



CITY OF SACRAMENTO

36

DEPARTMENT OF ENGINEERING
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SACRAMENTO, CALIFORNIA 95814
TELEPHONE (916) 449-5281

CITY MANAGER'S OFFICE
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APR 21 1983

J.F. VAROZZA
CITY ENGINEER
M.H. JOHNSON
ASSISTANT CITY ENGINEER

April 20, 1983

City Council
Sacramento, California

Honorable Members in Session:

SUBJECT: Status Report on Rice Herbicides, Bolero and Ordram

Submitted herewith, for your information, is a memorandum and fact sheet from the Department of Food and Agriculture (DOFA) regarding the use of rice herbicide, Bolero. Also attached is a letter from the DOFA, in response to the request by City staff, of an explanation and chronology of the reevaluation of Ordram and a letter from the Rice Research Board advising us of the estimated date they will begin applying Bolero and Ordram to the rice fields.

Respectfully submitted,

J. F. VAROZZA
City Engineer

For Council Information:

Walter J. Slipes, City Manager

JFV/hma

APPROVED
BY THE CITY COUNCIL

APR 26 1983

OFFICE OF THE
CITY CLERK

APPROVED
BY THE CITY COUNCIL

APR 26 1983

OFFICE OF THE
CITY CLERK

April 26, 1983
All Districts

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Memorandum

To : Mr. William H. Crooks, Executive Officer
California Regional Water Quality Control Board
Central Valley Region
3201 S Street
Sacramento, California 95816

Date : April 13, 1983

Place : Sacramento

RECEIVED
CITY OF SACRAMENTO
ENGINEERING DEPT.

From : Department of Food and Agriculture

APR 19 1983

NA
7:30 AM 4/13/83

cc Bd.
WTC

Subject: Bolero Rice Herbicide

Your April 1, 1983, memorandum expresses concern over the use of rice pesticides. As you know, Bolero (thiobencarb) rice herbicide has been applied in the Northern Sacramento Valley during 1981 and 1982 under the provisions of a Section 18 exemption. The objective for the coming use season is to keep Bolero out of the Sacramento River and subsequently out of Sacramento's drinking water. As a means of accomplishing this objective, a six-day water-holding period has been established for treated fields. This holding period was not a requirement for the last two years. The required holding period should significantly reduce levels of Bolero entering the drainage basins and eliminate detectable levels of Bolero entering the Sacramento River. Field holding of treated rice water will allow more time for soil adsorption, plant uptake, and degradation of Bolero.

To aid in compliance with this requirement, extensive educational programs are being conducted by Chevron to instruct growers, pest control advisors, and pest control operators in how to properly manage their rice water to ensure efficacy and enhance safety to aquatic organisms. Additional emphasis is being placed on drift reduction and accurate on-site application techniques. A 24-hour pre-treatment notification to the county agricultural commissioner is an additional restriction on Bolero applications this year and will help in enforcing the holding period.

Other factors will affect rice acreage to be planted this year. Estimates from the Sutter and Colusa county's agricultural commissioner offices (pers. comm.) indicate that overall acreage planted to rice this season will be down 40-55 percent from normal. This reduction is due to: large quantities of stored rice awaiting a better market, inclement weather this spring, and the Federal PIK (payment in kind) program providing funds for not growing rice. Obviously herbicide applications will likewise be reduced for 1983. This reduced acreage is opportune in that it will allow us to examine further our application and holding requirements to ensure their adequacy without undue risk to man or the environment. Based on all of these factors, the possibility of adverse impacts in 1983 should be substantially less than in 1982.

Mr. William H. Crooks
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Chevron will be following up by conducting in-field monitoring of Bolero applications and analysis of residues under differing water-holding periods (up to 12 days). Additional aquatic toxicology studies are to be conducted by SRI International for Chevron on salmon, striped bass, sturgeon, and carp (depending on species' availability) according to established EPA testing protocols. The Neomysis (delta shrimp) flow-through toxicology study has been completed by SRI and that data is forthcoming.

The acceptable daily intake criterion is not an absolute limit that cannot be exceeded. It is a guideline which is 1/100th of the maximum amount which can be ingested by the most sensitive test animal for a lifetime with no observable effects occurring. Bolero's use is limited to a four to six-week application period and dissipates rapidly from fish and water. Exposure during a four to six-week period does not equate with the lifetime exposure assumed under an ADI. While no adverse effects are expected, it is still the Department's position to prevent Bolero from appearing in water or fish.

The holding period requirements, environmental studies, and Chevron's intense educational program serve to mitigate our concerns and will control excessive levels of Bolero in both rice drainage basins and Sacramento's drinking water in the future. Our review of data developed during 1983 will determine what changes, if any, will be needed before full registration of Bolero may be granted.

I hope the enclosed "Fact Sheet" describing the conditions of registration of Bolero will answer your questions. If you need additional information, please contact George Reese, Chief, Pesticide Registration and Agricultural Productivity, at (916) 322-5130 or me.

Lori Johnston, Assistant Director
Pest Management, Environmental
Protection and Worker Safety
(916) 322-6315

Enclosure

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APR 13 1983
FBI - SAC, SACRAMENTO

CALIFORNIA DEPARTMENT OF FOOD
AND AGRICULTURE - Pesticide
Registration and Agricultural
Productivity Unit (916) 322-5130

FACT SHEET

REGISTRATION OF BOLERO 10G

THE FOLLOWING QUESTIONS AND ANSWERS ARE PROVIDED AS A MEANS OF EXPRESSING FACTS ABOUT THE REGISTRATION ACTION INVOLVING THE RICE HERBICIDE BOLERO.

1. SINCE THE DEPARTMENT PLANS TO CONDITIONALLY REGISTER BOLERO FOR ONE YEAR, WHAT ARE THE CONDITIONS OF THIS REGISTRATION?

- 1) COMPLETION OF THE SECOND-GENERATION PHASE OF A TWO-GENERATION REPRODUCTIVE STUDY INVOLVING RATS.
- 2) BASED ON LABEL RESTRICTIONS, ESTABLISHMENT OF A SIX-DAY WATER-HOLDING PERIOD FOR TREATED FIELDS.
- 3) IN ACCORDANCE WITH LABEL RESTRICTIONS, ESTABLISHMENT OF A 24-HOUR PRE-TREATMENT NOTIFICATION REQUIREMENT FOR COUNTY AGRICULTURAL COMMISSIONERS. THIS REQUIREMENT WILL ENABLE THE COUNTY AGRICULTURAL COMMISSIONER TO MONITOR APPLICATIONS AND ENFORCE THE HOLDING REQUIREMENT.

IN ADDITION, CHEVRON HAS AGREED TO CONDUCT:

- 1) WATER MONITORING STUDIES INVOLVING RICE WATER OUTFLOW.
- 2) WATER LEVEL AND WATER-HOLDING STUDIES WITHIN TREATED FIELDS.

3) EDUCATIONAL PROGRAMS COORDINATED WITH COUNTY AGRICULTURAL COMMISSIONERS' OFFICES FOR THE PURPOSE OF INFORMING RICE PRODUCERS AND PEST CONTROL OPERATORS OF USE RESTRICTIONS AND TECHNOLOGY APPLICABLE TO USE OF BOLERO FOR THE 1983 SEASON.

2. DOES THE USE OF BOLERO PRESENT ANY ACUTE OR CHRONIC HEALTH CONCERNS?

TOXICOLOGY AND HEALTH & SAFETY SPECIALISTS FROM THE DEPARTMENTS OF FOOD AND AGRICULTURE AND HEALTH SERVICES HAVE REVIEWED ALL AVAILABLE DATA ABOUT BOLERO AND HAVE STATED THEY HAVE NO PROFESSIONAL CONCERNS REGARDING THE HEALTH ASPECTS OF BOLERO USE.

3. HAVE THE BREAKDOWN PRODUCTS OF BOLERO BEEN IDENTIFIED AND DO THEY PRESENT A POTENTIAL HEALTH HAZARD?

ALL BREAKDOWN PRODUCTS OF BOLERO HAVE BEEN IDENTIFIED. MEDICAL AND TOXICOLOGY ADVISERS OF THE DEPARTMENTS OF FOOD AND AGRICULTURE AND HEALTH SERVICES HAVE INDICATED THAT THEY HAVE NO HEALTH-RELATED CONCERNS REGARDING BOLERO. THE BREAKDOWN OF BOLERO IS A DETOXIFICATION PROCESS AND THE METABOLITES ARE LESS TOXIC THAN THE PARENT COMPOUND.

4. ARE THERE ANY SCIENTIFIC STUDIES REQUIRED FOR PERMANENT REGISTRATION OF BOLERO THAT ARE INCOMPLETE?

YES. THE SECOND GENERATION OF A TWO-GENERATION REPRODUCTION STUDY IS NOT COMPLETED. HOWEVER, THE FIRST YEAR FINDINGS INDICATE THERE IS LITTLE LIKELIHOOD OF REPRODUCTIVE EFFECTS. CHEVRON HAS SUBMITTED ALL OF THE DATA REQUIRED FOR CONDITIONAL REGISTRATION.

5. WHY ISN'T BOLERO BEING PLACED ON THE RESTRICTED MATERIALS LIST?

AT THIS TIME, THERE IS NO SCIENTIFIC RATIONALE THAT WOULD SUPPORT RESTRICTING BOLERO OTHER THAN THE NEED FOR A SPECIFIED WATER-HOLDING PERIOD AND FOR PRE-NOTIFICATION OF THE COMMISSIONERS PRIOR TO APPLICATION. THE WATER-HOLDING RESTRICTION IS ACCOMPLISHED BY LABEL INSTRUCTIONS. IN ADDITION, LABEL RESTRICTIONS REQUIRE GROWERS AND APPLICATORS TO NOTIFY THEIR COUNTY AGRICULTURAL COMMISSIONER 24 HOURS IN ADVANCE OF ANY BOLERO APPLICATION TO ENABLE THE REGULATORY OVERVIEW NECESSARY TO MONITOR COMPLIANCE WITH THE SIX-DAY WATER-HOLDING REQUIREMENT.

6. IS THERE A TASTE PROBLEM ASSOCIATED WITH BOLERO THAT IS RELATED TO SACRAMENTO CITY WATER?

THE CITY OF SACRAMENTO WATER DEPARTMENT BELIEVES BOLERO CAUSES A NOTICEABLE CHANGE IN THE TASTE OF WATER.

7. WHAT IS THE CAUSE OF THE WATER TASTE PROBLEM?

A SCIENTIFICALLY VALID TASTE STUDY HAS BEEN PERFORMED. THE RESULTS CONFIRM THAT, AFTER CHLORINATION, BOLERO IMPARTS A TASTE TO WATER. IN RESPONSE TO THIS FINDING, THE CHEVRON CHEMICAL COMPANY (THE MANUFACTURER OF BOLERO) IS PLANNING TO DO ADDITIONAL RIVER WATER TESTS DURING THE BOLERO USE SEASON, TO DETERMINE IF BOLERO IS THE SOLE FACTOR RESPONSIBLE FOR THE CHANGE IN DRINKING WATER TASTE PERCEIVED BY THE SACRAMENTO CITY WATER DEPARTMENT.

8. HOW DOES THE DEPARTMENT PLAN TO RESPOND IN THE EVENT OF BOLERO TASTE COMPLAINTS FROM SACRAMENTO RIVER WATER USERS?

POTASSIUM PERMANGANATE TREATMENT REMOVES THE TASTE OF BOLERO AND THE CITY IS PREPARED TO TREAT THE WATER IF NECESSARY.

9. HOW DO THE LEVELS OF BOLERO FOUND IN THE SACRAMENTO RIVER LAST SEASON COMPARE WITH THE FEDERALLY ESTABLISHED RESIDUE TOLERANCES FOR FOOD AND MILK?

THE HIGHEST LEVEL FOUND WAS 2.8 PPB AT THE CITY WATER-INTAKE, WHICH IS WELL BELOW THE 200 PPB FEDERAL RESIDUE TOLERANCE FOR RICE AND THE 50 PPB TOLERANCE FOR MILK.

10. ARE BOLERO RESIDUE LEVELS IN FISH EXPECTED TO BE GREATER THAN THE AVERAGE DAILY INTAKE (ADI) THRESHHOLD?

FOR 1982, THERE WAS NO RESIDUE IN FISH FROM THE RIVER. . THERE WERE, HOWEVER, BOLERO RESIDUES FOUND IN CARP TAKEN FROM RICE DRAINAGE WATER. THE SIX-DAY WATER-HOLDING PERIOD HAS BEEN DESIGNED TO PREVENT RECURRENCE OF BOLERO RESIDUES IN FISH TAKEN FROM THE RICE DRAINS. THE LEVELS OF RESIDUES DETECTED IN 1982 WERE NOT SUFFICIENT TO POSE HAZARDS TO EITHER FISH OR TO CONSUMERS.

- 11. WHAT ACTION WILL BE TAKEN IF UNACCEPTABLE BOLERO RESIDUES OCCUR IN FISH OR RIVER WATER?

IN THE EVENT OF ANY UNACCEPTABLE FISH OR RIVER CONTAMINATION, THE DEPARTMENT HAS AUTHORITY TO IMMEDIATELY SUSPEND THE USE OF BOLERO.

- 12. IS THE PRESENCE OF BOLERO IN SACRAMENTO RIVER WATER A VIOLATION OF FEDERAL, STATE OR LOCAL LAWS OR REGULATIONS?

IN COMPLETING THE REGISTRATION REVIEW FOR BOLERO, THERE WERE NO FINDINGS INDICATING THAT ALLOWING USE WOULD CONSTITUTE A VIOLATION OF ANY LAWS OR REGULATIONS ADMINISTERED BY THE DEPARTMENT. IN CONSULTATION WITH COOPERATING STATE AND LOCAL AGENCIES, THE DEPARTMENT HAS NOT BEEN INFORMED THAT REGISTRATION AND USE OF BOLERO WOULD VIOLATE ANY OTHER LAWS, REGULATIONS OR LOCAL ORDINANCES.

- 13. IS THE SIX-DAY HOLDING PERIOD ADEQUATE TO PREVENT BOLERO FROM ENTERING THE SACRAMENTO RIVER?

BASED ON DEGRADATION STUDIES PERFORMED BY THE REGISTRANT, THE SIX-DAY HOLDING PERIOD APPEARS TO BE SUFFICIENT FOR PREVENTING RIVER WATER CONTAMINATION. RECENTLY, THE REGISTRANT PROVIDED ADDITIONAL INFORMATION INDICATING THERE SHOULD BE NO DETECTABLE RESIDUE IN RIVER WATER AT THE CONCLUSION OF THE REQUIRED HOLDING PERIOD.

- 14. HAVE THE RECOMMENDATIONS OF THE RICE PESTICIDE SUBCOMMITTEE BEEN ADDRESSED?

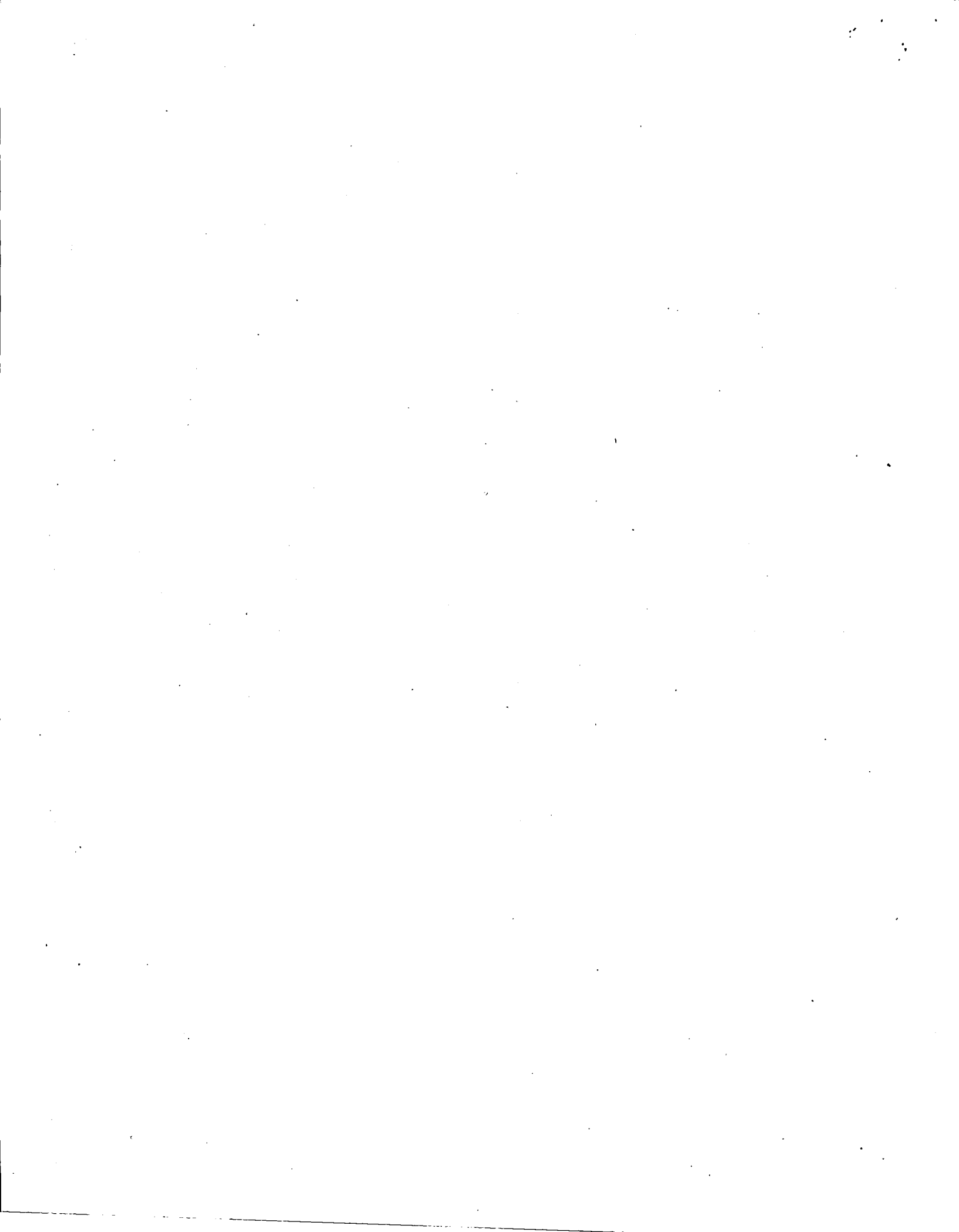
THE RICE PESTICIDE SUBCOMMITTEE WAS APPOINTED AS A PART OF THE REGISTRATION REVIEW PROCESS FOR THE PURPOSE OF CONDUCTING IN-DEPTH CONSIDERATION OF ALL ISSUES SURROUNDING BOLERO. THE SUBCOMMITTEE GATHERED CONSIDERABLE INFORMATION AND MADE SOME RECOMMENDATIONS TO THE FULL PESTICIDE REGISTRATION AND EVALUATION COMMITTEE. THE INFORMATION AND RECOMMENDATIONS THEY PROVIDED WERE USEFUL AND FULLY CONSIDERED AS A PART OF THE BOLERO REGISTRATION PROCESS. THEIR RECOMMENDATIONS WERE APPROPRIATE, AND APPLICABLE TO THE DEPARTMENT'S DECISION TO REGISTER BOLERO. THE DEPARTMENT HAS COMPLIED WITH THE RECOMMENDATIONS.

- 15. IS THE HERBICIDE BOLERO NEEDED TO ENABLE RICE PRODUCTION OR IS IT SIMPLY AN ALTERNATIVE TO OTHER RICE HERBICIDES?

IN RECENT YEARS, CALIFORNIA RICE PRODUCERS HAVE BEEN FORCED TO GROW HIGH YIELD, SHORT-STATURED RICE VARIETIES IN ORDER TO COMPETE IN THE RICE MARKET. OTHER RICE HERBICIDES ARE NOT EFFECTIVE ON THE SHORT-STATURED VARIETIES. BOLERO IS ESSENTIAL IF CALIFORNIA RICE PRODUCTION IS TO CONTINUE. IN ADDITION, THE SHORT-STATURED VARIETIES REDUCE AIR POLLUTION THAT RESULTS FROM BURNING BECAUSE LESS RICE STRAW RESULTS FROM THE SHORT-STATURED VARIETY. IF BOLERO IS NOT AVAILABLE, SACRAMENTO VALLEY RICE PRODUCERS WILL NOT BE ABLE TO COMPETE IN THE RICE MARKET.

16. WILL THERE BE MORE BOLERO USED THIS SEASON THAN WAS USED IN 1982?

COUNTY AGRICULTURAL COMMISSIONERS AND RICE PRODUCERS ADVISE THAT DUE TO THE FEDERAL PAYMENT IN KIND (PIK) PROGRAM, RICE PRODUCTION IN THE SACRAMENTO VALLEY WILL BE 40 TO 50 PERCENT LESS THAN THE PREVIOUS SEASON. IF THIS OCCURS, USE OF RICE HERBICIDES SHOULD BE CONSIDERABLY LESS THAN LAST YEAR.



DEPARTMENT OF FOOD AND AGRICULTURE

1220 N Street
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April 20, 1983

Mr. John F. Varozza
City Engineer
CITY OF SACRAMENTO
915 I Street, Room 207
Sacramento, CA 95814

Dear John

Here is the summary of the reevaluation of Ordram that you requested. I have included the semi-annual reports which summarize the actions taken during the reevaluation.

During 1979, the Department of Food and Agriculture received complaints about Ordram applications to rice from Pacific Gas and Electric (PG&E) workers in Chico. These workers included meter readers who had to read meters near applications and office workers in offices where the odor of nearby Ordram applications could be detected. They complained that the odor was very offensive and irritated their throats, eyes and skin, and made breathing difficult.

The Department advised PG&E management on the medical aspects of the exposure they were experiencing and suggested mitigation measures that could be taken.

During 1979 and 1980, Stauffer Chemical Company cooperated with PG&E and local physicians regarding worker complaints allegedly related to Ordram exposure. During 1980, Stauffer cooperated with the Department in performing field monitoring to determine the drift potential for Ordram.

During early 1980, the Department reviewed toxicology data on Ordram submitted in 1975-76. The Department's Toxicologist became concerned about data showing decreased male fertility in the rat. This data, as well as the offensive odor, were discussed with representatives of the Departments of Health Services and Industrial Relations and the University of California.

Communication with Stauffer confirmed that they were aware of the rat studies and had informed their plant workers and their Union representative in August of 1977 of the potential problem. They had conducted, since that time, a voluntary program of sperm counts and examinations without finding adverse health effects in their plant workers.

During all of 1980, the Department of Industrial Relations and Stauffer cooperated in analyses of data regarding workers at formulating plants engaged in manufacturing Ordram. No adverse effects were discovered, but more detailed studies were requested.

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On September 19, 1980, the Department of Food and Agriculture notified Stauffer Chemical Company that Ordram would be formally entered into the reevaluation process until the evaluation of any public and worker health hazard was completed. A public notice of the action was posted at that time.

In December of 1980, the Department of Fish and Game requested an extension of the reevaluation to allow a detailed investigation of any related fish losses that might occur during the use season in 1981. This extension was granted by the Department in January of 1981.

Stauffer Chemical submitted a preliminary report in October of 1981, covering a clinical/epidemiological study of the workers at its Richmond plant. This was performed at the Department's request with input on the protocol from the Departments of Health Services and Industrial Relations. The preliminary report was negative for adverse health effects related to Ordram exposure.

The Department discussed progress and outstanding needs in its reevaluation of Ordram at meetings of the Pesticide Registration and Evaluation Committee (PREC) during January and February of 1982. It was reported at these meetings that progress had been made in the following areas:

Odor--Still a problem in the formulation, but new bags were helping to control the odor at mixing and loading sites.

Male Infertility--Additional studies conducted by Stauffer had shown no infertility occurred in the male rabbit and the male monkey. The rat had the greatest potential for infertility followed by a lesser potential in mice. Preliminary human studies have shown no adverse effect on male fertility to date. Field studies had shown dustiness of the formulation to be a problem in increasing exposure of loaders.

The Department continued the reevaluation pending the receipt of the completed clinical/epidemiological study from Stauffer and the implementation by Stauffer of information on worker safety for mixers, loaders, and applicators handling Ordram.

In March and April of 1982, Stauffer carried out meetings with applicators in rice-growing areas to inform them of handling precautions for Ordram. Stauffer submitted data on the resolution of the dustiness problem with its prior formulation. Confirmation work is in progress on the adequacy of the new formulation.

In June, the Department set up a subcommittee of scientific experts to look at Ordram and possible adverse effects on fish. The Department received a position paper in August, 1982 on Ordram's possible relationship to fish losses occurring in agricultural drains from the PREC's subcommittee on Ordram. The connection is described as probably, but not proven, and a holding period of at least four (4) days is recommended to mitigate the potential adverse effect.

Mr. John F. Varozza
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Stauffer Chemical Company agreed to require a minimum four-day holding period for Ordram applications to rice fields on August 19, 1982.

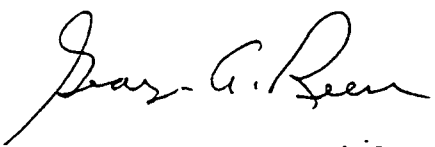
In October of 1982, at a meeting of the Rice Pesticide Subcommittee (PREC's subcommittee), Stauffer was requested to determine the breakdown products of Ordram after water treatment, to assist the Department of Fish and Game in an aquatic toxicology study on certain fish species, and to cooperate in fish monitoring and water sampling during 1983. Stauffer confirmed their agreement by letter on November 2, 1982.

On March 20, 1983, Stauffer presented to representatives of the Departments of Industrial Relations and Health Services, and Sacramento City, at the Department of Food and Agriculture, their interim report on the clinical/epidemiological study of workers at several of Stauffer's formulating plants. No adverse effects were noted.

In conclusion, we should have the final report in-house sometime in July. The reports, to date, support our conclusion that the amounts found in the Sacramento River during the past two years have not posed any kind of health hazard to the citizens of Sacramento. However, we are committed to controlling the use of Ordram to the point that no level is found to be present at any time in the Sacramento River.

If you have any further questions or need more information, please let me know.

Sincerely



George A. Reese, Chief
Pesticide Registration and
Agricultural Productivity
(916) 322-5130

Enclosures

PUBLIC NOTICE - SEMI-ANNUAL REPORT
CONCERNING REEVALUATION OF PESTICIDE PRODUCTS

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agreed to label changes that involve reducing the dosage per acre for alfalfa from 2 to 1-1/2 pounds, and changing the preharvest interval from 7 to 14 days. The Department will collect samples of alfalfa at harvest time in the spring of 1981 to determine if the problem has been mitigated.

C. Availability of Scientific Data Suggesting the Possibility of Adverse Health Effects Resulting from Excessive Exposure

1. TOK - (two products)

TOK (nitrophen) is a broad spectrum herbicide used in a variety of vegetable crops. Data became available that suggested a potential carcinogenic and teratogenic risk to consumers, mixer/loader/applicators, and field workers. Extensive studies by the Department resulted in the phase-out of the uses of these products in California as well as the rest of the United States. Studies will be conducted by the registrant to determine if the identified risk can be mitigated. This reevaluation has been completed.

2. DEF, Folex (Merphos) - (two products)

DEF and Folex are organophosphate cotton defoliants. The Department is concerned about data on delayed neurotoxicity and field observations of the movement of these materials and their breakdown products off target. An extensive literature search and several field studies have been conducted, and the results are currently under review.

3. Lasso - (two products)

Lasso, a pre-plant and early post-emergence herbicide, was placed under reevaluation because of laboratory data on one strain of rats that indicated internal eye damage from systemic administration. Medical examinations of formulation plant workers who have been exposed for many years have not shown this defect. In laboratory tests, only one strain of rat appears to develop the defect. A no-effect exposure level has been determined in the affected strain of rats. Mixer/loader/applicator exposure studies and other studies are now being conducted by the registrant to determine if an adequate safety factor exists for users. A wide margin of safety exists for consumers of treated crops.



4. Ordram - (six products)

Concern has developed over the offensive odor of Ordram, an herbicide used on rice, and the movement of the material and its breakdown product off target. Laboratory data also show adverse effects on sperm production. The registrant has conducted field studies of the airborne movement of Ordram. Medical studies on formulation plant workers, who have a potential for higher exposure than mixer/loader/applicators, are now under way to determine if there are any adverse effects on their health.

10. Chlorobenzilate - 1 product

EPA evaluation of chlorobenzilate, an acaricide, has involved some concerns that this material may be a weak carcinogen in laboratory animals, and may reduce sperm counts in test animals. The Department has imposed a set of strict permit conditions to protect mixers, loaders, and applicators, as well as a 14-day reentry interval to reduce exposure to pickers. The Department conducted field studies to monitor exposure to mixer/loader/applicators during application, exposure of field workers after the expiration of a 14-day reentry interval, and residue breakdown on treated foliage and fruit. Additional data on fertility of applicators is being obtained by use of a fertility assessment survey. A survey of a control population is now under way. All the new data is now under review.



11. Ordram - 6 products

Ordram, a herbicide used on rice, is under reevaluation due to its offensive odor and the movement of the pesticide and its breakdown products off target. Laboratory animal test data also show adverse effects on sperm production from exposure to this chemical. The registrant is conducting field studies on the airborne movement of Ordram. Medical studies of formulation plant workers are now under way by the registrant to determine if there are any adverse effects on their health. The Department has recently conducted a mixer/loader/applicator study to determine exposure levels during application. The results of this study are now being tabulated. The Department of Fish and Game is conducting a study on Ordram which will be completed in October. The results of this study will be considered in the final decision. Additional data on the fertility status of mixer/loader/applicators may be obtained in 1981 by use of a questionnaire.

12. Lindane - 33 products

Lindane products that may expose persons indoors are in the reevaluation process because of laboratory animal test data that suggest possible carcinogenicity and possible adverse effects on the reproductive process, including fetotoxicity, reduced reproductive capacity, and repressed sexual maturation. The lindane products under reevaluation are registered for use inside occupied dwellings, under or outside occupied dwellings which might result in indoor residues, or as a mange and flea control for pets that may be kept indoors. Telephone surveys of selected pet animal-practice veterinarians have recently been conducted to determine the extent of use and available alternatives for lindane in treatment of mange and fleas. The Department is formulating a position directed at proposed cancellation of all uses of lindane indoors and most veterinary uses.

PUBLIC NOTICE - SEMI-ANNUAL REPORT SUMMARIZING
REEVALUATION OF REGISTRATION STATUS OF PESTICIDE PRODUCTS
DURING THE PERIOD OF July 1, through December 31, 1981

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States have indicated that some towns still treat their water supplies with chlorine as a matter of routine. Safer alternates for water treatment where there is the potential for the presence of human pathogens in drinking water are now being researched; the most promising is the use of gamma radiation. It appears that the legal criteria for requiring a reevaluation are more than met and a reevaluation action may be considered early 1982.

CAPTAN

Captan is a widely used fungicide in California. There is continuing controversy over the interpretation of a number of laboratory studies that have been conducted involving possible carcinogenicity and teratogenicity. Canada has recently completed a reevaluation of Captan and is considering phasing out uses in or around dwellings and essentially establishing a zero food tolerance. The Department is planning detailed review of oncogenicity and teratogenicity to determine if there is a need to place Captan into formal reevaluation in 1982 to resolve these issues.

TERRAZOLE

Terrazole, an agricultural fungicide, is under evaluation because of laboratory animal data suggesting a risk of teratogenicity to users. New data was requested of a registrant, and some were received recently. Terrazole appears to be a weak teratogen in some animals, according to these available data. Final evaluation must await one important teratology study to be submitted by the registrant. Depending on the results of the review, a reevaluation action may be initiated.

BAYLETON

Bayleton, a new fungicide product to be used primarily on grapes had been registered in 1980 under experimental use permit but not in 1981, has the potential for significantly reducing field worker exposure to large amounts of other fungicides, such as elemental sulfur. Some previously submitted data was of questionable quality. Currently, a mixer/loader/applicator exposure study has been completed and the report is under review. The registrant was requested to repeat a number of the studies and conduct several new studies. Requests have been received for a Section 18 registration of Bayleton on grapes and sugar beets for the 1982 season.



BOLERO

Bolero, an herbicide, has a potential for filling a need in rice production. It was registered under a Section 18 during 1981. Additional data on reproductive effects was requested and was under review at the end of the year. A Section 18 request for 1982 is under evaluation in the Registration Unit presently.

processed for new wettable powder formulations. When this product was initially registered (conditionally) by EPA there was information that this chemical might be an animal oncogen. Considerable information has since been provided by the registrants. After reviewing this information and after discussions with EPA and former members of the EPA Scientific Advisory Panel (SAP), it was concluded that this chemical was probably not an animal oncogen. The registrants are repeating a long-term feeding study in mice; this study should be complete in about one year and should confirm our present opinion that amitraz is not a carcinogen. Final action on reevaluation will be taken at that time.

Bayleton (triadimeton)

Bayleton is a new fungicide that has the potential for reducing worker exposure to large amounts of other fungicides (i.e., sulfur). Its major use will be on grapes; however, other uses have been requested, such as on turf and azaleas. Data submitted by the registrant showed that the chemical causes teratogenic and embryotoxic effects in laboratory animals. The NOEL has been determined for all adverse effects.

The registrant has conducted a mixer/loader/applicator exposure study during an application to grapes. From this study it was estimated that the dermal absorption of Bayleton 50W was approximately 2 percent of the total exposure. It was then calculated that an adequate safety factor with respect to teratogenicity and embryotoxicity could be obtained for mixers, loaders, applicators, and field workers. The department has conducted another mixer/loader/applicator exposure study; the results are currently under review. The department has granted a conditional registration of Bayleton 25W for use on turf and azaleas; with the conditions being that the registrant cooperate in an exposure study with the department for these specific uses.

Benthiocarb (Bolero)

Bolero, an herbicide used in rice, has the potential to fill a need in the production of a new short-stemmed rice. A Section 18 registration was granted for 1982 while the registrant is collecting data to fill the last remaining data gap (2-generation reproduction study). The registrants submitted a substantial amount of data the last part of 1981 that resolved several concerns the department had originally. In early 1982, satisfactory information and data was received on medical management of possible overexposure. Also in early 1982, a rat teratology study indicated that Bolero is not teratogenic. The department conducted a loader/applicator/flagger exposure study in May 1981. The total exposures did not exceed 5 mg/person/day, with inhalation exposure not exceeding 17 percent of the total. The registrants have just completed an exposure study. These results will be reviewed as soon as they are submitted to the department.

will be handled only through closed systems, exposure will be at very low levels and an adequate safety factor for delayed neurotoxicity exists. Reevaluation of this product is considered to be complete and no further action will be taken.

LINDANE - 33 Products

Certain products containing lindane were placed in the reevaluation process because of laboratory animal test data that suggested possible carcinogenicity, adverse effects on the reproductive process, including fetotoxicity, reduced reproductive capacity, repressed sexual maturation, problems of persistence of residues in human fat, and lack of efficacy. The lindane products under reevaluation are those registered for use inside occupied dwellings, under or outside occupied dwellings which might result in indoor residues, or as mange and flea control for pets that may be kept indoors.

A report recently prepared by the National Research Council^{1/} summarizes the chronic feeding studies that have been conducted on lindane. An older study in mice demonstrated an increased incidence in liver tumors; however, NCI bioassays in both rats and mice, and several other studies in laboratory animals did not demonstrate significant increases in tumor incidence when compared with controls. The cancer risk due to lifetime dietary and occupational exposures was calculated to be very low. There are questions about the accuracy of the evaluation of some of the cancer findings; it appears that some of the early animal test data suggesting potential chronic effects is of questionable quality and has been overinterpreted.

Lindane has a high biodegradability, and thus, does not persist significantly in soil, water, or plant matter as do other organochlorines. Lindane does not bioaccumulate to any significant degree in fish or wildlife. Because of its rapid in-vivo metabolism and high water solubility, it is very unlikely that significant fat deposition of lindane occurs.

The Department conducted a survey of selected small-animal practice veterinarians to determine the extent of lindane use and availability of acceptable alternatives in the treatment of mange and fleas. Thirty-three veterinarians throughout the state were contacted; one-third stated that lindane was essential to their practice.

There is very weak evidence for the carcinogenicity of lindane. However, the data on reproductive effects is still being evaluated by the Department.

* MOLINATE (Ordram) - 6 Products

Ordram, a herbicide used on rice, was first placed into reevaluation due to its offensive odor and the movement of the pesticide and its breakdown products from the application site. Laboratory animal test data has also shown

^{1/} National Research Council: An Assessment of the Health Risks of Seven Pesticides Used for Termite Control, pg. 29. Washington, D. C.: National Academy Press (1982).

Ordram - Cont.

adverse effects on sperm production following exposure to this chemical. The registrant and the Department conducted a number of studies during 1981 and 1982. The registrants conducted extensive studies on the mechanism of the spermatotoxic effect, which demonstrates specificity to rodents. The Department is waiting for the data from the ongoing human epidemiology study currently being conducted in manufacturing/formulating plants. In this study, no adverse effects on male fertility have been confirmed at this time. Exposure studies have been conducted by the registrant, as well as the Department. The registrant voluntarily conducted an extensive educational program to inform workers of the potential adverse effects of Ordram and recommended safe handling procedures.

The registrant is continuing its efforts to formulate a granule that would reduce the foul odor and would be less dusty. This problem remains unresolved.

During May and June 1982, fish kills were observed in the Sacramento River. Odor and taste complaints were lodged by consumers concerning the City of Sacramento's drinking water. These incidents corresponded with detected levels of molinate and benthocarb (Bolero) in the river water. The Pesticide Registration and Evaluation Committee formed a Rice Herbicide Subcommittee to deal with these problems, as well as, problems involved with other rice herbicides. The Subcommittee investigated conditions of use involving these herbicides and considered input from industry representatives, the university and other public agencies.

As a result of concerns of residue in river water, the registrant of Ordram added a four-day holding period to the label. Educational methods to convey the necessity of the holding period were developed and presented by the registrant. As part of this reevaluation the registrant has verbally agreed to aid in the identification of taste and odor problems in Sacramento's drinking water and to better characterize the environmental fate of Ordram in the Sacramento River. A protocol has been submitted to determine whether low levels of molinate have any effect on spawning fish species and drinking water.

The Department is allowing the current registration of Ordram 10G to continue based on current findings and the extensive effort put forth by the registrant to solve these problems.

OXADIAZON - 2 Products

Oxadiazon is used for preemergence control of weeds in container and field-grown ornamentals and on turf (lawns). This reevaluation resulted from the review of an adverse effects disclosure, submitted by the registrant, relating new laboratory studies in mice which indicated a treatment-related increase in the incidence of liver tumors. A long-term-feeding study in rats submitted by the registrant did not result in an increased incidence of tumors at any dose level. According to available information, oxadiazon is not mutagenic. Oxadiazon is considered to be a very weak carcinogen in laboratory animals. Subsequent to risk assessment, the registrant may be requested to submit data from a mixer/loader/applicator exposure study and a dermal absorption study.

potential for reducing worker exposure to large quantities of other fungicides (i.e., sulfur). However, data submitted by the registrant indicated that the chemical causes teratogenic and embryotoxic effects in laboratory animals. The NOEL for all adverse effects is considered to be 10 mg/kg/day.

The registrant has conducted a mixer/loader/applicator exposure study during an application to grapes. It was then calculated that an adequate safety factor with respect to teratogenicity and embryotoxicity could be obtained for mixers, loaders, applicators, and field workers. An additional exposure study substantiated earlier information indicating that dermal absorption of Bayleton is low and risk of using Bayleton in water soluble packaging is negligible.

A survey of nurseries involved in the cultivation of azaleas and turf was conducted to determine the cultural practices involving the use of Bayleton. Following observations of applications, it was determined that very little exposure occurs during or after application to azaleas. Backpack or Hudson-type sprayers were not used by the nurseries contacted in the survey. Very few turf growers use Bayleton at this time; primarily because of cost considerations.

Based on a low dermal absorption rate and the use patterns examined, the Department finds no basis for formal reevaluation.



BENTHIOCARB (Bolero)

Bolero, a rice herbicide, has been used in California for about two years under a Section 18 emergency exemption. In an exposure study conducted by the Department, total exposure did not exceed 5 mg/person/day. The Department is awaiting the two-generation reproduction study (IBT replacement study) prior to issuing a full Section 3 registration. The first year study has been submitted to the Department and is presently being evaluated.

Bolero was present in the Sacramento River during the time period in which fish kills were noted and odor and taste problems were discovered in Sacramento drinking water. (See Section A - Molinate.) The Rice Herbicide Subcommittee is evaluating this problem. The registrant has studies underway to determine the involvement of Bolero in the fish kills and in the odor and taste problems in Sacramento waters. Tests were run to determine the fate of benthocarb in chlorinated water. Chlorination oxidizes the material to the same chemical as would form following detoxification in the mammalian liver; thus the degradation in chlorinated water seems to follow the same path as in the laboratory mouse. The theoretical contribution of residue in food and water following river water contamination gave a safety margin for all effects of over 500 fold.

Subsequent to completion and review of the above-mentioned studies a determination will be made concerning any formal reevaluation of benthocarb.

CAPTAFOL (Difolatan)

Chevron Chemical Company submitted an application for a new formulation of captafol (Difolatan 80 Sprills). This submission raised the issue of data

RICE RESEARCH BOARD

P. O. BOX 507
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April 18, 1983

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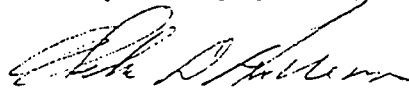
Mr. John Varozza
City Engineer
Department of Engineering
City of Sacramento
915 "I" Street
City Hall, Room 207
Sacramento, CA 95814

Dear Mr. Varozza:

As a follow-up to our telephone conversation, this is to advise you that the first applications of Bolero and Ordram should occur on or about April 25, 1983. If the weather deteriorates, these applications could be delayed.

If you have any questions on the matter, please contact me.

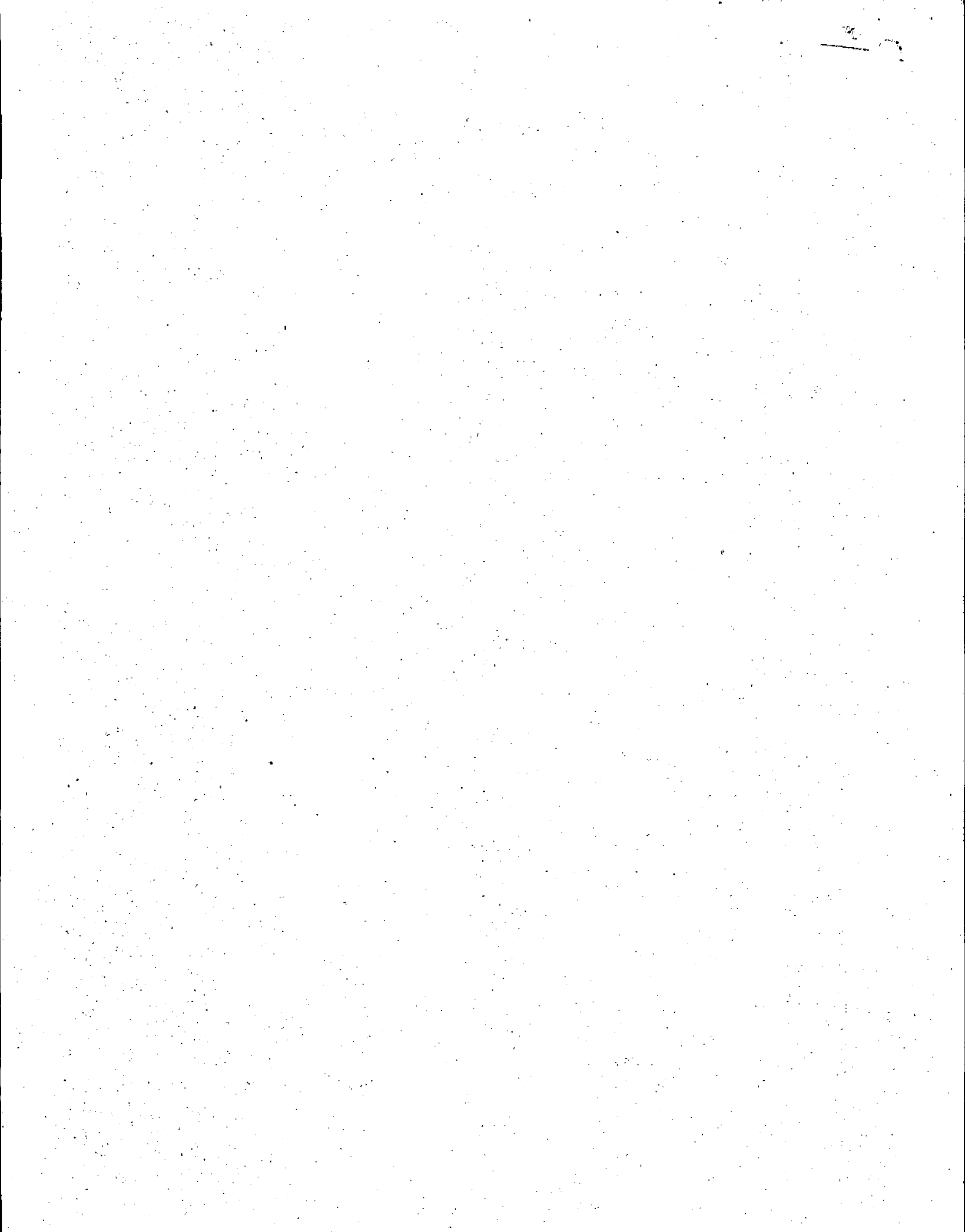
Very truly yours,



Melvin D. Androus
Manager

MDA/dl

cc: Mr. George Reese
Bryan J. Finlayson
Rudy Schnagle
Dr. Jim Hill
Dr. Donald Crosby





Stauffer Chemical Company

Westport, Connecticut 06881 / Tel. (203) 222-3000 / Cable "Staufchem"

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April 21, 1983

RECEIVED
APR 22 1983
STAFFER CHEMICAL COMPANY

Mr. John F. Varozza
City Engineer
City of Sacramento
Department of Engineering
915 "I" Street
Sacramento, California 95814

Dear Mr. Varozza:

First, let me thank you for attending our presentation on Ordram at the California Department of Food and Agriculture offices yesterday. As I mentioned at the meeting, there has been so much misinformation stated and written about the toxicologic properties of Ordram that I was most pleased to be able to present you with the scientific facts.

I stated at the meeting that SCC does not believe that the City of Sacramento should have to deal with any level of Ordram in its water supply. As a consequence, we are fully committed to taking all measures which will prevent the entry of our product into the Sacramento River. However, should that occur at levels comparable to those we have seen in the past, as a physician, I can assure you there is no reason for any health concern. The effect seen with Ordram is dose related, meaning simply that there is an amount of Ordram, which when fed to experimental animals, produces absolutely no effect. In the case of the rat this is 0.2mg/kg and for the monkey, 50mg/kg. For Ordram, then, and all of the substances for which drinking water standards have been established there is a safe level which can be consumed without any hazard to human health. As you heard Dr. Rosenberg say at the meeting, the safe level for Ordram is certainly many times higher than that detected in the Sacramento River.

You asked me to prepare a "fact sheet" which would in non-technical terms explain the substance of my presentation. You indicated that you could use this in keeping the Sacramento City Council informed with information about pesticides. Enclosed is a document which I hope will meet your needs.

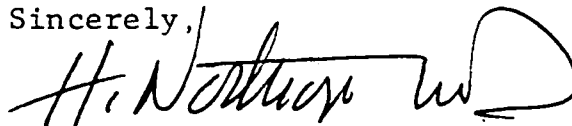
Stauffer Chemical Company

Mr. John Varozza
April 21, 1983
Page Two

For purposes of brevity and clarity, I have not included some portions of the presentation and of the discussion we had yesterday. If you think there is anything I have omitted that might be useful, please let me know. For that and any other purpose, you can contact me directly at (203) 222-3237.

Again, I hope the meeting was helpful to you and that the "fact sheet" was useful to the City Council.

Sincerely,



Herbert Northrop, M.D.
Director
Occupational Medicine Dept.

HN/ghw
Encls.

cc: Mr. George Reese, CDFA
Dr. Keith Maddy, CDFA
Michael Jackson, M.D., DHS
Ms. Ellen Widess, DIR



FACT SHEET

- Ordram is a major agricultural crop protection product which has been used on rice crops in California, the Southwest of the United States and throughout the world for more than fifteen years. It is extremely effective in controlling a weed (water grass) which limits rice production and as such is to a large extent responsible for the doubling of rice yields in the recent past.
- Ordram does not produce cancer, birth defects, or nerve damage in experimental animals. It does not produce damage to the future offspring of those animals.
- In one species only of experimental animals, i.e., rodents, administration of Ordram will produce a temporary reduction of fertility, not sterility. This effect is fully reversible in a short period of time following cessation of Ordram treatment. No effect on fertility occurs in higher species (rabbit and monkey) tested at extremely high doses.
- There is no evidence of fertility effects in men exposed to Ordram. A major clinical/epidemiologic health study of Ordram workers is being carried out at Stauffer plants by scientists from the University of Rochester School of Medicine in Rochester, New York. The purpose of the study is to determine if there are any potential reproductive effects in humans resulting from Ordram exposure. The study will be complete in

June of 1983, but all preliminary results show no evidence of major effect on sperm or fertility in any of the workers examined. Those workers are exposed to concentrations of Ordram many hundreds of times greater than those present in the Sacramento River last year.

- Ordram was found in the Sacramento River at the City water intake last year. The highest level found was 13 parts per billion.
- There is no evidence that Ordram was responsible for the "taste problem" observed in the Sacramento City Water only in the past two years.
- There are safe levels of chemicals in drinking water. Thus, arsenic, copper, and all of the other compounds for which drinking water standards have been established can be present and pose no threat to human health. The same is true of Ordram.
 - If Ordram or its degradation products were present in Sacramento City drinking water, a human, if he were as sensitive as the rat would have to drink 500 gallons of that water a day in order to possibly have a temporary effect on his fertility.
 - If man is more like the monkey, which we believe he is, drinking 39,000 gallons of Sacramento River water a day will have no effect on his fertility.

- Stauffer Chemical Company with the California Department of Food and Agriculture, the University of California Davis, the Rice Growers Association, the Rice Advisory Board and the Rice Growers themselves, have taken steps which are designed to assure that no residues of Ordram reach the Sacramento River during the brief upcoming application season. If, despite these efforts, low levels of Ordram or its degradation products are found in the Sacramento River there is no scientific evidence that its presence will pose any human health hazard of any sort.

