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Dioxin and 2,4,5-T: what are the risks?

A court case due to take place on Monday will decide for, or against, the use of the herbicide 2,4,5-T in the United States. Two old adversaries, the Dow Chemical Company and the Environmental Protection Agency, will argue the case over the legality and validity of the partial ban on 2,4,5-T currently in operation in the US. Dow Chemical, the largest manufacturer of 2,4,5-T in the world, will challenge the ban imposed by the EPA in March of last year; it is Dow's view that 2,4,5-T poses no risk to users.

There are those in the EPA who now believe that Dow will win the case. The Agency's own study linking 2,4,5-T spraying with an increase in spontaneous abortions in the state of Oregon — information on which the decision to ban the herbicide was based — apparently has serious flaws. The study has been severely criticised on methodological grounds by many independent scientists, and at least three reports have been produced opposing the EPA's findings. They argue that the areas of land chosen in the original EPA report were not carefully matched and therefore could not be regarded as truly representative of a 2,4,5-T sprayed area and control area. In addition, differences in hospital admissions for miscarriages vary among the regions chosen for study, and these practices, critics charge, were not given due consideration in the original study.

Such criticisms may be justified, and a reappraisal of the Oregon study, taking these additional factors into account would probably remove the association between miscarriages and 2,4,5-T spraying.

Evidence that the EPA is indeed moving away from a reliance on the Oregon study is provided in the Federal Register of 13 December, 1979. The Agency now appears to be basing its decision to call for a total ban on 2,4,5-T on the fact that the 2,3,7,8-tetrachlorodibenzo-p-dioxin (dioxin) contaminant present in the herbicide is an established animal carcinogen. Many oncologists now consider that there is no safe threshold dose for a carcinogen, and the EPA considers, therefore, that to expose the public to such a chemical by permitting usage of 2,4,5-T poses an unacceptable risk.

There are many in the EPA who believe, however, that in spite of the presence of dioxin in 2,4,5-T there is still no hard evidence of a health risk from the herbicide. A recent request from Dow Chemical under the Freedom of Information Act for all of the EPA's documentation on 2,4,5-T could well provide confirmation of the lack of this evidence. If Dow's request is granted, the EPA's case for seeking a permanent ban on the herbicide could well be undermined.

Evidence elsewhere against 2,4,5-T is not very strong either. The best study to date was completed in Sweden and produced evidence that among those exposed to 2,4,5-T and chlorinated phenols in the course of their work in the lumber industry, there was a six-fold increase in soft tissue sarcomas. But even in this study confounding factors may not have been taken fully into account and the Swedish government is reassessing it.

It is therefore quite clear that more good and reliable data need to be collected for a proper assessment of the hazards of exposure to 2,4,5-T and its contaminant, dioxin. The best place to seek such data is in the medical records of those who have been or will be involved in the manufacture of 2,4,5-T, since they are most likely to be at risk. In particular that is so because dioxin, which poses the greatest potential hazard, is generally present in larger concentrations during the manufacture of 2,4,5-T than during its use. And to conclude that 2,4,5-T is safe to use without reviewing the full evidence on industrial exposure, as did the UK Ministry of Agriculture, Fisheries and Food last March, is distinctly unsound.

At present the available industrial data are limited and concentrate on exposure after accidents. There is some evidence for a clustering of gastro-intestinal cancers among BASF workers who were exposed to dioxin in an accident in West Germany in 1953, and for an increased rate of heart attacks after an industrial accident in Amsterdam at the Philips Duphar plant in 1963. Monsanto have studied the after-effects of a 1949 accident, and concluded that among affected workers there was a normal incidence of cancer and a lower than normal incidence of heart attacks (*Nature* 14 February, page 613).

More industrial data are needed and must already be available both from the UK firm of Coalite and Chemical Products Ltd., whose reluctance to reveal its data we reported last week, and elsewhere. It is therefore essential that Coalite should reveal the study it has already done and conduct further studies using proper controls and including all those exposed to dioxin whilst in its employment. And when it has done so it must pass the data on to the two bodies which are accumulating a world data-base on 2,4,5-T: the US National Institute of Occupational Safety and Health and the International Agency for Research on Cancer. Only when good studies are complete and openly available can the air be cleared for or against 2,4,5-T. □

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