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CANCERS AND EXPOSURES IN AGRICULTURE

I had an inquiry from a Saline County farmer who both he and his wife, within a couple of years, a kidney removed due to cancer. Water tests for nitrates, heavy metals, arsenic and uranium were all negative. He wanted to learn more if his pesticide use in his farming career could have been a factor. He admitted he didn't use personal protective equipment like I have preached at applicator trainings but now it was hitting home. Kidney cancer is very low incidence in Nebraska, let alone both he and his spouse?

I looked at the National Agricultural Health study which is a highly regarded cohort study where more than 89,000 farmers and spouses in Iowa and North Carolina have been monitored concerning their health since 1993. More specifically, the study included 52,394 licensed private pesticide applicators (mostly farmers) from Iowa and North Carolina, as did 32,345 of their spouses. UNL Professor Emeritus Larry Schulze emphasized the high credibility that this ongoing study has.

As a cohort study, the Ag Health Study enrolled participants, collected their detailed medical history, and then monitored these individuals over the years for any health developments. Over time, participants are re-contacted to learn of changes in health, for updated information on farming practices, lifestyle, and health and they were asked to complete a dietary questionnaire and provide a sample of cheek cells as a source of DNA. That is the beauty of a cohort study.

In contrast, a case health study contacts individuals that have known cases of health concerns and attempts to search backwards in time to determine the causes of illnesses, the sources of exposures to pathogens and/or chemical/environmental residues. In case studies, information that is collected is fully dependent upon the memories of the participants. These data automatically can be incorrect. In many situations, information is collected from participants' survivors, which can be highly unreliable.

Schulze found only one report concerning kidney cancer since the study began 26 years ago and it was related to cigarette smoking. No report has been published from the Ag Health Study that associated any pesticide (which includes herbicides) with kidney cancers, however, there are some disturbing trends.

A higher incidence of Parkinson's disease was associated with some applicators using Paraquat, Permethrin or Trifluralin (Treflan). It was not associated with those applicators who wore gloves and practiced good workplace hygiene. Of note, a chemical called "MPTP" causes Parkinson's like symptoms. MPTP is chemically similar to Paraquat herbicide.

The study indicated significant increases of the risk of aggressive prostate cancer associated with four older insecticides: Fonofos (organophosphate, no longer registered for use), Malathion (organophosphate), Terbufos (organophosphate), and Aldrin (organochlorine, no longer registered for use).



The study adds further evidence that high level pesticide exposure, such as physician-diagnosed pesticide poisoning, is associated with increased risk of depression with women. Participants who used the old chlorinated insecticides (Lindane and DDT both now banned for use) were more likely to develop NHL or Non-Hodgkin Lymphoma. Researchers state there needs to be further work on a possible link with Terbufos, Diazinon, and Permethrin with NHL. There is a wide range of exposures in agriculture, including pesticides, solvents, engine exhaust emission, UV light, dust, as well as zoonotic viruses and bacteria. Exposures can vary considerably between occupations, and even between farms, therefore, future research must focus on specific exposures to identify and clarify which risk factors may contribute to the observed pattern of cancer incidence. For more information on the Ag Health Study, go to: <https://aghealth.nih.gov/>

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