bloodstream, they were very rarely successful, it was often hard to know how much had been ingested to start with and tests for quantifying paraquat in blood and urine were crude.

Educative campaigns about general household safety were proposed, but most of the attention was focused on changing the chemical to make it more noticeably poisonous, by adding an obnoxious smell, by changing the colour, or by making it thicker, or causing it to gel in the stomach. In summer 1972, marking nearly ten years of paraquat on the market the Daily Mail ramped up their reporting of paraquat poisoning.

[show 1972 Should this Killer article]

The newspaper ran their own investigation into how easy it was to obtain Gramoxone, showing that controls on retail were not working. They contacted spokespeople from ICI, MAFisheries Farming, and the Pharmaceutical Society, and were able to portray the chemical company positively, as working hard to make the formulation of the very effective and valuable herbicide safer, and investing in research for better treatments. The paper kept a running totals of deaths, continued calling for better retail practices, clearer labelling, and more thorough governmental approval processes, while continuing to carry regular advertisements for Weedol and other ICI garden care chemicals.

Later in 1972 the Mail carried their first report on suicide using paraquat, and although it had been used for this purpose for longer, could their educative articles have opened more eyes to its uses beyond killing weeds? In 1973 Dr Matthews of the Poisons Board blamed what he called 'disproportionate' media coverage given to paraquat deaths for the fact that in Scotland, the number of accidental deaths from paraquat was overshadowed by the number of suicides with the chemical. In 1974, there were two weeks of coverage of the first of several murder trials to feature Gramoxone. On the subject of educating people to the misuses, as opposed to safe use, all the media remained silent.

An alternative approach to preventing accidental poisoning suggested by the Scottish Medical Officer of Health involved criminalising those who used soft drink bottles for the storage of anything other than soft drinks, through the amendment of the Soft Drinks Regulations. In the 1960s cash deposits on glass bottles caused the Medical Officer of Health concern that bottles which had been used to store noxious household or garden chemicals would then be returned tainted with residue. However, this was considered unnecessary by MAFF, as the Poisons Law already covered the sale of poisons, and that enforcing how people used bottles in their private, domestic environments would be impossible.

In this talk, we've seen that ICI quite carefully considered the different users of its herbicides and developed a completely different product for home use specifically to make it safer for the perhaps more unpredictable domestic environment. Generally Weedol was used perfectly safely, but some domestic users rejected this product and chose to use the stronger Gramoxone. This was either taken from a work place, with some accidents being condemmed as people trying to avoid the cost of Weedol, or bought somewhat illegitimately. No doubt many people did manage this strong chemical perfectly ably at home, but unfortunately sometimes accidents happened, or it provided a pretty certain outcome for a suicidal person.

Overall, the number of deaths in relation to the total volume of paraquat sold and used was small, the precautions were easily followed, and the herbicide was extremely effective. This meant that ICI and regulatory government committees would not seriously contemplate a ban of such a valuable agricultural chemical, although ICI were directed to, and did, investigate and instigate a variety of changes to the formulation. Although the most important cause of accidents was users, rather than the inherent toxicity of the chemical, the large, diverse, population of users were much harder to influence and control than the company.

Despite Gramoxone being on the market since 1963, deaths relating to it were only evident from 1966, which was just when Weedol was being widely marketed to home gardeners. I conclude that accidents following unintended uses of Gramoxone brought paraquat to wider attention, and media reports contributed to unintended uses being perpetuated.

Thank you for your attention. I look forward to your comments and questions.