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PESTICIDES & Toxic Substances MONITORING REPORT

PESTICIDE MONITORING TRANSFERRED-NOW TO INCLUDE TOXICS

With this issue, the Pesticide Monitoring Semi-Annual Report becomes the Pesticides and Toxic Substances Monitoring Report. The Ecological Monitoring Branch was transferred in August 1979, to the Survey and Analysis Division of the Office of Program Integration and Information. The Survey and Analysis Division (SAD) is made up of three Branches, the Sources and Fate Branch (SFB), Design and Development Branch (DDB) and Field Studies Branch (FSB). SFB is responsible for the production of material balances which trace the flow of chemicals from manufacture through disposal, and for the identification of sites and sources of exposure to chemical substances. DDB is responsible for developing research, sampling and statistical designs for field studies and extrapolating from field study exposure data to populations of concern. FSB is responsible for conducting exposure assessment field studies to support the Toxic Substances Control Act (TSCA) and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) actions and chemical emergency investigations. This includes the monitoring of pesticides and toxic substances in soils, water, air and humans. FSB also includes the Toxicant Analysis Center in Bay St. Louis, MS, which is responsible for performing the chemical analysis of the field studies samples.

As an integral function of the Survey and Analysis Division, the monitoring programs will continue to monitor pesticides as mandated under FIFRA and expand efforts for non-pesticidal toxic substances as mandated by TSCA. Exposure monitoring data will continue to be developed by both long-term ambient networks and by special studies of chemical problems. Coverage of toxics monitoring information in this report will expand in future issues.



U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Pesticides & Toxic Substances
Survey & Analysis Division
Washington, D.C. 20460

David Redford - Editor

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INTRODUCTION

The Survey and Analysis Division functions to detect and assess evidences of human and environmental exposure to pesticides and other toxic chemicals. Current activities emphasize detection and quantitation of such residues. Agency responsibility for monitoring is mandated under Public Law 92-516 (Federal Insecticide, Fungicide, and Rodenticide Act, as amended) and Public Law 94-469 (Toxic Substances Control Act).

In fiscal year 1979, the Field Studies Branch has operated ambient monitoring activities in human adipose tissue, human blood serum, human urine, urban soils, surface water, and associated bottom sediments. Limited suburban air monitoring studies at nine sites have continued to be directed at chemicals of high regulatory interest. Existing monitoring programs in estuarine organisms and agricultural soils are not being conducted currently. Special projects in direct support of the Office of Pesticide Programs and other internal Office of Pesticide and Toxic Substances units are continuing. Analytical activities at the Toxicant Analysis Center have been modified slightly to support studies for the Effluent Guidelines Division, Office of Water and Waste Management.

Branch project officers are located in EPA Headquarters, Washington, D.C. Residue chemistry is performed at our Toxicant Analysis Center, Bay St. Louis, Mississippi, and under contract and cooperative agreement with selected State and University laboratories and other institutions.

This report seeks to provide potential users of monitoring information with a brief update on data, programs, and highlighted activities of the Branch that may be useful in their respective programs. Data summaries are necessarily incomplete and therefore subject to further evaluation.

Any reports referred to in this newsletter may be obtained by request addressed to Branch Secretary, Field Studies Branch, Survey and Analysis Division (TS-793), EPA, Washington, DC 20460.

For additional copies of this report, call the Industry Assistance Office toll free 800-424-9065. In Washington, D.C. call 554-1404.

NATIONAL HUMAN MONITORING PROGRAM

(Contact: Ms. Sandra C. Strassman-Sundy, 202/755-8060)

The National Human Monitoring Program is continuing to participate in the Health and Nutrition Examination Survey (HANES II), a 4-year endeavor to collect and evaluate medical and nutritional information from a random sample of the general population residing in 64 locations throughout the United States. Specimens of human blood serum and urine are being collected from survey participants under a cooperative agreement with the National Center for Health Statistics of the Public Health Service, and forwarded to EPA laboratories for pesticide-related residue determination.

All blood serum samples are being analyzed for residues of selected organochlorine pesticides; the urine samples are being analyzed for residues of selected organophosphate, chlorophenoxy, and carbamate pesticides. At the completion of the field examinations in March 1980, approximately 7,500 samples of human blood serum and a similar number of human urine samples had been collected for these pesticide residue and metabolite assessments.

Preliminary statistical summaries of these data are updated periodically as additional analytical reports become available. The residue data presented in the following table indicate the urinary metabolite residue levels which may result from exposure to selected pesticides. In evaluating or extrapolating these findings, please keep in mind that these data are of a preliminary nature and are subject to additional evaluation. Further, they may not be representative of the general population at this time.

Frequency and Mean Levels of Selected Pesticide Residues in Human Urine, Preliminary Data

<u>Pesticide</u>	<u>Chemical Detected</u>	<u>Percent of Samples Positive</u>	<u>Arithmetic Mean (ppb)</u>
Carbaryl & Naphthalene	<u>alpha-Naphthol</u>	2.3	< 10
Propoxur	Isopropoxyphenol	5.0	< 40
Carbofuran	Carbofuran phenol and	4.4	< 40
	3-Ketocarbofuran	4.5	< 30
Pentachlorophenol, Lindane and Hexachlorobenzene	Pentachlorophenol	81.0	7.4
Methyl and Ethyl Parathion	<u>para-Nitrophenol</u>	3.2	< 10
2,4-D	2,4-D	0.5	< 5
2,4,5-T	2,4,5-T	ND*	-
Silvex	Silvex	ND	-
Chloropyrifos	3,5,6-Trichloro-2-pyridinol	6.5	< 5
2,4,5-Trichlorophenol used as a disinfectant; or a metabolite of certain organochlorine insecticides	2,4,5-Trichlorophenol	3.1	< 5
Dicamba	Dicamba	1.3	< 5
Malathion	<u>alpha-Monocarboxylic Acid</u> and Dicarboxylic Acid	1.6	< 30
Any organophosphorus insecticide containing these phosphate or thiophosphate molecules	DMP	11.7	< 20
	DEP	7.5	< 20
	DMTP	6.5	< 20
	DETP	7.0	< 20
	DMDTP	0.4	< 20
	DEDTP	0.1	< 20

1 Preliminary data based on the analysis of 4480-4580 samples collected from the general population via the Health and Nutrition Examination Survey II (HANES II), National Center for Health Statistics.

*ND = Non Detected.

WATER MONITORING PROGRAM
(Contact: Mr. Thomas E. Dixon 202/755-8060)

Current operations of the Water Monitoring Program provide for analysis of surface water and sediment samples collected in cooperation with the U.S. Geological Survey. This includes 600 whole water samples, collected four times per year and 300 sediment samples, collected twice per year from about 150 sampling stations. The samples are analyzed by EPA's Toxicant Analysis Center at Bay St. Louis, MS, for selected organochlorine and organophosphorous pesticides, PCBs, phenoxy and triazine herbicides. Results from this program will be presented in the next monitoring report.

NATIONAL SOILS MONITORING PROGRAM
(Contact: Ann Carey, 202/755-8060)

URBAN SOIL MONITORING

- 1979: Sampling of metropolitan area soils in Pittsfield, Mass., Washington, DC., Evansville, Ind., Greenville, S.C., and Takoma, Washington was completed by the end of September 1979. These samples are being analyzed for selected pesticides, toxic chemicals and heavy metals, and these cities are not among those sampled in 1978.
- 1978: Most of the scheduled analyses have been completed for the samples from those cities collected in late summer of 1978. Preliminary results of the soil analyses from those cities indicate a declining trend in 3 of 4 cities for the percentage of sites with detectable concentrations of organochlorine compounds (see Table below).

Sites With Detectable Conc. of Organochlorines

<u>Location</u>	<u>Number of Samples</u>	<u>1972</u>	<u>1978</u>
Fitchburg, Mass	45	71%	38%
Pittsburgh, Pa.	194	18%	21%
Reading, Pa.	51	31%	27%
Lake Charles, La.	70	26%	06%

1976: Results of mercury analyses are shown below for the 14 cities sampled in 1976. Median values are presented as well as minimum and maximum values encountered, all as ppm dry weight.

<u>Location</u>	<u>No. of Samples</u>	<u>Median</u>	<u>Min-max</u>
Grand Rapids, Mich.	22	0.10	0.05 - 1.39
Sioux City, Iowa	22	0.10	0.05 - 0.90
Sikeston, Mo.	27	0.26	0.18 - 4.50
Memphis, Tenn.	28	1.00	0.12 - 1.44
Richmond, Va.	27	0.74	0.30 - 2.88
Cheyenne, Wyo.	19	1.05	0.65 - 2.48
Charleston, SC	26	0.86	0.14 - 1.56
Philadelphia, Pa.	24	0.71	0.26 - 2.60
Greenville, Miss.	28	0.11	0.03 - 3.54
Augusta, Maine	25	0.12	0.10 - 0.24
Honolulu, Hawaii	21	0.14	0.03 - 0.47
Wilmington, Del.	25	0.46	0.08 - 4.80
Portland, Ore.	25	0.32	0.14 - 5.40
Mobile, Ala.	23	0.12	0.06 - 1.04

AIR MONITORING ACTIVITIES

(Contact: Mr. Henry Yang 202/755-8060)

Suburban Air Monitoring Program

A. The final results of chemical analysis of air samples collected in FY 1977 have become available. Presented below are the arithmetic mean concentrations of detected pesticides in ng/m³ at the four sites sampled.

	<u>Pasadena, California</u>	<u>Wheaton, Illinois</u>	<u>Greenville, Mississippi</u>	<u>Midvale, Utah</u>
Alpha-BHC	1.01	2.46	1.07	1.14
Aldrin	ND	2.53	0.34	0.43
Cis-chlordane	2.75	1.96	ND	ND
Trans-chlordane	4.36	0.79	1.37	ND
DDT/DDD	6.58	9.56	6.44	2.80
Diazinon	1.94	ND	47.19	1.86
Dieldrin	ND	1.90	ND	ND
HCB	0.67	0.62	26.07	0.73
Heptachlor	1.37	ND	1.85	4.88
Heptachlor Epox.	ND	0.30	ND	ND
Lindane	2.86	1.20	18.13	0.43
Malathion	ND	2.46	30.80	ND
Methyl parathion	ND	ND	15.00	ND

Toxaphene	ND	ND	28.04	ND
Dursban	ND	ND	0.50	ND
Oxy-chlordane	ND	ND	0.70	ND

*ND -- Not Detected

B. In FY 1978, 70 air samples were collected at five sampling sites. Chemical analysis of these samples is near completion. Results will be available soon.

C. The FY 1979 air monitoring plan includes nine sampling sites with collection of 110 air samples. The nine sites are Pasadena, California; Fresno, California; Lubbock, Texas; Harlingen, Texas; Leland, Mississippi; Houston, Texas; Kalispell, Montana; Columbia, South Carolina; and Sanget, Illinois. Samples will be analyzed for commonly used pesticides. In addition, pesticides used on cotton will be specially analyzed for at the first four sites listed above.

SPECIAL STUDIES

(Contact: Dr. Frederick W. Kutz 202/755-8060)

EBDC/ETU Special Study. During February and March, 1979, a special study was undertaken to determine the potential for human exposure to ethylenebisdithiocarbamate (EBDC) and ethylenethiourea (ETU) through sugar beet by-products and the milk of cows fed sugar beet pulp known to have been treated with an EBDC-containing biocide. This special study was conducted at the request of the Special Pesticide Review Division.

Ethylenebisdithiocarbamate is a class of slimicides frequently used in sugar beet processing to control microbial growth in the diffuser operation. Under certain climatic and/or environmental conditions, or with the application of heat, some EBDC may degrade to a somewhat more toxic compound, ethylenethiourea.

Samples of molasses (used for animal food), sugar beet pulp containing factory added molasses, and crystalline sugar were collected at a midwestern sugar beet processing plant. At a nearby dairy research facility, high "normal" rations of commercially purchased sugar beet pulp containing factory-added molasses which originated at the same sugar beet processing plant were introduced into the daily ration of six

cows. Individual samples of raw and pasturized milk, mixed and separate animal food components, and all sanitizing/washing agents used were obtained prior to the initiation of the feeding study, and at selected intervals throughout the study.

All samples were analyzed for residues of EBDC and ETU according to the methods described in the published literature. The limit of detection for both EBDC and ETU was 0.01 ppm. All positive findings of ETU were confirmed by combined gas chromatographic mass spectrometric methods.

Although quantifiable residue levels of ETU were detected in the molasses (used for animal food), sugar beet pulp containing factory-added molasses, and certain of the animal dietary components, none were detected in the crystalline sugar, raw milk, pasturized milk, or sanitizing/washing agents. No residues of EBDC were detected in any of the samples.

TOXICANT ANALYSIS CENTER STUDIES

(Contact: Dr. Aubry Dupuy 601/688-3212)

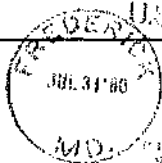
Among other projects, the lab handles the extraction of a variety of samples in the 2,4,5-T Project. These extracts are sent to various laboratories including EPA/RTP, University of Nebraska, and Wright State University, for high resolution mass spectrometric analysis. Sampled items include: human milk, fish tissue from Michigan, other animal tissue, and water and sediment from Oregon. The human milk and animal tissue studies are still in progress.



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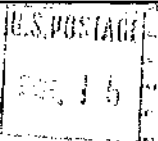
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