REVIEW

The 2,4,5-T Herbicide Controversy — in Hindsight

Oration delivered at the Eighth Australian Weeds Conference, Sydney, 21–25 September 1987

W. T. Parsons
Clendon Close, Mount Eliza, Victoria 3930

An oration gives someone who has retired recently the opportunity to look back on a career and review some issue in a way which might be helpful to those facing a similar problem in the future. The most controversial issue of my career was the dispute which surrounded the herbicides, 2,4-D and 2,4,5-T, but more particularly 2,4,5-T. It commenced in the late 1960s and peaked in the latter part of the 1970s and early 1980s.

As a herbicide effective for the control of woody plants, 2,4,5-T had come into general use in Australia about 1950 but was discovered, about 20 years later, to produce birth abnormalities in rats and mice when administered at certain stages of pregnancy. Later claims were made that it was also carcinogenic in laboratory animals. Naturally, there was world-wide concern over the possibility that 2,4,5-T might cause similar problems in humans.

The picture was complicated by the fact that 2,4,5-T cannot be manufactured without some level of contamination with 2,3,7,8-TCDD (one of the group of chemicals known as dioxins) which is one of the most toxic substances known. It was never clear whether the problems seen in test animals were caused by 2,4,5-T, by the contaminant, or both.

In addition, 2,4,5-T was used in the Vietnam War by the American forces in their extensive aerial spraying campaign to defoliate forests. It was used in mixtures with 2,4-D, the best known of which was Agent Orange. This mixture gained notoriety after the war for having allegedly caused a range of health problems in both the indigenous Vietnamese population and in servicemen stationed in Vietnam.

Over the past 20 years there have been hundreds of studies, numerous enquiries, court cases, a Royal Commission and other investigations and it is fair to say that there is no good evidence to condemn 2,4,5-T as causing any serious problems in humans. Nevertheless, it is now banned or withdrawn from sale throughout the world with the exception of Australia and New Zealand. This withdrawal from use has occurred not because of sound scientific evidence condemning the chemical but because of political and commercial reaction to community pressure.

What I could do is look at the issues and analyse them, but this approach has been taken many times and in numerous places and there would be little value in repeating it here. What I will attempt is to identify the types of organizations and individuals who were involved in the controversy and in one way or another formed part of the crusade against the herbicide. I will then suggest ways in which their efforts were, or could have been, minimized. It would be very easy to blame the media for generating community pressure against the herbicide but that would be too simple because, although the media have a lot to answer for which I will come to later, they have to be provided with stories before they can have much influence.

What should be appreciated at the outset is that, whilst there is no sound scientific evidence on which to condemn 2,4,5-T, it has the potential to generate great emotional reaction because:

- it was seen as an agent of chemical warfare in Vietnam, in an unpopular and controversial war,
- of the possibility of it causing birth abnormalities,
- of the possibility of it causing cancer, and
- it was manufactured by multinational companies.

I have identified a number of groups or individuals involved in the 2,4,5-T controversy in Victoria. No doubt, similar groups operated in other places and had greater or lesser effect depending on their own capacity and the local circumstances. The groups or individuals are:

(i) The frustrated scientist

This is a person with some professional training who for one reason or another feels he or she has not received the recognition or promotion that they believe is warranted. This could be as a rejected Ph.D. thesis, for example, or a denied promotion, which leads to lashing out at society and when the opportunity is presented to become an instant authority and 'buck the system' along the way, it is taken.

The media welcome this person with open arms. They are always available with a controversial statement. In return, the media will freely bestow such accolades as 'one of Australia's leading biological scientists' and even an instant Ph.D. degree. The ego is well and truly satisfied.

This person can be very clever.

He or she will address meetings but not where informed questioning is expected, and they will generally not enter into debate with other scientists. They fool a lot of people.

In one case in Victoria such a person was called as a Crown witness to give expert evidence in a court case, apparently being ranked ahead of the Government's own scientists.

They are readily available as consultants or technical advisers to unsuspecting organizations and these roles provide a considerable boost to the ego. They build a career on what is really a corruption of scientific principles because of selective and misleading use of data.

(ii) The 'out of his/her field' scientist

This is the scientist inexperienced in pesticide/animal experiments who wishes to study this controversial herbicide in areas of his or her own particular expertise. Possibly there are research funds available because of the controversy. The problem is that they can make fundamental errors through lack of knowledge of pesticide chemistry, metabolic pathways or field practices, and this can lead to conclusions which are inappropriate but appear valid because of the person's recognized expertise in their own field.

There is a case where a prominent Australian scientist has allowed his name to be associated with at least two very questionable reports. Presumably the colleagues who did the work were well out of their field but the scientist would not acknowledge this.

A sub-group of these scientists are those who take an extreme view on risk assessment. They argue the 'zero tolerance' theory for chemicals in food, conveniently ignoring the relatively high levels of natural carcinogens and other toxic compounds already occurring naturally in several foods.

(iii) The mischievous academic

This person is usually university-based and may be from a field quite unrelated to the subject of the controversy. He or she prepares criticisms of Government or industry reports claiming they are biased and wrong and that they draw unsubstantiated conclusions. This questioning, of course, is not mischievous in itself but when they seek information from reputable sources

and then ignore it, or intentionally distort it because it does not support their thesis, then this is unforgivably mischievous. Incidentally, their criticisms never appear in reputable journals but in non-refereed popular publications.

(iv) The medical profession

There are two types of cases here. One is with the general practitioner who I criticize for taking the line of least resistance. I will quote two examples. A worker I know of seeks medical attention for an infection under his finger-nails; the condition is diagnosed as a fungal disease and treatment is prescribed. The general practitioner then learns that the worker uses phenoxyacid herbicides and the diagnosis is changed to a herbicide reaction. The worker is declared unfit for work and entitled to worker's compensation benefits. It is interesting to note that this particular worker had used phenoxyacid herbicides for almost 30 years and yet had only recently developed the condition.

The other case is where a worker attends a general practitioner for an examination in connection with a life insurance policy. Amongst other things, a urine sample is taken in which traces of phenoxyacid herbicides are found. He is also declared unfit for work and is off duty for two weeks on worker's compensation. The reality is that, if a worker is using phenoxyacid herbicides, he cannot avoid some intake to his body. It is desirable, surely, that it is not stored in the body and is excreted quickly, in other words, it appears quickly in the urine.

An interesting aside is that in one such case 2,4,5-T was detected in the urine and yet the worker had not used this herbicide for at least 6 months, and pentachlorphenol was also present but he had never used this material. There is a clear need to question the reliability of the testing procedures used in such cases as well as the interpretation placed on the results.

In both cases the general practitioners are assuming the herbicide is hazardous without any evidence. Such assumptions are dangerous and, of course, create precedents and great ammunition for the anti-pesticide lobby. I must hasten to add, though, that these are two isolated examples and I am sure that most doctors are careful not to draw such unfounded conclusions.

The other problem with the medical profession is the general practitioner or specialist who is known to attribute almost any condition from mental depression to intoxication to the phenoxyacid herbicides. These doctors are invariably sought out by those who wish to further dubious claims for compensation.

(v) The antiscience/antitechnology movement

These people believe that science and technology have got out of control and are runing the world. They are closely aligned to the 'back to nature' groups and because 2,4,5-T is a man-made chemical which kills plants it is open to attack. These people are often sophisticated, articulate and well armed with literature.

(vi) The genuinely concerned citizen

There are many people with genuine concern resulting from media reports of birth abnormalities, cancers etc. resulting from exposure to 2,4,5-T. Naturally, pregnant women are greatly concerned at any possible exposure to such a chemical and when an abnormal child is born its parents will go to great lengths to discover any possible exposure to the chemical during pregnancy. These people make up a considerable percentage of the population; most of them genuinely want to know the truth, unlike several other groups. We must have great sympathy for these people.

(vii) The pseudo-concerned citizen

These are people whose motives are hard to define. They claim a bewildering array of effects of 2,4,5-T—birds dying, koalas falling from trees, farm animals made sterile, long-term pollution of ground water, children vomiting, etc., etc. Perhaps they are just drawing attention to themselves or want to challenge authority. They certainly seem to have plenty of time to devote to their cause, and 4-page, single spaced letters to Cabinet Ministers to make a point are not uncommon.

Another group of pseudo-concerned citizens are those with a vested interest in discrediting herbicides, for example, landholders who seek to avoid purchasing herbicides to treat noxious weeds.

(viii) The politician

Their attitude depends largely on which political party is in power. When in government they want reassurance that the government policy is appropriate and want information which will satisfy both the genuine and pseudo-concerned citizens. Alternatively, they might wish to distance themselves from the issue because it is too complex and they seek to avoid any personal involvement.

When in opposition they can be much more of a crusader and become quite vocal and visible. Let me give an example. I was approached by such a politician to be a speaker at a seminar he was organizing. Because all the other speakers were known for their anti-2,4,5-T stance, I asked if he had invited anyone to discuss the public health aspects and he asked me to suggest a few names. He then wrote to me withdrawing my invitation because he 'felt my views would not receive a fair hearing'. I wrote back saying this was strange considering my views were consistent with those of the National Health and Medical Research Council, the World Health Organization, the International Agency for Research on Cancer, etc. The seminar went ahead in my absence and I was the subject of considerable ridicule.

(ix) The union movement

The unions played an interesting role in the 2,4,5-T controversy in Victoria. The Victorian Trades' Hall Council recommended a partial ban on the compound and this was taken up by some of the affiliates including those covering municipal workers, but the large Australian Workers' Union which covered State employees using the herbicide took no action. This was probably because most of these users were long-time employees who had worked with the material over many years without ill-effect and were not impressed by the sensational stories being told.

(x) The media

It is easy to blame the media for the whole controversy but we must bear in mind that they are committed to filling a certain amount of print or radio/TV time each day and to gaining a maximum audience. Therefore, anything a little different or controversial is of interest. When it has the emotional components of the 2,4,5-T issue it naturally becomes of great interest to the media. Also journalists have to meet deadlines and cannot always do the amount of homework we would consider necessary. One could object to the emotional and sensational tones used but this is the way in which journalists work and we must live with this. What I object to is the philosophy developed by some media groups. I phoned one paper in Melbourne to query an article and was told the paper's policy was to 'get' 2,4,5-T and it would publish only material which helped achieve this end. With such an attitude one can only be concerned at the concentration of media ownership in a few hands.

Bias in the presentation of news seems to be always present. It takes several forms. For example, the anti-pesticide stories are invariably front page and yet I recall a report by a municipal health officer stating that after 20 years as a medical practitioner in a country town he had absolutely no evidence that herbicides were causing any human health problems; his report was on page 17, I think it was, of the local country paper.

Then there is the 'hit and miss' journalism which must be condemned. Having created confusion and hysteria with a sensational story surely there is a commitment on any responsible journalist to follow it up by presenting material available from the 'other side' in an unbiased way.

These are the major groups which had a significant impact on the 2,4,5-T controversy. There are two ways in which they influenced policy, one was by a direct approach to Members of Parliament through letters, petitions and deputations, and the other was by influencing public opinion through the media which, in turn, is aimed at influencing government policy.

Having identified the groups and individuals involved in the 2,4,5-T controversy I now want to look briefly at what was done or what I think could have been done to counter them. But, firstly, I want to emphasize how important it is to ensure at all times that our use of pesticides is safe for the operators, the public and the environment and that all regulations and restrictions are adhered to. We all know how easy

it is for use practices to sometimes stray from the recommendations and we must ensure this does not happen. Also, we should use application techniques, wherever possible, that minimize the possibility of spray drift and, hence, off-target damage. Naturally, it is essential to avoid incidents which could endanger the public or the environment. If they do occur, such incidents, of course, give great fuel to the anti-pesticide lobby.

The next thing required is a firm commitment to defend what we believe to be right.

With 2,4,5-T it was clear that there was no sound evidence against the chemical. It was a very useful herbicide; for some uses there was no alternative and, where there was an alternative, it was invariably much more expensive and its toxicity less well researched than that of 2,4,5-T. Therefore, to allow 2,4,5-T to be sacrificed would have added to the cost and convenience of weed control to both the farmer and the community. This commitment must be from various groups – government, public service, users and the pesticide industry. This commitment was often slow in coming in the 2,4,5-T controversy. For example, I drafted a circular in 1969 to our field staff setting out all the facts as I knew them so that members of the public, who were beginning to express concern to our staff, could be advised of the Department's view and the logic behind that view. The circular was not approved by the hierarchy of my Department and no advice was given to the staff. Although this attitude was relaxed to some degree as the controversy developed, I know this was not the case everywhere and officers were often not permitted to talk to the media nor to take the initiative on what were perceived to be sensitive issues. The point I make is that if the commitment is not there at all levels then the cause can soon be lost.

Having achieved that commitment, the next essential is an effective flow of information to people who need it. We were extremely fortunate in the 2,4,5-T controversy to have Jack Snelson as Pesticide Co-ordinator in Canberra with the commitment to keep people such as myself informed of all developments throughout the world. On several occasions this allowed us to defuse issues which had arisen due to misinformation or partial information being given to the media. Another information system that I found very useful was to establish personal contact with officers of such organizations as the United States administration in Washington, the Californian Department of Food and Agriculture and the United Kingdom Advisory Committee on Pesticides, in order to check on such often repeated media claims that 2,4,5-T had recently been banned in the United States or the United Kingdom. On a number of occasions I contacted these people by phone to check the accuracy of the claims being made. Invariably, the claims were wrong or grossly exaggerated.

Having gathered information, it is essential that it be put to the best possible use. In Victoria, at the time of the 2,4,5-T controversy, we had a Pesticide Review Committee which was established in 1966 to advise the Premier on all matters relating to pesticides. On the 2,4,5-T issue, I believe that the most important role of that committee was to keep the Premier advised of all developments both on a regular basis and irregularly as the need arose. Thus, we ensured that the Premier was always aware of the scientific facts and not just the political pressures.

Now I want to look at the 10 groups or individuals who were involved in the controversy to see what might have been done to reduce their influence.

(i) The frustrated scientist

He or she must be challenged at every opportunity but this can be difficult because they are usually reluctant to enter into open debate. However, the more they are challenged by reputable and respected scientists the less influence they have. The worst situation is to allow them to go unchallenged. When they operate through the media, editors should be warned continually of the weaknesses of their arguments. I believe editors will eventually become less receptive to these people.

(ii) The 'out of his her/her field' scientist and (iii) The mischievous academic

With both these people the problem is that their papers or articles are usually published before we know of them. In such cases the weaknesses must be pointed out to the authors and, by correspondence, to the journals where the papers or articles are published. We had one of the articles of a mischievous academic refereed by a competent statistician and his report stated that the statistical component of the article 'reveals a failure to comprehend the logic involved' and the author showed 'a rather irresponsible attitude'. Hardly the comments a responsible academic would welcome.

(iv) The medical profession

Both specialists and general practitioners should be advised of the overall issue and the facts surrounding particular incidents. It is important that they should know the role of competent medical authorities such as the National Health and Medical Research Council and State Health Departments in assessing the hazards of pesticides, in setting the limits on contaminants, such as TCDD, and in dictating the way in which individual pesticides can be used in Australia through the registration procedures. This information, plus reviews of particular pesticides and reports on specific incidents, should be provided by medically qualified scientists through various publications servicing the medical profession. *The Medical Journal of Australia* (particularly for specialists and consultants) and *The Australian Family Physician* (for general practitioners) are appropriate for both letters-to-the-editors and articles.

In addition, I believe it is essential that those doctors making unsupportable diagnoses should be queried by the relevant State Health Department. But this is a difficult area for obvious reasons.

(v) The anti-science/anti-technology movement

The aim here should be to present data at conferences and meetings where the philosophies of these groups are being promoted, showing the need for, and safety of, the procedures under attack and to bring perspective and balance to the argument. Again, reputable and respected scientists must speak out in such situations.

(vi) The genuinely concerned citizen

A well-informed staff equipped with appropriate literature is necessary to service this most important group. In addition, where local resources are not adequate, more knowledgeable specialists must be available to answer their queries promptly. In some cases, medical authorities are necessary for this purpose.

(vii) The pseudo-concerned citizen

They must be provided with appropriate literature and an attempt made to determine their motives. If it is to avoid prosecution for noxious weeds, for example, they should not be allowed to succeed because of the precedent which would be created.

(viii) The politician

Again appropriate literature is necessary, as well as the availability of specialists to discuss and clarify contentious issues.

(ix) The union movement

My experience is that the union movement reflects the attitude of the workers actually applying the pesticide (as it should) and, if the workers are satisfied that there are no problems, then the union does not become involved. Therefore, it is essential to develop a relationship of trust between the organization and its workers by regular discussions, provision of literature, provision of safety equipment etc. so that the workers know that the organization will not expose them to unacceptable risks.

I know this sounds idealistic and the reality might sometimes be that the union is represented by self-seekers who see an opportunity to further their own ambitions by creating concern where none should exist.

(x) The media

There is no easy solution here. We must keep the media supplied with factual material knowing that it will be used often to fuel a fire instead of presenting a balanced picture. We must be frank and open with the media and our spokesmen must be available at short notice, be well briefed and articulate. We must attempt to correct misinformation but, regardless of what we do, the media will always be 'anti-pesticide' because this approach is convenient for generating news. For example,

has anyone seen a T.V. presentation which attempts to communicate the concept of relative risk? It is apparently not newsworthy.

A key question is who should be the spokesperson on pesticide issues? If from industry they will be immediately suspect in the eyes of the public, if from Government service they will need the full support of the Government and their Departments. This support could well be denied, for example, there has been no support for the Agent Orange Commissioner's strong call that the good news on Agent Orange be 'shouted from the rooftops'.

Perhaps in future there will be a much greater role for professional societies in publicizing such views, but this has problems.

I now want to turn briefly to the pesticide industry. On such an issue as 2,4,5-T the industry is under attack and open to criticism no matter what approach it takes. What is needed all the time, and not just when there is a controversy, is a campaign to educate the public on the necessity of agricultural chemicals and the controls which exist over their registration and use. Also the pesticide industry must be positive in condemning any misuse of its products, and related service industries, such as applicators, must have adequate self-regulation to take action against any defaulters in their ranks.

In summary, the two most important things learned from the 2,4,5-T controversy were the need for a commitment at all levels to defend the chemical and the need for information to be available to allow an effective defence to be mounted.

Part of this commitment requires that reputable scientists do not remain silent and that poor science is attacked whenever it is exposed. And yet I can understand why reputable scientists are reluctant to be exposed to the possible distortion of their statements by journalists. This commitment must be supported with funds and staff to meet all the requirements I have mentioned.

Whilst we had problems with this controversy in Australia, the campaign against 2,4,5-T in the United States was much more intense with the use of court injunctions, physical violence to workers and sabotage of equipment. Anti-pesticide groups formed bodies such as CATS (Citizens Against Toxic Sprays) which were well funded (sometimes with Federal funds) and produced sophisticated kits on how to conduct anti-pesticide campaigns.

These bodies were countered to some degree by the formation of pro-pesticide groups with such titles as Citizens for Food and Shelter which developed successful strategies to handle their opponents.

This could well be the pattern for future controversies in Australia.