

2,4-D

Science and Public Perception

by

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As pointed out in an article in *Wheat Life's* October, 1996 issue, the 2,4-D Task Force had submitted the last of the 270 research studies required by the U.S. Environmental Protection Agency (EPA) for the re-registration of the herbicide 2,4-D, and that while ongoing research continues, that phase of the eight year, thirty million dollar project has been completed. By and large, these studies simply confirmed what is already known about 2,4-D, the world's most extensively researched herbicide, and certainly no new "red flags" were raised. The toxicology studies confirmed that 2,4-D, even at extraordinary high doses - - many thousands of times higher than what might be found in the environment - - does not cause cancer in laboratory animals. The studies also confirmed that 2,4-D does not cause birth defects, has low potential to cause neurotoxicity in both short- and long-term exposures and does not cause genetic damage. Nor is it likely to present any threat to wildlife.

Is industry research valid?

This is a question being raised increasingly often by anti-pesticide advocacy groups. Such advocacy groups invariably forget that ninety percent of all American research is done by U.S. industry, and that American research is second to none in the world. They also assume that the 2,4-D studies were done by either the Task Force or its four member companies, a gross misconception. This very specialized research was actually done by more than 50 research laboratories and scientific consulting companies across the country (a list of all of them can be made available on request). The research companies were selected on the basis of their proven ability to meet EPA's extraordinarily stringent Good Laboratory Practices (GLPs) and on the basis of competitive bids.

What are GLPs, and why is a GLP study important? Good Laboratory Practices are a system of strict regulations and controls which must be met on any industry research used for regulatory purposes. This requires, among other things, that each step of the research be properly verified and recorded by the researcher responsible. GLPs require an independent quality audit of each study, something that necessitates the hiring of an independent GLP quality assurance consultant for each study. An unintentional GLP violation can invalidate a study, requiring it to be done over. Since research is very expensive, you

don't want this to happen. Worse, an intentional GLP violation can be a criminal offense, a felony. Meeting EPA GLPs is very serious business. For example, should a finding in research in progress suggest that the substance being tested is more hazardous or toxic than previously believed, the company responsible must report that finding to EPA within 30 days or face the possibility of criminal charges. A GLP study is expensive to be sure, but it is also demonstrably valid.

Only industry research required to meet EPA/GLPs

EPA GLPs apply only to research done by industry for regulatory purposes. Government research organizations, such as the National Cancer Institute, are exempt, a position industry has opposed for many years. Any study, whether done by the government, a university or an environmental organization, should be required to be of GLP quality if it is to be used for regulatory purposes. The fact that they are not is one of the reasons that we see so many contradictory studies reported by the news media. Wheat Life will publish an article in a future issue which will document some appalling examples of this.

2,4-D and the expert panel reviews

2,4-D has now been reviewed by expert independent panels six times in the last decade and all six panels reached the same conclusion - - that the evidence of carcinogenicity was insufficient to establish a cause and effect relationship between 2,4-D and cancer. One panel (Munro et al, Journal of the American of Toxicology, 1992) concluded that any risk associated with the continued use of 2,4-D was "negligible."

Why the huge gap between science and public perception?

Has the fact that 2,4-D now has an extraordinary data base of GLP studies helped close the enormous gap that exists between the science and public perception? The answer, unfortunately, is no. This data base is, for the most part, simply ignored by both the mainstream media and anti-pesticide advocacy groups, as are the expert panel reviews. Let's look at some recent examples.

On July 24, 1995, ABC World News Tonight launched an attack on EPA and the registration program. Reporter John Martin solemnly told viewers that, "By law, manufacturers (of pesticides) submit their own test results to EPA for approval. But the agency has so far rejected about a quarter of all results as incomplete."

That statement seems to imply that pesticide manufacturers do their own research studies, and in so doing, can somehow manipulate the results. As of July 1, 1996, the task force had submitted all 270 studies, EPA had accepted 172 of them, and the remaining 98 were still under review. If the ABC News allegation is correct, EPA will have to reject 67 of the remaining 98 2,4-D studies still in review, a rejection rate that is highly improbable.

But ABC News continued, "Testing and retesting can take years. The pesticide 2,4-D, for example kills weeds, but it also causes cancer in laboratory animals. It stays on the market because the company hasn't finished retesting it. The law sets no priorities, so the companies have no incentive to test what may be the most dangerous products first."

If 2,4-D truly causes cancer in animals, a study would have been done to demonstrate this, and it would be recorded in the scientific literature. There is none. Additionally, EPA has clearly set deadlines for the required studies, a fact the 2,4-D Task Force can attest to through hard experience. I telephoned ABC News Producer Todd Easton to ask what studies showed that 2,4-D causes cancer in laboratory animals, and to ask the source of his other information.

When Easton's telephone screener learned who I was and what I wanted, Todd Easton was first "too busy" to talk to me, and, on later calls, "away from his office." The promised return calls never materialized. I then sent Easton a certified letter explaining why I wanted to talk to him and giving a time when I would call. My later calls brought exactly the same response, the promised return calls never materialized and my letter was never answered.

Where did ABC News get the idea that 2,4-D causes cancer in laboratory animals? Apparently from the anti-pesticide advocacy groups, who are usually treated as "reliable sources." And how is 2,4-D portrayed by such groups? Let's look at a couple of examples.

On September 21, 1995, Ralph Nader and the Cancer Prevention Coalition (CPC) held a press conference in the Lisagor Room of the National Press Club, to announce their annual "Dirty Dozen," a list of twelve widely used consumer products that are allegedly very hazardous to our health; a list, the hosts told us darkly, that was compiled "as information on their hazards is being withheld from American consumers." Ortho's Weed-B-Gon, a consumer lawn care product containing 2,4-D, was number twelve on the list. Such rather innocuous products as Borden's whole milk, Johnson & Johnson's baby powder, Crest Tartar Control Toothpaste and Ajax Cleanser preceded 2,4-D on the list. The press conference received extensive coverage from ABC, CNN, CBS, NBC, the Associated Press, etc.

The press conference was called, it turns out, not only to publicize the "dirty dozen," but to promote the sale of a book written by Samuel Epstein, CPC's Chairman, and David Steinmann, an "investigative reporter" and CPC board member. The information given out on Weed-B-Gon labeled 2,4-D "carcinogenic, neurotoxic" and "a reproductive toxin." No sources for this information were given, but the book being promoted, *The Safe Shoppers Bible*, shows 2,4-D to be a carcinogen and should "never be used," a neurotoxin and a reproductive toxin. What references does it cite for this information? It cites Jay Feldman of the National Coalition Against the Misuse of Pesticides (NCAMP).

A leaflet widely distributed in Michigan by the Mid Michigan Sustainable Organic Organization charges, "2,4-D has been found to damage chromosomes, and cause birth defects and tumors in lab animals." The leaflet continues, "One reason 2,4-D has been allowed to remain in use is that EPA has ignored and/or misinterpreted data on its ability to cause cancer." The references cited? None.

Another leaflet distributed by the Minnesota Herbicide Coalition takes a somewhat different tack. Apparently 2,4-D is not the problem. But, 2,4-D "degrades into 2,4-DCP" (2,4-dichlorophenol) which is "more toxic, persistent" and a known "carcinogen, mutagen, teratogen, fetotoxin" and is "toxic to birds, fish, bees and aquatic insects." Further, the leaflet continues, "EPA lists as groundwater contaminant." The 2,4-dichlorophenol toxicology supports none of these charges, and 2,4-DCP is actually somewhat less toxic and less persistent than 2,4-D. EPA shows 2,4-D to be an "unlikely" groundwater contaminant. This is partly due to 2,4-D's relatively short half-life, and the fact that it degrades all the way down to carbon, carbon dioxide and common salt. In this respect, it is a biodegradable compound. Who does the Minnesota Herbicide Coalition show as references? NCAMP, the N.W. Coalition for Alternatives to Pesticides and the Rachel Carson Council, Inc.

A leaflet distributed in northern New York which purported to have been produced by the Erie County unit of the American Cancer Society (ACS) and carried the ACS logo, attacked many lawn and garden pesticides, including 2,4-D, alleging a proven link had been established between the pesticides mentioned and cancer. On September 16, 1996, Dr. Clark W. Heath, Jr., Vice President, Epidemiology and Surveillance Research, American Cancer Society, stated that the brochure did not have the endorsement of the ACS and they tried to have it withdrawn. In his letter, Dr. Heath says that the brochure "contained statements that gave the misleading impression that research studies have proven a causal relationship to human cancer, instead of recognizing that the studies cited merely raised or suggested such a hypothesis." Nevertheless, the brochure continues to be distributed by anti-pesticide advocacy groups in both New York State and Ontario with the most recent distribution being done on a door-to-door basis by the Uxbridge (Ontario) Conservation Association.

2,4-D and the future

On the brighter side, the cancer charges seem to be occurring less frequently, and the public seems less likely to be frightened by them. In the case of 2,4-D, perhaps there is now just too much data to the contrary and the public seems to be tiring of such charges. How many people really believe that the use of such respectable products as Johnson & Johnson baby powder, Borden's milk, Crest toothpaste or Ajax cleanser will really give us cancer? Or that these companies are evil enough to attempt, as the Ralph Nader press release states, to hide this information from us? Morality aside, the selling of a carcinogen in today's litigious society is extremely bad business.

Yet pesticides will always be a prime target for activists. Pesticides, by definition, kill pests; they are always toxic to some degree and must be handled accordingly. Their enormous benefit to agriculture and mankind is too often simply taken for granted, and many urban and suburban people are content to assume that their food and fiber come from the local shopping mall. Further, "environmentalism" is now very big business with the jobs of tens of thousands of people depending on it. Activist groups must constantly demonstrate a need for their existence in order to maintain the public support necessary to pay their salaries. With the cancer issue more or less beaten to death, we can expect new and more vaguely defined alarms to be sounded. The current "endocrine disruptor" scare is a classic example.

2,4-D: an endocrine disruptor?

Endocrine disruption is a hypothesis which suggests that many man-made chemicals in the organochlorine group may have the potential to mimic human hormones such as estrogen, and thus may be a cause of cancers of the breast, uterus, prostate, testes, etc., along with such hormone related effects as decreased sperm counts, infertility, and altered child development, with similar effects on wildlife. This issue was very vividly brought to the public's attention with the early 1996 publication of *Our Stolen Future*, a book written by Theo Colborn of the World Wildlife Fund. The book was written much like a detective story, with endocrine disruption the criminal to be tracked down. The book appears to present endocrine disruption by man-made chemicals, not as a hypothesis, but a scientific fact. Although the impact of the book has been considerably less than that of *Silent Spring* (to which Vice President Al Gore compares it in the foreword), it has motivated many environmental groups to call for the banning or strict regulation of all man-made organochlorines, which would include many pesticides and a whole array of very useful products, including medicines.

Regulators have been much more cautious (see "Endocrine disruption data still too weak to serve as basis for pesticide regulation, scientists agree," *Pesticide and Toxic Chemical News*, October 9, 1996). One of the problems facing scientists investigating this issue, is that compounds of this type are both man-made and naturally occurring. Flavonoids present in most fruits and vegetables are, by far, our largest dietary source of such compounds. A recent study (see Safe, Stephen, *Environmental Health Perspectives*, Vol. 3, No. 4, 1995) measured the estrogen equivalents per day from normal fruit and vegetable consumption at 102 versus 0.0000025 from daily dietary exposure from all man-made sources, including pesticides. Compare this with exposure from the birth control pill (16,675) or the "morning after" pill (333,500), and you can see why scientists are proceeding cautiously with the hypothesis.

Nevertheless, activist groups have already jumped on the endocrine disruptor bandwagon, and are pumping out alarmist literature. A recent example is a report entitled, *Growing doubt: A Primer on Pesticides Identified as Endocrine Disruptors and or Reproductive Toxicants*, by Benbrook Consulting Services of Washington, D.C., a consulting

service which apparently specializes in writing reports for activist groups. This report, which deals with endocrine disruption as a proven fact and further "identifies" a number of pesticides as proven endocrine disruptors, received significant media attention. It was prepared for the National Campaign for Pesticide Policy Reform.

The report identifies 2,4-D as both an endocrine disruptor and reproductive toxin, although 2,4-D hardly fits the classic profile of the hypothetical endocrine disruptor (if, indeed, there is such a thing as a "classic profile" of hypothetical chemical activity). In any event, the type compound generally believed to be the best candidate for such activity is a very persistent (in the environment) organochlorine compound which gets into drinking water or the food chain and then bioaccumulates (i.e., concentrations increase over time in the body fat or some body organ and remain there for long periods of time). Activists generally point to DDT or chlordane as examples, although both of these compounds have been banned for decades. By contrast, 2,4-D is not a persistent compound, is unlikely to get into either the food chain or ground water and does not bioaccumulate. Additionally, the animal feeding studies show no evidence of cancer, no toxicity in hormone sensitive organs, no evidence of male reproductive toxicity and no evidence of birth defects. But, again, 2,4-D is a compound almost everyone recognizes and many people use, making it always a prime target for activists. There is little point for activist groups to target compounds which few people use or recognize. To get media attention, they must target widely used products, and for that reason, you can expect to see 2,4-D the subject of many more alarmist "news" reports to come.