AGRICULTURAL CHEMICALS

AND

UNEXPLAINED ILL HEALTH

by
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Kellogg Scholar - 1986

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Introduction:

Civilisation has survived for thousands of years using primitive forms of agriculture but in a few short years it has threatened to self-destruct by introducing chemicals not natural to it's environment. It has done this to 'more efficiently' protect it's food resource. People are now beginning to understand the implications of this chemical usage and throughout the world an environmentally aware public is beginning to emerge. In time this group will become extremely powerful and if New Zealand and it's food producing industries are to survive into the 21st Century and beyond, it must ensure that it's produce is able to satisfy the demands of a very discerning consumer. This will become more apparent as the population of the Northern Hemisphere, particularly North America, Japan and Europe, begins the search for produce free of contaminants. This is not a trendy phase in Society, but a serious attempt to restore the equilibrium of our environment to ensure the continued evolution of mankind.

New Zealand falsifies it's 'clean-green' image in the world marketplace by continuing to use agricultural chemicals indiscriminantly, but it has the world at it's feet if it is prepared to produce food that is free of chemical residues. There are numerous ways this can be achieved and are referred to later.

To give some understanding of what risks are taken using agricultural chemicals some case histories are referred to and then to give some direction to the future some of the options are discussed, including the use of alternative chemicals, organic farming, integrated pest management and restricting the use of certain chemicals by introducing some form of licensing system to bring about a more responsible and accountable use of these chemicals.

I stress that these views are my own and accept full responsibility for them. I will, however, be encouraging others in the farming industry of New Zealand to adopt similar principles.

ACUTE AND CHRONIC TOXICITY:

The possible link-up between unexplained ill-health and agricultural chemicals has become more apparent to the New Zealand public in the last two to three years as the exponents of this theory strive to convince the New Zealand Health Department of their case while the chemical companies attempt to prove the opposite - that chemicals such as Paraquat and 245-T are perfectly safe to handle and prove no threat to the public at large.

As an extension to this debate there are arguments about Acute Toxicity versus Chronic Toxicity. At present the medical views of the respective toxicity levels are poles apart. The Health Department is adamant that Chronic or Low Level Toxicity does not, in fact, occur and in their view the only chemical poisoning, particularly in relation to Paraquat, is an acute poisoning that has come from either accidental or deliberate ingestion of the chemical, generally resulting in death. They are steadfastedly refusing to accept that chronic toxicity resulting from chemical contact of any kind does in fact occur.

There have been allegations that the Health Department has been bought by the chemical companies but so far they have been proven unfounded. The Health Department must stand independent of the chemical companies and if the anti-chemical lobby can conclusively prove their case, the Department must be prepared to:

a. Recognise low level toxicity
b. Restrict the usage of chemicals likely to cause chronic toxicity.

The difference between Acute Toxicity and Chronic Toxicity can best be described using case histories of Paraquat poisoning.

CASE HISTORY:

A. Acute Toxicity:

Accidental poisoning resulting in death is becoming more apparent and what is disturbing is that these accidents are occuring with people who should know but are not taking adequate precautions. One of the major contributions to this danger is the decanting of Paraquat into bottles with no label and most frequently bottles that have previously contained some other beverage. A notable example of this unfortunate accident was the death of a prominent Palmerston North surgeon.. He had a small amount of Paraquat stored in a Vermouth bottle at his home and when he found the bottle and raised it to his lips, he spat the liquid out as soon as he realised it was the weedkiller. He had eaten two mouthfuls of dirt in an apparent attempt to neutralise the Paraquat but sought medical help a few days later because of a sore mouth and difficulty drinking. Although there were no signs of the surgeon having swallowed any Paraquat his condition worsened and he died twenty days after the initial accident. At the time the Director of the National Poisons Centre in Dunedin said that this practise of decanting Paraquat into beverage bottles accounted for a large number of the accidental poisonings by 'this desperately dangerous herbicide'. He said that the Centre handled nearly thirty enquiries on Paraquat poisoning each year, that not every case was fatal, and that many cases were deliberate. About 50 per cent of the cases where the herbicide was ingested were fatal, but many of the inquiries related to Paraquat splashed on eyes or skin.

A 49 year old woman at a party drank 'weedkiller' which had been stored in a Whisky bottle. It was mixed with lemonade. She visited her General Practitioner the following day with abdominal pains and a throat infection but did not say anything about the incident with the Whisky bottle. The initial diagnosis was tonsilitis and an antibiotic was prescribed. Six days later she was admitted to hospital with renal and liver failure. She was initially treated with septicaemia until the story of the offending bottle emerged. She died 36 hours after admission and the autopsy showed her lungs were expanded, solid, and a deep plum red colour.

At the same party a 75 year old man drank from the same bottle. His health deteriorated at the same rate as the woman and he also died shortly after being admitted to hospital.

An example of accidental poisoning while spraying can be illustrated by what happened to a 59 year old farmer's wife who was spraying weeds under

shrubbery in her garden using a strong solution of Paraquat. While she was reaching under the shrub the spray jet was inadvertently aimed at her mouth, causing her to swallow involuntarily. She immediately took several mouthfuls of salt water and managed to vomit but she did not see her General Practitioner for three days and was admitted to hospital three days after that. Her respiratory system steadily deteriorated and she died one month after the initial accident.

In a deliberate attempt on his own life, a 53 year old man swallowed a cupful of undiluted Paraquat and died seventeen hours later. A young Waikato dairy farmer died earlier this year from being poisoned by Paraquat leaking from his knapsack, yet ICI will argue that Paraquat has a low dermal toxicity.

These and other well documented cases highlight the danger presented by ingestion of even small amounts of diluted Paraquat. No matter how careful people are, accidents of this nature can and will still happen while Paraquat remains available in New Zealand.

Clinical Features:

To highlight the many poisonings which have now been reported from Paraquat, the clinical features are well established. There is an initial burning of the mouth and throat. Vomitting and diarrhoea occur anytime over the next few days. There is a latent period over several days before painful ulceration of the mouth, throat and oesophagus occurs. This can disappear after a week or two if the patient survives. With ingestion of small amounts, there is a transient renal dysfunction with a temporarily raised serum urea and creatinine. Ingestion of large amounts can cause complete renal failure over a few hours but other cases may vary between the two extremes. Patients dying from respiratory failure after several weeks have had normal kidney histology (the study of the microscopic structure of tissues). With ingestion of small amounts there may be no evidence of liver dysfunction, but with larger amounts, raised bilirubin and liver enzyme levels will occur as soon as the second day.

Histology of the liver ranges from normal to mid zonal and centri lobuiar degeneration of the liver cells with near necrosis (death of a small part of the tissues) toward the centre of the lobules. After ingestion of large amounts, it has been thought that acute cardiac failure has contributed to death. If amounts ingested have been small, respiratory problems may not start to appear before about one week, when the patients are apparently

recovering. However, there is a relentless progression leading to eventual death from hypoxia, sometimes after more than a month.

B. Chronic Toxicity:

In the early 1980's a young Bay of Plenty farmer answered the call for diversification by deciding to establish a kiwifruit orchard on his property. Being a newly settled farmer, he had very limited resources, particularly time and financial, consequently some of the options chosen in developing his orchard were not necessarily the right ones. Young kiwifruit plants, especially new planted seedlings, needed to be kept weed free as did the young shelter belt trees. Because the farmer had little labour or financial resources he chose to keep his new plants weed free by using a chemical containing Paraquat, rather than using the more laborious process of hand weeding using a push-hoe. The chemical was chosen because it was a cheap knock-down chemical that the farmer thought was just another chemical, quite safe in the diluted form and not one to take special precautions with.

The farmer treated the chemical with little respect, particularly in the diluted form that was being applied around the kiwifruit and shelter belt plants. During the Winter of 1981 the farmer planted trees to shelter six hectares of horticultural land and during the next summer sprayed around those trees with Paraquat using a knapsack sprayer. A full knapsack containing fourteen litres of diluted chemical is quite heavy and to swing it up onto a person's shoulders he or she can not always keep the knapsack in an upright position. With the top filler cap having a breather hole in it, if the person tips the knapsack over slightly, that person is going to have chemical overflow down the side and drip onto their back or the back of their legs. When it is full any sudden movement is going to cause splashing and consequently the chemical will overflow and this particular Bay of Plenty farmer thought that this diluted solution was just another dessicant and not particularly dangerous. When farmers are spraying in hot, mild and still conditions, they naturally want to have as few clothes on as possible and the last thing they would consider is to get togged in breathing apparatus and water proof clothing. This was this farmer's attitude so when it came to lifting the full knapsack onto his shoulders, the splash from the filler cap ran down his back and dripped onto the back of his legs. In that instance the chemical may have entered his body through the skin.

However, the following winter (1982), the farmer planted his kiwifruit plants and to maintain weed control he used a weed boom which is mounted on the side of the tractor and sprays a strip approximately a metre wide down each side of the plant, making a two metre wide strip down each row. The boom uses an offset nozzle to get the spray to travel to the side because one can not spray directly over the top. This nozzle has fine tolerances and if the farmer does not have a good filtering system, small solid particles can cause problems with the flow. The farmer had just that problem and fiddled with the nozzle when chemical was still dripping from it but he still was not satisfied so he unscrewed the cap, took the nozzle and the small filter out, could see a small particle of grit in the nozzle, put it to his mouth and blew! He did the same to the small filter as well. So in this case, the chemical would have entered his body through his mouth, one of the most highly absorbent parts of the body. This was an accident born out of ignorance, not knowing the dangers and implications of handling such chemicals as Paraquat.

Many farmers will say they have had similar experiences, will have had plenty of exposure to chemicals and are suffering no ill-effects, but there is one very important point to remember. Each person has their own level of tolerance to foreign substances and each has a different ability to excrete these same substances, but if that person's immune system has been weakened by a viral infection, generally before the chemical exposure, then that chemical residue can become locked up in the body's organs and maintain a low level of toxicity for an indefinite period.

Diagnosis:

This low level toxicity can lead to a range of medical conditions which, when examined by doctors using conventional medical practice, fail to show any specific conditions. People can develop extreme fatigue, loss of memory, increased irritability, joint and muscle pains, night sweats, skin rashes, digestive upsets and concentration lapses - all indicative of a low level toxic condition. The farmer in question developed virtually all of these symptoms over a period of two to three years. Numerous blood tests, x-rays, consultations with physicians, all failed to show anything positive using conventional medical practices. At one point he was admitted to hospital with a suspected coronary but was sent home a week later, again with nothing positive being diagnosed except that he was psychoneurotic! The farmer knew his health was not what it should be, his normal tasks were becoming mammoth

ones and motivation and concentration were deteriorating. He suspected, along with his family doctor, that he may have MYALGIC ENCEPHALO-MYELITIS (M. E.), more commonly known as Tapanui 'Flu, a viral infection that first came to notice in a small town in the Southland area.

Treatment:

The farmer discovered that a Medical Practitioner in Cambridge, Doctor Ricky Gorringe, was working on the possible link-up between pesticides and M. E. and after a couple of consultations in July 1985, Doctor Gorringe positively diagnosed the farmer as having M. E. The most likely pesticide to have caused the virus would be either Paraquat or 245-T. Doctor Gorringe then informed the farmer that a doctor in Auckland, Doctor Matthew Tizard, was using a new form of diagnosis and treatment to New Zealand but one that had been widely used in Germany for the past 20 years. Doctor Tizard uses a system called 'Electro-acupuncture according to Voll' (EAV) to detect minute chemical loads in the body. Developed by a German, Doctor Voll, the equipment measures electrical resistance at acupuncture points on the hands or feet and displays the readings on an electronic dial. The patient holds something akin to an earthpeg in one hand on a lead to the machine and on the other hand or toes is placed the end of a ball-point pen-like apparatus that completes the electrical circuit through the body. By inserting various homeopathic solutions into the circuit, Doctor Tizard can then calculate the neutralising dose required to rid the body of the chemical that he initially diagnosed as residual in the various organs. Patients are given homeopathic doses of the chemical which are injected into the body in tiny amounts, working on the principle of like curing like, stimulating the body to excrete the chemicals. Patients, particularly those with very heavy levels of toxicity can choose the Hyper-baric treatment involving doses of intraveneous injections of Vitamin C plus an hour each day in a decompression tank where the patient breathes pure oxygen.

The farmer from the Bay of Plenty chose to have a ten week course of injections, starting late August 1985, to stimulate his body to reject the Paraquat that was at dangerously high levels. By the end of the course the farmer's health had improved considerably and continued to improve over the summer months but by March 1986 there was still some Paraquat residue locked in his sytem so the ten week course was repeated. The improvement continued with minor adjustments being made to the homeo-pathic solutions that act as a catalyst for excretion and by February 1987 the farmer should have his health completely restored.

Unorthodox Versus Orthodox Medicine:

Orthodox medicine has extreme difficulty coming to grips with Doctor Tizard's apparatus. Professor Campbell Murdoch, Head of General Practice at Otago Medical Schoolj, says Electro-acupuncture as medical technique is totally foreign to everything doctors have been taught. While heading an enquiry into M. E. he says he can not recommend a treatment he does not understand. This same line of thought came out of a Health Department Task Force, headed by Doctor Tim Maling, set up to investigate Doctor Tizard after he had treated approximately 200 firemen (one-third of Auckland's fire fighting force) as a result of chemical spillage at a fire at ICI's Mount Wellington Storage Depot. The Task Force said they could not understand the EAV machine, nor was it reliable, consequently they were not prepared to take the investigation further. They did not interview one single patient and by ignoring the weight of evidence of patients who have been significantly helped by Doctor Tizard's unorthodox treatment, the Task Force failed to appreciate the potential of EAV to help people with low level toxicity of chemicals such as 245-T and Paraquat.

Since the release of the Task Force Report a retired Head of the Physics Department of Auckland University, Professor David Hooten, has had blood from himself and his wife measured by a Gas Cromatograph Mass Spectrometer (G. C. M. S.), an internationally accepted machine that can measure extremely low levels of chemicals in the blood, tests that previously could not identify these chemicals. The G. C. M. S. can achieve levels as low as one part per trillion, results are fed into a computer and are then presented in graphical form. Professor Hooten says that G. C. M. S. would be the best method worldwide, that the results are unequivocal and that there are several sets available in New Zealand. His particular blood tests were done by Doctor Bob Cradich from the Forestry Research Institute in Rotorua and that these tests will back up conclusively the EAV diagnosis of Doctor Tizard.

Organic Farming:

The recent nuclear disaster in Chernobyle, Russia, must have quickened the world's demand for food grown free of contaminants and organic farming in New Zealand presents itself as an extremely strong contender to produce this food. There is little doubt that a market exists for naturally produced food products targeted at the health conscious or environmentally aware consumer. The market is prepared to pay exceptionally well for these goods and New Zealand must devise a strategy to sell it's product, particularly red meat, aiming at this specific market, and be able to produce it in sufficient quantity.

There are many and varied systems of organic farming, each claiming to be superior to the rest so it is difficult to find any common denominator amongst the organic growers.

Doctor Bernward Geier, a Research Scientist from West Germany's Kassell University's Agronomy Department, said recently in New Zealand that our biggest potential was in exporting organically grown matter. We must be able to supply sufficient quantity but presently New Zealand has only 47 growers registered to sell under the 'Bio-Gro' Label.

We feel that if sufficient quantity is to be supplied to satisfy this potential suggested by Doctor Geier, a modified version of the 'purest' organic farming should be introduced that is more readily adapted to New Zealand hill country farming.

'Tinopai' Concept:

Ruakura Scientist Doctor Tony Haystead, having carried out a research programme on eight biological farms comparing them with eight conventional farms, is now promoting, along with colleague Doctor Bert Quin, a revised version of organic farming, calling it the 'Tinopai' Concept. (Tinopai - Maori for 'the very best' or 'the best there is'.) They are recommending the investigation of production and marketing of 'naturally grown' sheep and beef meats. They say the New Zealand farmer is in an almost unique position to be able to produce food which meets higher standards of purity than can be achieved elsewhere.

Main Objectives of 'Tinopai':

1. To develop and demonstrate the viability of our animal production system which minimises chemical imput

2. To develop a marketing strategy which:

   a. Highlights the difference in agricultural practices between New Zealand and it's competitors

   b. Highlights the wholesomeness and purity of the new product line of red meats produced without the use of any artificial chemicals

   c. Gives this meat an identifiable brand name - 'Tinopai'

   d. Highlights that the 'Tinopai' brand would be distinct from other organically grown brands

   e. Justifies a premium price for the product which would raise the acceptability and market share of red meat in general.

Suggested Criteria for 'Tinopai':

1. **Animal Health:**

   No synthetic antihelminthics, growth promoting agents and insecticides will be used. Penicillin, streptomycin, etc, will be used only where necessary.

2. **Fertiliser:**

   Only naturally occuring fertiliser will be used, e.g. phosphate rock (instead of super-phosphate), potash, sulphur, trace elements, serpentine and lime.

3. **Plant Protection and Weed Control:**

   No synthetic insecticides or weedicides will be used. Protection and control will be maintained through type of stock (goats) and grazing management.

We see this concept as having particular merit because most of the criteria can be readily adapted to New Zealand farming, although we would have some reservation about the nil usage of antihelmenthics, particularly with young stock in the northern half of the North Island. The marketing of this

concept and of the product needs to be vigorously pursued, particularly by innovative exporters, to rejuvenate the faltering meat industry in New Zealand.

Rudolph Steiner Principle:

The bio-dynamic farming principles of Rudolph Steiner, established in the 1920's in Germany and carried out by people such as Norrie and John Pearce at their South Kaipara Heads property, are aimed at revitalising or healing the soil. They concentrate on building up the soil, promoting humus and using mulches to build a vigorous population of earthworms. The Steiner Principles also include:

a. Collecting thistle heads to get nutrients such as copper - the thistle heads are gathered, burned and distributed in small amounts four to five times per year

b. Spreading rotted down fish manure

c. A specially prepared cow manure buried in a cow horn through the winter (called Preparation 500).

The Ministry of Agriculture and Fisheries, although sceptical of these farming practices, nonetheless note that all Pearce's stock were in good to excellent condition after using Steiner methods for five to six years. Although it appears to be working exceptionally well, we would envisage some of these principles too labour-intensive to implement on a wide scale.

At the vanguard of Organic Farming in New Zealand would undoubtedly be Lincoln College's Senior Lecturer in Horticulture, Bob Crowder. He also is cautious of the Steiner Principles and issues a warning to anybody contemplating adopting some form of organic farming, saying that things can very easily go completely wrong before getting it completely right. It is not something that should be considered lightly by farmers and they should be prepared to take a few tumbles.

Vigorous efforts by a few growers to produce export quality kiwifruit have so fair failed and they have yet to overcome some of the insect damage to the fruit. Doctor David Steven, an entomologist with the Department of Scientific and Industrial Research is working on ways to combat such pests as Greedy Scale, using both biological control (finding natural parasites) and a reduced chemical imput.

What of the future for biological and organic farmers? In March this year John Pearce and his latest shipment of lamb to Germany sold for $37.00 per kilogram and that overseas buyers are clambering to get large supplies of this type of product. New Zealand farmers must adapt to producing this type of product in a much more extensive manner than presently if they are to capitalise on these new and exciting markets.

Biological Control:

Considerable work has been done in this field and the Noxious Plants Authority have achieved a measure of success with a range of weeds. Although not entirely successful on it's own, a natural predator (e.g. the weevil that lives on the seed of a Nodding Thistle flower), can be intergrated with a grazing system or some other form of control. A break-through in identifying a predator for gorse would solve many problems and save New Zealand farmers from spending large amounts of money on chemicals, particularly 245-T.

Bob Crowder needs every encouragement for the fine work he is carrying out at Lincoln College and research in this field needs to be given greater priority by the Ministry of Agriculture and Fisheries rather than accepting that chemicals will continue to be an easy cure for weeds and pesticides.

Has enough research been done on complementary stocking ratios between sheep and cattle, between goats and cattle, between dairy cows and deer, etc? We need to know more about how these stock ratios affect stock health, e.g. the farmers in the North Island who get the best sheep production figures invariably have the highest ratio of cattle on their farms. A farmer in Great Britain puts only sheep on half the farm one year and only cattle in the second year and appears to have eliminated animal health problems. Can this be applied to New Zealand?

OPTIONS FOR PARAQUAT AND 245-T:

Paraquat:

As far back as 1977 the New Zealand Medical Journal was recommending the banning of Paraquat in New Zealand and failing that, subsequent steps should include:

1. Adequate labelling which leaves no doubt as to the danger of the agent and the danger of decanting the agent to another container
2. Wide publicity of dangers and education of both users and medical practitioners as to appropriate safety precautions
3. Addition of a stenching agent to Paraquat which will make it impossible to mistake for a normal beverage
4. Much tighter retail control. Paraquat concentrate is being obtained from retail outlets by many non-commercial users without difficulty.

The New Zealand Medical Journal surmised that these steps would be necessary because a comparable low toxic agent was not available for New Zealand conditions. Since that time a range of chemicals have been introduced to the market, albeit more expensive, but certainly less toxic than Paraquat. To be fair, the stenching agent has been introduced to Paraquat but retail control still leaves a lot to be desired. The Toxic Substances Act 1983 requires deadly and dangerous poisons to be locked away from the public and that only a person with a licence is permitted to sell Paraquat to the public. In many retail outlets those store-rooms are not locked during the day, are freely accessible and in some outlets, particularly garden centres and supermarkets, granular Paraquat in cardboard boxes can be found on the open shelves. Retail outlets that do not have a licence to sell dangerous poisons have been knowingly sold those poisons by energetic salesmen creating awkward situations for retailers. Chemicals containing less than 5 per cent Paraquat (standard poison) can be sold without a licence but poisons containing in excess of 5 per cent Paraquat (Dangerous Poison) can not be sold without a licence being issued by the Health Department, generally to the retail company who must then nominate individuals (e.g. Head Storeman or Merchandise Salesman) who then assists the customer to choose the correct chemical. Liability must be accepted by the Licence Holder, in most cases being the retail company.

Part of Point 2, above, has been handled by ICI placing booklets on how to treat Paraquat poisoning at Accident and Emergency Wards in most public hospitals in New Zealand. The recommended treatment for Paraquat poisoning from the New Zealand Medical Journal includes:

1. Immediate production of vomitting followed by gastric lavage (washing out) as soon as possible
2. Administration of a clay containing substance (a slurry will only be effective if it contains adequate clay)
3. As soon as possible, Fuller's Earth should be administered, made up into a 30 per cent suspension (60 grams in 200 mls of water), repeated two to four hourly for two days. If Fuller's Earth is unavailable, an effective substitute is Bentonite. A pourable suspension of this compound is obtained by adding 70 grams of Bentonite to 100 mls of glycerine and making it up to one litre of water.

Competitors to Paraquat:

There are now numerous chemicals available today that have an efficacy price competitiveness with Paraquat. In other words, they are either equal to, or superior to Paraquat in terms of price, the range of weeds controlled and the length of time these weeds are controlled.

Horticulture:	Generally used for knock-down and are non residual. Amitrol (Weedazol), Glyphosate (Roundup), Gluphosinate (Buster), Strel (has an application in citrus orchards)
Total Vegetation Control (TVC):	Used predominantly by Local Authorities. Includes above chemicals plus; Caraguard, Dicamba, Banvine
Agriculture:	Predominantly Paraquat is used for pre-cultivation spraying (Spraygrow). Manufacturers will also argue that it is suitable for conservation tillage but weed control does not last as long as e.g. Roundup or Weedazol. Gramoxone is used for Barley Grass control but can readily be replaced by Roundup, Carbetamix or Nortron. Paraquat's only significant use would appear to be the spraying of clover seed crops prior to harvest.

We feel that because Paraquat is a recognised health hazard and that there is now a sufficient range of chemicals to replace Paraquat (particularly Roundup which now has a majority market share in the horticulture sector of the Bay of Plenty) we would strongly recommend Paraquat be withdrawn from the market. If this does not happen, we suggest that Paraquat, now available to commercial users only, be restricted to those users who hold some form of Application Licence. The present requirements in terms of the Toxic Substances Act, only control the safe storage and sale of Paraquat but once a customer has complied with these requirements at point of purchase, there is nothing under the regulations to prevent him or her from taking the chemical home, decanting the Paraquat into a popular fruit juice bottle and having it freely accessible to children.

245-T:

245-T is a chemical that has had ample public scrutiny over recent years but through the work of Doctor Tizard and the recent chemical spillage at New Plymouth, attention has yet again been focused on it's dangers. No conclusive results have been drawn one way or the other with all these studies and a recent New Zealand Herald editorial says it all:

> 'It may never be possible to conclusively condemn or clear the controversial herbicide 245-T on charges that it constitutes a health hazard. The chemical has been subject to countless and continuing scientific studies. None, so far, has provided incontrovertible proof that it's risky reputation is justified.
>
> 'Nonetheless some scientists now advise caution. Such concern is backed by strong, often emotive, public questioning of the herbicide that, at the least, asks that no chances be taken.
>
> 'Not surprisingly, a Committee of the Environmental Council does little to unravel the controversy. It reports that there are insufficient reasons to ban the use of the chemical but, oddly, calls for a moratorium on it's manufacture, partly in deference to the health of those living near the plant.
>
> 'That issue is the concern of a separate inquiry still being conducted. It's difficulty, too, will be to reconcile the view that 245-T should not be accorded innocence until proven not guilty with the near impossibility of demonstrating that a link between the herbicide and ill health does not exist.

'In the end, the only option may be to apply even more stringent restrictions on it's manufacture and use, or to ban it for precautionary rather than scientific reasons'.

This is exactly how we see the issue. We also are confused by the inconsistency shown by the Environmental Council Working Party where they firstly acknowledge that orthodox medicine appears to be floundering in it's attempt to diagnose the condition M. E. and that there is no consensus amongst the orthodox practitioners, yet they wipe their hands of any work being done by unorthodox medical practitioners.

The Working Party are critical of the Health Department in numerous cases, particularly:

a. Professor Elliot's re-evaluation of the Northland Birth Survey

b. The Department's inability to demonstrate what is harmful evidence

c. The Department having become an apologist for Ivan Watkins Dow and it's operations.

We find the Working Party's attitude to the Health Department inconsistent with their total acceptance of the Maling Task Force Report on Doctor Tizard and his EAV machine. This report is referred to previously. Doctor Tizard refused to co-operate with the Task Force for several reasons.

He was reluctant to do a 'double blind test'. They spent only two hours with him examining the machine and did not follow up one patient. He has had 40 patients whose blood tests, using a Spectrometer, have had chemicals reducing an average from 30 ppb to 1 ppb How can the Task Force and the Working Party ignore these results?

The Working Party of the Environmental Council in Recommendation 6, called for greater public awareness of the nature of chemicals, their risks and benefits, the precautions in their use and the need to take account of those who could be affected by the manufacture, distribution and use of agricultural chemicals. We accept this wholeheartedly, but are disappointed that no direction as to how this can be achieved, is offered by the Working Party.

Also, the Herald editorial fails to acknowledge why 245-T users prefer it to other chemicals. Most would say for economic reasons although many others would recognise 245-T's ability to be a selective herbicide leaving the pasture relatively untouched.

The New Zealand Herald has hinted at two options. Either ban the chemical for precautionary reasons or apply even more stringent restrictions on it's manufacture and use. We see 245-T as being slightly different to Paraquat. It has an L. D. 50 rating, four times less toxic than Paraquat so it is a slightly safer chemical to use and because of it's cost effectiveness and it's selected properties, we would see it continue to be used but on a much more restricted basis than it is presently, restricting the chemical for sale to Licensed Applicators only.

Licensed Applicators:

We would recommend that a Licensing System be introduced to bring about a more responsible use of 245-T. Licences are required for people to handle explosives, for people to lay poisoned bait and for people to use firearms therefore we suggest that before anybody can procure Paraquat or 245-T they must first present their Agricultural Chemical Applicator's Licence. To obtain this licence the person should be required to attend a two to three day course at a local Community College and then sit and pass the examination.

We suggest a likely programme for the course administered by the Pesticide Board and supervised by Community Colleges or the Ministry of Agriculture and Fisheries to be as follows:

Stage I - Introduction:

1. The need for Agriculture and Horticulture Chemicals
2. The Toxic Substances Board
3. The Pesticides Board
4. The Pesticides Act
5. The Role of Agcarm

Stage II - Field Operations:

1. Methods of Chemical Application
2. Calibrating Sprayer
3. The Careful Operator
4. Safety Equipment
5. Choosing the Right Chemical

Stage III - Hazards:

1. Chemicals and Bees
2. Protection of Plants Susceptible to Chemicals
3. Protection of People from Chemicals
4. Agricultural Chemicals and Health
5. Safe Storage, Transport and Disposal of Chemicals.

Stage IV - Examination:

1. Practical Test - Calibration
   - Safe Handling
2. Written Test - Multiple Choice.

We recognise that there is already an extensive course for chemical application but we believe that this type of licence will be the catalyst for more responsible use of chemicals. There is an immense gap in standards between a registered applicator and e.g. a farm labourer with little understanding of the dangers and who is often not adequately instructed and supervised on correct procedures.

Administration of Licences:

We would recommend that the issuing of an Agricultural Chemical Applicator's Licence be administered by the Pesticides Board and be supervised on a regional basis by local Community Colleges or the Ministry of Agriculture and Fisheries. Other licences involving deadly poisons are administered in a similar manner and two examples will illustrate the point:

Example 1 - Cyanide Licence:

A person pays $40.00 on application then receives study material compiled by the Pesticides Board. After two to three weeks the applicant then sits two written papers, also compiled by the Pesticides Board, under the supervision of the Ministry of Agriculture and Fisheries Livestock Officer. He also shows the applicant a series of slides and asks for some comment. The applicant, if successfully completing the examination, will then be issued with a licence approximately two weeks later.

Example 2 - Certificate of Competence:

This is required by a person wishing to fumigate logs, etc, on the waterfront prior to export. The applicant makes written application to the Health Department, who then post out study material to be examined on at a later date along with a practical test before the Certificate can be issued.

Although Paraquat and 245-T are not in the deadly poisons classification, we feel that the only way further education and public awareness is going to take place is to introduce a registration system whereby each commercial user either has an Agricultural Chemical Applicator's Licence or an Agricultural Chemicals Certificate of Competence.

Company Reaction:

Chemical companies will argue that sufficient warnings are already placed on their container labels but farmers do tend to read the labels after they have used the chemical, if at all. The companies readily acknowledge this so we feel that the safety issue can best be encouraged by forcing each applicator to at least be more aware of the dangers and this can best be done by obtaining a licence to handle 245-T. We would argue that some education is better than no education.

Farmer Reaction:

Farmers will initially resent any further bureaucracy but there is a growing concern amongst many of them of the dangers in handling chemicals. Also the potential damage to our 'clean green' image in our overseas markets must cause some concern, particularly in North America and Europe where the more environmentally aware consumers worry about traces of agro chemicals in meat and the possible allergic and carcinogenic effects residues may have.

Once farmers accept these restrictions and acknowledge the other areas of concern, a more considered and responsible use of chemicals will prevail.

SUMMARY:

Evidence is mounting that there may be a link-up between chemical residues and chronic ill-health, yet the Health Department and the chemical companies steadfastly refuse to accept this phenomena. The Environmental Council Working Party on 245-T acknowledges that residues may be accumulating in the food chain, but apart from calling for a twelve month moratorium on the manufacture of 245-T, does little to suggest that the chemical is a hazard and should be banned. The outcome of the 1986 New Plymouth Brinkman Report may have a major bearing on the issue.

As for the long term, chemical users must accept that residues can, and do, accumulate in the soil and waterways and therefore they must also accept that alternative methods will be the only salvation of the modern society. We would therefore make the following recommendations:

1. Paraquat:

There is a sufficient range of less toxic chemicals in the marketplace and it is a known health hazard and therefore should be withdrawn from the market in New Zealand in line with West Germany.

Paraquat is also severely restricted for use in Sweden, Finland, Denmark, Israel, Turkey and the Philippines. It has been banned in some states of the United States of America and in other states is treated as a Category B chemical, i.e. use is conditional and under further investigation.

2. 245-T:

A chemical that has a doubtful future in New Zealand agriculture. Extreme efforts should be made to replace this chemical with alternative methods but if it is to remain on the market in New Zealand (the only country in the world left manufacturing this chemical!) then it must be more restricted in it's availability. The only method to educate and publicise the hazards is to license the use of the chemical and we would recommend that 245-T be only available to holders of a Certificate of Competence which can be obtained through the Ministry of Agriculture and Fisheries and that the chemical be applied through hand held guns only.

3. 24-D:

Be treated in the same context as 245-T.

4. Aerial Spraying:

Chemicals such as 245-T, 24-D and MCPA, contrary to chemical company claims, can be readily absorbed through the lung, throat and sinus regions, which suggests the poisoning would come from inhalation of micro droplets from aerial spray drifts. These chemicals should be banned from aerial spraying. Forestry must be prepared to use other chemicals less toxic.

5. Health Department:

Must distance itself from the Maling Task Force and acknowledge the valuable work being carried out by Doctor Gorringe and Doctor Tizard, who have helped identify the major health hazards created by chemicals such as Paraquat and 245-T. It must also distance itself from the chemical companies and be seen to be acting independantly of them, not alongside them.

6. The Farming Community:

Farmers will wail loud and long about infringement of rights to have access to cheap chemicals but if they take into account the added cost of using some alternative form of pesticide control in the process of producing a product that will attract premium prices around the world then they will see the long term benefits of a healthy environment returned for successive generations to enjoy. To continue on the present path of widespread and often indiscriminant use of agricultural chemicals can only be a recipe for disaster.