ORNAMENTALS NORTHWEST ARCHIVES

May-June 1988
Vol.12, Issue 3
Pages 5-6

Robert H. Stamps, Central Florida Research and Education Center
2807 Binion Rd., Apopka, FL 32703

CANCER RISK: THERE IS MORE TO PESTICIDE SAFETY THAN ACUTE TOXICITY[1]

Acute toxicity tests give an indication of how much of a chemical, in a single dose, is required to kill test animals. However, there is more to pesticide safety than acute toxicity. Recent studies indicate that even if a person has never been acutely poisoned by pesticides, their health may still be adversely affected by exposure to some pesticides and those pesticides do not have to be highly toxic, i.e., have low LD50s and LC50s. Many of these studies have dealt with the effects of exposure, especially by farmers, to chemicals (pesticides and otherwise) on the risk of developing cancer. Although farmers generally enjoy better health and lower mortality than those with nonagricultural pursuits (3), it appears that farmers are more likely to develop certain types of cancer.

In 1979 Swedish investigators reported that exposure to phenoxyacetic acids (such as the phenoxy herbicides 2,4-D, 2,4,5-T, and MCPA) or **chlorophenols** (used to preserve woods and waterproof leather and textiles**) gave an approximately 6-fold increase in the risk of soft-tissue sarcomas** (STS) [cancerous tumors] (6). A subsequent study (4) in a different part of Sweden confirmed the earlier findings. The later study showed that the increase in risk of developing STS held even for exposure to supposedly contaminant-free phenoxy acids, such as MCPA, dichlorprop and mecoprop. Importantly, persons who owned or were employed on farms where chemical pesticides were sprayed, but who were not actively involved in the spraying showed no increased cancer risk.

A 1981 study, again in Sweden, added organic solvents, for example benzene and styrene, as probable causative factors in malignant lymphoma [tumor of lymphoid tissue-Hodgkin's disease (HD) and non-Hodgkin lymphomas (NHL)] (5). **Exposure to phenoxyacetic acids, chlorophenols, and certain organic solvents increased the risk of cancer 4.6 to 6 times.**

A study comparing the death rates due to multiple myeloma (a cancer of well-differentiated B-cells) of farmers versus non-farmers in Wisconsin found that farmers in counties with high insecticide and fertilizer use had elevated (1.9X and 1.7X respectively) risk of developing cancer (3). **Non-farmers from highly agricultural counties did not have increased risk of cancer** compared to non-farmers from counties with low farm activity indicating that an increase in cancer risk may require fairly direct exposure to pesticides and fertilizers.

A 1983 study of Iowa "farmers" found that they were at increased risk of dying due to the following cancers when compared to nonfarmers: multiple myeloma, 1.48; non-Hodgkin's

lymphoma, 1.26; prostrate cancer, 1.19; and stomach cancer, 1.32 (2). Only the first two cancers were associated with pesticide use. The results of a 1984 study of farmers in a northwestern Illinois county came up with results similar to the 1983 study in Iowa (1).

More recently, a 1986 study in Kansas found farm herbicide use to be associated with increased risk (1.6X) of non-Hodgkin's lymphoma (7). Relative risk of NHL increased with number of days of herbicide exposure per year and with increasing years of herbicide use. Men exposed to herbicides more than 20 days per year had a sixfold increased risk of NHL. Frequent users who mixed or applied the herbicides themselves had an eightfold increased risk of NHL.

Farmers who did not use protective equipment, such as rubber gloves or masks, had a higher cancer risk (2.1X) associated with herbicide use than those who protected themselves (1.5X).

Farmers who used backpack or hand sprayers had a higher risk (2.1X) than those who applied herbicides using tractor-mounted or mist-blower spraying (1.5X) and aerial application (1.5X).

Summary

Treat all chemicals with respect. Exposure to all pesticides, as well as other chemicals such as organic solvents, should be kept to a minimum regardless of the acute toxicity rating (LD50s and LC50s) of the compound. Protective gear should be worn whenever these products are being used, and application methods that reduce contact with these chemicals should be employed whenever possible.

References

1. Buesching, D.P., and L. Wollstadt. 1984. Cancer mortality among farmers. JNCI 72-503.

2. Burmeister, L.F., G.D. Everett, S.F. Van Lier and P. Isacson. 1983. Selected cancer mortality and farm practices in Iowa. AmJ.Epidemiol. 118:72-77.

3. Cantor, K.P. and A. Blair. 1984. Farming and mortality from multiple myeloma: a case-controlled study with the use of death certificates. JNCI 72:251-255.

4. Eriksson, M., L. Hardell, N.O. Berg, T. Moller, and O. Axelson. 1981. Soft-tissue sarcomas and exposure to chemical substances: a case-referent study. Br. J. Ind. Med. 38:2733.

5. Hardell, L., M. Eriksson, P. Lenner, and E. Lundgren. 1981. Malignant lymphoma and exposure to chemicals, especially organic solvents, chlorophenols and phenoxy acids: a case-controlled study. Br. J. Cancer 43-169-175.

6. Hardell, L. and A. Sandtrom. 1979. Case-controlled study: Soft-tissue sarcomas and exposure to phenoxyacetic acids or chlorophenols. Br. J. Cancer 39:711-717.

7. Hoar, S.K., A. Blair, F.F. Holmes, C.D. Boysen, R.J. Robel, R. Hoover, and J. F. Fraumeni, Jr. 1986. Agricultural herbicide use and risk of lymphoma and soft-tissue sarcoma. J. Amer. Med. Assoc. 256:1141-1147.

8. Stamps, R.H. 1986. Pay attention to those LD50s and LC50s. Cut Foliage Grower 1(9):1-4.

[1]*(Reprinted from: Cut Foliage Grower 1-10:1-3, 1986*). §
