

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

PESTICIDE LABORATORY REPORT

1701 Nimbus Road, Suite F
Rancho Cordova, California 95670

Lab No: P- 2360 Date Received: February 27, 2003

E.P. No. L- 103-03 **Sample: 2 grass carp, 1 flathead catfish, 1 largemouth bass**

Index: N400 **PICA: H1893**

To: Warden Carol Sassie
P.O. Box 1673
Brawley, CA 92227

Report Date: **April 3, 2003**

Remarks

A fish kill was reported in the Lavender Canal east of Highway I 11, Imperial County, on February 19, 2003. Staff from the Imperial County Agricultural Commissioner's office responded to the report and documented the fish kill. A Notice of Intent had been filed for aerial application of a tank mix containing the insecticides cyfluthrin and chlorpyrifos for the agricultural field adjacent to the site of the kill. The kill was estimated at close to 400 fish and consisted of approximately 320 Flathead Catfish *Pylodictis olivaris*, 60 Grass Carp *Ctenopharyngodon idella*, and 20 Largemouth Bass *Micropterus dolomieu*. Water samples were collected and submitted to the California Department of Food and Agriculture (CDFA) Pesticide Chemistry Laboratory for analysis. Dead fish were collected from the canal and submitted to the Department of Fish And Game (DFG) Pesticide Investigations Unit for necropsy and pesticide residue analysis.

RESULTS OF EXAMINATION

The samples received consisted of one largemouth bass, one flathead catfish and two grass carp. The fish appeared to be in good condition. There were no observable external signs of autolysis. A small amount of bleeding from the gills was observed in the catfish. There were no observable ectoparasites present on any of the fish. Internal examination indicated blood tinged fluids in the abdominal cavities of both grass carp. Gill samples were collected from all four fish and submitted to the DFG Water Pollution Control Laboratory (WPCL) for pesticide residue analysis. The results of the analysis of the water and tissue samples are presented in Table 1.

Table 1. Sample Analysis Results, Lavender Canal Fish Kill (conc. in parts per billion, ppb)

Sample	Cyfluthrin _	Chlorpyrifos
Upstream Water Sample	N. D. _	0.08
Kill_Site_Water Sample	0.33 -	11.7
Bass Gills	390 _	2.100
Catfish Gills	240 _ _	660
Grass Ca Gills	220	830
Grass Carp Gills- _ _	270 _ ~	770

Data supplied to the California Department of Pesticide Regulation in support of product registration indicated that the LC50 values for bluegill sunfish *Lepomis macrochirus* were 0.998 ppb for cyfluthrin and 5.8 ppb for chlorpyrifos.

Conclusion

The concentrations of both cyfluthrin and chlorpyrifos in the water sample from the site of the fish kill were near or exceeded the LC50 concentrations for these compounds. The presence of elevated levels of both compounds in the gill tissues of all four fish analyzed indicates that these fish were exposed to both compounds. Based on the results of these analyses it is highly likely that the fish kill in the Lavender Canal was due to exposure to cyfluthrin and chlorpyrifos. The absence of any other applications of these compounds in the area at the time of the fish kill indicates that the source of the compounds was overspray from the reported aerial application.

Chemical analysis of water samples was performed by the CDFA Pesticide Chemistry Laboratory. Tissue analyses were performed by Abdou Mekebri, chemist, DFG WPCL.

PESTICIDE INVESTIGATIONS UNIT
OFFICE OF SPILL PREVENTION AND RESPONSE

By
Robert C. Hosea
Principal Investigator

Approved
Brian Finlayson, Chief
Pesticide Investigations Unit

Chemical analysis:	\$3,600.00
Assessment and report:	\$ 575.00
Total Cost of investigation:	\$4,175.00

cc:

Mr. Robert Powell
Imperial County Department of Agriculture
150 South 9th Street
El Centro, CA 92243-2850

Pesticide Registration Branch
1001 I Street
P.O. Box 4015
Sacramento, CA 95812-4015

Mr. F. Nicholas Mastrota
EIS Database Manager
Environmental Fate and Effects Division
Office of Pesticide Programs
U.S. Environmental Protection Agency
Washington, D.C. 20460

Mr. Dan Weerasekera
California Department of Pesticide Regulation
Enforcement Branch, Southern Region
130 Chaparral Court, #130
Anaheim, CA 92808

Bob Hosea
<bhosea@OSPR.DFG.
CA.GOV>
04/25/03 12:08 PM

To: Nicholas Mastrota/DC/USEPA/US@EPA
cc:
Subject: Re: Feb fish kill

Nick-

I am trying to find out the answer to question 1. As far as question 2. No the pilot did not follow buffer restrictions as the County Ag Comm. staff documented that it was an overspray case. I didn't mention it in my report as the data didn't directly apply to the dead fish but there were detectable residues on vegetation on both sides of the canal. The CAC staffer Robert Powell has that information. -Bob

»» <Mastrota.Nicholas@epamail.epa.gov> 04/25/03 06:05AM » >

Hi Bob,

Thank you for sending me the report on the Feb fish kill in the Lavender Canal (Lab No. P-2360). I have a couple of questions about it.

1. Do you know on what crop the tank mixture of cyfluthrin and chlorpyrifos was sprayed?
2. Were label restrictions, such as buffer zones, followed in the application?

Thanks.

Nick Mastrota

Legality = "Misuse (Accidental)"

Nicholas Mastrota

To: Norman Spurling/DC/USEPA/US@EPA

04/29/2003 09:04 AM

cc:

Subject: Imperial County fish kill

Norman,

I just got this additional information about a fish kill in California caused by a mixture of chlorpyrifos and cyfluthrin. I just mailed the incident report to you yesterday. I will mail a hardcopy of this note to you today along with a couple of other items I have found.

Nick ----- Forwarded by Nicholas Mastrota/DC/USEPA/US on 04/29/03 09:00 AM -----



Bob Hosea
<bhosea@OSPR.DFG.
CA.GOV >
04/28/03 11:55 AM

To: Nicholas Mastrota/DC/USEPA/US@EPA
cc:
Subject: Imperial County fish kill

Nick-

The crop associated with the fish kill in the Lavender Canal was alfalfa.

-Bob

DIAGNOSTIC SERVICES SECTION

FINAL REPORT

SOUTHEASTERN COOPERATIVE WILDLIFE
DISEASE STUDY (SCWDS)
COLLEGE OF VETERINARY MEDICINE
THE UNIVERSITY OF GEORGIA
ATHENS, GEORGIA 30602-7393
TELEPHONE: 706-542-1741; FAX: 706-642-6868

CASE NUMBER CC19-03
DATE RECEIVED January 16, 2003
DATE OF REPORT March 3, 2003

STATE GA COUNTY Rabun

AREA Kingwood Golf Resort-Clayton

SPECIES (NO.) Red Fox

SEX M AGE Adult WEIGHT 7.5 lbs

CASE HISTORY: This fox was found convulsing on the ground next to a pond by a Kingwood Golf Resort employee in the morning of January 15, 2003. It later began walking in large circles when disturbed, and then collapsed. The fox was euthanized by Chris Moore of the Georgia Department of Natural Resources (GADNR). The fox was submitted to SCWDS by Jav Cantrell of the GA@NR on January 16, 2003.

FINAL DIAGNOSIS:

Parathion (organophosphate) toxicity suspect

COMMENTS: Toxicologic results demonstrate high levels of parathion (35 ppm) with possible intoxication. There is no information in the literature on parathion toxicity for foxes. However, oral LD60 concentrations reported for dogs are 3-5 ppm (Extoxnet; <http://ace.orst.edu/cgi-bin/mfs/01/pips/parathio.htm>), suggesting that this fox ingested a toxic dose of parathion. There was no gross, histologic, or microbiologic evidence of an infectious process. Mr. Cantrell was e-mailed results on March 3, 2003.

WILD ANIMAL IMPLICATIONS: Parathion is a broad spectrum, organophosphate pesticide used to control many insects and mites. Wild birds and mammals are susceptible to the toxic effects of parathion and other organophosphates. Parathion is highly toxic by all routes of exposure (transdermal, ingestion, and inhalation). Parathion primarily affects the nervous system. Clinical signs of mammals normally include excessive salivation and defecation, as well as prostration, tremors, or convulsions.

PUBLIC HEALTH IMPLICATIONS: Humans are susceptible to effects of organophosphate pesticides and should follow manufacturer's instructions to avoid exposure.

LIVESTOCK IMPLICATIONS: Domestic livestock and pets are susceptible to organophosphate toxicity.

DIAGNOSTICIAN

Nicole L. Gottdenker, DVM, MS
SUPERVISOR

John R. Fischer, DVM, PhD

DISTRIBUTION: SCWDS Idle, Waller, Holbrook, Harris, Frazier, Fletcher, Cantrell, Hon, Mastrotta, Rafter, Cooks, Bowers, Myers, Arza

Laboratory Results Begin on Page 2

GROSS FINDINGS: This fox presents in adequate nutritional condition with loose, wet feces on the perianal region and hind limbs. The kidneys are diffusely pale yellow. There is severe hemorrhage in the lungs and thoracic cavity (euthanasia artifact). There are fragments of mammal tissues in the stomach (hair, bones), loose ingests in the intestines, and soft, pale, loose feces in the colon. There are no gross lesions apparent in the spleen, reproductive tract, adrenal glands, and brain.

MICROSCOPIC FINDINGS: W03-09 Multifocally, there are large numbers of clear vacuoles in the cytoplasm of proximal renal tubules. In some tubules, the vacuoles are so large as to compress the renal tubular nucleus. There are small amounts of hemorrhage randomly scattered in the cerebrum. There is multifocal, mild meningeal hemorrhage. There is mild peribiliary fibrosis and biliary epithelial hyperplasia and cytoplasmic vacuolation of the biliary tubular epithelium. There is diffuse, severe pulmonary hemorrhage. There are few cross sections of adult nematodes in a large bronchus with intrauterine capillarid eggs. Multifocally, there are moderate numbers of eosinophils and few lymphocytes and neutrophils in the intestinal lamina propria. There are no histologic lesions apparent in the testis, adrenals, and spleen.

MORPHOLOGIC DIAGNOSIS:

Fatty change of proximal renal tubules

MICROBIOLOGIC RESULTS: There was heavy growth of *Proteus* sp. (interpreted as a contaminant) from the lung and intestines anti heavy growth of *Clostridium perfringens* (interpreted as post mortem overgrowth) from intestinal cultures. Brain tissue was negative for rabies, canine distemper virus, and infectious canine hepatitis virus by fluorescent antibody testing.

TOXICOLOGIC RESULTS: Fresh tissues were submitted to the University of Pennsylvania, New Bolton Center Laboratory of Toxicology in Kennett Square, Pennsylvania. A complete metal screen yielded no significant findings. Organic chemical screens of gastrointestinal contents yielded 35 ppm of parathion (an organophosphate). These screens are capable of detecting a large number of compounds including pesticides, strychnine, metaldehyde, a number of therapeutic and illicit drugs, euthanasia agents, and environmental contaminants.