

FROM
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DATE : April 3, 1979 -
SUBJECT : Q&A ON "AGENT ORANGE" DIOXIN - KRUMMRICH
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Attached is a preliminary Q&A on "Agent Orange" dioxin at the W. G. Krummrich Plant. Questions have been raised by employees regarding exposure. The final version of our Q&A listing would be used to respond to individual questions from employees and to answer press queries.

I would appreciate any comments you may have as soon as possible.

Thanks.

John J. Spano

JJS:pa
Attachment

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PREPAREDNESS Q&A RE "AGENT ORANGE" DIOXIN AT KRUMMRICH

- Q. When did you make "Agent Orange" brush defoliant for the U.S. Government at the W. G. Krummrich Plant?
- A. Monsanto was one of several companies asked to supply this compound during the Vietnam War. "Agent Orange" was a mixture of the commonly used herbicides 2,4-D and 2,4,5-T. We made 2,4-D at the Krummrich Plant and used some 2,4,5-T at the Krummrich Plant during the period from 1947 to 1968. We decided to cease production for economic reasons.
- Q. How many people were involved over the years in these operations?
- A. There may have been as many as _____. We are checking our records now to determine this information.
- Q. What are the long-term effects of exposure to "Agent Orange" dioxin?
- A. There are no known long-term physical effects but this subject has not been studied in depth. There are now under way, or will be under way shortly, studies to determine whether long-term effects, if any, have been produced from exposure to "Agent Orange."
- Q. What are the short-term effects?
- A. Acne - formed lesions, peripheral nerve involvement and liver disfunction. These symptoms, however, decrease and disappear over a long period of time.
- Q. What is the situation at Krummrich?
- A. Monsanto made 2,4,5-T acid at Nitro, West Virginia. A health study is currently under way to determine long-term health effects, if any, of "Agent Orange" dioxin exposure. Dioxin is the impurity in "Agent Orange" which is thought to be responsible for health effects. A situation at Nitro is different from that at W. G. Krummrich because there was gross exposure at Nitro due to accidental rupture in a manufacturing process. If the current studies under way at Nitro indicate that there may be adverse health effects from exposure to "Agent Orange" dioxin, we will institute similar studies at Krummrich.

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- Q. What is the status of the various class action law suits being brought against Monsanto and other "Agent Orange" producers?
- A. These suits are all in early stages of development. Monsanto intends to vigorously contest them on the grounds that they are not supportable in fact or law.

The potential health hazards of "Agent Orange" were fully explored by a committee of the National Academy of Science in 1974 which found no evidence of human health problems associated with exposure to this herbicide. The major constituents of "Agent Orange" (2,4-D and 2,4,5-T, containing trace amounts of dioxin) have been the subject of more than 40,000 scientific papers and technical articles in the past 30 years. These studies show that they are not significantly hazardous to human or animal life under normal and recommended conditions of use.

A recent article in the St. Louis Globe-Democrat quoted both the Veterans Administration and the U.S. Environmental Protection Agency as saying "there is no conclusive evidence of a correlation between exposure to herbicides in Vietnam and medical problems that may exist today."

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The term "Dioxin" has recently become a household word, as had asbestos, PCB's and DDT during the last decade. Actually, "Dioxin" is a term commonly used as the abbreviation for 2,3,7,8-tetrachlorodibenzo-p-dioxin, a polycyclic chlorinated compound. Dioxin is an unwanted contaminant formed during several chemical processes (such as 2,4,5-T production) and also during incineration of industrial and municipal wastes.

Here at the Nitro Plant 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), a herbicide, was produced from 1948 to 1969 in Buildings 41, 34, 51 and finally 92, which was demolished in 1972. On March 8, 1949 a violent reaction and decomposition occurred which released vapors and a tarry residue into the atmosphere. 121 personnel developed chloracne, a skin condition resembling but usually more severe than adolescent acne, who were either exposed during the release or during cleanup operations. It is believed that dioxin was the chemical that caused the chloracne.

There have been several other incidences of human dioxin exposure in recent years. Agent Orange, a herbicide used in Vietnam, was a 50:50 mixture of 2,4-D and 2,4,5-T with a dioxin contamination level estimated at 2 ppm. Studies to date have shown no differences in health status between those soldiers who were exposed to Agent Orange and a control group of soldiers who were not. In July of 1976, dioxin was released from a trichlorophenol plant in Seveso, Italy when a safety disc on a reactor ruptured. An area of about one square mile was contaminated with the settling reactor contents, potentially exposing upwards of 37,000 people. There have been 134 confirmed chloracne cases as a result of this release. Studies on the exposed groups continue, but to date there have been no increases in deaths, cancers or other health problems when compared to a non-exposed Italian control group.

Several incidences of dioxin contamination have also occurred in Missouri. In 1971, waste oil contaminated with dioxin was sprayed on horse arenas to keep dust down. Over 65 horses and other animals died and one girl developed an inflamed and bleeding bladder, which returned to normal after her exposure was stopped. The latest incident was in Times Beach, Missouri when contaminated soil from similar oil spraying activities on dirt roads and in landfill soil was found to contain various levels of dioxin. EPA was put under pressure to alleviate the problem, and because the human health effects besides chloracne are not known, they decided to buy out the residents and evacuate the town.

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There were no diagnosed cases of chloracne, which is considered to be the most sensitive indicator (clinical marker) of human exposure; however, the evacuated people were emotionally affected through national media coverage and simultaneous flooding of the Merrimac River.

As stated above, chloracne is the predominate health effect diagnosed in humans, and if absent, other adverse health effects are not likely. Following occupational exposures, symptoms have been reported of fatigue, nerve response changes and liver toxicity. Follow-up surveys have shown that these effects are reversible, except for possible permanent scarring from severe chloracne cases.

Extensive dioxin studies have been performed on a variety of animals with a wide range of results found.

Actually, animal studies are the reason for much of the concern and confusion about the toxicity of dioxin. For example, a very minute amount of dioxin can kill the guinea pig, whereas 5,000 times more is necessary to kill a hamster (however, still a small amount). Also, the cause of death or toxic effect often differs between animals making it difficult to anticipate what amount and what effect dioxin will have on humans.

Another important consideration when discussing dioxin is the route of exposure. In animal studies, the dioxin is usually administered either in food or injected directly into the body. Dioxin is a solid at room temperature so therefore doesn't evaporate and become an airborne vapor. Dioxin is essentially non-soluble in water and tends to attach firmly to soil particles. Sunlight has been shown to be effective at breaking down this chemical quickly, which diminishes potential health concerns on plants, upper layer of ground and equipment. But because dioxin is tightly bound to soil and does not dissolve in water, it tends to remain in the soil subsurface for a long period of time. The soil would have to be disturbed and either eaten or rubbed on the skin to be a potential health concern.

Studies continue on dioxin and it will be some time before the accurate toxic level and effects on man are known. It will remain an emotional issue probably for awhile and will continue as a national media story.

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