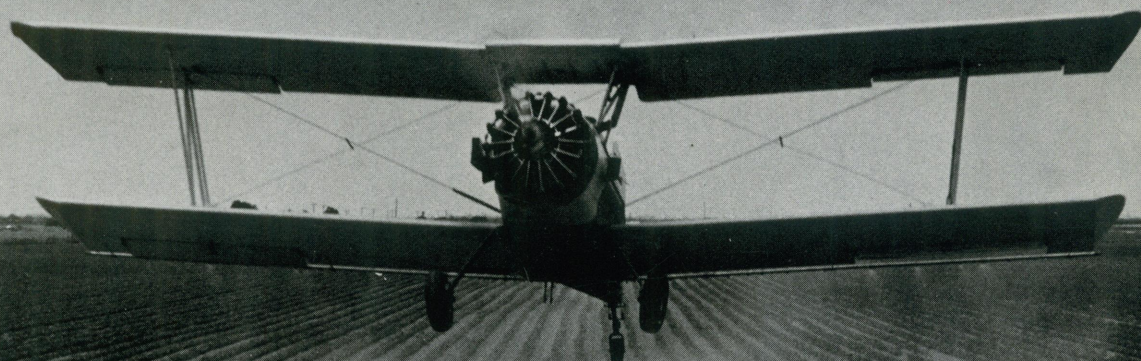


UNIV
SERV

FRUITS OF YOUR LABOR

A Guide to Pesticide Hazards
for California Field Workers

INSTITUTE OF INDUSTRIAL
RELATIONS LIBRARY
NOV 14 1985
UNIVERSITY OF CALIFORNIA
BERKELEY



FRUITS OF YOUR LABOR :

**A Guide to Pesticide Hazards
for
California Field Workers**

by Sidney Weinstein

Labor Occupational Health Program.]

Institute of Industrial Relations (Berkeley) Center for Labor Research
University of California, Berkeley

(c) 1984 The Regents of the University of California



AUTHOR'S NOTE

I wish to specially thank the dedicated and skilled people who aided me in the research for this project, and reviewed the various drafts: Keith Maddy, DVM, Chief-Staff Toxicologist, California Department of Food and Agriculture, Worker Safety Unit; Gunther Zweig, PhD., Resident Scientist (on loan from EPA) at the School of Public Health, University of California, Berkeley; Michael Stimmann, Ph.D., Statewide Pesticide Coordinator, Agricultural Extension services, University of California, Davis; Donald Whorton, M.D., Northern California Occupational Health Center; Jon Rosenberg, M.D., Gideon Letz, M.D., and Kim Hooper, Ph.D., Hazard Evaluation System and Information Service, California Departments of Health Services and Industrial Relations; Ephraim Kahn, M.D., Richard Jackson, M.D., and Don Mengle, M.P.H., Epidemiology Studies Branch, California Department of Health Services.

Thanks also to: Catherine Caldwell for her invaluable encouragement and assistance in many capacities, Patty Ayers and Cathy Davis for long hours spent typing; Andrew Rowland and Laura Fenster for research assistance early in this project; and Sue Edmiston and the rest of the CDFA Worker Safety Unit staff who meticulously reviewed each draft for technical accuracy.

Thanks also to: Morris Davis, former Director of the Labor Occupational Health Program, who encouraged me to start this project; and Robert Spear, Director of the Northern California Occupational Health Center, who enabled me to finish it.

A final and special thanks to Kennedy Smith for his tolerance and good humor throughout the ups and downs of this effort.

-- Sidney Weinstein

EDITORS' NOTE

The Labor Occupational Health Program wishes to dedicate this book to the farmworkers of California, with hope for a healthy future.

Special thanks to Ellen Widess, J.D., and Molly Coye, M.D., who helped to conceive of and complete this project.

The Editors

Robin Baker
Director, LOHP

Paul Chown
Chair, Center for Labor
Research and Education

Gene Darling
Editorial Assistant,
LOHP

Patricia Quinlan
Industrial Hygienist,
LOHP

TABLE OF CONTENTS

	Page
INTRODUCTION	i
PART I: POSSIBLE HAZARDS OF PESTICIDES AND THEIR RESIDUES	I-1
PART II: HAZARDS ASSOCIATED WITH MAJOR CHEMICAL GROUPS USED AS PESTICIDES	II-1
A. Organophosphates	II-3
B. N-Methyl Carbamates	II-6
C. Organochlorines	II-8
D. Nitrophenols	II-10
E. Dipyridyls	II-11
F. Chlorophenoxy Herbicides	II-13
G. Phthalimide Derivatives	II-15
H. Dithiocarbamates	II-16
PART III: POTENTIAL DANGERS OF 60 PESTICIDES	III-1
1. Aldicarb	III-6
2. Amitraz	III-6
3. Azinphosmethyl	III-6
4. Benomyl	III-7
5. Captafol	III-7
6. Captan	III-7
7. Carbophenothion	III-8
8. Chlorobenzilate	III-8
9. Chloropicrin	III-8
10. Chlorothalonil	III-9
11. 2,4-D and Esters and Salts	III-9
12. D-D	III-10
13. DEF	III-10
14. Demeton	III-11
15. Diallyl	III-11
16. Diazinon	III-11
17. Dichloropropene	III-12
18. Dieldrin	III-12
19. Dimethoate	III-13
20. Dinoseb	III-13
21. Dioxathion	III-14
22. Disulfoton	III-14
23. DNOC	III-14
24. Dyfonate	III-15
25. Endosulfan	III-15
26. Endrin	III-16
27. EPN	III-16
28. Ethion	III-17
29. Ethoprop	III-17
30. Ethylene Dibromide	III-17

	Pages
31. Fenamiphos	III-18
32. Fensulfothion	III-18
33. Folpet	III-19
34. Glyphosate	III-19
35. Lindane	III-19
36. Malathion	III-21
37. Maneb	III-21
38. Metasystox-R	III-22
39. Methidathion	III-22
40. Methiocarb	III-22
41. Methomyl	III-23
42. Methyl Bromide	III-23
43. Methyl Parathion	III-24
44. Mevinphos	III-24
45. Molinate	III-25
46. Monocrotophos	III-25
47. Naled	III-25
48. Nitrofen	III-26
49. Paraquat	III-26
50. Parathion	III-27
51. Phosmet	III-28
52. Phosphamidon	III-28
53. Propargite	III-29
54. Sodium Arsenite	III-29
55. Sulfotepp	III-29
56. Sulfur	III-30
57. Thiram	III-30
58. Toxaphene	III-31
59. Trichlorfon	III-31
60. Trifluralin	III-32
Footnotes	III-32

**PART IV: POTENTIAL EFFECTS OF PESTICIDES FREQUENTLY USED
ON 26 CALIFORNIA CROPS** **IV-1**

1. Alfalfa	IV-5
2. Almonds	IV-10
3. Apples	IV-13
4. Artichokes	IV-16
5. Asparagus	IV-18
6. Avocados	IV-21
7. Broccoli	IV-25
8. Brussel Sprouts	IV-28
9. Cabbage	IV-30
10. Carrots	IV-33
11. Cauliflower	IV-36
12. Celery	IV-39
13. Citrus (except Grapefruit, Oranges, Lemons)	IV-42
14. Cotton	IV-46
15. Dates	IV-50

	Pages
16. Grapefruit	IV-52
17. Grapes	IV-56
18. Lemons	IV-60
19. Lettuce	IV-63
20. Mushrooms	IV-66
21. Onions	IV-68
22. Oranges	IV-72
23. Peaches	IV-76
24. Roses	IV-79
25. Strawberries	IV-81
26. Tomatoes	IV-85
Footnotes	IV-89
 PART V: APPENDICES	 V-1
A. Medical Testing for Pesticides	V-1
B. Dermatitis in Agricultural Workers	V-2
C. CDFA Pesticide Evaluation Process	V-5
D. California Restricted Materials	V-6
E. Summary of Worker Health and Safety Protections	V-11
F. Resources (Training Program and Publications)	V-18
G. Resources (Organizations that Can Provide Information on Pesticides and Hazards)	V-21
H. Pesticides that Were Recently Tested for Mutagenicity in Microbial Laboratory Tests	V-23
I. Pesticides that Tested Positive in Other Mutagenicity Tests	V-25
J. Pesticides NIOSH Considers to Display No Significant Carcinogenicity in Laboratory Animal Tests	V-26
K. Pesticides that are Suspect Carcinogens, as Demonstrated in Laboratory Animal Tests	V-27
L. Other Pesticides that Have Shown Evidence of Carcinogenic Activity in Animal Tests, but Where Data was Inconclusive	V-28
M. Pesticides that Have Caused Reproductive System Problems, as Demonstrated in Animal Tests	V-30
N. Organophosphates Suspected of Causing Delayed-Onset Peripheral Neuropathy, as Demonstrated in Chickens	V-32
O. Pesticides Whose Registration Status Was Dependent on IBT Data	V-33
P. Government Agencies with Responsibility for Pesticides and Field Worker Health and Safety	V-34
Q. Pesticide Ingredients for Which Close To or More Than 1,000,000 Pounds Were Sold in California in 1980 for Use in Agriculture	V-37
R. Major Chemical Groups Used as Pesticides and Their Uses	V-39
S. EPA Signal Words	V-44
T. Glossary: Trade Names and Common Names	V-45

INTRODUCTION

INTRODUCTION

The writing of this book was first started in 1978-79 at the same time that the Labor Occupational Health Program began working with the United Farm Workers of America (UFW) to provide training and information on pesticide hazards to California farm workers. While collecting toxicity data on pesticides, no comprehensive survey of potential dangers from field residue exposures could be found. The UFW was particularly concerned that their members might have an increased risk of developing cancer, chronic diseases, or problems of the reproductive system related to pesticide exposure.

This book is addressed to "you," the exposed worker, but it is expected that many others will make use of it—health and legal professionals, government officials, labor educators, public health officers, rural and community groups, UFW staff, and others with field worker safety responsibilities.

A. WHAT DOES THIS BOOK INTEND TO DO?

A Guide to Pesticide Hazards for California Field Workers compiles well-documented information about potential health risks associated with commonly used pesticides in California. It is not a guide to medical treatment for pesticide-induced illnesses. Nor is it an argument to ban useful pesticides. Rather, this book summarizes the limited information that is available on pesticides and how they may affect human health.

A Guide to Pesticide Hazards for California Field Workers is above all a survey of pesticides that are most likely to cause health problems among California field workers. The pesticides included in this book were chosen because: 1) they have caused acute systemic illnesses (poisoning) or eye/skin problems during the past four years, as reported to the state through Doctor's First Reports of Injury and Illnesses forms; 2) they are frequently used on 26 crops in which California farm workers are most likely to be working; or 3) the pesticides have been shown to be carcinogenic, mutagenic, or teratogenic, based on tests involving experimental animals.

B. HOW THIS BOOK IS ORGANIZED

PART I: POSSIBLE HAZARDS OF PESTICIDES AND THEIR RESIDUES and *PART II: HAZARDS ASSOCIATED WITH MAJOR CHEMICAL GROUPS FREQUENTLY USED AS PESTICIDES* provide an overview of the pesticide problem. *PART III: POTENTIAL DANGERS OF 60 PESTICIDES* includes the most toxic pesticides field workers are apt to encounter in California. It also includes a number of pesticides (e.g., malathion, glyphosate, 2,4-D) which are widely used, and about which misconceptions have arisen concerning their toxicity. *PART IV: PESTICIDES FREQUENTLY USED ON 26 CROPS* includes compounds that were applied to at least one half of one percent of the acreage reported for each crop in the 1977 and 1978 California Department of Food and Agriculture's *Pesticide Use Reports*. Although weather conditions and pest infestations vary from year to year, the pesticides listed in *PART IV* are for the most part consistently and widely used each year. The *APPENDICES* document many of the book's assertions about the potential dangers of pesticides. *APPENDIX E: SUMMARY OF WORKER HEALTH AND SAFETY PROTECTIONS* summarizes protective field worker safety regulations and outlines the responsibilities of various government agencies for ensuring that field workers do not suffer adverse health effects from their pesticide exposures.

All pesticides referred to in *A Guide to Pesticide Hazards for California Field Workers* are mentioned by common name, but are indexed by common name and by most frequently used brand names.

Due to limitations of size and scope, this book does not include every potentially dangerous pesticide that is currently being used in California agriculture. Additionally, new compounds are constantly being developed and therefore cannot all be included in this book. To protect yourself, always find out which pesticides are being applied and what their potential health hazards might be. If a specific pesticide is not covered in this book, refer to other resources, such as those listed in *APPENDIX G*, for information.

PART I

POSSIBLE HAZARDS OF PESTICIDES AND THEIR RESIDUES

PART I: POSSIBLE HAZARDS OF PESTICIDES AND THEIR RESIDUES

Pesticides by their nature affect living organisms in some fashion. They can be dangerous to humans, too, if exposures are high or of long enough duration. However, the toxicity of individual pesticides varies greatly. Even members of the same chemical group are not equally toxic. How a pesticide affects human health depends on a number of factors, including:

- **Individual characteristics of the pesticide**—its acute toxicity; its rate of decomposition once applied; how skin-absorbable it is; how reactive it is within the body; what the target organs are.
- **How it enters the body**—inhalation; skin absorption; ingestion.
- **Physical form**—powder, pellets, liquid.
- **Amount of exposure.**
- **Length of exposure.**
- **Frequency of exposure.**
- **Time lapse between application of pesticide and individual exposure.**
- **Concentration.**
- **Other materials applied with the pesticide.**
- **How soon after exposure you are able to wash skin.**
- **Amount of foliage.**

In addition, the amount of air pollution, the temperature, and time since it last rained are other factors in the toxicity of pesticide residues, particularly organophosphates.

It is possible that several pesticides applied together can cause more damage than expected from the additive effects; this is called **synergism**. Organophosphates may exhibit this type of synergism. Therefore, the California Department of Food and Agriculture requires a longer safety interval when two or more organophosphates have been applied. The combination of parathion, methyl parathion, and/or EPN is especially hazardous.

A. HOW MIGHT PESTICIDES (AND THEIR RESIDUES) HARM HUMAN HEALTH?

Most information on the effects of pesticides on human health comes from animal studies and acute poisoning incidents in humans. But the exact correlation between toxic effects on animals and human risk (particularly for chronic effects, reproductive system problems, or cancer) is not always fully understood or documented.

1. SOME PESTICIDES AFFECT THE BODY AT THE POINT OF CONTACT

These are called “local” effects. A large number of pesticide illnesses are reported each year involving eye and/or skin problems. Many of these cases are caused by sulfur and propargite, or a combination of the two. Another skin irritant, glyphosate (Roundup), can also cause wheezing and nausea from its irritating properties to the lungs if large amounts are inhaled. This usually only occurs among field workers who are sent into newly treated areas before the spray has dried or the dust has settled.

2. SOME PESTICIDES CAN “SENSITIZE” THE BODY WHERE THEY COME INTO CONTACT WITH IT

A person can be exposed to pesticides frequently without developing any adverse effects. But once an allergic reaction does occur, each additional exposure, no matter how small, will cause increasingly severe problems. Maneb and captafol are skin sensitizers, causing rashes that mimic the symptoms of poison oak. Captafol is also a respiratory sensitizer, causing asthma-like attacks.

3. SOME PESTICIDES AFFECT THE BODY AFTER THEY ARE ABSORBED

Pesticides can enter the body in three ways-inhalation, absorption through the skin, or ingestion. Skin absorption is the main exposure route for most field workers. Some pesticides and their residues (such as parathion and mevinphos) can be absorbed through the skin very rapidly so that washing with soap and water at lunch and after work may not effectively remove pesticide residues from the skin.

Once a pesticide or its residue is absorbed by the body, it is transported by way of the blood stream throughout the body and is excreted. Once the pesticide is carried throughout the body, it can affect various organs. Organochlorines, organophosphates, and N-methyl carbamates affect the nervous system; organochlorines also affect the liver and kidneys; nitrophenols upset the body’s heat-regulating ability, causing the body to overheat.

4. SOME PESTICIDES CAUSE ILLNESS IMMEDIATELY OR SOON AFTER EXPOSURE

These are called “acute” effects. Examples of acute illnesses reported among field workers exposed to pesticide residues are: organophosphate poisoning with flu-like symptoms and dizziness; red, tearing or burning eyes; and skin rash. Acute effects, because they are fairly easily linked to specific events, are the best reported pesticide-related incidents. They are also part of the basis for California Department of Food and Agriculture field worker safety re-entry intervals and annual pesticide safety re-evaluation program.

5. SOME PESTICIDES CAUSE ILLNESS MONTHS OR YEARS AFTER EXPOSURE

These are called “chronic” effects. Examples are liver or kidney damage or nervous system disease. Chronic effects are much more difficult to link to a specific incident than are acute effects. They may cause irreversible damage. There is little existing documented evidence for chronic pesticide-related illnesses among field workers although a number of commonly used pesticides have the ability to damage the nervous system, liver, and kidneys in animals.

6. SOME PESTICIDES MAY CAUSE MUTATIONS, BASED ON LABORATORY TESTS

Mutations are changes in the genes, carriers of hereditary information which are found in all cells, including eggs and sperm. Some agents that cause mutations (mutagens) have also been found to cause cancer or birth defects in animal tests. A few commonly used California pesticides (such as captan, dimethoate) have caused mutations in laboratory tests although we do not yet know if they are carcinogenic or teratogenic in humans.

7. SOME PESTICIDES MAY CAUSE BIRTH DEFECTS OR OTHER PROBLEMS WITH REPRODUCTION, AS DEMONSTRATED IN LABORATORY TESTS. ONE PESTICIDE HAS CAUSED INFERTILITY IN MALE WORKERS

In animal tests with various pesticides, reproductive system effects have included: lowered sperm counts or physical changes in sperm (in males) (DBCP); reduced testosterone uptake by prostate (males); decreased ovulation (females); inability to mate (males and females); inability to conceive (males and females); decreased number, size, and survival of litters; frequent stillbirths; and birth defects. Although a number of commonly used California pesticides have caused these effects in animals we do not yet know if they produce the same effects in humans.

Most data linking birth defects and other reproductive system problems to pesticides comes from animal tests. Only one pesticide, DBCP, has so far been found to cause reproductive system problems in humans. DBCP was linked to low sperm counts (infertility) among male manufacturing and formulation workers in 1977. Ethylene dibromide (EDB), because of its similar chemical structure and properties, is also suspected of being a human spermatotoxin, based on animal studies.

The hazard to the reproductive system from pesticide exposure is not limited to male or female exposures before conception or female exposures during pregnancy (chemicals can pass directly to the fetus across the placenta). Newborn infants can also be harmed by exposures to pesticides present in the mother's milk. Organochlorines in particular are stored in the body's fat cells and may show up in a mother's milk long after a work exposure ceases. DDT and kepone have been detected in tissues of people years after both pesticides were banned. Having infants and young children in newly treated fields can also endanger them, since there is an hypothesis that they are more susceptible to pesticides than are most adults.

Another source of exposure to pregnant women, infants, and young children is contaminated work clothes which distribute pesticide residues in the home or spread it to the family's clothing during washing. Bringing home empty pesticide containers or small amounts of pesticides for household use may also endanger the family. Pesticides must be kept in the original, labeled container.

8. SOME PESTICIDES CAUSE CANCER IN EXPERIMENTAL ANIMALS

Cancer is a name for a number of different diseases which are characterized by uncontrolled division of cells. Cancers can affect almost any site in the body. Like chronic diseases, cancers may be very difficult to link to a particular job situation because of the long latency period, ranging from 5 to 30 years from the first exposure to a cancer-causing agent (carcinogen) to onset of recognizable symptoms. Making this link is also difficult because of the multitude of pesticides farmworkers are exposed to over the years.

As with problems of the reproductive system, most data linking cancer and pesticides are derived from animal tests. The only human evidence of pesticide-related human cancers is higher cancer incidence among workers exposed to inorganic arsenicals such as lead arsenate and possibly sodium arsenate. Lead arsenate is widely used in Florida to ripen fruit. Sodium arsenate is still occasionally used in California to treat "dead arm," a grape plant disease.

B. SOME PESTICIDES MAY BE CONTAMINATED WITH OTHER TOXIC BYPRODUCTS

Sometimes other, even more toxic chemicals are present as breakdown products of pesticides. Currently, scientists feel that evidence of cancer and birth defects in animals exposed to maneb and other ethylene bisdithiocarbamates is due to the presence of ethylenethiourea (ETU). Some chlorophenoxy herbicides (2,4,5-T) were contaminated with TCDD, a birth defect and cancer-causing agent. Alachlor was found to be contaminated with small amounts of epichlorohydrin which is a suspected carcinogen based on animal tests.

C. OTHER JOB CONDITIONS COULD CAUSE ILLNESS AMONG FIELD WORKERS

Field workers are also exposed to other agents and job conditions that could cause acute and chronic illnesses, for example: certain plants and crops can cause skin rashes and sensitivities (see *APPENDIX B*); exposure to improperly ventilated fumes produced by internal combustion engines or hot cutting operations on lettuce and other wrapping machines could cause dizziness, nausea, flu-like symptoms, and skin and eye irritation.

PART II

**HAZARDS ASSOCIATED WITH MAJOR CHEMICAL GROUPS
USED AS PESTICIDES**

PART II: HAZARDS ASSOCIATED WITH MAJOR CHEMICAL GROUPS USED AS PESTICIDES

Chemical groups are classes of chemicals, in this case pesticides, with similar chemical structures and properties. Some of the more commonly used pesticides with potential health hazards are from the following groups:

ORGANOPHOSPHATES (insecticides such as parathion and malathion)
N-METHYL CARBAMATES (insecticides such as methomyl and carbaryl)
NITROPHENOLS (herbicides such as dinitrophenol and dinoseb)
DIPYRIDYLS (herbicides such as paraquat and diquat)
CHLOROPHENOXY HERBICIDES (herbicides such as 2,4,-D and 2,4,5-T)
PHTHALIMIDE DERIVATIVES (fungicides such as captan and captafol)
DITHIOCARBAMATES (fungicides such as thiram and maneb)

Although individual members of the same chemical group are not equally toxic, they have similar effects on target, as well as non-target organisms. For example, organophosphates interfere with nerve functions of both insects and humans. Types of effects of pesticides organized by groups are summarized in the following chart:

PESTICIDE EFFECTS BY CHEMICAL GROUP

ACUTE (poisoning):	ORGANOPHOSPHATES (flu symptoms, no fever) N-METHYL CARBAMATES (flu symptoms, no fever) NITROPHENOLS (flu symptoms, fever) DIPYRIDYLS (paraquat only)
(eye/skin):	ORGANOCHLORINES (rash) NITROPHENOLS (yellow staining, rash) CHLOROPHENOXY HERBICIDES (rash) DIPYRIDYLS (rash) PHTHALIMIDE DERIVATIVES (rash) DITHIOCARBAMATES (rash)
CHRONIC (liver, kidneys):	ORGANOCHLORINES (demonstrated in animals only)
(nervous system):	ORGANOPHOSPHATES (mainly demonstrated in animals but also in humans; delayed-onset peripheral neuropathy) ORGANOCHLORINES (mainly in animals, but tremors from chronic exposures to DDT and kepone reported in humans) NITROPHENOLS (behavior changes in humans, other effects of brain damage with very severe poisoning in humans)
REPRODUCTIVE SYSTEM:*	ORGANOCHLORINES (in some animals) DITHIOCARBAMATES (in animals where ETU exists as a breakdown product) CHLOROPHENOXY HERBICIDES (in animals where TCDD contamination is present) PHTHALIMIDE DERIVATIVES (in animals)
CANCER:	ORGANOCHLORINES (in animals) [liver cancer in mice] DITHIOCARBAMATES (in animals where ETU exists as a breakdown product) CHLOROPHENOXY HERBICIDES (in animals where TCDD contamination is present)

THE GREATEST DANGER TO FIELD WORKERS EXPOSED TO PESTICIDE RESIDUES IS ACUTE POISONING (especially from organophosphates and N-methyl carbamates) AND EYE AND SKIN PROBLEMS.

**Reproductive system effects have been divided into 1) birth defects, and 2) embryotoxic and fetotoxic effects. When a chemical causes the embryo or fetus to die, resulting in a spontaneous abortion, this is called embryotoxic or fetotoxic. Chemicals which do not kill the embryo or fetus, but cause deformities, are called teratogens and result in birth defects.*

The following subsections A-H, describe the possible hazards from exposure to any member of a particular chemical group. Due to the scarcity of information on health problems of field workers, it is not known whether chronic diseases are more prevalent in this population than in the general population. Some experts feel that the incidences of acute illnesses and eye/skin problems are greatly underreported.

Some potentially hazardous pesticides are unique chemical compounds not belonging to a specific chemical class. Benomyl, nitrofen, chlorothalonil, sulfur, propargite, and glyphosate (Round-up) are discussed individually in *PART III: POTENTIAL DANGERS OF 60 PESTICIDES*.

A. ORGANOPHOSPHATES

The greatest health danger to field workers from organophosphates is acute poisoning. Organophosphates are the most widely used group of insecticides. They also cause the largest number of reported acute systemic illnesses or poisonings every year in California among field workers exposed to pesticide residues. Poisoning from these compounds occurs because organophosphates interfere with an enzyme, cholinesterase (the enzyme responsible for nerve transmission). Early symptoms of poisoning include headache, dizziness and flu-like symptoms.

Some of the more commonly used organophosphates are:

AZINPHOSMETHYL (Guthion)	DIMETHOATE	METHYLPARATHION
AZODRIN	DISULFOTON	MEVINPHOS
CARBOPHENOTHION	EPN	(Phosdrin)
CHLOROPYRIFOS	ETHION	NALED (Di Brom)
(Dursban)	ETHOPROP	PARATHION (ETHYL)
COUMAPHOS	FAMPHUR	PHORATE
CRUFOMATE	FENSULFOTHION	PHOSPHAMIDON
DEMETON	FENTHION (BAYTEX)	RONNEL
DIAZINON	MALATHION	SULFOTEPP
DICHLORVOS (DDVP)	META-SYSTOX-R	TEPP
	METHAMIDOPHOS	TRICHLORFON
		(Dylox)

RESIDUES OF SOME ORGANOPHOSPHATES CAN BE MORE DANGEROUS THAN THE PARENT COMPOUND under certain climatic conditions. These include: high daily temperatures; no recent rainfall (or overhead spray-watering); a large amount of dust in the air or on the plants; and nitrous oxide or ozone present in the air. Field workers are particularly at risk from residues of PARATHION, MEVINPHOS, AZINPHOSMETHYL, and ETHION.

THE BEST PROOF OF ORGANOPHOSPHATE POISONING IS LOWER-THAN-NORMAL BLOOD CHOLINESTERASE LEVELS. Workers exposed regularly to organophosphates should have a "baseline" cholinesterase level test taken each year they are exposed to organophosphates. Later in the year, these "baseline" tests will provide proof that

poisoning has occurred due to organophosphates. A copy of the “baseline” test results should accompany a field worker in the case of a change in work location or doctor. For a more detailed discussion of medical testing for pesticide exposure, see *APPENDIX A*.

IF YOU GET ILL WHILE WORKING IN THE FIELDS AND SUSPECT IT MIGHT BE DUE TO AN ORGANOPHOSPHATE PESTICIDE—IMMEDIATELY: Remove contaminated clothing; wash skin and hair with soap and water; have someone take you to a doctor. Your doctor should take a blood sample and have it tested for cholinesterase activity. Your doctor should: treat your condition if necessary, usually with a combination of atropine and pralidoxime; report your illness to the local county health officer; report your illness on a “Doctor’s First Report of Injury and Illness” form if he/she even suspects your condition may be due to pesticides; and remove you from further exposure to cholinesterase-inhibiting compounds (organophosphates and N-methyl carbamates) until all symptoms of poisoning have disappeared and blood cholinesterase levels are at least 80 percent of “baseline” values.

The following chart summarizes the symptoms of acute illness and potential long-term risks due to organophosphate exposures.

HEALTH EFFECTS: ORGANOPHOSPHATES

ACUTE (poisoning): SYMPTOMS OF POISONING ARE PROGRESSIVE, APPEAR WITHIN 12 HOURS OF EXPOSURE, AND AT FIRST RESEMBLE FLU.

Fever generally does not occur with organophosphate poisoning.

MILD/MODERATE POISONING (from pesticide, residue)

Dizziness	Blurred (or darkened) vision
Headache	Unusual amount of sweating
Tiredness	Nausea, vomiting
	Increased salivation, sweating, tearing

SEVERE POISONING (from pesticide, residue)

Symptoms of mild/moderate poisoning
 Difficulties walking
 Tight feeling chest
 Twitching muscles, eyelids
 Tiny (pinpoint) pupils in eyes
 Uncontrolled urination, diarrhea

VERY SEVERE POISONING (rarely from residues)

Symptoms of mild/moderate/severe poisoning
 Generalized seizures
 Unconsciousness
 Difficulties breathing
 Death (usually from respiratory system failure)

(eye/skin): Less common with organophosphates; many reported skin problems due to organophosphates are caused by solvents and petroleum distillates with which pesticides are applied.

CHRONIC: Not common to organophosphates in general. Certain organophosphates have caused delayed-onset peripheral neuropathy in humans and in animal tests.

DELAYED-ONSET PERIPHERAL NEUROPATHY*

Methamidophos (Monitor) (humans, animals)
 DEF (animals)
 Merphos (FOLEX) (animals)
 EPN (animals)
 TOCP (animals, humans) **
 Leptophos (Phosvel) (animals, humans) **
 MIPAFox (animals)

REPRODUCTIVE SYSTEM:

Not common to organophosphates in general

BIRTH DEFECTS:	EMBRYOTOXIC:
Dimethoate (animals)	Dimethoate (animals)
Carbophenothion (animals)	Methyl parathion (animals)
	Parathion (animals)
	Cruformate (rat)

CANCER:

Not common to organophosphates in general
CANCER

Dimethoate (suspected: cancer in one animal test only)
MUTATIONS (laboratory tests)
 Dimethoate (laboratory tests)
 Trichlorofon (laboratory tests; "weak")

*Pain, numbness and weakness in the extremities, which may persist for years. It is caused by damage to the peripheral nerves (i.e., nerves in the extremities).

**No longer used in California

B. N-METHYL CARBAMATES

N-methyl carbamates are also widely used in California agriculture. They have similar effects on nerve function as organophosphates and cause similar symptoms of poisoning. However, with N-methyl carbamate poisoning, cholinesterase blood levels return to normal within a few hours of the incident. Therefore **CHOLINESTERASE LEVELS ARE NOT RELIABLE FOR DIAGNOSING N-METHYL CARBAMATE POISONING** (see *APPENDIX A*). As with organophosphates, the **GREATEST DANGER FROM EXPOSURE TO N-METHYL CARBAMATES AND THEIR RESIDUES IS ACUTE ILLNESS** (poisoning). Unlike those due to organophosphates, few carbamate poisonings are life-threatening (with the exception of Aldicarb, which is extremely toxic).

Some of the more commonly used N-methyl carbamates are:

ALDICARB (Temik)	METHIOCARB
CARBARYL (Sevin)	METHOMYL (Lannate)
CARBOFURAN (Furadan)	OXAMYL (Vydate)
LANDRIN	PROPOXUR (Baygon)

IF YOU GET ILL WHILE WORKING IN THE FIELDS AND SUSPECT IT MIGHT BE DUE TO AN N-METHYL CARBAMATE—IMMEDIATELY: Remove contaminated clothing; wash skin and hair with soap and water; have someone take you to a doctor. Your doctor may still want to take a cholinesterase activity blood test. He/she should: treat your condition, usually with atropine, report your illness to the local county health officer; report it on a “Doctor’s First Report of Injury and Illness” form if he/she even suspects your condition may be due to pesticides; and remove you from further exposure to cholinesterase-inhibiting compounds (organophosphates and N-methyl carbamates) until symptoms disappear and blood cholinesterase levels are at least 80 percent of “baseline” values.

The following chart summarizes the symptoms of acute illness, and potential long-term, reproductive system, and cancer risks to be expected from N-methyl carbamate exposures. Where such effects don’t appear to be a group characteristic, exceptions (if any) are listed.

HEALTH EFFECTS: N-METHYL CARBAMATES

ACUTE (poisoning):	<p>SYMPTOMS APPEAR IMMEDIATELY OR WITHIN 12 HOURS OF EXPOSURE AND AT FIRST RESEMBLE FLU.</p> <p>Fever does not occur with N-methyl carbamate poisoning.</p> <p>MILD/MODERATE POISONING (from pesticide, residue)</p> <table><tr><td>Headache</td><td>Unusual amount of sweating</td></tr><tr><td>Tiredness</td><td>Blurred (or darkened) vision</td></tr><tr><td>Vomiting</td><td>Stomach pain</td></tr></table> <p>SEVERE POISONING (from pesticide, residue)</p> <p>Symptoms of mild/moderate poisoning</p> <p>Dizziness</p> <p>VERY SEVERE POISONING (usually from pesticide, very rarely from residues)</p> <p>Symptoms of mild/moderate/severe poisoning</p> <p>Generalized seizures</p> <p>Unconsciousness</p> <p>Difficulties breathing</p>	Headache	Unusual amount of sweating	Tiredness	Blurred (or darkened) vision	Vomiting	Stomach pain
Headache	Unusual amount of sweating						
Tiredness	Blurred (or darkened) vision						
Vomiting	Stomach pain						
(eye/skin)	<p>Less common with N-methyl carbamates in general; many reported skin problems due to N-methyl carbamates are caused by solvents and petroleum distillates with which pesticides are applied.</p>						
CHRONIC:	<p>Not common to N-methyl carbamates in general. There is no animal or human evidence for delayed-onset peripheral neuropathy as with some organophosphates.</p>						
REPRODUCTIVE SYSTEM:	<p>Not common to N-methyl carbamates in general</p> <p>BIRTH DEFECTS:</p> <p>Carbaryl—Although there are several reports in the literature of birth defects among the offspring of dogs fed high doses of carbaryl, EPA takes the position that there is no danger for humans since dogs metabolize carbaryl in a different manner than humans, and doses used were high enough to threaten the health of the mothers.</p>						
CANCER:	<p>No known evidence for N-methyl carbamates to date.</p>						

C. ORGANOCHLORINES

Not much is known about the specific mode of action of organochlorines. These compounds interfere with the nerves' ability to transmit messages in target organisms (pests) and non-target organisms (humans). This chemical group is not likely to cause acute systemic illness (poisoning) among field workers exposed to residues. **THE GREATEST DANGERS FROM EXPOSURES TO ORGANOCHLORINES ARE: SKIN RASH, AND THE RISK OF SLOW-TO-DEVELOP LIVER, KIDNEY, BRAIN, AND REPRODUCTIVE SYSTEM DAMAGE, AND CANCER.**

Organochlorines were once the most commonly used group of insecticides. They were extremely effective against target pests and had low acute toxicities for warm-blooded animals. Now many have been withdrawn or their agricultural uses severely restricted due to their persistence in the environment, damage to endangered species, or potential to cause chronic health problems, reproductive system damage, and cancer. Some organochlorines are also very persistent in human fat tissue.

Some of the more common organochlorines are:

ALDRIN	ENDRIN
BENZENE HEXACHLORIDE	HEPTACHLOR
(BHC)	KELTHANE
CHLORDANE**	KEPONE (chlordecone)
CHLOROBENZILATE	LINDANE*
DDT	METHOXYCHLOR*
DICOFOL	MIREX
DIELDRIN	STROBANE
ENDOSULFAN*	TOXAPHENE*

* Still used in agriculture

**Still used in structural pest control.

IF YOU ARE EXPOSED TO LARGE AMOUNTS OF FRESH ORGANOCHLORINES SUCH AS FROM DRIFT, SPILLS, OR BEING ACCIDENTALLY SPRAYED, AND HAVE TWITCHING MUSCLES—IMMEDIATELY: Wash with soap and water; and have someone drive you to a doctor. Your doctor should: diagnose your condition, usually with blood or urine tests (which must be taken within 72 hours of the incident); treat you; report the illness to the local county health officer; and report your illness on a "Doctor's First Report of Injury and Illness" form if he/she even suspects your condition may be due to pesticides.

The following chart summarizes the symptoms of acute illness, and potential long-term reproductive system and cancer risks to be expected from organochlorine exposures. Where such effects don't appear to be a group characteristic, exceptions are still listed.

HEALTH EFFECTS: ORGANOCHLORINES

ACUTE (poisoning): Poisoning could occur in field workers exposed to very large amounts of fresh organochlorines from drift, being accidentally sprayed, or from spills.

MILD/MODERATE POISONING (usually from pesticide, not from residue)

Dizziness	Weakness
Nausea	Excitability
Stomach pain	Unusual amount of fearfulness and irritability
Vomiting	

SEVERE POISONING (usually from pesticide, not residue)

Symptoms of mild/moderate poisoning

Muscle twitching
Generalized seizures
Difficulties breathing

(eye/skin): Skin irritation, rash

CHRONIC: Many organochlorines can cause chronic skin rash from regular exposures.

Many have also been found to produce nervous system disorders, possibly involving the: brain, peripheral nerves, muscles, and liver.

Appetite and weight loss

BRAIN, NERVE DAMAGE	KIDNEY, LIVER DAMAGE
DDT (humans)	Lindane (animals)
Chlordecone (Kepone)	Endrin (animals)
(humans)	
Endrin (humans)	
Aldrin (animals)	
Lindane (humans, animals)	

REPRODUCTIVE SYSTEM: Many organochlorines have been found to have adverse effects on reproduction in test animals.

BIRTH DEFECTS	EMBRYOTOXIC
Aldrin (animals)	Endrin (animals)
Dieldrin (animals)	Dieldrin (animals)
Endrin (animals)	Lindane (animals)
	Kepone (mouse)
	Heptachlor (rat)

LOWERED SPERM COUNTS	DECREASED OVULATION
(male infertility)	(female infertility)
Chlorobenzilate (animals)	Mirex (rat)
Kepone (humans)	

CANCER: Many organochlorines have tested positive in animal cancer tests.

CANCER	MUTATIONS
DDT (animals)	Toxaphene (laboratory tests)
Chlordecone (Kepone)	
(animals)	
Aldrin (animals)	
Chlorobenzilate ("weak" in animals)	
Dieldrin (animals)	
Toxaphene (animals)	
Lindane (animals)	
Dicofol (animals)	

D. NITROPHENOLS (also NITROCREOLS)

Acute exposures to large amounts of nitrophenols affect the body's heat-regulating mechanism, causing the body to overheat. Nitrophenols are easily absorbed into the body through the skin. Very large acute exposures may damage the liver, kidneys, or brain. **THE GREATEST DANGER TO FIELD WORKERS FROM THIS CLASS OF HERBICIDES IS ACUTE SYSTEMIC ILLNESS (poisoning), especially in hot weather.** Contact with nitrophenols will stain skin and hair at the points of contact.

Some of the most commonly used nitrophenol herbicides are:

DINOSEB (DNBP, 2-sec-butyl-4,6-dinitrophenol)
DNOC (4,6-Dinitro-o-cresol)

IF YOU ARE POISONED BY NITROPHENOL HERBICIDES—IMMEDIATELY: Wash skin and hair with soap and water; flush chemicals from eyes with large amounts of water; get out of the sun; lower body temperature, by sponge baths or wrapping in wet blankets; have someone take you to a doctor. **DO NOT TAKE ASPIRIN. DO NOT LET YOUR DOCTOR GIVE YOU ATROPINE.** Your doctor should: diagnose your condition; take blood and/or urine tests (but should not wait for test results to begin treatment); treat your condition with fluids; report your illness to the local county health officer; and report your illness on a "Doctor's First Report of Injury or Illness" form if he/she even suspects your condition may be due to pesticides.

HEALTH EFFECTS: NITROPHENOLS

ACUTE (poisoning):	IF WHITES OF EYES TURN YELLOW, YOU HAVE BEEN SEVERELY POISONED.
	MILD POISONING (from pesticides, not residues) Unusual amount of sweating Headache Unusual amount of thirst Nausea
	SEVERE POISONING (from pesticides, not residues) Warm, red skin Rapid heartbeat Fever
(eye/skin):	Skin rash
CHRONIC:	Weight loss (from regular poisoning at low doses).
REPRODUCTIVE SYSTEM:	Nitrophenols have shown no evidence of reproductive system effects.
CANCER:	Nitrophenols have shown no evidence of causing cancer.

E. DIPYRIDYLS

Dipyridyl compounds (Paraquat, Diquat) bind to and injure certain tissues of the nails, eyes, nose, mouth, and respiratory and gastrointestinal tracts. Small doses of fresh pesticides (as from spills, drift, or being accidentally sprayed) can cause inflammation (soreness, redness), cell death, and holes (ulcers) in mucosal (nose, mouth and throat) linings. Residue exposures do not appear to be very dangerous. These compounds have been mistaken for soft drinks and as little as one teaspoonful has caused accidental poisonings. **THE GREATEST DANGER TO FIELD WORKERS FROM DIPYDRIDYLS IS SKIN PROBLEMS FROM DIRECT CONTACT WITH THE LIQUID CONCENTRATE, SPRAY, OR NEWLY TREATED LEAVES (before the spray has adequately dried).**

Three dipyridyl compounds are used in California: **PARAQUAT, DIQUAT, MORFAMQUAT.**

One dipyridyl, **PARAQUAT, IS MUCH MORE DANGEROUS THAN THE OTHERS, PARTICULARLY WHEN SWALLOWED.** A sip of Paraquat concentrate could kill you, and dermal exposure can also be dangerous.

IF YOU GET DIPYRIDYLS ON YOUR SKIN—IMMEDIATELY: Wash with soap and water (including hair); flush eyes if they are involved; notify your doctor of exposure. **IF YOU SWALLOW PARAQUAT—IMMEDIATELY:** Go to your doctor; tell him/her that you swallowed Paraquat and to begin treatment right away (even when early symptoms are not severe, Paraquat could kill you if not removed from your body), including removal of Paraquat from your stomach and gut; report the illness to the local county health officer; and report your illness on a “Doctor’s First Report of Injury and Illness” form if he/she even suspects your condition may be due to pesticides.

The following chart summarizes symptoms of acute illness, and potential long-term, reproductive system, and cancer risks from dipyridyl exposures.

HEALTH EFFECTS: DIPYRIDYLS

ACUTE (poisoning):	<p>The most severe symptoms of paraquat poisoning (from ingestion) don't appear for several days to weeks.</p> <p>FROM CONTACT WITH LARGE AMOUNTS OF FRESH DIPYRIDYLS OR STILL-WET FOLIAGE:</p> <p>Nose bleeds Cough</p> <p>FROM SWALLOWING PARAQUAT:</p> <table><tr><td>Stomach pain</td><td>Liver damage (first appearing 48-72 hours after exposure)</td></tr><tr><td>Vomiting</td><td></td></tr><tr><td>Diarrhea</td><td>Kidney damage (first appearing 48-72 hours after exposure)</td></tr><tr><td>Generalized muscle ache</td><td>Lung damage (scarring, lesions, first appearing 72 hours to 14 days after exposure)</td></tr></table>	Stomach pain	Liver damage (first appearing 48-72 hours after exposure)	Vomiting		Diarrhea	Kidney damage (first appearing 48-72 hours after exposure)	Generalized muscle ache	Lung damage (scarring, lesions, first appearing 72 hours to 14 days after exposure)
Stomach pain	Liver damage (first appearing 48-72 hours after exposure)								
Vomiting									
Diarrhea	Kidney damage (first appearing 48-72 hours after exposure)								
Generalized muscle ache	Lung damage (scarring, lesions, first appearing 72 hours to 14 days after exposure)								
(eye/skin):	<p>Sore, red eyes Skin rash, sensitivity in some individuals</p>								
CHRONIC:	<p>Discolored, irregular nails (in humans from regular exposure to concentrate).</p>								
REPRODUCTIVE SYSTEM:	<p>Not common to dipyridyls. BIRTH DEFECTS Paraquat (animals)</p>								
CANCER:	<p>No known evidence for dipyridyls to date.</p>								

F. CHLOROPHENOXY HERBICIDES

Fresh chlorophenoxys are very easily absorbed through the skin. There have been reports of peripheral neuropathy in people who spilled large amounts of 2,4-D on their skin. Once dried, however, these compounds break down very quickly. They are also quickly eliminated from the body, although a contaminant of some chlorophenoxy herbicides (TCDD) is not. **THE GREATEST DANGER TO FIELD WORKERS EXPOSED TO CHLOROPHENOXY HERBICIDES** (usually fresh from spills, drift, or being accidentally sprayed) **IS SKIN RASH.** These compounds can also be extremely irritating to the eyes, throat, and respiratory tract.

In recent years, use of chlorophenoxy herbicides has become very controversial. TCDD, the dioxin contaminant in the defoliant Agent Orange, which was used in Viet Nam, causes liver and kidney damage and cancer, birth defects and chloracne* in test animals. Agent Orange was a combination of 2,4-D and 2,4,5-T. TCDD, however, is only found in 2,4,5-T. No final determination of its effect on humans has been made to date.

Some commonly used chlorophenoxys are:

2,4-D	MCPA
2,4-DB	MCPB
2,4,5-T	MCPP
DICHLORPROP	SILVEX
ERBON	
FALONE	

IF YOU GET LIQUID CHLOROPHENOXY ON YOUR SKIN—IMMEDIATELY: Wash with soap and water; flush eyes (if involved) with large amounts of water for 5-10 minutes. **IF YOU HAVE CHRONIC SKIN DISEASE OR SENSITIVITY** (caused by any chemicals, including chlorophenoxy herbicides), avoid direct contact with chlorophenoxys. **IF YOU GET ILL FROM BREATHING IN CHLOROPHENOXY HERBICIDE SPRAYS OR DIRECT CONTACT WITH LIQUID,** have someone take you to a doctor. Your doctor should: diagnose your condition, usually by a urine test (although the sample must be taken within 24-72 hours of exposure); remove you from further exposure to chlorophenoxys for at least two days; report the illness to the local county health officer; and report your illness on a "Doctor's First Report of Injury or Illness" form if he/she even suspects your condition may be due to pesticides.

The following chart summarizes the symptoms of acute illness, and potential long-term, reproductive system, and cancer risks to be expected from chlorophenoxy exposures. Where such effects don't appear to be a group characteristic, exceptions are still listed.

*Chloracne is an acne-like eruption on the skin caused by contact with certain chlorine-containing compounds.

HEALTH EFFECTS: CHLOROPHENOXY HERBICIDES

ACUTE (poisoning):	<p>Most acute illnesses are due to the irritating properties of these compounds.</p> <p>VERY LARGE EXPOSURES (usually inhalation of spray) Burning throat, nose, breathing passages Cough Muscular weakness</p>
(eye/skin):	<p>Red, tearing eyes Skin rash, sensitivity in some individuals</p>
CHRONIC:	<p>Loss of skin color (in manufacturing workers with regular long-lasting skin contact) Peripheral neuropathy--2,4-D (reported in humans after accidental spills)</p>
REPRODUCTIVE SYSTEM:	<p>This area is controversial. Animal evidence seems to indicate a danger only when a chlorophenoxy is contaminated with TCDD (such as 2,4,5-T).</p> <p>BIRTH DEFECTS 2,4,5-T and TCDD (animals)</p> <p>MALE INFERTILITY (reduced testosterone uptake by prostate) 2,4,5-T (no TCDD) (mouse)</p>
CANCER:	<p>This area is also controversial. Again, animal evidence seems to indicate a danger only when a chlorophenoxy is contaminated with TCDD.</p> <p>CANCER 2,4,5-T contaminated with TCDD (animals and one Swedish study involving humans)</p>

G. PHTHALIMIDE DERIVATIVES

These compounds can be very irritating to the skin and respiratory tract. They are also chemically similar to a drug, thalidomide, which was used in the 1950s to counteract nausea in pregnant women. Thalidomide caused widespread birth defects (shortened or missing arms and legs) in the offspring. Phthalimide derivative fungicides caused birth defects in a number of animal tests. **THE GREATEST DANGER TO FIELD WORKERS EXPOSED TO PHTHALIMIDE DERIVATIVE RESIDUES IS SKIN RASH AND SENSITIVITY.** Captafol may also cause respiratory system sensitization.

Three phthalimide derivative fungicides are used in California: CAPTAFOL, CAPTAN, FOLPET.

IF YOU GET FRESH PHTHALIMIDES ON YOUR SKIN—IMMEDIATELY: Wash with soap and water (including hair); flush eyes (if involved) with clear water. **IF YOU DEVELOP A SKIN OR RESPIRATORY SYSTEM SENSITIVITY:** avoid direct contact with phthalimides. **IF YOU DEVELOP A SKIN RASH OR BREATHING PROBLEM FROM EXPOSURE TO PHTHALIMIDE DERIVATIVES:** go to a doctor. Your doctor should: treat your condition ; report the illness to the local county health officer; and report your illness on a "Doctor's First Report of Injury and Illness" form if he/she even suspects your condition may be due to pesticides.

The following chart summarizes the symptoms of acute illness, and potential long-term, reproductive system, and cancer risks to be expected from phthalimide derivatives. Where such effects don't appear to be a group characteristic, exceptions are listed.

HEALTH EFFECTS: PHTHALIMIDES

ACUTE (poisoning):	Most acute illnesses are due to the irritating properties of these compounds.	
	FROM BREATHING LARGE AMOUNTS OF SPRAY DROPLETS Congestion Breathing problems, sensitization in some individuals	
(eye/skin):	Skin rash, sensitization in some individuals.	
CHRONIC:	Not common to phthalimides.	
REPRODUCTIVE SYSTEM:	Birth defects (animals)	
	BIRTH DEFECTS Captan (animals) Captafol (animals) Folpet (animals)	EMBRYOTOXICITY (toxic effects on an embryo in first 3 months of development) Captan (animals) Folpet (animals) Captafol (animals)
CANCER:	Not common to this class in general.	
	CANCER Captan (animals)	MUTATIONS Captan (animals)

H. DITHIOCARBAMATES

Many members of this group of fungicides are skin and respiratory system irritants and sensitizers. They may also aggravate an existing allergic skin or respiratory system illness, or sensitize you to chemically similar disulfiram compounds. **THE GREATEST DANGER FROM ACUTE EXPOSURE TO THESE COMPOUNDS IS SKIN RASH AND SENSITIVITY, AND SOMETIMES RESPIRATORY SYSTEM IRRITATION OR SENSITIVITY.** Ethylene bisdithiocarbamates have been linked to cancer and birth defects in animal tests when the breakdown product (ETU) is present. After formally reevaluating these products, EPA has mandated that cautionary statements be added to the labels to reflect this problem.

The dithiocarbamates are made up of three subgroups:

Tetramethyl thiuram disulfide: **THIRAM**

Metallodimethyl dithiocarbamates: **ZIRAM, FERBAM, VAPAM**

Ethylene bisdithiocarbamates: **MANEB, ZINEB**

Thiram and the metallodimethyl dithiocarbamates are chemically similar to antabuse (tetraethyl thiuram disulfide, also known as disulfiram), a drug often given alcoholics to discourage them from drinking. Taking antabuse in combination with even one drink can cause you to become very ill. Thiram and some other members of this pesticide group can act similarly if ingested (swallowed).

IF YOU COME INTO DIRECT CONTACT WITH LIQUID, SPRAY DROPLETS, OR STILL-WET FOLIAGE—IMMEDIATELY: Wash skin and hair with soap and water; flush eyes with fresh water for 10-15 minutes. **IF YOU ARE SENSITIVE TO SIMILAR COMPOUNDS** (a “rubber-sensitive individual”), avoid working around these compounds. **IF YOU ACCIDENTALLY SWALLOW A DITHIOCARBAMATE PESTICIDE:** do not drink alcohol for three weeks; do not work around ethylene dibromide for four weeks (exposure to some dithiocarbamates was found to increase ethylene dibromide’s carcinogenetic potency in some animal tests). **IF YOU DEVELOP SKIN OR RESPIRATORY SYSTEM PROBLEMS FROM WORKING AROUND DITHIOCARBAMATES,** go to a doctor. Your doctor should: diagnose your condition (laboratories can measure blood acetaldehyde (a substance in the blood which is necessary for the breakdown of alcohol in the body) to confirm alcohol-dithiocarbamate reaction); treat you; report the illness to the local county health officer; and report your illness on a “Doctor’s First Report of Injury and Illness” form if he/she even suspects your condition may be due to pesticides.

The following chart summarizes the symptoms of acute illness, and potential long-term, reproductive system, and cancer risks to be expected from dithiocarbamates. Where such effects don’t appear to be a group characteristic, exceptions are still listed.

HEALTH EFFECTS: DITHIOCARBAMATES

ACUTE (poisoning): Dithiocarbamates are relatively nontoxic with acute exposures to residues. However, breathing in large amounts of spray mists can irritate the respiratory system and lead to sensitivity in some individuals.

LARGE EXPOSURES TO FRESH COMPOUND (drift)

Congested nose

Hoarseness

Cough

(eye/skin): Skin rash, sensitivity in some individuals.

CHRONIC: None associated with dithiocarbamates.

REPRODUCTIVE **BIRTH DEFECTS**

SYSTEM: Thiram (animals)

Ethylene bisdithiocarbamates (MANEB, ZINEB) (with ETU) (animals)

CANCER: **CANCER**

Thiram (animals)

Ethylene bisdithiocarbamates (MANEB, ZINEB) (with ETU) (animals)

MUTATIONS

Maneb (laboratory tests, with and without ETU)

PART III
POTENTIAL DANGERS OF 60 PESTICIDES

PART III: POTENTIAL DANGERS OF 60 PESTICIDES

The following table outlines the potential health dangers of 60 commonly used California agricultural pesticides. These pesticides have been selected for their potential toxicity (acute, chronic, reproductive system, and/or cancer) or because they are widely used (e.g., malathion, 2,4-D) and misconceptions have arisen concerning their ability to cause toxic effects in people. On the whole, only acute effects have been substantiated in humans; evidence for most chronic effects, reproductive system problems, and cancer comes from animal tests (as noted in the table). This is not a comprehensive list of pesticides which are potentially toxic, so if you work with a pesticide which is not included here, refer to *APPENDIX G: RESOURCES* for where to get additional information.

A. HOW TO USE THIS TABLE

All pesticides included in this table are listed alphabetically by common (generic) name. The information about each pesticide is listed in four columns:

Column 1: PESTICIDE

Column 2: CHEMICAL GROUP/USE

Column 3: CALIFORNIA REGULATIONS

Column 4: WHAT THE DOCTOR SHOULD KNOW

The following subparts 1 through 4 explain the format and information included in each column.

1. KEY TO INFORMATION IN COLUMN ONE: PESTICIDE

PESTICIDE

COMMON NAME

(SUMMARY OF
HAZARDS--"A," "E/S,"
or "C")

Brand Name A

Brand Name B

"EPA SIGNAL WORD"

THE COMMON (OR GENERIC) NAME by which a pesticide is known. In many cases, common names have been assigned by the American National Standard Institute (ANSI) in America or the International Organization of Standardization (ISO) outside the U.S.A. The common name is for use when the chemical name is too long and/or complex for easy reference.

SUMMARY OF HAZARDS refers to the pesticide's potential to cause:

(A) **Acute systemic (poisoning) effects**, usually from single, large exposures;
(E/S) **Acute eye and/or skin effects** usually from single, large exposures; and
(C) **Chronic effects**, including slow-to-develop diseases of the nervous system, liver and kidneys, cancer, or reproductive system problems.

BRAND NAMES are names given by the manufacturer, representing “the name, number, trademark, or designation applied to an economic poison of any particular description by the manufacturer, distributor, importer, or vendor thereof. Each economic poison differing in the ingredient statement, analysis, manufacturer, or distributor, name, number or trademark shall be considered as a distinct and separate brand name.”

EPA SIGNAL WORD: EPA-designated code words indicating the relative acute toxicity of pesticides to people. “CAUTION” indicates lowest toxicity; “WARNING” is next most toxic; “DANGER” and “DANGER POISON” are very hazardous. EPA has an elaborate scheme for determining the signal word/toxicity category for a pesticide, including: Acute Oral LD₅₀; Acute Inhalation LD₅₀; Acute Dermal LD₅₀; eye damage; skin damage (see *APPENDIX S*).

EPA signal words reflect acute hazards only. They do **not** account for a pesticide’s potential to cause chronic or reproductive system effects, or cancer, as demonstrated in test animals. For most pesticides used in California, the EPA signal word determines California Department of Food and Agriculture field worker safety re-entry intervals.

2. KEY TO INFORMATION IN COLUMN TWO: CHEMICAL GROUP/USE

**CHEMICAL
GROUP/USE**

CHEMICAL GROUP

(USE)

THE CHEMICAL GROUP OR CLASS to which the pesticide belongs. The kinds of effects that might be caused by any member of a particular chemical group are discussed in *PART II: HAZARDS ASSOCIATED WITH MAJOR CHEMICAL GROUPS* used as pesticides. The groups discussed in *PART II* are: organophosphates; N-methyl carbamates; organochlorines; nitrophenols; dipyridyls; chlorophenoxy herbicides; phthalimide derivatives; and dithiocarbamates. If a pesticide listed in *PART III* belongs to any one of the above chemical groups, refer to *PART II*.

USE (how a material is used):

(I) as an insecticide.

(M) as a miticide or acaricide.

(H) as an herbicide.

(F) as a fungicide.

(S) as a soil fumigant.

3. KEY TO INFORMATION IN COLUMN THREE: CALIFORNIA REGULATIONS

CALIFORNIA REGULATIONS	FIELD WORKER SAFETY RE-ENTRY INTERVALS are assigned by the California Department of Food and Agriculture in part based on: relative acute toxicity category determined by EPA signal word; whether there have been reported illnesses (acute systemic or eye/skin) during the past year, and how many; skin absorbability; evidence of potential to cause chronic or reproductive system effects, or cancer, especially at low doses, as demonstrated in animal tests; and rate of decomposition once applied, due to biochemical and climatic factors.
CDFA FIELD WORKER SAFETY RE-ENTRY INTERVAL	
Citrus	
Peaches	
Nectarines	
Grapes	
Apples	
DANGEROUS if fields are entered before end of reentry interval	Thus, although nitrofen (now deregistered) was assigned only a "WARNING" EPA signal word, CDFA required a 14-day field worker safety re-entry interval due to its high skin absorbability; evidence of causing birth defects in animals at fairly low doses; and slow rate of decomposition once applied.
RESTRICTED-USE PESTICIDE	For most pesticides, however, the EPA signal word determines the re-entry interval: "CAUTION" and "WARNING"—WAIT UNTIL THE SPRAY HAS DRIED OR THE DUST HAS SETTLED. "DANGER" and "DANGER POISON"—24 hours.

Certain pesticides require 48 hours before fields can be re-entered. They are:

- | | |
|--------------------|----------------------|
| 1. carbophenothion | 9. methidathion |
| 2. demeton | 10. methomyl |
| 3. dicrotophos | 11. methyl parathion |
| 4. disulfoton | 12. mevinphos |
| 5. endosulfan | 13. parathion |
| 6. endrin | 14. phorate |
| 7. ethion | 15. phosphamidon |
| 8. Metasystox-R | 16. TEPP |

Whenever two or more organophosphates are applied, the re-entry interval is the longest interval plus one-half of the next longest one.

Whenever a combination of parathion, methyl parathion, and/or EPN are applied (and the amount is one pound/acre or more) the safety re-entry interval is 14 days.

In addition, application of the following pesticides to certain crops requires longer field worker safety re-entry intervals, usually for citrus, peaches, nectarines, grapes, and apples:

azinphosmethyl	ethion	parathion (also referred to as ethyl parathion)
carbophenothion	malathion	phosalone
chlorobenzilate	methidathion	phosphamidon
demeton	methiocarb	phosmet
diazinon	methomyl	sulfur
dimethoate	methyl parathion	TEPP
dioxathion	mevinphos	TORAK (dialifor)
EPN	naled	

See *APPENDIX E* for a more detailed summary of worker safety intervals.

DANGEROUS. Some pesticides (e.g., parathion, mevinphos) are particularly dangerous if fields are entered before re-entry intervals are up.

RESTRICTED-USE PESTICIDE. According to CDFA regulations, restricted-use pesticides must be applied by a certified pest control operator. And before they can be applied, the grower must seek a use permit from the local county agricultural commissioner. Permits may either be “SEASONAL” or “SINGLE-USE,” depending on the pesticide and the county. After a restricted-use pesticide is applied, its application must be reported to the local county agricultural commissioner within 7 days. See *APPENDIX D* for a complete list of CDFA restricted-use pesticides.

4. KEY TO INFORMATION IN COLUMN FOUR: WHAT THE DOCTOR SHOULD KNOW

WHAT THE DOCTOR SHOULD KNOW

ACUTE EFFECTS: Poisoning; eye/skin problems; see **CHEMICAL GROUP** if applicable

Acute Oral LD50
(animal):
number mg/kg
body weight

Acute Dermal LD50
(animal):
number mg/kg
body weight

ACUTE EFFECTS are those that can be linked to single, usually fairly large exposures; most are acute systemic illnesses (poisoning) or eye/skin effects.

ACUTE ORAL LD50 is the amount of a pesticide it took to kill 50 percent of the animals tested (usually rats) in a short-term feeding study. LD50s are computed in number of milligrams (mg) of pesticide per kilogram (kg) of the animal's body weight for comparative purposes.

ACUTE DERMAL LD50 is the amount of a pesticide it took to kill 50 percent of the animals tested (usually rabbit, guinea pig, or rat) in short-term skin exposure test. It is computed in mg/kg body weight as is the oral LD50. If the dermal LD50 is fairly close to the oral LD50, the material is very skin absorbable, and is a very great danger to field workers whose main form of exposure is through skin contact.

CHRONIC EFFECTS:
Slow-to-develop effects
on internal organs; see
CHEMICAL GROUP if
applicable

**REPRODUCTIVE SYSTEM
EFFECTS:** embryotoxicity;
birth defects; lowered
sperm counts in test animals

CANCER: Cancer in test
animals

OTHER: Mutations in
laboratory test systems

CHRONIC EFFECTS are mostly as demonstrated in animal tests. Possible exceptions are some organochlorines where there is human evidence. Animal evidence does not always mean the same effects will occur in humans.

REPRODUCTIVE SYSTEM EFFECTS are as demonstrated in animal tests. We don't know if humans are also at risk, and if so to what extent. Embryotoxicity refers to such effects as lowered birth weights, reduced litter sizes, before-birth deaths. "Suspected" indicates that effects were not clear or were not statistically significant in the test population.

CANCER as demonstrated in test animals. "Suspected" indicates test results either weren't clear or statistically significant for one test population, or that the cancer occurred in only one species of animals (instead of two), for example, rats but not mice. As with reproductive system effects, we don't know if humans are also at risk and if so, to what extent.

OTHER. Chemicals that cause mutations in laboratory tests are thought to have the ability to cause cancer and birth defects also. However, attempts to correlate laboratory mutagens with animal carcinogens has so far failed to produce a model of comparative activity. Again, evidence for mutations in a laboratory system does not mean there is necessarily a human risk.

B. TABLE OF 60 PESTICIDES

Footnotes to these charts (both asterisks and numbered) appear at the end of *PART III*.

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
ALDICARB (A) Permethrin Temik “DANGER”	N-METHYL CARBAMATE (I)	STAY OUT OF TREATED FIELDS FOR 24 HOURS RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; skin rash; see N-METHYL CARBAMATES, Part II Acute Oral LD50 (rat): 7.0 mg/kg body weight
AMITRAZ (C) BAAM “WARNING”	FORMAMIDINE (I)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED REGISTERED for pears only	ACUTE EFFECTS: Acute Oral LD50 (rat): 800 mg/kg body weight Acute Dermal LD50 (rabbit): more than 800 mg/kg body weight CANCER: “Weak” carcinogen in some animal tests ¹
AZINPHOS-METHYL (A) Guthion “DANGER POISON”	ORGANO-PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 24 HOURS* Citrus: 30 days** Peaches: 14 days** Nectarines: 14 days** Grapes: 21 days** Apples: 14 days** DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOSPHATES, Part II Acute Oral LD50 (rat): 5-6 mg/kg body weight Acute Dermal LD50 (rat): 220 mg/kg body weight

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
BENOMYL (E/S,C) Benlate Tersan "CAUTION"	BENZIMIDAZOLE CARBAMATE (F)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED	ACUTE EFFECTS: Skin rash, sensitization Acute Oral LD ₅₀ (rat): more than 10,000 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Reduced sperm counts, birth defects in test animals OTHER: Mutagenic in laboratory tests ⁵
CAPTAFOL (E/S) Difolatan "CAUTION"	PHTHALIMIDE DERIVATIVE (F)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED	ACUTE EFFECTS: Skin rash, sensitization Acute Oral LD ₅₀ (rat): 6200 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Birth defects, embryo- toxic in test animals ^{2,4}
CAPTAN (E/S,C) Merpan Orthocide 406 "CAUTION"	PHTHALIMIDE DERIVATIVE (F)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED	ACUTE EFFECTS: Skin rash Acute Oral LD ₅₀ (rat): 10,000 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Embryotoxicity, birth defects in animal tests CANCER: cancer in test animals ⁴ OTHER: Mutagenic in many laboratory test systems ⁴

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
CARBOPHENTHION (A) Trithion "WARNING"	ORGANOPHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS* Citrus: 14 days** Peaches: 14 days** Nectarines: 14 days** Grapes: 14 days** Apples: 14 days** RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOSPHATES, Part II Acute Oral LD ₅₀ (female rat): 32.2 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Birth defects in test animals ⁴
CHLOROBENZILATE (C) Acaraben "CAUTION"	ORGANOCHLORINE (M)	STAY OUT OF TREATED FIELDS FOR 14 DAYS RESTRICTED-USE PESTICIDE REGISTERED only for use on citrus as part of an Integrated Pest Management Program; it is an effective miticide and eliminates the need for many acutely toxic organophosphates	ACUTE EFFECTS: Acute Oral LD ₅₀ (rat) technical grade: 702 mg/kg body weight CHRONIC EFFECTS: see ORGANOCHLORINES, Part II REPRODUCTIVE SYSTEM EFFECTS: Lowered sperm counts in test animals CANCER: Cancer in test animals ⁴ (CDFA does not accept data)
CHLOROPICRIN (A) Acquinate Larvacide (May be formulated with methyl bromide) "DANGER"	HALOGENATED HYDROCARBON (S)	TARPS MUST REMAIN IN PLACE FOR 48 HOURS IN MOST COUNTIES; STAY OUT OF FIELDS UNTIL THEY ARE REMOVED CDFA: "Negligible risk to field workers"	ACUTE EFFECTS: Acts like tear gas--irritates, burns eyes, skin, and respiratory system Acute Oral LD ₅₀ (rat): 250 mg/kg body weight

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
CHLOROTHA- LONIL (E/S) Bravo Daconil 2787 "CAUTION" "DANGER"	ORGANO- CHLORINE— BENZNITRILE (F)	STAY OUT OF TREATED FIELDS FOR 24 HOURS RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Eye irritation; skin rash Acute Oral LD ₅₀ (rat): more than 10,000 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): more than 10,000 mg/kg body weight CHRONIC EFFECTS: Possible problems with kidney function in long term animal studies CANCER: Kidney cancer in rats but not mice ⁴
2, 4-D, AND ESTERS AND SALTS (C) "CAUTION"	CHLOROPHENOXY HERBICIDE (H)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Acute delayed nervous system damage (peri- pheral neuropathy) has occurred in humans from spills Acute Oral LD ₅₀ (rat): 370 mg acid/kg body weight; 500-1200 mg ester/kg body weight; 300-1200 mg amine/kg body weight; 666-875 mg sodium salt/kg body weight

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
D-D (A) dichloropropane- dichloropropene D-D Soil Fumigant Nemafene “DANGER”	HALOGENATED HYDROCARBON (S)	STAY OUT OF TREATED FIELDS FOR 3 DAYS VERY DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: See HALOGENATED HYDROCARBONS, Part II Acute Oral LD ₅₀ (rat): 140 mg/kg body weight (mouse): 300 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): 2100 mg/kg body weight CHRONIC EFFECTS: Central nervous system damage; neuropsychia- tric symptoms (possibly irreversible) OTHER: Mutagenic in laboratory test systems ⁴
DEF (C) Folex “WARNING”	ORGANO- PHOSPHATE (Defoliant)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED* RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Acute Oral LD ₅₀ (rat) technical: 200 mg/kg body weight Acute Dermal LD ₅₀ (rat) technical: 1000 mg/kg body weight CHRONIC EFFECTS: Nervous system damage (peripheral neuropathy) in test animals ⁴

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
DEMETON (A) Systox "DANGER POISON"	ORGANO-PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS* Citrus: 5 days* Peaches: 7 days** Nectarines: 7 days** Grapes: 7 days** DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANO-PHOSPHATES, Part II Acute Oral LD ₅₀ (rat) technical grade: 2.5-12 mg/kg body weight Acute Dermal LD ₅₀ (rat): 8.2-14 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Birth defects, embryotoxicity in animals ^{2,4}
DIALATE (C) Avadex "WARNING"	ISOPROPYL-THIOCARBAMATE (H)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED	ACUTE EFFECTS: Acute Oral LD ₅₀ (rat): 395 mg/kg body weight CANCER: Cancer in test animals ⁶
DIAZINON (E/S) Spectracide "CAUTION" "WARNING"	ORGANO-PHOSPHATE (I)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED* Citrus: 5 days* Peaches: 5 days* Nectarines: 5 days* Grapes: 5 days*	ACUTE EFFECTS: Eye irritation; skin rash; inhibits cholinesterase; see ORGANO-PHOSPHATES, Part II Acute Oral LD ₅₀ (rat) technical: 542 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): 600 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Embryotoxicity in test animals ^{2,4}

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
DICHLORO- PROPENE (A) Telone II "DANGER"	HALOGENATED HYDROCARBON	STAY OUT OF TREATED FIELDS FOR 24 HOURS RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Severe eye irritation, burns; severe skin irritation, burns Acute Oral LD ₅₀ (rat): 250-500 mg/kg body weight CHRONIC EFFECTS: Long-lasting skin rash; central nervous system damage in test animals; neuropsychiatric symptoms (possibly irreversible) in humans OTHER: Mutagenic in laboratory test systems
DIELDRIN (C) "WARNING"	ORGANO- CHLORINE (I)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST DUST HAS SETTLED RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Acute Oral LD ₅₀ (rat): 40 mg/kg body weight Acute Dermal LD ₅₀ (rat): 10-102 mg/kg body weight CHRONIC EFFECTS: see ORGANOCHLO- RINES, Part II REPRODUCTIVE SYSTEM EFFECTS: Embryotoxic, birth defects in test animals ^{2,4} CANCER: Some test animal data suggests it is a "weak" carcino- gen ⁴

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
DIMETHOATE (C) Cygon Defend "WARNING"	ORGANO- PHOSPHATE (I)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED* Citrus: 4 days* Grapes: 4 days*	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (albino male rat): 215 mg/kg body weight Acute Dermal LD ₅₀ (guinea pig): more than 1000 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Some evidence of embryotoxicity (animals) ⁴ CANCER: Some animal data suggest it is a "weak" carcino- gen OTHER: Mutagenic in laboratory test systems ⁴
DINOSEB (A) DNBP Dinitro Premerge "DANGER POISON"	NITROPHENOL	STAY OUT OF TREATED FIELDS FOR 24 HOURS RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: see NITROPHENOLS, Part II Acute Oral LD ₅₀ (rat): 40-60 mg/kg body weight NOTE: If whites of eyes turn yellow, serious poisoning has occurred; get victim to a doctor immediately.

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
DIOXATHION (A) Delnav "DANGER POISON"	ORGANO- PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 24 HOURS* Citrus: 30 days** Peaches: 30 days** Nectarines: 30 days** Grapes: 30 days**	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (male rat): 45 mg/kg body weight Acute Dermal LD ₅₀ (male rat): 235 mg/kg body weight
DISULFOTON (A) Di-Syston "DANGER"	ORGANO- PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS* DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (rat) technical: 2-12 mg/kg body weight Acute Dermal LD ₅₀ (rat): 6-25 mg/kg body weight
DNOC (A) Sincox "DANGER"	NITROPHENOL (H)	STAY OUT OF TREATED FIELDS FOR 24 HOURS RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Skin rash; see NITROPHENOLS, Part II Acute Oral LD ₅₀ (rat): 20-50 mg/kg body weight NOTE: If whites of eyes turn yellow, serious poisoning has occurred; get victim to a doctor immediately.

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
<p>DYFONATE</p> <p>(A)</p> <p>Fonofos</p> <p>“DANGER”</p>	<p>ORGANO- PHOSPHATE</p> <p>(I)</p>	<p>STAY OUT OF TREATED FIELDS FOR 24 HOURS*</p>	<p>ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II</p> <p>Acute Oral LD₅₀ (male rat) technical: 8-17.5 mg/kg body weight</p> <p>Acute Dermal LD₅₀ (rabbit): 25 mg/kg body weight</p>
<p>ENDOSULFAN</p> <p>(A)</p> <p>Thiodan</p> <p>“WARNING”</p> <p>“DANGER”</p>	<p>ORGANO- CHLORINE</p> <p>(I)</p>	<p>STAY OUT OF TREATED FIELDS FOR 48 HOURS</p> <p>RESTRICTED-USE PESTICIDE</p>	<p>ACUTE EFFECTS: Skin rash; see ORGANO- CHLORINES, Part II</p> <p>Acute Oral LD₅₀ (rat): 30 mg/kg body weight in alcohol suspension; 70 mg/kg body weight in water suspension; 110 mg/kg body weight in oil</p> <p>Acute Dermal LD₅₀ (rabbit): 359 mg/kg body weight</p> <p>CHRONIC EFFECTS: see ORGANO- CHLORINES, Part II</p> <p>REPRODUCTIVE SYSTEM EFFECTS: Lowered sperm count in test animals at very high doses⁴</p> <p>CANCER: Some evidence of cancer in animal tests⁴</p>

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
ENDRIN (A) Hexadrin "DANGER"	ORGANO-CHLORINE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS; 10 days if used with methyl parathion on cotton; 30 days if applied post-harvest to apple trees VERY DANGEROUS if field is entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: see ORGANO-CHLORINES, Part II Acute Oral LD ₅₀ (male rat): 15 mg/kg body weight Acute Dermal LD ₅₀ (rat): 7-16 mg/kg body weight CHRONIC EFFECTS: see ORGANO-CHLORINES, Part II REPRODUCTIVE SYSTEM EFFECTS: Embryotoxicity, birth defects in test animals ^{2,4} CANCER: Cancer in test animals ⁴
EPN (A) "DANGER"	ORGANO-PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 24 HOURS*, *** Citrus: 14 days** Peaches: 14 days** Nectarines: 14 days** Grapes: 14 days** Apples: 14 days** RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANO-PHOSPHATES, Part II Acute Oral LD ₅₀ (rat): 26 mg/kg body weight (mouse): 43 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): 420 mg/kg body weight CHRONIC EFFECTS: Delayed-onset nervous system damage (peripheral neuropathy) in test animals ⁴

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
ETHION (A) "WARNING"	ORGANO- PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS* Citrus: 30 days** Peaches: 14 days** Nectarines: 14 days** Grapes: 14 days** RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Skin rash; inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (rat) technical: 96 mg/kg body weight
ETHOPROP (A) Mocap "WARNING" "DANGER" (may be formu- lated with disul- foton as Mocap Plus 10-5G and 4-2EC)	ORGANO- PHOSPHATE (I)	IF "WARNING," STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED; IF "DANGER," STAY OUT OF TREATED FIELDS FOR 24 HOURS DANGEROUS if field is entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (rat): 61.5 mg/kg body weight
ETHYLENE DIBROMIDE (A,C) EDB Bromofume Dowfume W-85 Pestmaster Soilbrom 85 Terr-O-cide (with chloropicrin which is included for its tear gas-like warning properties)	HALOGENATED HYDROCARBON (S)	STAY OUT OF FIELDS FOR 3 DAYS VERY DANGEROUS if fields (or related areas) are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: see HALOGENATED HYDROCARBONS, Part II Acute Vapor Toxicity: 200 ppm PEL (Cal/OSHA): 0.130 ppm Acute Oral LD ₅₀ (male rat): 146 mg/kg body weight CHRONIC EFFECTS: see HALOGENATED HYDROCARBONS, Part II

(continued)

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
ETHYLENE DIBROMIDE continued			
"DANGER"			<p>REPRODUCTIVE SYSTEM EFFECTS: Lowered sperm counts in four species of test animals</p> <p>CANCER: Cancer in both rats and mice</p> <p>OTHER: Mutagenic in laboratory test systems</p>
FENAMIPHOS (A) Nemacur "DANGER"	ORGANO- PHOSPHATE (I)	<p>STAY OUT OF TREATED FIELDS FOR 48 HOURS and 7 days if soil is muddy; during the first 7 days after application, stay out 24 hours after watering or rain*</p> <p>RESTRICTED-USE PESTICIDE</p>	<p>ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II</p> <p>Acute Oral LD₅₀ (rat) technical: 8.1-9.6 mg/kg body weight</p> <p>Acute Dermal LD₅₀ (rat) technical: 72-84 mg/kg body weight</p>
FENSULFO- THION (A) Dasanit "DANGER"	ORGANO- PHOSPHATE (I)	<p>STAY OUT OF TREATED FIELDS FOR 24 HOURS*</p> <p>RESTRICTED-USE PESTICIDE</p>	<p>ACUTE EFFECTS: Inhibits cholinesterase; very easily absorbed into body through skin, see ORGANO- PHOSPHATES, Part II</p> <p>Acute Oral LD₅₀ (rat) technical: 2-10 mg/kg body weight</p> <p>Acute Dermal LD₅₀ (rat) technical: 3-30 mg/kg body weight</p>

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
FOLPET (E/S,C) "CAUTION"	PHTHALIMIDE DERIVATIVE (F)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED	ACUTE EFFECTS: Skin rash; see PHTHALIMIDE DERIVATIVE, Part II Acute Oral LD ₅₀ (rat): greater than 10,000 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Embryotoxicity, birth defects in test animals ^{2,4} OTHER: Mutagenic in some laboratory tests ⁴
GLYPHOSATE (E/S) Roundup-R "WARNING"	(H)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED	ACUTE EFFECTS: Eye irritation; skin rash; reports of nausea and other effects due to irritating properties Acute Oral LD ₅₀ (rat): 4900 mg/kg body weight
LINDANE (A,C) "WARNING"	ORGANO- CHLORINE (I)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED VERY DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: see ORGANO- CHLORINES, Part II Acute Oral LD ₅₀ (male rat): 88-125 mg/kg body weight Acute Dermal LD ₅₀ (male rat): 1000 mg/kg body weight CHRONIC EFFECTS: Central nervous system effects in both humans

(continued)

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
LINDANE continued			<p>and test animals; liver and kidney damage in test animals; linked to aplastic anemia in humans by a number of literature reviews; see ORGANO- CHLORINES, Part II</p> <p>REPRODUCTIVE SYSTEM EFFECTS: Embryotoxicity in test animals⁶</p> <p>CANCER: Suspected of causing cancer in test animals^{4,6}</p>

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
MALATHION (A) Cythion "CAUTION"	ORGANO- PHOSPHATE (I)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED* Citrus: 1 day* Peaches: 2 days* Nectarines: 2 days* Grapes: 1 day* Apples: 1 day*	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (rat): 1000 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): 4100 mg/kg body weight NOTE: Included because of its crop- specific safety inter- vals.
MANEB (C) Dithane-M22 Polyram-M "CAUTION"	DITHIO- CARBAMATE (F)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED	ACUTE EFFECTS: Skin rash; see DITHIO- CARBAMATES, Part II Acute Oral LD ₅₀ (rat): 6750 mg/kg body weight CANCER: Cancer in test animals (thought due to ethylene- thiourea (a breakdown product). OTHER: Mutagenic in some laboratory tests

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
METASYSTOX-R (A) "WARNING"	ORGANO-PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOSPHATES, Part II Acute Oral LD ₅₀ (rat): 65-75 mg/kg body weight Acute Dermal LD ₅₀ (rat): 250 mg/kg body weight OTHER: Mutagenic in laboratory tests
METHIDATHION (A) Supracide "DANGER"	ORGANO-PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS* Citrus: 30 days** Dormant almonds, apples, apricots, cherries, nectarines, peaches, pears, plums, prunes, walnuts: 2 days* VERY DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOSPHATES, Part II Acute Oral LD ₅₀ (rat) technical: 44 mg/kg body weight Acute Dermal LD ₅₀ (rabbit) technical: 200 mg/kg body weight
METHIOCARB (A) Mesurol "WARNING"	N-METHYL CARBAMATE (I)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED Peaches: 14 days** Grapes: 14 days** Seed cucumbers: 14 days** Seed peppers: 14 days**	ACUTE EFFECTS: Inhibits cholinesterase; see N-METHYL CARBAMATES, Part II Acute Oral LD ₅₀ (rat) technical: 100 mg/kg body weight Acute Dermal LD ₅₀ (rabbit) technical: more than 2000 mg/kg body weight

(continued)

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
METHIOCARB continued			
			NOTE: This N-METHYL CARBAMATE decom- poses much more slowly than others of the same chemical type; it also forms toxic breakdown -oxons and -sulfons.
METHOMYL (A) Lannate Nudrin "DANGER POISON"	N-METHYL CARBAMATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see N-METHYL CARBAMATES , Part II Acute Oral LD ₅₀ (male rat): 17 mg/kg body weight (female rat): 24 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): for 24 per- cent liquid formula- tion 5880 mg/kg body weight
METHYL BROMIDE (A,E/S) MeBr Brom-O-Gas Dowfume Kayafume Pestmaster Fumigant I Terr-O-Gas 100 "DANGER"	HALOGENATED HYDROCARBON (S)	STAY OUT OF TREATED FIELDS FOR 24 HOURS RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: see HALOGENATED HYDROCARBONS , Part II Acute Vapor Toxicity: 200 ppm PEL: 15 ppm (1979) CHRONIC EFFECTS: Delayed respiratory and nervous system effects (continued)

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
METHYL BROMIDE continued			
			<p>OTHER: Mutagenic in laboratory test systems</p> <p>NOTE: Methyl Bromide penetrates rubber, therefore non-rubber protective equipment should be used.</p>
METHYL PARATHION (A) “DANGER”	ORGANO-PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS* Apples: 14 days** Peaches: 21 days** Nectarines: 21 days** Grapes (Monterey County): 6 days* Grapes (encapsulated form--all counties): 21 days** DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOSPHATES , Part II Acute Oral LD ₅₀ (rat): 9-25 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): 300-400 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Birth defects; embryotoxicity in test animals ^{2,4}
MEVINPHOS (A) Phosdrin “DANGER POISON”	ORGANO-PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS* Citrus: 4 days* Peaches: 4 days* Nectarines: 4 days* Grapes: 4 days* DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOSPHATES , Part II Acute Oral LD ₅₀ (rat): 3.7-12 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): 16.0-33.8 mg/kg body weight

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
MOLINATE (C) Ordram “WARNING” “CAUTION”	(H)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED	ACUTE EFFECTS: Acute Oral LD ₅₀ (male rat): 501-720 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): more than 2000 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Embryotoxicity, abnormal sperm, lowered sperm count in test animals ¹
MONOCROTOPHOS (A) Azodrin “DANGER POISON”	ORGANO- PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 24 HOURS* RESTRICTED-USE PESTICIDE	ACUTE EFFECTS Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (rat): 8-23 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): 450 mg/kg body weight
NALED Dibrom “DANGER”	ORGANO- PHOSPHATE (I)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED* Citrus: 1 day* Peaches: 1 day* Nectarines: 1 day* Grapes: 1 day*	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (rat): 430 mg/kg body weight Acute Dermal LD ₅₀ (rabbit): 1100 mg/kg body weight

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
NITROFEN (C) TOK-25 "DANGER"	NITROPHENYL ETHER (H)	FIELD MUST BE POSTED WITH SIGN WARNING OF APPLICATION 24 HOURS BEFORE APPLICATION: "Field to be treated with TOK- 25 on (date). Do not re- enter until (re-entry date). Irrigators wearing heavy duty work gloves and boots may enter during the re-entry interval."	ACUTE EFFECTS: Severe eye irritation; skin rash; very easily absorbed into the body through skin Acute Oral LD ₅₀ (rat): 2630 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Birth defects in test animals (considered a potent teratogen) ¹ CANCER: Animal data suggests it is carcinogenic ⁴ OTHER: Mutagenic in bacteria ⁴ NOTE: Nitrofen was used mainly in coastal counties; it was heavily restricted for mixers/ loaders/applicators; however, the manufac- turer has developed new application techniques that it claims meet CDFA exposure concerns.
PARAQUAT (A) "DANGER POISON"	DIPYRIDYL (H)	STAY OUT OF TREATED FIELDS FOR 24 HOURS RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Deaths have occurred from swallowing paraquat; see DIPYRIDYLS, Part II Acute Oral LD ₅₀ (rat): 150 mg/kg body weight (continued)

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
PARAQUAT continued			<p>REPRODUCTIVE SYSTEM EFFECTS: Embryotoxicity in test animals²</p> <p>NOTE: As little as one teaspoonful, if swallowed, can be fatal and there is no specific medical treatment for paraquat.</p>
PARATHION (A) Phoskil "DANGER POISON"	ORGANO- PHOSPHATE (I)	<p>STAY OUT OF TREATED FIELDS FOR 48 HOURS*</p> <p>Citrus: 30-60 days, depen- ding on dose** Peaches: 21 days** Nectarines: 21 days** Grapes: 21 days** Apples: 14 days**</p> <p>VERY DANGEROUS if fields are entered before end of reentry interval</p> <p>RESTRICTED-USE PESTICIDE</p>	<p>ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II</p> <p>Acute Oral LD₅₀ (male rat) technical: 2-4 mg/kg body weight</p> <p>Acute Dermal LD₅₀ (guinea pig) technical: 20-30 mg/kg body weight</p> <p>REPRODUCTIVE SYSTEM EFFECTS: Embryotoxicity in test animals^{2,4}</p>

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
PHOSMET Imidan Prolate "WARNING"	ORGANO- PHOSPHATE (I)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED* Peaches: 5 days* Nectarines: 5 days* Grapes: 5 days*	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (rat) technical: 147- 316 mg/kg body weight Acute Dermal LD ₅₀ (rabbit) technical: more than 4640 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Has chemical structure similar to known tera- togens
PHOSPHAMIDON (A) Dimecron "DANGER POISON"	ORGANO- PHOSPHATE (I)	STAY OUT OF TREATED FIELDS FOR 48 HOURS* Citrus: 14 days** DANGEROUS if fields are entered before end of reentry interval RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (rat): 17-30 mg/kg body weight Acute Dermal LD ₅₀ (rat): 374-530 mg/kg body weight

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
PROPARGITE (E/S) Omite Comite "DANGER"	(M)	STAY OUT OF TREATED FIELDS FOR 24 HOURS Grapes: 7 days**	ACUTE EFFECTS: Severe skin rash Acute Oral LD ₅₀ (rat): 2200 mg/kg body weight NOTE: Skin irrita- ting properties are more severe when there also is exposure to sulfur.
SODIUM ARSENITE (C) Arsenite Kill-All "DANGER"	INORGANIC ARSENIC (F)	STAY OUT OF TREATED FIELDS FOR 60 DAYS UNLESS YOU WEAR IMPERMEABLE RAIN CLOTHING AND AVOID DIRECT SKIN CONTACT WITH TREATED VINES VERY DANGEROUS if fields are entered before end of reentry interval REGISTERED ONLY FOR DORMANT GRAPES RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Dizziness, fainting, eye irritation, skin rash, nausea, vomiting Acute Oral LD ₅₀ (mammals): 10-50 mg/kg body weight CHRONIC EFFECTS: Peripheral neuropathy; hyper-pigmentation CANCER: Inorganic arsenic compounds are considered to be potential human carcinogens
SULFOTEPP (A) Bladafume Dithione Dithio Thiotepp "DANGER POISON"	ORGANO- PHOSPHATE (F)	STAY OUT OF TREATED AREAS FOR 24 HOURS* RESTRICTED-USE PESTICIDE	ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II Acute Oral LD ₅₀ (rat): 7-10 mg/kg body weight

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
SULFUR (E/S) "CAUTION"	SULFUR	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED Citrus: 1 day Peaches: 1 day Nectarines: 1 day Grapes: 1 day	ACUTE EFFECTS: Eye irritation, skin rash, respiratory system irritation (wheezing, cough), nausea NOTE: Skin irrita- ting properties are even more severe when you are also expo- sed to propargite.
THIRAM AAtack Arasan TMTDS Thylate Tersan "CAUTION"	DITHIO- CARBAMATE (F)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED; used in seed treatment--residues are on seeds	ACUTE EFFECTS: Irritates eyes; antabuse effect if you drink alcohol within 3 weeks of exposure; see DITHIOCARBA- MATES, Part II Acute Oral LD ₅₀ (rat): 780 mg/kg body weight CHRONIC EFFECTS: Reports of thyroid damage among workers in contact with thiram REPRODUCTIVE SYSTEM EFFECTS: Birth defects in test animals ^{2,4} OTHER: Mutagenic in bacteria ⁴ NOTE: Antabuse effects seem only to be a danger if thiram is ingested.

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
<p>TOXAPHENE</p> <p>(C)</p> <p>Toxakil</p> <p>“WARNING”</p> <p>“DANGER” (when combined with Methyl Parathion)</p> <p>“DANGER POISON”</p>	<p>ORGANO- CHLORINE</p> <p>(I)</p>	<p>IF “CAUTION” OR “WARNING,” STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED</p> <p>IF “DANGER,” STAY OUT OF TREATED FIELDS FOR 24 HOURS</p>	<p>ACUTE EFFECTS: see ORGANO- CHLORINES, Part II</p> <p>Acute Oral LD₅₀ (rat): 69 mg/kg body weight</p> <p>CANCER: Suspected of causing cancer in rats; caused cancer in mice</p> <p>OTHER: Mutagenic in bacteria</p>
<p>TRICHLORFON</p> <p>(C)</p> <p>Danex</p> <p>Dipterex</p> <p>Dylox</p> <p>“WARNING”</p>	<p>ORGANO- PHOSPHATE</p> <p>(I)</p>	<p>STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED</p>	<p>ACUTE EFFECTS: Inhibits cholinesterase; see ORGANOPHOS- PHATES, Part II</p> <p>Acute Oral LD₅₀ (rat) technical: 144- 184 mg/kg body weight</p> <p>Acute Dermal LD₅₀ (rat) technical: 2000 mg/kg body weight</p> <p>CHRONIC EFFECTS: Delayed-onset nervous system damage (peri- pheral neuropathy) in test animals as well as humans at very high doses⁴</p> <p>CANCER: “Weak” carcinogen⁴</p>

PESTICIDE	CHEMICAL GROUP/USE	CALIFORNIA REGULATIONS	WHAT THE DOCTOR SHOULD KNOW
TRIFLURALIN (E/S,C) Treflan "WARNING"	SUBSTITUTED ANILINE (H)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED	ACUTE EFFECTS: Skin rash Acute Oral LD ₅₀ (rat): 10,000 mg/kg body weight REPRODUCTIVE SYSTEM EFFECTS: Birth defects in test animals ^{2,4} CANCER: Cancer in test animals ⁴

C. FOOTNOTES

*If two or more organophosphates are applied, stay out of treated fields for the longest possible safety interval plus one-half of the next longest one.

**If the safety interval is 7 days or longer, the grower must post warning signs at all entrances to the field. Warning signs must indicate pesticide applied; date applied; date it is safe to go back into the field.

***If parathion, methyl parathion, or EPN is applied at 1 lb/acre actual material or more, either singly or in any combination with the others, the re-entry interval is 14 days.

¹Personal communications with Keith Maddy, Chief-Staff Toxicologist, Worker Safety Unit, California Department of Food and Agriculture.

²Wilson and Fraser, *Handbook on Teratology*. (New York, Plenum Press, 1977, 4 volumes.)

³Reports in the literature.

⁴NIOSH, *Criteria for a Recommended Standard...Occupational Exposure During the Manufacture and Formulation of Pesticides*. (DHEW-NIOSH Publication No. 78-174, July 1978.)

⁵EPA RPAR, 45 Federal Register 45362 July 3, 1980 (benomyl).

⁶EPA RPAR.

PART IV
POTENTIAL EFFECTS OF PESTICIDES FREQUENTLY
USED ON 26 CALIFORNIA CROPS

PART IV: POTENTIAL EFFECTS OF PESTICIDES FREQUENTLY USED ON 26 CALIFORNIA CROPS

The pesticides listed on these crop tables were used on at least one half of one percent of the acreage reported for each crop in 1977 and 1978. Specific pesticides used and amounts applied vary each year, depending on climatic conditions and pest infestations. However, large amounts of most of the pesticides listed on these tables are applied most years. Acreage was used as a criteria for selecting pesticides to be included because it seemed a good indicator of the possible extent of field worker exposures. 1977 and 1978 figures were used because those were the last years that total acreage of reported applications for each crop was tallied.

Many of the pesticides registered for each crop do not appear on these tables. But they could still be dangerous to people's health if widely used in a given year. If you encounter a pesticide not listed for a particular crop, look it up in the *TABLE OF CONTENTS* of this book to see if it is included, and where. If it is not discussed in this book, see *APPENDIX G: RESOURCES*, for where to get information on the pesticide.

A. HOW TO USE THESE TABLES

The tables are in alphabetical order by crop. Each table is organized primarily by chemical group, listed in the far right-hand column in the order of:

ORGANOPHOSPHATES
N-METHYL CARBAMATES
ORGANOCHLORINES
NITROPHENOLS
DIPYRIDYLS

CHLOROPHENOXY HERBICIDES
DITHIOCARBAMATES
PHTHALIMIDE DERIVATIVES
OTHERS

The tables are organized secondarily by individual pesticides within each chemical group, listed alphabetically by common (or generic) name in the far left-hand column. The two middle columns indicate "When applied/use" and "California regulations/warnings." The following subparts 1-4, explain the format and information for the tables. For more information, see *PART III: DANGERS OF 60 PESTICIDES*, for pesticides with the symbol ° after their common names, and *PART II: HAZARDS ASSOCIATED WITH MAJOR CHEMICAL GROUPS USED AS PESTICIDES* for the chemical groups listed in the right-hand column.

1. KEY TO COLUMN ONE: PESTICIDE/SIGNAL WORD

PESTICIDE/ SIGNAL WORD	THE COMMON NAME is the name by which the pesticide is known. In many cases, common names have been assigned by ANSI in the US or ISO elsewhere (for an explanation of common name, see Introduction to <i>PART III: DANGERS OF 60 PESTICIDES</i>). The ° after the common name indicates this pesticide is also discussed in <i>PART III</i> .
COMMON NAME ° Brand Name “EPA SIGNAL WORD”	

BRAND NAMES represent the name, number, trademark, or other designation applied to an economic poison by the manufacturer, distributor, importer, or vendor.

“EPA SIGNAL WORD” refers to the pesticide’s potential acute human toxicity:

“CAUTION” denotes lowest toxicity

“WARNING” denotes intermediate toxicity

“DANGER” and “DANGER POISON” denote highest toxicity

See Introduction to *PART III: DANGERS OF 60 PESTICIDES* for a more complete explanation of EPA SIGNAL WORDS.

2. KEY TO COLUMN TWO: WHEN APPLIED/USE

WHEN APPLIED/ USE	WHAT PART OF THE GROWING CYCLE PESTICIDE IS APPLIED indicates when field workers can expect exposure to occur:
WHAT PART OF GROWING CYCLE PESTICIDE IS APPLIED	ALL SEASON--at any time during the growing cycle BEFORE PLANTING--before crop is planted BEFORE WEEDS OR PLANTS COME UP
Kills or controls what types of pests	JUST AFTER WEEDS OR PLANTS COME UP JUST BEFORE HARVEST

KILLS OR CONTROLS WHAT TYPES OF PESTS indicates how material is used:

Kills insects (insecticide)

Kills mites (miticide)

Controls plant diseases (fungicide)

Kills nematodes (nematocide)

Controls weeds (herbicide)

Controls birds (avicide)

Dries out leaves (dessicant)

3. KEY TO COLUMN THREE: CALIFORNIA REGULATIONS/WARNINGS

**CALIFORNIA
REGULATIONS/
WARNINGS**

**FIELD WORKER
SAFETY RE-ENTRY
INTERVAL**
 type of dangers
 associated with
 pesticide

FIELD WORKER SAFETY RE-ENTRY INTERVAL is the amount of time growers are required by California law to keep field workers out of newly treated fields. These re-entry intervals are generally based on acute hazards only.

Re-entry intervals, which depend in part on EPA Signal Words, and in part on other factors assessed by the CDFA (see discussion in Introduction to *PART III: DANGERS OF 60 PESTICIDES*) can be:

1. STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED ("CAUTION" or "WARNING" Signal Words.)

2. 24 HOURS ("DANGER" or "DANGER POISON" Signal Words).

3. 48 HOURS (carbophenothion, demeton, dicotophos, disulfoton, endosulfan, endrin, ethion, Metasystox-R, methidathion, methomyl, methyl parathion, mevinphos, parathion, phorate, phosphamidon, TEPP).

4. 1 DAY (all nitrophenols).

5. 1 DAY to 60 DAYS (for application to citrus, peaches, nectarines, grapes, apples of: azinophosmethyl, carbophenothion, chlorobenzilate, demeton, diazinon, dimethoate, dioxathion, EPN, ethion, methidathion, methiocarb, methomyl, methyl parathion, mevinphos, naled, parathion, phosalone, phosmet (Imidan), phosphamidon, propargite, sulfur, TEPP).

6. 10 DAYS for combination of methyl parathion and parathion (or endrin) on cotton.

7. 14 DAYS if more than one pound per acre is applied of parathion, EPN, or methyl parathion, singly or in combination.

8. THE LONGEST SAFETY INTERVAL PLUS ONE-HALF THE NEXT LONGEST ONE IF TWO OR MORE ORGANOPHOSPHATES ARE APPLIED . (Denoted by *.)

9. LABEL REQUIREMENT, IF LABEL REQUIREMENT FOR SAFETY RE-ENTRY INTERVAL IS LONGER THAN CALIFORNIA REGULATIONS.

10. REDUCED BY 50% if there is no foliage on plant (but re-entry interval for pesticides with "DANGER" or "DANGER POISON" Signal Word must be at least 24 hours).

TYPES OF DANGERS ASSOCIATED WITH PESTICIDES are:

- aAcute systemic (poisoning) incidents frequent.
 - e/s, e/s acuteEye/skin irritant.
 - rReproductive system problems in test animals.
 - cCancer in test animals
 - nDelayed-onset peripheral neuropathy in animal tests.
 - mMutations in laboratory tests.
 - l/kLiver, kidney damage in animal tests (humans indicated).
- "suspected" indicates tests were indicative but not conclusive.

4. KEY TO COLUMN FOUR: CHEMICAL GROUP

**CHEMICAL GROUP/
EFFECTS**

**EFFECTS OF SMALL
FIELD EXPOSURE:**symptoms of poisoning;
eye/skin problems**LARGE EXPOSURE:**symptoms of large acute
exposures**IF YOU FEEL SICK,
IMMEDIATELY:****LONG-TERM
EXPOSURE:**

CHEMICAL GROUPS: organophosphates; N-methyl
carbamates; organochlorines; nitrophenols; dipyridyls;
chlorophenoxy herbicides; phthalimide derivatives; dithio-
carbamates; others.**COMMON EFFECTS OF FIELD EXPOSURE:** are types
of symptoms and problems that commonly occur among
field workers exposed to any member of the chemical
group.**LARGE EXPOSURE:** effects that could occur in cases of
large exposure due to drift, being accidentally sprayed, or
spills.**IF YOU FEEL SICK, IMMEDIATELY:** first aid measures and signs of poisoning if you clearly
get sick from an exposure.**LONG-TERM EXPOSURE:** possible effects due to low-level regular exposures, although none
have been specifically found in field workers.**B. TABLES OF CROPS**

For footnotes (such as *) see end of Part IV.

ALFALFA

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
CHLORPYRIFOS Dursban "CAUTION" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	ORGANOPHOSPHATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, stagger- ing walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GET TO A DOCTOR (DO NOT DRIVE YOURSELF)
DIAZINON ^o Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, e/s, suspected r	
DICROPTOPHOS Bidrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
DIMETHOATE ^o Cygon "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, r, suspected c, m	
DISULFOTON ^o Di-Syston "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
MALATHION ^o Cythion "CAUTION"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
METASYSTOX-R ^o "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, m	
METHAMIDOPHOS Monitor "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*, n	
METHIDATHION ^o Supracide "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, suspected c	
METHYL- PARATHION ^o "DANGER"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	

ALFALFA (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
MEVINPHOS ^o Phosdrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	ORGANOPHOSPHATES (cont'd)
PARATHION ^o "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
PHOSMET ^o Imidan "WARNING"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
TRICHLORFON ^o Dylox "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, n (possibly in humans at very high doses)	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, stagger- ing walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GET TO A DOCTOR (DO NOT DRIVE YOURSELF)
CARBOFURAN Furadan "WARNING" "DANGER"	ALL SEASON Kills insects, mites, . nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, UNLESS LABEL SAYS "DANGER" THEN STAY OUT OF TREATED FIELDS FOR 24 HOURS	
FORMETANATE Carzol "DANGER POISON"	ALL SEASON Kills mites, thrips	STAY OUT OF TREATED FIELDS FOR 24 HOURS	
METHOMYL ^o Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

ALFALFA (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DICOFOL Kelthane "CAUTION"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>ORGANOCHLORINES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rashes
ENDOSULFAN ^o Thiodan "DANGER" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS, e/s, suspected r, suspected c	LARGE EXPOSURE: headache, twitching muscles, difficulty breath- ing, convulsions IF YOU FEEL SICK AND HAVE TWITCHING MUSCLES: GO TO A DOCTOR IMMEDIATELY (BUT DO NOT DRIVE YOURSELF) LONG-TERM EXPOSURE: Possible liver, kidney damage
DINOSEB ^o DNBP "DANGER POISON"	APPLIED JUST BEFORE OR JUST AFTER CROP OR WEEDS COME UP Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<u>NITROPHENOLS</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash, yellow stain on skin or hair (at points of contact with pesticide residue) LARGE EXPOSURE: yellow skin (all over), unusual amount of sweat- ing or thirst, fever, rapid breathing, yellow "whites" of eyes IF WHITES OF YOUR EYES TURN YELLOW, SERIOUS POISONING HAS OCCURRED: IMMEDIATELY GET INTO SHADE, RINSE

ALFALFA (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			NITROPHENOLS (cont'd) WITH COOL WATER, GO TO A DOCTOR IMMEDIATELY (BUT DO NOT DRIVE YOURSELF)
PARAQUAT ^o "DANGER POISON"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS , r	<u>DIPYRIDYLS</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red tearing eyes LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; respiratory system failure; scarred lungs (death can occur from swallowing a small amount of fresh Paraquat) IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY--IMMEDIATELY: WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR
2.4 DB "CAUTION"	Kills weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>CHLOROPHENOXY HERBICIDES</u> SMALL FIELD EXPOSURE: skin rash IF YOU FEEL SICK FROM EXPOSURE TO A CHLOROPHENOXY HERBICIDE: SEE A DOCTOR

ALFALFA (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
PROPARGITE° Omite Comite "DANGER"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS, c/s	<u>OTHERS</u>
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS UNTIL DUST HAS SETTLED, c/s	

ALMONDS

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GET TO A DOCTOR (BUT DO NOT DRIVE YOURSELF)
CARBOPHENOTHION° Trithion "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, suspected r	
ETHION° "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing

ALMONDS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
ENDOSULFAN° Thiodan "DANGER" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS, s, suspected r, suspected c	<p>N-METHYL CARBAMATES (cont'd)</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GET TO A DOCTOR (DO NOT DRIVE YOURSELF)</p> <hr/> <p><u>ORGANOCHLORINES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rashes</p> <p>LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions</p> <p>IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES--GO TO A DOCTOR IMMEDIA- TELY (DO NOT DRIVE YOURSELF)</p> <p>LONG-TERM EXPOSURE: Possible liver, kidney damage</p>

ALMONDS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
PARAQUAT® "DANGER POISON"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<p data-bbox="1263 383 1446 418"><u>DIPYRIDYLS</u></p> <p data-bbox="1157 448 1495 547">EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes</p> <p data-bbox="1157 577 1495 836">LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat)</p> <p data-bbox="1157 866 1495 1095">IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY--IMMEDIATELY: WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR</p>

APPLES

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 14 DAYS*, ** (7 DAYS* IF TREES HAVE NO LEAVES)	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
CARBOPHENOTHION° Trithion "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS* (24 HOURS* IF TREES HAVE NO LEAVES) n, r	
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS FOR 48 HOURS* (24 HOURS* IF TREES HAVE NO LEAVES) e/s, suspected r	
ETHION° "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS* (24 HOURS* IF TREES HAVE NO LEAVES)	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GET TO A DOCTOR (DO NOT DRIVE YOURSELF)
PHOSMET° Imidan "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DREID OR DUST HAS SETTLED	
PHOSPHAMIDON° Dimecron "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS* (24 HOURS* IF TREES HAVE NO LEAVES)	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing

APPLES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>N-METHYL CARBAMATES (cont'd)</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
<p>ENDOSULFAN° Thiodan "DANGER" "WARNING"</p>	<p>ALL SEASON Kills insects, mites</p>	<p>STAY OUT OF TREATED FIELDS FOR 48 HOURS, s, suspected r, suspected c</p>	<p><u>ORGANOCHLORINES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rashes</p> <p>LARGE EXPOSURE: headaches, twitching muscles, difficulty breathing, convulsions</p> <p>IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)</p> <p>LONG-TERM EXPOSURE: Possible liver, kidney damage</p>
<p>PARAQUAT° "DANGER POISON"</p>	<p>ALL SEASON Kills weeds above ground</p>	<p>STAY OUT OF TREATED FIELDS FOR 24 HOURS, r</p>	<p><u>DIPYRIDYLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes; nose bleeds</p>

APPLES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>DIPYRIDYLS (cont'd)</p> <p>LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat)</p> <p>IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY--IMMEDIATELY: WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR</p>
<p>MANEB° Dithane-M22 "CAUTION"</p>	<p>ALL SEASON Controls fungus</p>	<p>STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, suspected c, m</p>	<p><u>DITHIOCARBAMATES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization; red, tearing eyes</p> <p>LARGE EXPOSURE: (to fresh Dithiocarba- mates) cough, stuffy nose, difficulty breathing</p> <p>IF YOU FEEL SICK FROM EXPOSURE TO A DITHIOCARBAMATE: REMOVE CONTAMI- NATED CLOTHES, WASH SKIN WITH SOAPY WATER, SEE A DOCTOR</p>
<p>PROPARGITE° Omite Comite "DANGER"</p>	<p>ALL SEASON Kills mites</p>	<p>STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s</p>	<p><u>OTHERS</u></p>
<p>CYHEXATIN Plictran "WARNING"</p>	<p>ALL SEASON Kills mites (especially where resis- tant to other chemicals)</p>	<p>STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED</p>	

ARTICHOKES

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	ORGANOPHOSPHATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
METHIDATHION° Supracide "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
METHYL PARA- THION° "DANGER"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
MEVINPHOS° Phosdrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
PHOSALONE Zolone "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
ENDOSULFAN° Thiodan "DANGER" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS, s, suspected r, suspected c	ORGANOCHLORINES EFFECTS OF SMALL FIELD EXPOSURE: skin rashes LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)

ARTICHOKES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			ORGANOCHLORINES (cont'd)
			LONG-TERM EXPOSURE: Possible liver, kidney damage

ASPARAGUS

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
FONOFOS Dyfonate "DANGER"	ALL SEASON Kills soil insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
MALATHION° Cythion "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

ASPARAGUS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>N-METHYL CARBAMATES (cont'd)</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
LINDANE° "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED n (humans), r, c, other chronic effects in test animals and humans	<p><u>ORGANOCHLORINES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rashes</p> <p>LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions</p> <p>IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)</p> <p>LONG-TERM EXPOSURE: Possible liver, kidney damage</p>
PARAQUAT° "DANGER POISON"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<p><u>DIPYRIDYLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes</p>

ASPARAGUS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>DIPYRIDYLS (cont'd)</p> <p>LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat)</p> <p>IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY--IMMEDIATELY: WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR</p>
2,4-D° "CAUTION"	Kills weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<p><u>CHLOROPHENOXY HERBICIDES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash</p> <p>LARGE EXPOSURE TO FRESH HERBICIDES: twitching muscles, dizziness, reports of delayed acute nervous system damage (peri- pheral neuropathy) from fresh 2,4-D</p> <p>IF YOU FEEL SICK FROM EXPOSURE TO A CHLOROPHENOXY HERBICIDE: SEE A DOCTOR</p>
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	<u>OTHERS</u>

AVOCADO

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
MALATHION° Cythion "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

AVOCADO (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			N-METHYL CARBAMATES (cont'd)
			IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DINOSEB ^o DNBP Premerge "DANGER POISON	JUST BEFORE OR JUST AFTER WEEDS COME UP Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<u>NITROPHENOLS</u>
			EFFECTS OF SMALL FIELD EXPOSURE: skin rash, yellow stain on skin or hair at points of contact with pesti- cide residue
			LARGE EXPOSURE: yellow skin (all over); unusual sweating or thirst, fever, rapid breathing, yellow "whites" of eyes
			IF WHITES OF YOUR EYES TURN YELLOW, SERIOUS POISONING HAS OCCURRED: IMMEDIATELY GET INTO SHADE AND RINSE OFF WITH COOL WATER, THEN GO TO A DOCTOR (DO NOT DRIVE YOUR- SELF)

AVOCADO (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
PARAQUAT° "DANGER POISON"	AFTER WEEDS COME UP Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<p data-bbox="1187 394 1365 426"><u>DIPYRIDYLS</u></p> <p data-bbox="1114 459 1398 584">EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes</p> <p data-bbox="1114 616 1435 907">LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; respiratory system failure; scarred lungs (death can occur from swallowing a small amount of fresh Paraquat)</p> <p data-bbox="1114 940 1435 1159">IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY, IMMEDIATELY WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR</p>
2,4-D° "CAUTION"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<p data-bbox="1146 1192 1406 1252"><u>CHLOROPHENOXY HERBICIDES</u></p> <p data-bbox="1114 1284 1398 1381">EFFECTS OF SMALL FIELD EXPOSURE: skin rash</p> <p data-bbox="1114 1414 1435 1640">LARGE EXPOSURE: twitching muscles, dizzi- ness, reports of delayed acute nervous system damage (peripheral neuropathy) from fresh 2,4-D</p> <p data-bbox="1114 1673 1435 1834">IF YOU FEEL SICK FROM EXPOSURE TO A CHLOROPHENOXY HERBICIDE: SEE A DOCTOR</p>

AVOCADO (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
GLYPHOSATE° Roundup-R "WARNING"	AFTER WEEDS COME UP Kills weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	<u>OTHERS</u>
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	

BROCCOLI

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DEMETON° Systox "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, r	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, c/s suspected r	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, r, suspected c, m	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DISULFOTON° Di-Syston "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	
METHAMIDOPHOS Monitor "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*, n	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

BROCCOLI (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>N-METHYL CARBAMATES (cont'd)</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR DO NOT DRIVE YOURSELF)</p>
<p>CHLOROTHALONIL° Bravo Daconil 2787 "DANGER" "CAUTION"</p>	<p>Kills fungus</p>	<p>STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s</p>	<p><u>ORGANOCHLORINES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rashes</p>
<p>ENDOSULFAN° Thiodan "DANGER" "WARNING"</p>	<p>ALL SEASON Kills insects, mites</p>	<p>STAY OUT OF TREATED FIELDS FOR 48 HOURS, s, suspected r, suspected c</p>	<p>LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions</p> <p>IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)</p> <p>LONG-TERM EXPOSURE: Possible liver, kidney damage</p>

BROCCOLI (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
MANEB° Dithane M-22 "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, suspected c, m	<u>DITHIOCARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization; red, tearing eyes LARGE EXPOSURE: cough, stuffy nose, difficulty breathing IF YOU FEEL SICK FROM EXPOSURE TO A DITHIOCARBAMATE: REMOVE CONTAMI- NATED CLOTHES, WASH SKIN WITH SOAPY WATER, SEE A DOCTOR.

BRUSSEL SPROUTS

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, e/s, suspected r	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DISULFOTON° Di-Syston "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
METASYSTOX-R° "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, m	
METHAMIDOPHOS Monitor "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*, n	
MEVINPHOS° Phosdrin "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
TRICHLORFON° Dipterek Dylox "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*,	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

BRUSSEL SPROUTS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>N-METHYL CARBAMATES (cont'd)</p> <p>LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
CHLOROTHALONIL° Bravo "DANGER" "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s, suspected c	<p><u>ORGANOCHLORINES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash</p>
ENDOSULFAN° Thiodan "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS, s, suspected r, suspected c	LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions
TOXAPHENE° "WARNING" "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, UNLESS "DANGER" IS ON THE LABEL, THEN STAY OUT OF FIELDS FOR 24 HOURS, suspected c, m	<p>IF YOU FEEL SICK-- AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)</p> <p>LONG-TERM EXPOSURE: Possible liver, kidney damage</p>

CABBAGE

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DEMETON° Systox "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, e/s, r	ORGANOPHOSPHATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK: IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, e/s, suspected r	
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, r, suspected c, m	
DISULFOTON° Di-Syston "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
METASYSTOX-R° "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, m	
METHAMIDOPHOS Monitor "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*, n	
METHYL PARA- THION° "DANGER"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
MEVINPHOS° Phosdrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
TRICHLORFON° Dylox "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	

CABBAGE (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<p><u>N-METHYL CARBAMATES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision</p> <p>LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
ENDOSULFAN° Thiodan "DANGER" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS, s, suspected r, suspected c	<p><u>ORGANOCHLORINES</u></p> <p>EFFECTS OF SMALL FIELD ESPOSURE: skin rashes</p> <p>LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions</p> <p>IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)</p>

CABBAGE (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			ORGANOCHLORINES (cont'd)
			LONG-TERM EXPOSURE: Possible liver, kidney damage
MANEB° Dithane M-22 "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, suspected c, m	<u>DITHIOCARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization; red, tearing eyes LARGE EXPOSURE: cough, stuffy nose, difficulty breathing IF YOU FEEL SICK FROM EXPOSURE TO A DITHIOCARBAMATE : REMOVE CONTAMI- NATED CLOTHES, WASH SKIN WITH SOAPY WATER, SEE A DOCTOR.
CHLOROTHALONIL° Bravo Daconil 2787 "DANGER" "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s, suspected c	<u>OTHERS</u>

CARROTS

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, e/s, suspected r	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
METHYL PARA- THION° "DANGER"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
TRICHLORFON° Dylox "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing

CARROTS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>N-METHYL CARBAMATES (cont'd)</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
<p>TOXAPHENE° "WARNING" "DANGER POISON"</p>	<p>ALL SEASON Kills insects</p>	<p>STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, UNLESS LABEL SAYS "DANGER" THEN STAY OUT OF TREATED FIELDS FOR 24 HOURS, suspected c, m</p>	<p><u>ORGANOCHLORINES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rashes</p> <p>LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions</p> <p>IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: TO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)</p> <p>LONG-TERM EXPOSURE: Possible liver, kidney damage</p>
<p>MANEB° Dithane M-22 "CAUTION"</p>	<p>ALL SEASON Controls fungus</p>	<p>STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, suspected c, m</p>	<p><u>DITHIOCARBAMATES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization; red, tearing eyes</p> <p>LARGE EXPOSURE: cough, stuffy nose, difficulty breathing</p>

CARROTS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			DITHIOCARBAMATES (cont'd)
			IF YOU FEEL SICK FROM EXPOSURE TO A DITHIOCARBAMATE: REMOVE CONTAMI- NATED CLOTHES, WASH SKIN WITH SOAPY WATER, SEE A DOCTOR.
CHLOROTHALONIL ^o Bravo Daconil 2787 "DANGER" "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s, suspected c	<u>OTHERS</u>

CAULIFLOWER

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	ORGANOPHOSPHATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DEMETON° Systox "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, r	
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, c/s, suspected r	
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, r, suspected c, m	
DISULFOTON° Di-Syston "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
METASYSTOX-R° "WARNING"	ALL SEASON Kill insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, m	
MEVINPHOS° Phosdrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
PHOSPHAMIDON° Dimecron "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	

CAULIFLOWER (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			ORGANOPHOSPHATES (cont'd)
TRICHLORFON° Dipterex Dylox "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
TOXAPHENE° "WARNING" "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, UNLESS LABEL SAYS "DANGER," THEN STAY OUT OF TREATED FIELDS FOR 24 HOURS, suspected c, m	<u>ORGANOCHLORINES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rashes LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions

CAULIFLOWER (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>ORGANOCHLORINES (cont'd)</p> <p>IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)</p> <p>LONG-TERM EXPOSURE: Possible liver, kidney damage</p>
<p>MANEB° Dithane M-22 "CAUTION"</p>	<p>ALL SEASON Controls fungus</p>	<p>STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, suspected c, m</p>	<p><u>DITHIOCARBAMATES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization; red, tearing eyes</p> <p>LARGE EXPOSURE: cough, stuffy nose, difficulty breathing</p> <p>IF YOU FEEL SICK FROM EXPOSURE TO A DITHIOCARBAMATE REMOVE CONTAMI- NATED CLOTHES; WASH SKIN WITH SOAPY WATER, SEE A DOCTOR</p>
<p>CHLOROTHALONIL° Bravo Daconil 2787 "DANGER" "CAUTION"</p>	<p>ALL SEASON Kills fungus</p>	<p>STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s, suspected c</p>	<p><u>OTHERS</u></p>

CELERY

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DEMETON° Systox "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, r	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, e/s, suspected r	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
MALATHION° Cythion "CAUTION"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
METHYL PARA- THION° "DANGER"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
MEVINPHOS° Phosdrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
NALED° Dibrom "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision

CELERY (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>N-METHYL CARBAMATES (cont'd)</p> <p>LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
ENDOSULFAN° Thiodan "DANGER" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS, s, suspected r, suspected c	<p><u>ORGANOCHLORINES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rashes</p>
TOXAPHENE° "WARNING" "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, UNLESS LABEL SAYS "DANGER" THEN STAY OUT OF TREATED FIELDS FOR 24 HOURS, suspected c, m	<p>LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions</p> <p>IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)</p> <p>LONG-TERM EXPOSURE: Possible liver, kidney damage</p>

CELERY (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
CAPTAN° Merpan Orthocide "CAUTION"	ALL SEASON Controls fungus when applied to leaves	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED s, r, m, c	<u>PHthalimide DERIVATIVES</u> SMALL FIELD EXPOSURE: skin rash, sensitization in some individuals LONG-TERM EFFECTS: Mutagenic in laboratory tests; embryotoxic in test animals; birth defects in test animals
FOLPET° "CAUTION"	ALL SEASON Controls fungus when applied to leaves	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, r, m	
BENOMYL° Benlate Tersan "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s, r, m	<u>OTHERS</u>
CHLOROTHALONIL° Bravo Daconil 2787 "DANGER" "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s, suspected c	
DCNA Dicloran Botran "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	

CITRUS
(EXCEPT GRAPEFRUIT, ORANGES, LEMONS which are
discussed elsewhere in these tables)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 30 DAYS*, **	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 4 DAYS*, r, suspected c, m	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
DIOXATHION° Delnav "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	IF YOU FEEL SICK -- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
ETHION° "WARNING"	ALL SEASON Kills insects mites	STAY OUT OF TREATED FIELDS FOR 30 DAYS*, **	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 30-60 DAYS (depending on lbs./acre applied as well as total amount applied during the year--c.f., Pesticide List)*, **, r	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
FORMETANATE Carzol "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

CITRUS (except Grapefruit, Oranges, Lemons cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
METHIOCARB° Mesurol "WARNING"	ALL SEASON CLOSE TO HARVEST Kills insects, repels snails	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	N-METHYL CARBAMATES (cont'd) LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
CHLOROBENZILATE° Acaraben "CAUTION"	ALL SEASON Kills mites (must be used as part of an integrated pest management program)	STAY OUT OF TREATED FIELDS FOR 14 DAYS r, suspected c	ORGANOCHLORINES EFFECTS OF SMALL FIELD EXPOSURE: skin rashes LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions
DICOFOL Kelthane "CAUTION"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF) LONG-TERM EXPOSURE: Possible liver, kidney damage

CITRUS (except Grapefruit, Oranges, Lemons cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DINOSEB° DNBP Premerge "DANGER POISON"	JUST BEFORE OR JUST AFTER WEEDS COME UP Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<p><u>NITROPHENOLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; yellow stain on skin or hair (at points of contact with pesticide residue)</p> <p>LARGE EXPOSURE: yellow skin (all over); unusual sweating or thirst; fever; rapid breath- ing; yellow "whites" of eyes</p> <p>IF WHITES OF YOUR EYES TURN YELLOW, SERIOUS POISONING HAS OCCURRED: IMMEDIATELY GET INTO SHADE AND RINSE OFF WITH COOL WATER, GO TO DOCTOR (DO NOT DRIVE YOURSELF)</p>
PARAQUAT° "DANGER POISON"	ALL SEASON Kills weeds above ground	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<p><u>DIPYRIDYLS</u></p> <p>COMMON EFFECTS OF FIELD EXPOSURE: skin rash; red, tearing eyes</p> <p>LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system fail- ure (death can occur from swallowing a small amount of Paraquat)</p>

CITRUS (except Grapefruit, Oranges, Lemons--cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			DIPYRIDYLS (cont'd)
			IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY: IMMEDIATELY WASH OFF SKIN WITH WATER, GO TO A DOCTOR
CYHEXATIN Plictran "WARNING"	ALL SEASON Kills mites (especially where immune to other miticides)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	OTHERS
FENBUTATIN OXIDE Vendex "DANGER"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

COTTON

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
ACEPHATE Orthene "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	ORGANOPHOSPHATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
CHLORPYRIFOS Dursban "WARNING" "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, c/s, suspected r	
DEF° "WARNING"	JUST BEFORE HARVEST Dries out leaves so they drop off	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, suspected n	
DICROTOPHOS Bidrin "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
DISULFOTON° Di-Syston "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
FOLEX "CAUTION" "WARNING"	JUST BEFORE HARVEST Dries out leaves so they drop off	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED OR DUST HAS SETTLED*, suspected n	
EPN° "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*, ***, suspected n	
METHAMIDOPHOS Monitor "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*, n	

COTTON (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
METHIDATHION° Supracide "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*, suspected c	ORGANOPHOSPHATES (cont'd)
METHYL PARATHION° "DANGER"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
MONOCROTOPHOS° Azodrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
PHORATE Thimet "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
ALDICARB° Temik "DANGER"	ALL SEASON Kills insects, mites, nematodes (injected six inches into soil)	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache nausea, blurred vision
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)

COTTON (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DICOFOL Kelthane "CAUTION"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>ORGANOCHLORINES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rashes
PCNB Terrachlor "CAUTION" "DANGER"	ALL SEASON Controls plant diseases	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions
TOXAPHENE° "WARNING" "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS, suspected c, m	IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (BUT DO NOT DRIVE YOURSELF) LONG-TERM EXPOSURE: Possible liver, kidney damage.
PARAQUAT° "DANGER POISON"	ALL SEASON, JUST BEFORE CROP IS HARVESTED Kills weeds, dries out leaves so they drop off	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<u>DIPYRIDYLS</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat) IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY: IMMEDIATELY WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR

COTTON (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
PROPARGITE° Omite Comite "DANGER"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s	<u>OTHERS</u>
SULFUR° "CAUTION"	ALL SEASON Controls fungus, kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	
TRIFLURALIN° Treflan "WARNING"	BEFORE CROP COMES UP Kills weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s, suspected c, r	

DATES

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
MALATHION® Cythion "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<p>ORGANOPHOSPHATES</p> <p>EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision</p> <p>LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
FERBAM Fermate "CAUTION"	ALL SEASON Kills fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	<p>DITHIOCARBAMATES</p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes; unusual amount of sweating; difficulty breathing</p> <p>LARGE EXPOSURE: cough; stuffy nose; difficulty breathing</p> <p>IF YOU FEEL SICK FROM EXPOSURE TO A DITHIOCARBAMATE: REMOVE CONTAMI- NATED CLOTHING, WASH SKIN WITH SOAPY WATER, GO TO A DOCTOR</p>

DATES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>OTHERS</u>

GRAPEFRUIT

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 30 DAYS*, **	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMI- NATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 4 DAYS*, r, suspected c, m	
MALATHION° Cythion "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 30-60 DAYS*, ** (depending on concen- tration/acre and total amount applied to field the previous 12 months-- Pesticide List), r	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMI- NATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
METHIOCARB° Mesurol "WARNING"	ALL SEASON, JUST BEFORE HARVEST Repels snails	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS	

GRAPEFRUIT (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
CHLOROBENZILATE° Acaraben "CAUTION"	ALL SEASON Kills mites (Registered only for an Integrated Pest Management Program)	STAY OUT OF TREATED FIELDS FOR 14 DAYS, r, suspected c	<u>ORGANOCHLORINES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rashes LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF) LONG-TERM EXPOSURE: Possible liver, kidney damage
DICOFOL Kelthane "CAUTION"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	
PARAQUAT° "DANGER POISON"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<u>DIPYRIDYLS</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat) IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY--IMMEDIATELY: WASH SKIN WITH SOAPY WATER, GO TO A DOCTOR

GRAPEFRUIT (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
2,4D° "CAUTION"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<p>CHLOROPHENOXY HERBICIDES</p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash</p> <p>LARGE EXPOSURE: twitching muscles; dizziness; reports of delayed acute nervous system damage (peri- pheral neuropathy) from fresh 2,4-D</p> <p>IF YOU FEEL SICK FROM EXPOSURE TO A CHLOROPHENOXY HERBICIDE: SEE A DOCTOR</p>
BROMACIL Borea Boracil "CAUTION" "WARNING"	APPLIED TO SOIL JUST BE- FORE, OR JUST AFTER ACTIVE GROWTH OF WEEDS Kills weeds, brush	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	OTHERS
DIURON Karmek "CAUTION"	Kills weeds, grasses, steri- lizes soil	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	
CYHEXATIN Plictran "WARNING"	ALL SEASON Kills mites (expecially used where mites have become immune to other chemi- cals)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	
GLYPHOSATE° Roundup-R "WARNING"	ALL SEASON AFTER WEEDS HAVE COME UP Kills weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	

GRAPEFRUIT (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
SULFUR° "CAUTION"	ALL SEASON Kills mites, control fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s	OTHERS (cont'd)

GRAPES

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 21 DAYS*, **	ORGANOPHOSPHATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DEMETON° Systox "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 7 DAYS*, r	
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, r, suspected c, m	
ETHION° "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 14 DAYS*, **	
METASYSTOX-R° "WARNING"	ALL SEASON Kills insects,	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, m	
MEVINPHOS° Phosdrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 4 DAYS*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 21 DAYS*, **, r	N-METHYL CARBAMATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS	

GRAPES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			N-METHYL CARBAMATES (cont'd)
			IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DCNA Dicloran Botran "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>ORGANOCHLORINES</u>
			EFFECTS OF SMALL FIELD EXPOSURE: skin rashes
DICOFOL Kelthane "CAUTION"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions
ENDOSULFAN° Thiodan "DANGER" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS, s, suspected r, suspected c	IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF)
			LONG-TERM EXPOSURE: Possible liver, kidney damage

GRAPES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
PARAQUAT ^o "DANGER POISON"	ALL SEASON Kills weeds above ground	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<p><u>DIPYRIDYLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes</p> <p>LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat)</p> <p>IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY: IMMEDIATELY WASH SKIN WITH SOAPY WATER, GO TO A DOCTOR</p>
CAPTAN ^o Merpan Orthocide "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, r, m, c	<p><u>PHTHALIMIDES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization in some individuals</p> <p>LONG-TERM EFFECTS: Mutagenic in laboratory tests; embryotoxic in test animals; birth defects in test animals</p>

GRAPES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
BENOMYL° Benlate "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s, r, m	<u>OTHERS</u>
PROPARGITE° Omite "DANGER"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS (7 DAYS IF OMITE 30 W IS APPLIED), e/s	
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s	

LEMONS

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
ETHION° "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 30 DAYS*, **	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
MALATHION° Cythion "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
METHIDATHION° Supracide "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 30 DAYS*, **, suspected c	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 30-60 DAYS*, ** (depending on dose), r	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
METHIOCARB° Mesurol "WARNING"	ALL SEASON, JUST BEFORE HARVEST Repels snails	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS	

LEMONS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>N-METHYL CARBAMATES (cont'd)</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
<p>DINOSEB DNBP Premerge "DANGER POISON"</p>	<p>JUST BEFORE OR JUST AFTER WEEDS COME UP Kills weeds</p>	<p>STAY OUT OF TREATED FIELDS FOR 24 HOURS</p>	<p><u>NITROPHENOLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; yellow stain on skin or hair (at points of contact with pesticide residue)</p> <p>LARGE EXPOSURE: yellow skin (all over); unusual sweating or thirst; fever; rapid breathing; yellow "whites" of eyes</p> <p>IF WHITES OF YOUR EYES TURN YELLOW, SERIOUS POISONING HAS OCCURRED: IMMEDIATELY GET INTO SHADE AND RINSE OFF WITH COOL WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>

LEMONS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
PARAQUAT° "DANGER POISON"	ALL SEASON Kills weeds above ground	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<p><u>DIPYRIDYLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes</p> <p>LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat)</p> <p>IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY--IMMEDIATELY: WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR</p>
2, 4-D° "CAUTION"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<p><u>CHLOROPHENOXY HERBICIDES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash</p> <p>LARGE EXPOSURE: twitching muscles; dizziness; reports of delayed acute nervous system damage (peri- pheral neuropathy) from fresh 2,4-D</p> <p>IF YOU FEEL SICK FROM EXPOSURE TO A CHLOROPHENOXY HERBICIDE: SEE A DOCTOR.</p>
PROPARGITE° Comite Omite "DANGER"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s	<p><u>OTHERS</u></p>

LETTUCE

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, e/s, suspected r	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, r, suspected c, m	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
MALATHION° Cythion "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
METASYSTOX-R° "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, m	
METHYL PARATHION° "DANGER"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
MEVINPHOS° Phosdrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
PHORATE Thimet "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

LETTUCE (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			N-METHYL CARBAMATES (cont'd)
			LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
			IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DCNA Dicloran Botran "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>ORGANOCHLORINES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rashes
DICOFOL Kelthane "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DIRED, OR DUST HAS SETTLED	LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions
ENDOSULFAN° Thiodan "DANGER" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS s, suspected r, suspected c	IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF).
TOXAPHENE° "WARNING" "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, UNLESS LABEL SAYS "DANGER" THEN STAY OUT OF TREATED FIELDS FOR 24 HOURS, suspected c, m	LONG-TERM EXPOSURE: Possible liver, kidney damage

LETTUCE (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
PARAQUAT° "DANGER POISON"	ALL SEASON Kills weeds above ground	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<p><u>DIPYRIDYLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes</p> <p>LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure, scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat)</p> <p>IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY--IMMEDIATELY: WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR</p>
CAPTAN° Merpan Orthocide "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, r, m, c	<p><u>PHTHALIMIDES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization in some individuals</p> <p>LONG-TERM EFFECTS: Mutagenic in laboratory tests; embryotoxic in test animals; birth defects in test animals</p>

MUSHROOMS†

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED AREAS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
DICHLORVOS DDVP Vapona "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED AREAS FOR 24 HOURS	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
MALATHION° Cythion "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED AREAS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)

†Agricultural safety intervals may not be adequate for mushrooms, since they are grown in enclosed buildings. As of May, 1981, there have been a growing number of reports of illnesses possibly associated with the use of various pesticides for mushroom growing.

MUSHROOMS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
METHOXYCHOLOR Marlate "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>ORGANOCHLORINES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rashes LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDI- ATELY (DO NOT DRIVE YOURSELF) LONG-TERM EXPOSURE: Possible liver, kidney damage
METHYL BROMIDE° Brom-O-Fumè Pestmaster Terr-O-Gas "DANGER"	BEFORE CROP IS PLANTED Kills weeds, insects and nematodes; controls plant diseases, fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s, m (behavioral and emotional changes), m	<u>OTHERS</u>

ONIONS

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	ORGANOPHOSPHATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, e/s, suspected r	
ETHION° "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
MALATHION° Cythion "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
METHYL PARA- THION° "DANGER"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
MEVINPHOS° Phosdrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	N-METHYL CARBAMATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

ONIONS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
TOXAPHENE° "WARNING" "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, UNLESS "DANGER" IS ON THE LABEL, THEN STAY OUT OF TREATED FIELDS FOR 24 HOURS, suspected c, m	N-METHYL CARBAMATES (cont'd)
			LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
			IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
			<u>ORGANOCHLORINES</u>
			EFFECTS OF SMALL FIELD EXPOSURE: skin rashes
			LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions
			IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDI- ATELY (DO NOT DRIVE YOURSELF)
			LONG-TERM EXPOSURE: Possible liver, kidney damage

ONIONS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DINOSEB° DNBP Premerge "DANGER POISON"	JUST BEFORE OR JUST AFTER CROP COMES UP Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<p><u>NITROPHENOLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; yellow stain on skin or hair (at points of contact with pesti- cide residue)</p> <p>LARGE EXPOSURE: yellow skin (all over); unusual sweating or thirst; fever; rapid breathing; yellow "whites" of eyes</p> <p>IF WHITES OF YOUR EYES TURN YELLOW, SERIOUS POISONING HAS OCCURRED: IMMEDIATELY GET INTO SHADE AND RINSE OFF WITH COOL WATER, THEN GO TO THE DOCTOR (BUT DO NOT DRIVE YOURSELF)</p>
CAPTAFOLO Difolatan "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s (sensitizer), r	<p><u>PHTHALIMIDES</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization in some individuals</p>
CAPTAN° Merpan Orthocide "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, r, m, c	<p>LONG-TERM EFFECTS: Mutagenic in laboratory tests; embryo-toxic in test animals; birth defects in test animals</p>
FOLPET° "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, r, m	

ONIONS (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
ANILAZINE Dyrene "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	<u>OTHERS</u>
CHLOROTHALONIL° Bravo Daconil 2787 "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s, suspected c	
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	

ORANGES

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 30 DAYS*, **	ORGANOPHOSPHATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, r, suspected c, m	
DIOXATHION° Delnav "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 30 DAYS*, **	
MALATHION° Cythion "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
METHIDATHION° Supracide "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 30 DAYS*, **, suspected c	
NALED° Dibrom "DANGER"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 30-60 DAYS*, *** (depending on dose), r	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	N-METHYL CARBAMATES EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
FORMETANATE Carzol "DANGER POISON"	ALL SEASON Kills mites, thrips	STAY OUT OF TREATED FIELDS FOR 24 HOURS	
METHIOCARB° Mesurol "WARNING"	ALL SEASON, CLOSE TO HARVEST, repels snails	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	

ORANGES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS	N-METHYL CARBAMATES (cont'd) IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
CHLOROBENZILATE° Acaraben "CAUTION"	ALL SEASON Kills mites, (Only registered for use as part of an Integrated Pest Management Program)	STAY OUT OF TREATED FIELDS FOR 14 DAYS, r, suspected c, m	<u>ORGANOCHLORINES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rashes LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOURSELF) LONG-TERM EXPOSURE: Possible liver, kidney damage
DICOFOL Kelthane "CAUTION"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	

ORANGES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DINOSEB° DNBP Premerge "DANGER POISON"	JUST BEFORE OR JUST AFTER WEEDS COME UP Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<p><u>NITROPHENOLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; yellow stain on skin or hair (at points of contact with pesti- cide residue)</p> <p>LARGE EXPOSURE: yellow skin (all over); unusual sweating or thirst; fever; rapid breathing; yellow "whites" of eyes</p> <p>IF WHITES OF YOUR EYES TURN YELLOW, SERIOUS POISONING HAS OCCURRED: IMMEDIATELY GET INTO SHADE AND RINSE OFF WITH COOL WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF).</p>
PARAQUAT° "DANGER POISON"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<p><u>DIPYRIDYLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes</p> <p>LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat)</p>

ORANGES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			DIPYRIDYLS (cont'd)
			IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY--IMMEDIATELY: WASH SKIN WITH SOAPY WATER, GO TO A DOCTOR
BROMACIL Borea "CAUTION" "WARNING"	JUST BEFORE OR DURING ACTIVE GROW- ING PERIOD Kills weeds, brush	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>OTHERS</u>
COPPER SULFATE, BASIC "DANGER"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s (often from extender used to apply material)	
FENBUTATIN OXIDE Vendex "DANGER"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s	

PEACHES

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 14 DAYS*, **	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS FOR 5 DAYS*, e/s, suspected r	
ETHION° "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	
METHIDATHION° Supracide Ultracide "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, suspected c (c.f. Pesticide List)	
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 21 DAYS*, **	
PHOSMET° Imidan "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR FIVE DAYS*	
CAPTAN° Merpan Orthocide "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s r, m, c	<u>PHTHALIMIDES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization in some individuals LONG-TERM EFFECTS: Mutagenic in laboratory tests; embryo-toxic in test animals; birth defects in test animals

PEACHES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DINOSEB° DNBP "DANGER POISON"	JUST BEFORE OR JUST AFTER CROP COMES UP Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<p><u>NITROPHENOLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; yellow stain on skin or hair (at points of contact with pesti- cide residue)</p> <p>LARGE EXPOSURE: yellow skin (all over); unusual sweating or thirst; fever; rapid breathing; yellow "whites" of eyes</p> <p>IF WHITES OF YOUR EYES TURN YELLOW, SERIOUS POISONING HAS OCCURRED: IMMEDIATELY GET INTO SHADE AND RINSE OFF WITH COOL WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
PARAQUAT° "DANGER POISON"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS, r	<p><u>DIPRIDYLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; red, tearing eyes</p> <p>LARGE EXPOSURE (if fresh Paraquat is swallowed): liver, kidney failure; scarred lungs; respiratory system failure (death can occur from swallowing a small amount of fresh Paraquat)</p> <p>IF YOU GET FRESH PARAQUAT ON YOUR SKIN, OR SWALLOW ANY--IMMEDIATELY: WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR</p>

PEACHES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
ZIRAM "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	<u>DITHIOCARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization; red, tearing eyes LARGE EXPOSURE: cough; stuffy nose; difficulty breathing IF YOU FEEL SICK FROM EXPOSURE TO A DITHIOCARBA- MATE: REMOVE CONTAMINATED CLOTHING, WASH SKIN WITH SOAPY WATER, SEE A DOCTOR
CYHEXATIN Plictran "WARNING"	ALL SEASON Kills mites (used where mites have become immune to other agents)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	<u>OTHERS</u>
DCNA Dicloran Botran	ALL SEASON Kills certain weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	
PROPARGITE° Omite Comite "DANGER"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s	
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s	

ROSES

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, r, suspected c, m	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
MALATHION° "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
MONOCROPTOPHOS° Azodrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
ALDICARB° Temik "DANGER"	ALL SEASON Kills insects, mites, nematodes (applied 6" deep into soil)	STAY OUT OF TREATED FIELDS FOR 24 HOURS	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing

ROSES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			<p>N-METHYL CARBAMATES (cont'd)</p> <p>IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
<p>DINOSEB° Amine salts DNBP "DANGER POISON"</p>	<p>JUST BEFORE OR JUST AFTER WEEDS COME UP Kills weeds</p>	<p>STAY OUT OF TREATED FIELDS FOR 24 HOURS</p>	<p><u>NITROPHENOLS</u></p> <p>EFFECTS OF SMALL FIELD EXPOSURE: skin rash; yellow stain on skin or hair (at points of contact with pesticide residue)</p> <p>LARGE EXPOSURE: yellow skin (all over); unusual sweating or thirst; fever; rapid breathing; yellow "whites" of eyes</p> <p>IF WHITES OF YOUR EYES TURN YELLOW, SERIOUS POISONING HAS OCCURRED: IMMEDIATELY GET INTO SHADE AND RINSE OFF WITH COOL WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)</p>
<p>FENBUTATIN OXIDE Vendex "DANGER"</p>	<p>ALL SEASON Kills mites</p>	<p>STAY OUT OF TREATED FIELDS FOR 24 HOURS</p>	<p><u>OTHERS</u></p>
<p>SULFUR° "CAUTION"</p>	<p>ALL SEASON Kills mites, controls fungus</p>	<p>STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s</p>	

STRAWBERRIES

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, e/s, suspected r	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
MALATHION° "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing
METASYSTOX-R° "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
MEVINPHOS° Phosdrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
NALED° Dibrom "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing

STRAWBERRIES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			N-METHYL CARBAMATES (cont.d)
			IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
ENDOSULFAN° Thiodan "DANGER" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS, e/s, suspected r, suspected c	<u>ORGANOCHLORINES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rashes
DICOFOL Kelthane "CAUTION"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDIATELY (DO NOT DRIVE YOUR- SELF) LONG-TERM EXPOSURE: Possible liver, kidney damage
DINOSEB° DNBP Premerge "DANGER POISON"	BEFORE WEEDS COME UP Kills weeds	STAY OUT OF TREATED FIELDS FOR 24 HOURS	NITROPHENOLS EFFECTS OF SMALL FIELD EXPOSURE: skin rash; yellow stain on skin or hair (at points of contact with pesticide residue)

STRAWBERRIES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			NITROPHENOLS (cont'd)
			LARGE EXPOSURE: yellow skin (all over); unusual sweating or thirst; fever; rapid breathing; yellow "whites" of eyes
			IF WHITES OF YOUR EYES TURN YELLOW, SERIOUS POISONING HAS OCCURRED: IMMEDIATELY GET INTO SHADE AND RINSE OFF WITH COOL WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
CAPTAN® Merpan Orthocide "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, r, m, c	<p data-bbox="1182 1062 1406 1095"><u>PHthalimides</u></p> <p data-bbox="1130 1127 1419 1252">EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization in some individuals</p> <p data-bbox="1130 1284 1406 1479">LONG-TERM EFFECTS: Mutagenic in laboratory tests; embryo-toxic in test animals; birth defects in test animals</p>

STRAWBERRIES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
THIRAM° "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, antabuse reaction from also drinking alcohol (Thiram is chemi- cally very similar to Disulfiram which is used to keep alcoholics from drinking), r	<u>DITHIOCARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization; red, tearing eyes; antabuse reaction from also drinking alcohol (pounding headache, weakness, unusual sweating, difficulty breathing) LARGE EXPOSURE: cough, stuffy nose; difficulty breathing IF YOU FEEL SICK FROM EXPOSURE TO A DITHIOCARBA- MATE: REMOVE CONTAMINATED CLOTHING, WASH SKIN WITH SOAPY WATER, GO TO A DOCTOR
BENOMYL° Benlate Tersan "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s, (skin sensitizer), r, m	<u>OTHERS</u>
CYHEXATIN Plictran "WARNING"	ALL SEASON Kills mites (used where mites have become immune to other agents)	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	
PROPARGITE° Omite Comite "DANGER"	ALL SEASON Kills mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s	

TOMATOES

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
AZINPHOSMETHYL° Guthion "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	<u>ORGANOPHOSPHATES</u> EFFECTS OF SMALL FIELD EXPOSURE: weakness, headache, nausea, blurred vision LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea and urination, shaking muscles, difficulty breathing IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
DIAZINON° Spectracide "CAUTION" "WARNING"	ALL SEASON Kills insects, nematodes	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, e/s, suspected r	
DIMETHOATE° Cygon "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, r, suspected c, m	
DISULFOTON° Di-Syston "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS*	
FENSULFOTHION° Dasanit "DANGER"	ALL SEASON Kills insects, nematodes (applied 6" deep into the soil)	STAY OUT OF TREATED FIELDS FOR 24 HOURS*	
METHYL PARA- THION° "DANGER"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
NALED° Dibrom "DANGER"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED*, s	<u>N-METHYL CARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE weakness, headache, nausea, blurred vision
PARATHION° "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS FOR 48 HOURS*, ***, r	
CARBARYL Sevin "CAUTION"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, or DUST HAS SETTLED	
METHOMYL° Lannate Nudrin "DANGER POISON"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 24 HOURS	

TOMATOES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
			N-METHYL CARBAMATES (cont'd)
			LARGE EXPOSURE: sweating, drooling, staggering walk, slurred speech, vomiting, uncontrolled diarrhea or urination, shaking muscles, difficulty breathing
			IF YOU FEEL SICK-- IMMEDIATELY: REMOVE CONTAMINATED CLOTHING, WASH WITH SOAPY WATER, GO TO A DOCTOR (DO NOT DRIVE YOURSELF)
ENDOSULFAN° Thiodan "DANGER" "WARNING"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS FOR 48 HOURS, e/s, suspected r, suspected c	<u>ORGANOCHLORINES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rashes
LINDANE° "WARNING"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, n (humans), r, suspected c	LARGE EXPOSURE: headache, twitching muscles, difficulty breathing, convulsions
TOXAPHENE° "WARNING" "DANGER POISON"	ALL SEASON Kills insects	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, UNLESS LABEL SAYS "DANGER" THEN STAY OUT OF TREATED FIELDS FOR 24 HOURS	IF YOU FEEL SICK AND HAVE TWITCH- ING MUSCLES: GO TO A DOCTOR IMMEDI- ATELY (DO NOT DRIVE YOURSELF) LONG-TERM EXPOSURE: Possible liver, kidney damage

TOMATOES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
CAPTAFOL° Difolatan "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s (skin sensitizer), r, m	<u>PHTHALIMIDES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization in some individuals LONG-TERM EFFECTS: Mutagenic in laboratory tests; embryotoxic in test animals; birth defects in test animals
MANEB° Dithane M-22 "CAUTION"	ALL SEASON Kills insects, mites	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, s, suspected c, m	<u>DITHIOCARBAMATES</u> EFFECTS OF SMALL FIELD EXPOSURE: skin rash, sensitization; red, tearing eyes LARGE EXPOSURE: cough, stuffy nose; difficulty breathing IF YOU FEEL SICK FROM EXPOSURE TO A DITHIOCARBA- MATE: REMOVE CONTAMINATED CLOTHING, WASH OFF SKIN WITH SOAPY WATER, GO TO A DOCTOR
ANILAZINE Dyrene "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	<u>OTHERS</u>
BENOMYL° Benlate Tersan "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s (skin sensitizer), r, m	

TOMATOES (cont'd)

PESTICIDE SIGNAL WORD	WHEN APPLIED/USE	CALIFORNIA REGULATIONS/ WARNINGS	CHEMICAL GROUP/ EFFECTS
OTHERS (cont'd)			
CHLOROTHALONIL° Bravo Daconil 2787 "DANGER" "CAUTION"	ALL SEASON Controls fungus	STAY OUT OF TREATED FIELDS FOR 24 HOURS, e/s, suspected c	
DIPHENAMID Dymid Enide "CAUTION"	ALL SEASON Kills weeds	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED	
SULFUR° "CAUTION"	ALL SEASON Kills mites, controls fungus	STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED, e/s	

C. FOOTNOTES

*** If two or more organophosphates are applied, stay out of treated fields for the longest safety interval, plus one-half the next longest one.**

**** If the re-entry interval is seven or more days, the growers must post warning signs at all entrances to the field indicating: what pesticide was applied; the date it was applied; and the date it will be safe to re-enter the field.**

***** If more than one pound actual parathion, methyl parathion, or EPN is applied/acre, either singly or in combination, the field worker safety re-entry interval is 14 days.**

PART V
APPENDICES

APPENDIX A: MEDICAL TESTING FOR PESTICIDES

Many workers who have been exposed to pesticides and are suffering health effects which may be related to their exposure go to their doctor and ask for a medical test to find out whether they have been affected or if the pesticide is still in their body. Unfortunately, there are not very many tests of this kind. There is only one really practical medical test for pesticide-exposed workers: the blood cholinesterase level, for workers exposed to organophosphate (and in some circumstances, to carbamate) pesticides.

Cholinesterase is an enzyme required for the normal function of the nervous system. It can be measured in the blood, and if the amount of the enzyme is "lower than normal," the patient may be diagnosed as having organophosphate pesticide poisoning. Because the normal level of cholinesterase varies greatly between individuals, however, the "normal range" is very large. In order to find out whether a worker has actually been exposed to enough organophosphate to cause a lowering of his/her own level, a "baseline" (pre-exposure) test is needed for comparison. In California, pesticide applicators are required to have baseline cholinesterase tests before they begin work each season.

When baseline cholinesterase tests have been done, it is possible to compare the cholinesterase level of a worker who may have been poisoned with that worker's own baseline. A worker who normally has a high cholinesterase level may be exposed, with a decrease in cholinesterase which still is within the general "normal range." By comparing his pre-exposure baseline with his test result after exposure, the decrease can be discovered. If the worker does not have a baseline, however, his test after exposure may be within "laboratory normal," and the doctor might decide that he does not have pesticide poisoning.

Most fieldworkers do not have pre-exposure baseline cholinesterase levels. If a fieldworker goes to a doctor with pesticide-related symptoms, the correct diagnosis may be missed because there is no baseline level for comparison. It is important to remember that a test result "within laboratory normal range" means that pesticide poisoning is less likely, but not unlikely or impossible.

The cholinesterase test is not very reliable for carbamate pesticides, because the cholinesterase effect is very rapidly reversed (usually within 4-12 hours).

Organophosphates and other pesticides can be measured in the blood and urine, but these tests cost many hundreds of dollars each, and the results are not back in time to change medical treatment. The only reason for doing these tests is either (1) if there is a medical emergency, and the cause is very much in doubt—it is important to learn the cause even after the crisis has passed, and (2) for medical-legal reasons, such as to prove that a pesticide caused the problem for purposes of compensation.

APPENDIX B: DERMATITIS IN AGRICULTURAL WORKERS

Both pesticides and plants can cause skin rashes (dermatitis) and other skin problems in agricultural workers. These rashes do not usually look any different from dermatitis caused by other agents. The doctor can diagnose a plant or pesticide cause for the dermatitis by the history of exposure, the elimination of other possible causes, and in the case of allergic dermatitis, by doing skin patch tests. The major treatment for dermatitis caused by plants and pesticides is to relieve the symptoms and prevent further exposure.

Of the total pesticide-related illnesses reported in California in 1980, approximately 30% were skin diseases. Certain chemical families of pesticides, such as the drying agents sulfur and propargite (Omite), are responsible for a large number of these reports, and are generally well known to cause a primary irritant effect. Others, such as captan and captafol (Difolatan), are strong sensitizers which cause an allergic reaction in workers after they have been exposed for varying periods of time. Because the skin effects of many pesticides have not been thoroughly researched, doctors may not find support in the medical texts for what they observe in farmworker patients, and may be reluctant to diagnose a pesticide-related condition.

Some of the pesticides which have caused the largest number of reports of skin problems in California during the past six years are:

Sulfur	Propargite (Omite)
Triazine (Dyrene)	Dithiocarbamate (Ziram)
Captan	Benomyl (Benlate)
Organotin (Plictram)	Dibrom (Naled)

The two most common types of skin disease caused by plants and pesticides are irritant and allergic.

A. IRRITANT DERMATITIS

Many substances can irritate the skin directly on contact. Other substances may not usually have an irritant effect until other factors such as sunburn, sweating, skin already damaged by scratching or cuts, or a combination of pesticides create the conditions which lead to irritation. Most substances which cause irritation will do so in almost anyone who is exposed to enough of them. Families of pesticides we currently know can cause irritant dermatitis include:

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Sulfur b. Propargite (Omite) c. Dithiocarbamates: Ziran, Thiram,, Zineb, Maneb, Ferbam d. Thalidomide analogues: Captan, Captafol (Difolatan), Folpet e. Organophosphates: Diazinon, Ethion, Demeton (Systox), Dimethoate, Mevinphos (Phosdrin), Methidathion (Supercide), Dibrom (Naled), Torak (Dialifor), Malathion, Monocrotophos (Azodrin), Disulfoton, Imidan (Phosmet), Acephate (Orthene), Methyl parathion, DVDP (Vapona) | <ul style="list-style-type: none"> f. Carbamates: Methomyl g. Nitrophenols: Dinoseb (DNBP), Dinitro, Synox (DNOC), Nitrofen (TOK) h. Organotin: Cyhexatin (Plictran) i. Organochlorines: Endosulfan, Lindane, Toxaphene, Kelthane j. Triazine (Dyrene) k. Benomyl (Benlate) l. Glyphosate (Roundup) m. DCPA (Dacthal) n. Ethephon (Ethrel, Growth Regulator) o. Chloropicrin p. Chlorothalonil (Bravo) |
|---|---|

In addition, the petroleum distillates (hydrocarbon solvents) with which many pesticides are mixed can also cause irritation, or make the irritant effect of the pesticide worse. "Weed oil" is a petroleum distillate herbicide and is often reported as the cause of irritant dermatitis.

Some plants also can cause direct irritation. Those known to have this effect include:

flowers: dieffenbachia, castor bean, daffodil, buttercup, foxglove, tulip and narcissus bulbs
plants: tomato, carrot, mushroom, cucumber, cowparsnip, indian bean, turnip, parsely, celery
trees: rubber tree latex

B. ALLERGIC DERMATITIS

Some workers may develop allergic reactions to certain pesticides and plants after they have been exposed to them for awhile. The exposure period can vary from days to years before the worker becomes sensitized (develops the allergy). There is no way to tell in advance which workers will be allergic to a plant or pesticide.

The allergic reaction to a pesticide does not usually look any different from the allergic reaction to any other chemical, such as a soap or perfume. Red skin, itching and swelling or blisters are common. Plants which cause allergic reactions, such as poison oak, often cause lines of blisters where the leaves have brushed against the skin.

Pesticides which are known to cause allergic dermatitis include:

- a. Captafol (Difolatan), Captan, Phaltan
- b. Benomyl (Benlate)
- c. Triazine (Dyrene)
- d. Organophosphates: Dischlorvos, Parathion (erythema multiforme), Malathion, Naled,, Phosphothioates (Plondrel)
- e. Amides (Randox)
- f. Pyrethroids (Chrysanthemum extracts; synthetics less potent)
- g. Chloronitrobenzenes: PCNB, DNCB

- h. Dithiocarbamates: Zineb, Maneb, Mancozeb
- i. Thiurams: Thiram
- j. Cresol, Chlorocresol
- k. Nitrophen, Dinobuton
- l. Formaldehyde: as fumigant in mushroom plants, and liberated from Dazomet as formalin
- m. Phynylmercurics (wood preservative)
- n. Mercaptobenothiazole

Plants which are known to cause **allergic reactions** include:

(1) "Poison-oak" type reactions: ivy, poison oak, poison sumac, cashew nut oil, lacquer trees, ginkgo fruit pulp, mango rind, liverwort (among forestry workers).

(2) Others: **Flowers:** Algerian and English ivy, primrose, chrysanthemum, tulip and narcissus bulbs. **Plants:** onion, garlic, celery. **Trees:** cedar, pine, teak, cocobolo. Lichens and liverwort, two tree-associated plants, have caused allergic contact dermatitis among forestry and lumber workers.

C. DERMATITIS CAUSED BY INTERACTIONS WITH SUNLIGHT

Some chemicals and plants cause a direct irritant effect when sunlight falls on skin which has already been exposed to the chemical or plant. This reaction, called "phototoxic" looks just like a very bad sunburn. It develops within 2-6 hours after the exposure to sunlight, and when the reaction goes away it often leaves a darkened area on the skin. Plants known to cause this kind of reaction include: fig, cowslip, parsnip, fennel, dill, parsley, carrot, masterwort, atrillal, angelica, common rice, gas plant, lime bergamot, lime, buttercup, mustard, blind weed, agrimony, yarrow, goose foot, bavachi, St. John's wort, pink rot celery, and meadow grass. However, almost all reported cases of plant related phototoxic dermatitis have been from pink rot celery.

Very little research has been done on pesticide related phototoxicity. Coal tar and its derivatives may be found in many pesticides, and is known to cause a phototoxic reaction with a very severe skin darkening after the reaction goes away.

Other chemicals and plants, when sunlight falls on them in the skin of exposed persons, can provoke an allergic reaction called "photoallergic." This looks just like a usual allergic reaction, developing within 24-48 hours after exposure. The reaction is found most commonly in the sun-exposed areas of the body but may extend into unexposed areas. Phenothiazines used as pesticides have caused a photoallergic response. No plants are associated with this response.

APPENDIX C: CDFA PESTICIDE EVALUATION PROCESS

All pesticide registrants must submit data to the California Department of Food and Agriculture (CDFA) concerning human health and environmental hazards due to exposure to pesticides.

The Director of CDFA may, at any time, put a particular pesticide into formal reevaluation based on reported pesticide episodes and on information which indicates that a pesticide has or may cause health problems. CDFA may then require the registrant to provide more studies based on the concerns raised (**Formal Reevaluation Actions**). CDFA may act on the specific concerns of other state agencies (such as Cal/OSHA or the Department of Health Services) or members of the public.

In addition to reevaluation, CDFA is also required to put all pesticides through a continuous review process (**Orderly Evaluation**). CDFA also publishes a list of products for which they have identified possible hazards as a result of preliminary investigation or continuing evaluation (**Preliminary Investigation**).

Finally, CDFA publishes a list of products for which adverse effects have been disclosed by pesticide registrants (**Adverse Effects Disclosures**).

CDFA publishes these lists semiannually. If you are interested in obtaining a current list of pesticides which are undergoing reevaluation or preliminary investigation, contact the Pesticide Registration and Agricultural Productivity Unit, Department of Food and Agriculture, 1220 N Street, Room A-400, Sacramento, CA 95814.

APPENDIX D: CALIFORNIA RESTRICTED MATERIALS*

The following pesticides are restricted in California. To apply them, growers or their contracted pest control operators must obtain a **use permit** from the local County Agricultural Commissioner's office and **report each application** within seven (7) days. Use permits are good either for an entire **season** (these are usually more easily obtained by professional pest control companies) or for a **single use**. Some counties also require written notification (Notice of Intent) 24 hours prior to any application of a restricted material. Workers and the public have a right to examine permits and Notices of Intent.

In the chart below, "high risk" refers to the material's potential to cause harm if protective measures are not adhered to. For example, azinphosmethyl is probably not a high risk to field workers if they are kept out of newly treated fields until re-entry intervals are up—unless unusual climatic conditions exist and the pesticide's degradation is not complete.

COMMON NAME Brand names	REASON FOR RESTRICTION: CDFA HAZARD ASSESSMENT*
ALDICARB Temik	High risk to domestic animals, bees, wildlife, water persistent in the environment
ALDRIN	High risk to humans, wildlife; persistent in the environment
ALUMINUM PHOSPHIDE Phostoxin	High risk to humans
AVITROL	High risk to domestic animals, wildlife
AZINPHOSMETHYL	High risk to bees, wildlife (mammals, birds, fish)
CADMIUM-CONTAINING PESTICIDES	High risk to humans
CALCIUM CYANIDE	High risk to humans, domestic animals, bees
CARBARYL Sevin	High risk to bees
CARBOFURAN Furadan	High risk to bees, wildlife (mammals, birds)
CARBON BISULFIDE	High risk to nontarget crops (phytotoxic—poisonous to plant life)

*This chart was developed from the "California Restricted Materials Hazard Chart" compiled in 1978 by the California Department of Food and Agriculture's Worker Safety Unit.

CARBON TETRACHLORIDE	High risk to humans (mixers, loaders, applicators), domestic animals, nontarget crops (phytotoxic)
CARBOPHENOTHION Trithion	High risk to domestic animals, wildlife (mammals)
CHLORDANE	High risk to humans, water; persistent in the environment. (Only registered for structural pest control.)
CHLORDIMEFORM Galecron Fundal	High risk to humans. Registered in Imperial County for cotton. Use will be expanded to Riverside and San Bernardino Counties.
CHLORINE GAS	High risk to humans (public health, mixers, loaders, applicators)
CHLOROBENZILATE	High risk to humans, wildlife (fish)
CHLOROPICRIN	High risk to humans, nontarget crops (phytotoxic), water; persistent in the environment
2,4-D	High risk to nontarget crops (phytotoxic), water
2,4-DB	High risk to nontarget crops (phytotoxic)
DBCP	Not registered
DDD	Not registered
DDT	Not registered
DEF, FOLEX (merphos)	High risk to humans (mixers, loaders, applicators), nontarget crops (overtolerance), wildlife (fish)
DEMETON Systox	High risk to humans, domestic animals, wildlife (mammals, birds)
DIALIFOR Torak	High risk to humans (mixers, loaders, applicators, field workers), domestic animals, wildlife (mammals, birds, fish)
DICHLOROPROPANE- DICHLOROPROPENE D-D Telone	High risk to humans, water; persistent in the environment
DIELDRIN	High risk to bees, nontarget crops (overtolerance), water; persistent in the environment

2,4-DINITROPHENOL	High risk to humans (mixers, loaders, applicators, field workers), nontarget crops (overtolerance, phytotoxic), wildlife (mammals, birds)
4,6-DINITROPHENOL	High risk to humans (mixers, loaders, applicators, field workers), nontarget crops (overtolerance, phytotoxic), wildlife (mammals, birds)
4,6 DINITRO-O-CRESOL DNOC	High risk to humans (mixers, loaders, applicators), Nontarget crops (overtolerance, phytotoxic), wildlife (mammals, birds)
DINOSEB	High risk to humans (mixers, loaders, applicators, field workers), nontarget crops (overtolerance, phytotoxic), wildlife (mammals, birds, fish)
DISULFOTON Di-Syston	High risk to humans, domestic animals, wildlife (mammals, birds, fish)
EDB Ethylene dibromide	High risk to humans, nontarget crops (phytotoxic) water; persistent in the environment. Banned for structural use (termite control); further restrictions (i.e., soil fumigation) very likely.
EDC Ethylene dichloride	High risk to humans, water; persistent in the environment
ENDOSULFAN Thiodan	High risk to wildlife (mammals, birds, fish), water; persistent in the environment
ENDRIN	High risk to humans, domestic animals, nontarget crops (overtolerance), wildlife (mammals, birds, fish), water; persistent in the environment
ENDRIN-TREATED CONIFER SEEDS	High risk to domestic animals, wildlife (mammals), water; persistent in the environment
EPN	High risk to humans, domestic animals, bees, wildlife (mammals, birds)
ETHION	High risk to domestic animals
ETHOPROP Mocap	High risk to humans, domestic animals, wildlife (mammals, birds)
FENAMIPHOS Nemacur	High risk to humans, domestic animals, bees, nontarget crops (overtolerance), wildlife (mammals, birds)
HEPTACHLOR	High risk to humans, bees, nontarget crops (overtolerance), wildlife (mammals, birds, fish), water; persistent in the environment

INORGANIC ARSENICALS	High risk to humans (mixers, loaders, applicators), domestic animals, bees, wildlife (mammals, birds, fish), water; persistent in the environment
LINDANE	High risk to humans, bees, nontarget crops (overtolerance), wildlife (mammals, birds, fish); persistent in the environment
MCPA	High risk to nontarget crops (phytotoxic)
MERCURY-CONTAINING PESTICIDES	High risk to humans (mixers, loaders, applicators), domestic animals, wildlife (mammals, birds), water; persistent in the environment
MERCURY-TREATED SEEDS	High risk to domestic animals, wildlife (mammals, birds, fish), water; persistent in the environment
METHAMIDOPHOS Monitor	High risk to bees, wildlife (mammals, birds)
METHIDATHION Supracide	High risk to humans, domestic animals, wildlife (mammals, birds, fish)
METHOMYL Lannate Nudrin	High risk to humans, bees, wildlife (mammals, birds, fish)
METHYL BROMIDE	High risk to humans, nontarget crops (phytotoxic), water; persistent in the environment
METHYL PARATHION	High risk to humans, domestic animals, bees, wildlife (mammals, birds)
MEVINPHOS Phosdrin	High risk to humans, domestic animals, bees, wildlife (mammals, birds, fish)
OMPA	Not registered
PARAQUAT	High risk to domestic animals, nontarget crops (overtolerance)
PARATHION	High risk to humans, domestic animals, bees, wildlife (mammals, birds, fish)
PHORATE Thimet	High risk to humans, domestic animals, wildlife (mammals, birds, fish)
PHOSPHAMIDON Dimecron	High risk to humans, domestic animals, bees, wildlife (mammals, birds)
PICLORAM	High risk to nontarget crops (phytotoxic)

PROPANIL	High risk to nontarget crops (phytotoxic)
PYRIMINIL Vacor	Not registered
SILVEX	High risk to nontarget crops (phytotoxic)
SODIUM ARSENATE	High risk to humans, domestic animals, nontarget crops (phytotoxic), wildlife (mammals), water; persistent in the environment
SODIUM CYANIDE	High risk to humans, domestic animals, wildlife (mammals)
SODIUM FLUOROACETATE Compound 1080	High risk to domestic animals, wildlife (mammals)
STARLICIDE	High risk to domestic animals
STRYCHNINE	High risk to humans (public health), domestic animals, wildlife (mammals, birds)
SULFOTEPP	High risk to humans, domestic animals
2,4,5-T	High risk to nontarget crops (phytotoxic)
TEPP	High risk to humans, domestic animals, wildlife (mammals, birds, fish)
TOXAPHENE	High risk to humans, nontarget crops (over-tolerance), wildlife (mammals, birds, fish), water; persistent in the environment
ZINC PHOSPHIDE	High risk to humans (public health), domestic animals, wildlife (mammals, birds)

In addition, other materials may be considered restricted-use, particularly if: 1) they are dusts with high drift potential and hazardous active and other ingredients; 2) they are specially regulated through the Federal Insecticide, Fungicide, Rodenticide Act (FIFRA) Sections 18 and 24(c); or 3) they are Federal (EPA) restricted-use pesticides.

APPENDIX E: SUMMARY OF WORKER HEALTH AND SAFETY PROTECTIONS

California state regulations extend certain basic health and safety protections to all workers, including agricultural workers. Agricultural workers are entitled to:

1. be informed about relevant job hazards;
2. be protected against retaliation and discrimination for exercising rights to achieve safe and healthful working conditions;
3. file complaints (anonymous or named) with Cal/OSHA or Agricultural Commissioners;
4. participate in a walk-around;
5. obtain investigation reports;
6. have pesticide poisoning or condition reported by treating physician;
7. refuse hazardous work if work would involve violating safety and health laws;
8. emergency medical care provided by employers.

In addition, mixers, loaders and applicators have the right to:

1. medical surveillance (blood tests, etc.);
2. protective clothing and equipment;
3. training on pesticide safety hazards.

Most California workers come under the protections of the California Occupational Safety and Health Administration (Cal/OSHA), which has a very well-defined complaint and appeal procedure as well as standards for safety hazards and chemical contaminants. Agricultural workers, however, are protected for **pesticide exposures** by the California Department of Food and Agriculture (CDFA) and local county agricultural commissioners who enforce CDFA regulations. Both the CDFA and agricultural commissioners have a dual interest to promote agriculture and to protect mixers, loaders, applicators and all field workers against harm from pesticide and residue exposures.

The bulk of the CDFA field worker safety pesticide protection regulatory program (administered by the Enforcement Unit) consists of **Field Worker Safety Re-entry Intervals**. These were first adopted in 1971 based on those pesticides and crops that were associated with frequent field worker acute incidents (poisonings and eye/skin problems). Worker safety regulations were adopted in 1972 and have been modified over the years. The CDFA has regularly evaluated the effectiveness of the intervals based on yearly reports of acute incidents (see *APPENDIX C—CDFA PESTICIDE EVALUATION PROCESS*). Re-entry intervals generally are based on acute hazards only and do not reflect serious chronic hazards. For some pesticides (e.g., nitrofen and chlorobenzilate), CDFA has based re-entry intervals on other factors: rate of skin absorption; potential to cause reproductive system damage or cancer, as demonstrated in animal tests; and rate of degradation due to climatic and environmental conditions once the pesticide is applied.

In addition to the above regulations, the following requirements also apply: (1) growers are required to get use permits from the county agricultural commissioner and report the use monthly to the CDFA; (2) counties must do periodic field inspections to check pesticide residue levels, compliance with re-entry intervals, and proper use of PPE; (3) and the state must conduct dislodgeable residue and other studies to determine safe levels for pesticides.

A. For most pesticides, the field worker safety re-entry interval is determined by the EPA Signal Word that appears on the label: "CAUTION," "WARNING," "DANGER," and "DANGER POISON."

EPA SIGNAL WORD	USUAL CDFA FIELD WORKER SAFETY RE-ENTRY INTERVAL
"CAUTION" or "WARNING"	"STAY OUT OF TREATED FIELDS UNTIL SPRAY HAS DRIED, OR DUST HAS SETTLED"
"DANGER" or "DANGER POISON"	24 hours

B. Growers or person in charge of the property must keep workers out of fields until safety re-entry intervals are up.

C. California sets its own re-entry intervals which are often longer than EPA intervals. Growers must follow the California re-entry intervals **unless** the one required on the label is longer. (In other words, growers should follow the longest possible re-entry interval.)

D. Summary of Re-entry Intervals

Pesticide and/or Application Situation	CDFA Field Worker Safety Re-entry Interval†
ALL APPLICATIONS bidrin carbophenothion*, ** demeton* disulfoton endosulfan endrin ethion Metasystox-R methidathion* methyl parathion*, ** mevinphos* parathion*, ** phorate phosphamidon* TEPP	2 days ("48 hours")
ALL SOIL FUMIGANTS chloropicrin ethylene dibromide (EDB) D-D, Telone II methyl bromide	3 days (tarps must be kept in place for three days; workers should stay out of fields until tarps are removed)
EPN MORE THAN 1 LB ACTUAL PER ACRE OF PARATHION, METHYL PARATHION, or EPN Singly or in combination	14 days
IF PLANT HAS NO FOILAGE	Reduce safety interval by half, but in no case shall it be less than 24 hours.
METHIDATHION* ON DORMANT TREES Almonds Peaches Apples Pears Apricots Plums Cherries Prunes Nectarines Walnuts	2 days

†When a mixture of two or more organo-phosphates—the safety interval is 72 hours.

METHYL PARATHION***GRAPES.**

Monterey County	6 days
Encapsulated, all counties	21 days

MORE THAN 1 LB ACTUAL METHYL PARATHION/ACRE	14 days
Singly or in combination with EPN and/or parathion	

PARATHION***GRAPES, APPLIED AS SPRAY**

MIXTURES:	30 days
------------------	----------------

2 lbs or less actual parathion/
100 gallons water, at rates of
8 lbs or less actual parathion/
acre, and no more than 10 lbs
total/acre in prior 12 months

2 lbs or less actual parathion/ 100 gallons water, at rates of more than 8 lbs actual parathion/acre, and no more than 10 lbs total/acre in prior 12 months	45 days
--	----------------

More than 10 lbs total actual parathion/acre in prior 12 months	60 days
--	----------------

MORE THAN 1 LB ACTUAL PARATHION/ACRE: Singly or in combination with EPN and/or methyl parathion	14 days
--	----------------

PROPARGITE ON GRAPES (30W)	7 days
-----------------------------------	---------------

*See other exceptions listed on table, subpart E that follows.

**See other exceptions listed below on this table.

E. Certain pesticides require especially long safety intervals when applied to some crops.

PESTICIDE	PEACHES				
	CITRUS	NECTARINES	GRAPES	APPLES	ALL OTHERS
AZINPHOSMETHYL	30 days	14 days	21 days	14 days	2 days
CARBOPHENOTHION	14 days	14 days	14 days		2 days
CHLOROBENZILATE	14 days	-----	not registered for other crops -----		
DEMETON	5 days	7 days	7 days		2 days
DIAZINON	5 days	5 days	5 days		"Wait until spray has dried, dust has settled"
DIMECRON	14 days				
DIMETHOATE	4 days		4 days		"Wait until spray has dried, dust has settled"
DIOXATHION	30 days	30 days	30 days		1 day
EPN	14 days	14 days	14 days	14 days	1 day
ETHION	30 days	14 days	14 days		2 days
MALATHION	1 day	1 day	1 day		"Wait until spray has dried, dust has settled"
METHIOCARB		7 days			2 days
METHOMYL	2 days	2 days	2 days		2 days
METHYL PARATHION		21 days	14 days (see exceptions under methyl parathion above)	14 days	2 days
MEVINPHOS	4 days	4 days	4 days		2 days

Pesticide	Citrus	Peaches Nectarines	Grapes	Apples	All Others
NALED	1 day	1 day	1 day		"Wait until spray has dried, dust has settled"
OMITE			7 days		
PARATHION	30-60 days (see exceptions listed under Para- thion, above)	21 days	21 days	14 days	2 days
PHOSALONE	7 days	7 days	7 days		"Wait until spray has dried, dust has settled"
PHOSMET		5 days	5 days		"Wait until spray has dried, dust has settled"
PHOSPHAMIDON	14 days				2 days
SULFUR	1 day	1 day	1 day		"Wait until spray has dried, dust has settled"
SUPRACIDE	30 days				
TEPP	4 days	4 days			
TORAK			75 days		

F. Growers must either adhere to the CDFA-set re-entry intervals (unless the label or other California regulations specify longer safety re-entry intervals) or they must seek a permit from the Director of CDFA (through the local commissioner) to allow workers into the field early. The Director is authorized to grant such permits—IF:

1. GROWER WARNS WORKERS ORALLY IN A LANGUAGE THEY UNDERSTAND, PROVIDES THEM WITH THE SAME PROTECTIVE CLOTHING AND EQUIPMENT REQUIRED FOR APPLICATORS EXPOSED TO THE SAME PESTICIDES AND PROVIDES MEDICAL SUPERVISION FOR ALL EMPLOYEES ENTERING THE TREATED AREA.

2. TWO (2) INCHES OF RAINFALL OCCUR WITHIN SEVEN (7) DAYS OF APPLICATION.
3. EQUIVALENT OF TWO (2) INCHES OF RAINFALL ARE APPLIED EVENLY ABOVE ALL PLANTS BY SPRINKLER IRRIGATION EQUIPMENT WITHIN SEVEN (7) DAYS OF APPLICATION (for tree crops, at least 50 gallons of water must be applied at one time under pressure and evenly distributed to each tree).
4. SAMPLES OF FOLIAGE ARE COLLECTED BY THE LOCAL COUNTY AGRICULTURAL COMMISSIONER OR LICENSED AGRICULTURAL PEST CONTROL ADVISOR IN ACCORDANCE WITH A PROCEDURE APPROVED BY THE DIRECTOR OF CDFA, ANALYZED BY AN APPROVED LABORATORY USING APPROVED EXTRACTION AND ANALYTICAL PROCEDURES OR IN THE FIELD (with an approved field test kit), AND ARE DETERMINED TO MEET SAFE LEVELS FOR THE PESTICIDE AND ITS METABOLITES.

Although the local commissioners actually authorize early re-entry by any of the above measures, they must notify the Director of CDFA in a report.

G. The farm operator or his agent must post warning signs for pesticides which have a re-entry interval of greater than seven (7) days. This includes the following:

AZINPHOSMETHYL	ETHION
CARBOPHENOTHION	METHYL PARATHION
DEMETON	PARATHION
DIMECRON	SUPRACIDE
DIOXATHION	TORAK
EPN	

Warning signs must be posted at the usual points of entry (or in a manner prescribed by the commissioner). If treated fields are adjacent to public right-of-ways and are unfenced, warning signs must be posted at each corner and at intervals not greater than 600 feet in addition to the normal points of entry. In addition, the signs must:

1. Be posted 24 hours before application.
2. Be clearly visible at a distance of 25 feet and remain legible for the entire safety interval.
3. Be in English as well as in Spanish, and include a skull and crossbones symbol, the name of the pesticide, "DO NOT ENTER UNTIL (date)," date of application, grower's name and field identification, if any.
4. Not be removed during safety interval.
5. In Monterey County, posting is required for all pesticides with a re-entry interval greater than or equal to 24 hours.

APPENDIX F: RESOURCES

Resources: Training Program

Interagency Pesticide Training Coalition

PESTICIDE TRAINING: CONTINUING
EDUCATION SEMINAR FOR HEALTH
PERSONNEL

This is a continuing education program on the health hazards of pesticide exposure, including discussions of pesticide use patterns; clinical diagnosis and management; emergency treatment; dermatological effects; chronic and delayed onset effects; physician reporting requirements; worker education; and prevention approaches.

Tapes of the sessions have been prepared in 40 minute segments for a total composite one-day training program, or for individual use as one-hour in-service trainings.

Written materials are provided with the tapes.

To obtain, contact: Community Toxics Unit, California State Department of Health Services, 2151 Berkeley Way, Berkeley, CA 94720. Charge for shipping only.

Resources: Publications

General References

California Department of Food and Agriculture, Worker Safety Unit, *Pesticide Information Series* (on California restricted-use pesticides), 1982.

Davies, John E., *Recognition and Management of Pesticide Poisonings*, second edition, EPA, September 1977.

Doull, J., C.D. Klaassen, M.D. Amdur, "Pesticides" in Casarett and Doull's *Toxicology: The Basic Science of Poisons*, second edition, New York: Macmillan Publishing Co., 1980.

EPA, *Acceptable Common Names and Chemical Names for the Ingredient Statement on Pesticide Labels*, 4th edition, December 1979 No. EPA-540/9-77-017.

Epstein, Samuel P., *The Politics of Cancer*, San Francisco: Sierra Club, 1978.

Farm Chemicals Handbook, Willoughby: Meister Publishing Co., (published yearly in January-February). Order from the publisher: 37841 Euclid Ave., Willoughby, Ohio 44094 (\$39 in 1983).

Goodman and Gilman, *The Pharmacological Basis of Therapeutics*, sixth edition, New York: Macmillan Publishing Co., 1980.

Hayes, Wayland Jr., *Pesticides Studied in Man*, Baltimore: Williams and Wilkins Publishing Co., 1982.

Herbicide Handbook, Champaign, IL: Weed Science Society of America, 1979.

Hiatt, H.H., Watson, J.D., Winsten, J.A., *Origins of Human Cancer*, Book A, Cold Spring Harbor Laboratory, 1977.

IARC *Monographs On the Evaluation of Carcinogenic Risk of Chemicals and Man*, various volumes on various pesticide groups (orgnochlorines, organophosphates, etc.).

International Labor Organization, *Encyclopedia of Occupational Health and Safety*, New York: McGraw Hill, 1974.

International Labor Organization, *Safety and Health in Agricultural Work*, Geneva: ILO Codes of Practice Series, 1979.

Morgan, Donald P., *Recognition and Management of Pesticide Poisonings*, third edition, EPA, January 1982, No. EPA540/9-80005.

NIOSH, *Criteria Document for a Recommended Standard . . . Occupational Exposure to Carbaryl*, USDHEW (NIOSH) 1977, No. 77-107.

NIOSH, *Criteria Document for a Recommended Standard . . . Occupational Exposure During the Manufacture and Formulation of Pesticides*, USDHEW (NIOSH) 1978, No. 78-174.

NIOSH, *Criteria Document for a Recommended Standard . . . Occupational Exposure to Inorganic Arsenic, New Criteria*, USDHEW (NIOSH) 1975, No. 75-41.

NIOSH, *Criteria for a Recommended Standard. . . Occupational Exposure to Methyl Parathion*, USDHEW (NIOSH) 1977, No. 77-106.

NIOSH, *Criteria for a Recommended Standard. . . Occupational Exposure to Organotins*, USDHEW (NIOSH).

NIOSH, *Criteria for a Recommended Standard . . . Occupational Exposure to Parathion*, USDHEW (NIOSH) 1976, No. 76-190.

NIOSH, *Health and Safety Guide for Pesticide Formulators*, USDHEW (NIOSH) 1977, No. 77-100.

NIOSH, *Occupational Exposure to Leptophos and Other Chemicals*, USDHEW (NIOSH) 1978, No. 78-114.

NIOSH, *Registry of Toxic Effects of Chemical Substances* (put out yearly, with a special supplement on pesticides).

- NIOSH, *Occupational Health and Safety for Agricultural Workers*, USDHEW (NIOSH) 1977, No. 77-150.
- NIOSH, *Pesticide Use in California* (1981). (This report gives total poundage applied, acreage treated, and number of applications. The listing is: county/crop/month/top 20 pesticides.) Obtained from NIOSH, Regional Office IX, 50 UN Plaza, San Francisco, CA 94102.
- Pimentel, David and Marcia, "The Risks of Pesticides," *Natural History*, 88:24-33, 1979.
- Proctor, N., and Hughes, J., *Chemical Hazards in the Workplace*, Philadelphia: Lippincott Publishing Co., 1978.
- Sax, Irving, *Dangerous Properties of Industrial Chemicals*, Philadelphia: Van Nostrand Reinhold Co., 1975.
- Van Den Bosch, Robert, *The Pesticide Conspiracy*, New York: Doubleday & Co., Inc., 1978.
- Ware, George, *The Pesticide Book*, San Francisco: W.H. Freeman Publishing Co., 1978.
- Whiteside, Thomas, *The Pendulum and the Toxic Cloud: the Course of Dioxin Contamination*, New Haven: Yale Univ. Press, 1979.
- Wilson, J.G., and Fraser, F.C., *Handbook of Teratology*, New York: Plenum Press, 1977 (4 volumes).

APPENDIX G: RESOURCES
ORGANIZATIONS THAT CAN PROVIDE INFORMATION ON
PESTICIDES AND HAZARDS

WHAT INFORMATION	ORGANIZATION/AGENCY
EMERGENCY TREATMENT	<p>24-hour Bay Area Poison Control Center: 800/772-0720 415/666-2845</p> <p>Other areas:</p> <p>Fresno 209/233-0911 ext. 2511</p> <p>Los Angeles 213/664-2121</p> <p>Irvine 714/634-5988 714/634-6011</p> <p>San Diego 714/294-6000</p> <p>San Jose 408/293-1262 ext. 318</p> <p>Sacramento 916/453-3692</p>
INFORMATION ON PESTICIDE HAZARDS	<p>Epidemiological Studies Branch California Department of Health Services 5th Floor 2151 Berkeley Way Berkeley, CA 94704 415/540-2339</p> <p>Hazard Evaluation System and Information Service (HESIS) California Departments of Health Services and Industrial Relations Room 504 2151 Berkeley Way Berkeley, CA 94704 415/540-3014 415/540-2115</p> <p>Labor Occupational Health Program (LOHP) Institute of Industrial Relations University of California Berkeley, CA 94720 415/642-5507</p>

National Institute of Occupational Safety
and Health (NIOSH)
50 United Nations Plaza
San Francisco, CA 94102
415/556-3781

Office of the Statewide Pesticide Coordinator
University of California
111 Environmental Toxicology
Davis, CA 95616
916/752-7011

U.S. Environmental Protection Agency (EPA)
Hazardous Materials Branch
215 Fremont Street
San Francisco, CA 94102
415/556-3352

**INFORMATION ON PESTICIDE
USE REGULATIONS,
REGISTRATION, AND
TOXICITY**

Pesticide Use Enforcement
California Department of Food and Agriculture
(CDFA)
1220 N Street
Sacramento, CA 95814
916/322-5032

**INFORMATION ON WORKER
SAFETY REGULATIONS**

Cal/OSHA Legal Unit
Room 615
525 Golden Gate Avenue
San Francisco, CA 94102
415/557-2960

Worker Safety Unit, California Department
of Food and Agriculture
1220 N Street
Sacramento, CA 95814
916/445-8474

APPENDIX H: PESTICIDES THAT WERE RECENTLY TESTED FOR MUTAGENICITY IN MICROBIAL LABORATORY TESTS

Out of 193 substances tested, 16 were positive for mutations, the rest were negative.

I. Tested positive

CAPTAFOL	FOLPET
CAPTAN	HEH
DEXON	NBT
DICHLLOFLUANID	NNN
DICHLORVOS	TMTD
EMSC	TTCA
ETU	VAMIDOTHION
FERBAM	ZIRAM

II. Tested negative

A. Fungicides (64)

Asozin	Dichlozoline	NBT
Baykel	Dicloran	NNN
BEBP	Dithianon	OPP
Benzalkonil chloridum	DTAS	PCNB
Binapacryl	EMP	Phenazine
Bis-dithane	ESBP	PMA
Blasticidin S ^a	ESTP	PMC
Captafol	ETM	PMF
Captan	Fentiazon	Polyoxin B
CBA	Ferbam	Polyoxin D
CECA	Folpet	Rabcide
Cellocidin	Griseofluvin	Sankel
Chinomethionate	Hinosan	Styrocide
CPA	IBP	Tachigaren
Daconil	Karathane	Thiabendazole
DAD	Kasugamycin	Thiophanate
DAPA	MAE	TMTD
DDPP	MAF	Triazine
Denmert	Maneb	TTCA
Dichlofluanid	MAS	Zineb
Dichlone	Metiram	Ziram
		ZM

From "Mutagenicity Screening on Pesticides and Modification Products: A Basis of Carcinogenicity Evaluation," by Y. Shirasu, M. Moriya, K. Kato, F. Lienard, H. Tezuka, S. Teramoto, and T. Kada, in *Origins of Human Cancer, Book A: Incidence of Cancer in Humans*, ed. H.H. Hiatt, J.D. Watson, and J.A. Winsten; Cold Spring Harbor Laboratory, 1977.

B. Insecticides (60)

Aldrin	Dinobuton	Mipcin
Arprocarb	Dimethoate	MTMCZ
BHC	Dimite	Ofunack
BPMC	Dioxathion	Propargite (Omite)
Carbanolate	DMTP	Phenisobromolate
Carbaryl	Dursban	Phenkapton
Cartap	Elsan	Phosalone
Chlorfenson	EPN	Phosvel (Leptophos)
Chlorfenvinphos	Eradex	Propaphos
Chlorobenzilate	Ethion	Salithion
Chlorophenamidine	Fenthion	Sevin
Chloropropylate	Heptachlor	Smite
Cidial	Hopcide	Sumithion
CVMP	Hydrol	Tetradifon
Cyanox	Phosmet (Imidan)	Torque
DCIP	Kelthane	Trichlorfon
DDT	Macbal	Triforine
Diazinon	Malathion	Tsumacide
Dichlorvos	Mecarbam	Vamidothion
Dieldrin	Meobal	Vydate

C. Herbicides (67)

ACN	Dichlobenil	Pebulate
Alachlor	Diphenamid	Pentanochlor
Alanap	Diquat-dibromide	Phenmedipham
Ametryne	Diuron	Phenopylate
Amitrole	Eptam	Phenothiol
Asulam	HEH	Prometryne
Atrazine	Ioxynil-octanoate	Propazine
Benefin	IPC	Ronstar
Bensulide	Lenacil	Siduron
Benthiocarb	Linuron	Simazine
Bromacil	MCPB-ethyl	Simetryne
Butachlor	MCPB-sodium	Swep
CBN	MCPCA	2,4,5-T
Chloroitrophen	MCPE	TCA
Chloroxuron	MCPFA	TCBA
Chlorthiamid	MCPP	TCTP
CMPT	Methoxyphenone	Tetrapion
Cremart	MO	Thiochlormethyl
2,4-D	Molinate	Tokunol
DCPA	Monuron	TOPE
Desmetryne	NIP	Trietazine
Dicamba-dimethylamine	Pentachlorophenol (PCP)	Trifluralin
		Vernolate

D. Plant Growth Regulators (2)

Sodium 1-phthaleneacetate
MH

**APPENDIX I: PESTICIDES THAT TESTED POSITIVE
IN OTHER MUTAGENICITY TESTS**

PESTICIDES	TEST RESULTS	TOTAL TESTS
DDT	Positive: 1 test Negative: 5 tests	6
METHYL PARATHION	Positive: 4 tests	4
DIMETHOATE	Positive: 4 tests	4
DICHLORVOS	Positive: 4 tests Negative: 3 tests	7
META-SYSTOX-R	Positive: 5 tests	5
MONOCROTOPHOS	Positive: 4 tests	4
PENTACHLOROPHENOL	Positive: 2 tests Negative: 4 tests	6
1,2-DIBROMOETHANE	Positive: 5 tests Negative: 1 test	6
CAPTAN	Positive: 5 tests Negative: 1 test	6
FOLPET	Positive: 3 tests Negative: 1 test	4
ETHYLENE DIBROMIDE	Positive: 3 tests	3
ETHYLENE OXIDE	Positive: 7 tests	7
ETHYLENE CHLOROHYDRIN	Positive: 2 tests	2
DBCP	Positive: 1 test	1
DICROTOPHOS	Positive: 2 tests	2

From Table XIV-10: Results of Mutagenicity Studies with Pesticides in NIOSH, *Criteria Document for a Recommended Standard...Occupational Exposures During the Manufacture and Formulation of Pesticides*, July 1978, which includes 15 tests.

**APPENDIX J: PESTICIDES NIOSH CONSIDERS TO DISPLAY
NO SIGNIFICANT CARCINOGENICITY IN LABORATORY ANIMAL TESTS**

Atrazine
2-sec-Butyl-4,6-dinitrophenol (Dinoseb DNBP)
Carbaryl
2,6-Dichloro-4-nitroaniline (DCNA, dichloran Botran)
Dichlorvos
Dicryl
Diuron
Dodine
2-(2,4-DP)
Folpet
Gibberellic acid
3-Indoleacetic acid (plant growth regulator)
Malathion
Maleic Hydrazide (a growth retardant)
Maneb
Methoxychlor
Nabam
1-Naphthalene acetamide (Rootone)
1-Naphthalene acetic acid (NAA)
Ovex
Pentachlorophenol
Picloram
Propazine
Rotenone
Simazine
Tetradifon
Thiram
2,4,6-Trichlorophenol
2-(2,4,5-Trichlorophenoxy)-propionic acid (Silvex)

From NIOSH, *Criteria Document for Occupational Exposure During the Manufacture and Formulation of Pesticides* (1978), Table IX, "Pesticides Displaying No Significant Carcinogenicity in Assays with Experimental Animals."

**APPENDIX K: PESTICIDES THAT ARE SUSPECT CARCINOGENS, AS
DEMONSTRATED IN LABORATORY ANIMAL TESTS**

PESTICIDE	COMMENTS
ALDRIN*	Numerous reports in the literature ^{1,2}
AMITRAZ	"Weak" carcinogen in some animal tests ²
CAPTAN	"Weak" carcinogen in some animal tests ^{1,3}
CHLOROTHALONIL	Kidney cancer in rats but not mice ^{2,3}
DBCP*	Potent carcinogen ¹
DDT*	Numerous reports in the literature ¹
DIELDRIN	Numerous reports in the literature ¹
ENDOSULFAN	Some evidence of lung cancer in mice at fairly low doses; considered by NIOSH to require further animal testing for carcinogenicity ⁴
ETHYLENE BISDITHIO- CARBAMATES (See <i>PART II: HAZARDS ASSOCIATED WITH MAJOR CHEMICAL GROUPS USED AS PESTICIDES—H. DITHIOCARBAMATES</i>)	Potential to cause cancer is inferred from evidence that a metabolite, ethylene thiourea (ETU) is a fairly potent animal carcinogen ¹
ETHYLENE DIBROMIDE (EDB)	Potent carcinogen ¹
KEPONE*	Fairly potent carcinogen ¹
MANEB	Carcinogenesis thought due to ETU metabolite ^{1,4}
MIREX	"Weak" carcinogen at a variety of doses ¹
NITROFEN (TOK)	Potent carcinogen in mice and rats ¹

* No longer registered in California.

¹NIOSH, *Criteria Document for a Recommended Standard...Occupational Exposures During the Manufacture and Formulation of Pesticides* (1978), Table XIV-8, "Suspected Occupational Carcinogens," pp. 403-406.

²California Department of Food and Agriculture, Workers Safety Unit.

³c.f., *APPENDIX O: PESTICIDES WHOSE REGISTRATION STATUS DEPENDS ON IBT DATA FOR CANCER, BIRTH DEFECTS, AND OTHER TOXICITY*.

⁴NIOSH, *Criteria for a Recommended Standard...Occupational Exposures During the Manufacture and Formulation of Pesticides* (1978), Table XIV-9, "Examples of Pesticides Considered by NIOSH to require Further Carcinogenicity Testing," pp. 407-411.

**APPENDIX L: OTHER PESTICIDES THAT HAVE SHOWN
EVIDENCE OF CARCINOGENIC ACTIVITY IN ANIMAL TESTS,
BUT WHERE DATA WAS INCONCLUSIVE**

PESTICIDE	COMMENTS
ALACHLOR	"Weak;" cancer activity was possibly due to epichlorohydrin contamination; manufacturer is redoing tests ²
AMITRAZ	Data is "weak," ² results are controversial ²
CHLORAMBEN	Doses were very high; statistical significance was low (4 in 1,000) ¹
CHLORDANE	Doses were fairly low; tests in rats were negative; tests in mice had very low statistical significance (less than 1 in 10,000 to less than 1 in 1,000) ¹
CHLOROBENZILATE	Doses were very high with statistical significance of 1 in 1,000; doses were medium with statistical significance of 1 in 100; both tests were on mice only (same species); CDFA does not consider as an animal carcinogen ^{1,2}
2,4-D	Most tests were negative, including NCI bioassays; one test with rats at high doses yielded a 5 in 100 statistical significance for "various" kinds of cancer; considered by NIOSH to warrant further testing ²
DIALATE	Data is "weak" ²
DIMETHOATE	NCI tests on rat and mouse were negative; German test revealed various cancers, including spleen; considered by NIOSH to require further testing ²
HEPTACHLOR	NCI test was negative in rats, positive in mice at fairly low dose with a statistical significance of less than 1 in 1,000 ¹
LINDANE	NCI bioassay was positive in mice with a 1 in 1,000 statistical significance and negative in rats; most of other tests in literature were negative; considered by NIOSH to require further testing; ² considered by EPA as animal carcinogen ³
METHIDATHION	"Weak," reported by the manufacturer; results are controversial ²

MEXACARBATE	NCI bioassay was positive for mouse (liver) with a statistical significance of 5 in 100; considered by NIOSH to require further testing ²
PCNB	NCI bioassay was positive for mouse with a statistical significance of 1 in 100 and negative in both mouse and rat at very high doses; considered by NIOSH to require further testing ²
2,4,5-T	Positive in various tests (thought due to TCDD contamination); considered by NIOSH to require further testing ²
TRICHLORFON	German study shows cancer in animals at fairly low doses; considered by NIOSH to require further animal testing for carcinogenicity ²
TRIFLURALIN	NCI bioassay in mice at very high doses yielded a 36 in 1,000 statistical significance for lung cancers ¹

*No longer registered in California.

¹NIOSH, *Criteria Document for a Recommended Standard...Occupational Exposures During Manufacture and Formulation of Pesticides* (1978), Table XIV-8, "Suspected Occupational Carcinogens," pp. 403-406.

²NIOSH, *Criteria Document for a Recommended Standard...Occupational Exposures During Manufacture and Formulation of Pesticides*, (1978), Table XIV-9, "Examples of Pesticides Considered by NIOSH to Require Further Carcinogenicity Testing," pp. 407-411.

³In preliminary decision resulting from "Completion of Rebuttal Presumption Against Registration (RPAR) of Lindane," published in 45 *Federal Register*, July 3, 1980, p. 45362, EPA-suggested label changes include: "The U.S. EPA has determined that lindane causes cancer...in laboratory animals...."

**APPENDIX M: PESTICIDES THAT HAVE CAUSED REPRODUCTIVE
SYSTEM PROBLEMS, AS DEMONSTRATED IN ANIMAL TESTS**

PESTICIDE	COMMENTS
ALDRIN*	Birth defects, ^{1,2} embryotoxicity, infertility ³
BENOMYL	Spermatotoxicity, birth defects ⁵
CAPTAFOL (Difolatan)	Birth defects (high doses), embryotoxicity ^{1,2} (some tests showed no effects) ²
CAPTAN	Birth defects, embryotoxicity ^{1,2}
CARBARYL	Numerous reports in the literature ² (some with dog which have been discounted as dogs metabolize carbaryl much slower than do humans and doses were very high ⁴), embryotoxic, birth defects in guinea pigs (at very high doses ²); embryotoxic in pig, ² reduced fertility in second and third generations of rats, gerbils; ² EPA has removed compound from RPAR; ⁸ CDFA after toxicological evaluation of published and unpublished data, considers there to be no significant risk to humans ⁴
CHLOROBENZILATE	Spermatotoxicity ⁴
DEMETON	Birth defects, embryotoxicity ²
DIAZINON	Embryotoxicity ^{1,2}
DBCP*	Spermatotoxicity (humans ² as well as animals) ⁷
DICHLORVOS (DDVP)	Birth defects ^{1,2}
DIELDRIN	Birth defects ^{1,2}
DIQUAT	Embryotoxicity ²
ENDOSULFAN	Spermatotoxicity (high doses)
ENDRIN	Birth defects ^{1,2}
ETHYLENE DIBROMIDE (EDB)	Spermatotoxicity (four species of animals) ⁴
FOLPET	Birth defects (high doses), embryotoxicity ^{1,2}
HEPTACHLOR	Embryotoxicity ³

KELTHANE	Birth defects, postnatal growth retardation, third generation ²
KEPONE*	Reduced fertility (males; humans as well as animals) ⁷
LINDANE	Stillbirths ^{2,6}
MCPA (ethylester)	Birth defects, embryotoxicity ²
METHYL PARATHION	Birth defects, embryotoxicity ²
MIREX*	Reduced fertility (female) ³
MOLINATE (ORDRAM)	Embryotoxicity, spermatotoxicity ⁴
NITROFEN (TOK)	Birth defects ⁴
PARATHION	Embryotoxicity ^{1,2}
PARAQUAT	Embryotoxicity ²
PHOSMET	Birth defects ¹
2,4,5-T (with and without TCDD)*	Birth defects, embryotoxicity, ^{1,2} reduced fertility (male) ³
THIRAM	Birth defects, embryotoxicity (at fairly high doses for both effects) ^{1,2}
TRIFLURALIN	Birth defects ^{1,2}

* No longer registered in California.

¹From NIOSH, *Criteria Document for a Recommended Standard...Occupational Exposures During the Manufacture and Formulation of Pesticides* (1978), Table XIV-12, "Compounds Reviewed by NIOSH Which Have Been Tested for Teratogenicity," pp. 414-418.

²From James G. Wilson, "Environmental Chemicals," chapter 9 in James G. Wilson and F. Clarke Fraser, *Handbook of Teratology*, Book I, Plenum Press, 1977.

³From NIOSH, *Criteria Document for a Recommended Standard...Occupational Exposures During the Manufacture and Formulation of Pesticides* (1978), Table XIV-13, "Examples of Adverse Reproductive Effects Due to Pesticides."

⁴Personal communication with Keith Maddy, head of the Worker Safety Unit, California Dept. of Food and Agriculture (from unpublished data submitted by manufacturer for California registration of material).

⁵"Rebuttal Presumption Against Registration and Continued Registration of Pesticide Products Containing Benomyl," EPA, *Federal Register*, Dec. 6, 1977, p. 61788.

⁶From preliminary decision that EPA Rebuttal Presumption Against Registration (RPAR) for Lindane is completed, as published in 45 *Federal Register*, July 3, 1980, p. 45362, suggested label changes included: "The U.S. EPA has determined that lindane causes cancer and fetotoxic effects in laboratory animals, and central nervous system effects in both humans and laboratory animals."

⁷Numerous reports/articles in the literature.

⁸NIOSH, *Criteria Document for a Recommended Standard...Occupational Exposures During the Manufacture and Formulation of Pesticides* (1978).

**APPENDIX N: ORGANOPHOSPHATES SUSPECTED OF CAUSING
DELAYED-ONSET PERIPHERAL NEUROPATHY,
AS DEMONSTRATED IN CHICKENS**

PESTICIDE	COMMENTS
HALOXON ¹	
EPN ^{1,3}	However, a later human study using volunteer prisoners exposed to fairly high doses of EPN resulted in no human incidences .
DEF ^{1,2}	
FOLEX ^{1,2}	
CARBOPHENOTHION ^{1,3}	Doses were exceptionally high, although the effect was permanent in the chickens tested.
METHAMIDOPHOS (Monitor) ⁶	Evidence was in humans.
DMPA ¹	
LEPTOPHOS ^{1,3,4}	Evidence was in humans.
TOCP ⁵	Evidence was in humans and animals.

¹From NIOSH, *Criteria Document for a Recommended Standard...Occupational Exposures During the Manufacture and Formulation of Pesticides* (1978), Table XIV-14, "Organophosphorous Insecticides Suspected of Delayed Neurotoxicity Based on Experimental Evidence in Chickens," p. 420 (NIOSH tables include levels).

²Personal communication with Keith Maddy, DVM, Senior Toxicologist, Worker Safety Unit, California Dept. of Food and Agriculture, Sacramento, California.

³Effect was permanent in chicken tests.

⁴NIOSH, *Criteria Document for a Recommended Standard...Occupational Exposure to Leptophos and Other Chemicals* (1978).

⁵Casarett and Doull, *Toxicology*, 1980, p. 196.

⁶*New England Journal of Medicine*, Vol. 3, January 21, 1982, pp. 155-156.

APPENDIX O: PESTICIDES WHOSE REGISTRATION STATUS WAS DEPENDENT ON IBT DATA

To register a pesticide with either the Environmental Protection Agency (EPA) or the California Department of Food and Agriculture (CDFA), the manufacturer must submit a battery of laboratory tests to demonstrate that: 1) the pesticide is effective for the targeted pests and crops, and 2) it will not produce acute or chronic health hazards to workers.

There has recently been a great deal of concern about the adequacy and accuracy of many of these studies. Many manufacturers contracted with an independent lab, Industrial Biotests Laboratories (IBT) in Chicago, for these tests. Many of the tests were fraudulent and the EPA has required that new studies be done. This could take several years to complete.

The following is a list of pesticides for which the EPA, in July 1983, required new tests. If you are working with any of these pesticides, you should contact the EPA to find out the results of the new round of testing.

I. Pesticides requiring new testing (as of July 1983) or facing suspension of use.

Benzadox	Norea
Bromopropylate	Perfluidone
Chlorobromuron	Phenthoate
Glyphosine	Pik-off
Irgasan	PPG-124
Malonoben	Prometon
Methazole	Ramrod
Nemefene	Randox
	Santophen
	Sodium Chlorate
	Torak

II. Pesticides needing "further review" (July 1983).

Antor	Fluoridifen
Bromofenoxim	MBR
Butyltin Oxide	Mesuroi
Chloropicrin	Meta Systox-R
Cypromid	Nicotine
Dantoin	Phosphamidon
D-Phenothrin	Prometryn

III. Pesticides under discussion.

Ametryn	Formetanate
Avadex	Gluteraldehyde
Bifenox	HCL
Co-Ral	Paraquat
Desmedipham	Polyram
Dicamba	

APPENDIX P: GOVERNMENT AGENCIES WITH RESPONSIBILITIES FOR PESTICIDES AND FIELD WORKER HEALTH AND SAFETY

A number of federal, state, and county governmental agencies have responsibilities for protecting field workers against harm from pesticides and residues.

A. Federal Agencies

1. Environmental Protection Agency (EPA)

Federal pesticide regulations contained in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) give the Environmental Protection Agency (EPA) authority to register all pesticides used in the United States, establish guidelines for registration procedures, certify state programs for licensing pesticide applicators, and establish re-entry intervals, mandate label instructions, and establish worker safety regulations.

The registration process requires manufacturers to submit experimental data demonstrating the material's effectiveness for specified uses, crops, and targeted pests as well as its effects on humans, animals, nontarget crops, and the environment. EPA, as part of the registration process, determines the material's toxicity rating (denoted by the Signal Word on the label), approves the pesticide for general or restricted use, specifies label information and use instruction, and assigns a registration number (which appears on the label). At the same time, EPA may also determine acceptable food residue levels from experimental data submitted by the manufacturer for registration.

Should a material that is already registered be found to be potentially hazardous to humans, EPA has a procedure called the Special Pesticide Review to re-evaluate the product's safety. As part of the RPAR process, EPA may require the manufacturer to do additional tests on the product, for example cancer bioassays.

2. National Institute for Occupational Safety and Health (NIOSH)

NIOSH was designated in the Occupational Safety and Health Act of 1970 to conduct research on various aspects of occupational health and recommend appropriate standards. NIOSH also has a team of industrial hygienists and physicians around the country who do Health Hazard Evaluations (HHEs) of workplaces at the request of employers and/or employees, especially where there is evidence of a disease pattern but no clear cause. For example, NIOSH has recently done investigations at the request of workers at a mushroom farm and in a celery banding crew. Much of the background for this book came from NIOSH's *Criteria for a Recommended Standard...Occupational Exposure During the Manufacture and Formulation of Pesticides*, 1978.

B. California State

1. California Department of Food and Agriculture

The California Department of Food and Agriculture is primarily responsible for regulating pesticides used and sold in California. The CDFA determines what pesticides may be registered in California, classifies pesticides as general or restricted use, establishes pesticide

use and worker safety regulations for workers who apply and use pesticides, monitors pesticide residues in food samples (to make sure they meet EPA tolerances), licenses professional agricultural pest control advisors and applicators, and has a reporting system to keep track of all pesticides sold in the state, all restricted materials applied, all pesticides applied by professional pesticide control applicators, and worker illnesses due to pesticides.

To have a pesticide used in California, manufacturers must provide CDFA with a summary of all data submitted to EPA. In some cases, CDFA has more stringent registration requirements than does EPA.

2. Department of Industrial Relations (DIR)

The Department of Industrial Relations and its divisions enforce worker health and safety regulations, with the exception of pesticide exposures among agricultural employees. Within DIR, the Division of Industrial Accidents (DIA) provides assistance and information to individuals on workers' compensation claims, and conducts appeals if claim settlements are contested. The Division of Labor Standards Enforcement (DLSE) investigates wage retaliation complaints and other labor law matters. The Division of Occupational Safety and Health (Cal/OSHA) investigates working conditions to determine that they meet all worker safety and health standards. Cal/OSHA enforces non-pesticide-related health and safety regulations that might affect field workers (for example, general worker training, fertilizers, and equipment safety). This agency also has responsibility for enforcing the state pesticide reporting requirement for physicians, and investigates any pesticide incident that results in any deaths due to pesticides, any worker hospitalizations for over 24 hours, and pesticide incidents in which five or more workers become ill. Cal/OSHA enforces agricultural workers' right of access to medical and exposure records. The Department also participates in pesticide registration and advisory committees to evaluate the safety of pesticides.

3. Department of Health Services (DOHS)

The Department primarily conducts studies and investigates causes of pesticide exposures (Epidemiological Studies Branch). The Department also participates in various CDFA pesticide registration committees to evaluate the safety of pesticides and discuss public policy issues. They also make recommendations concerning re-entry and other worker safety regulations.

C. County Agencies

1. County Agricultural Commissioners (CAC)

County agricultural commissioners enforce CDFA pesticide regulations, investigate complaints of pesticide misuse, do periodic field investigations of fields, issue pesticide use permits, and receive reports of all restricted pesticides applied in the county within seven (7) days of application. County agricultural commissioners also certify pest control operators and advisors. They have the authority to revoke use permits as well as pest control or advisor licenses in cases of noncompliance with state regulations (although they rarely do so). Some counties also require a 24-hour prior notification of a pesticide application.

2. County Health Departments

County health departments receive calls of pesticide incidents within 24 hours and reports of occupational incidents (on Doctor's First Report of Injury and Illness forms) within seven days which they then send on to the local County Agricultural Commissioner to investigate and to the Division of Labor Statistics and Research (DIR).

D. Local Physicians

Although they are not a governmental agency, local physicians have certain legal obligations to protect field workers who are exposed to pesticides and residues. According to California law (Section 2950 of the California Health and Safety Code) any physician who knows or has reasonable cause to believe that a patient has a pesticide-related illness or condition **must** report the case to the local county health officer by telephone within 24 hours, and follow it up (in occupational cases) with a written Doctor's First Report of Injury and Illness to the local health department and the Division of Labor Statistics and Research (DLSR) within seven (7) days. The reporting requirement covers all types of pesticide cases, including: skin and eye injuries; systemic (acute) poisonings; suicides; homicides; home cases, and occupational cases.

Also, according to the California Labor Code (6409.3), a case seen as a pesticide poisoning or even a condition **suspected** of being caused by pesticides may not be categorized as "first aid." It **must** be reported. First aid cases are not reportable under workers' compensation provisions of the Labor Code. Physicians who fail to comply with these reporting requirements are liable for a civil penalty of \$250. The Division of Occupational Safety and Health is responsible for enforcing these reporting requirements. Physicians may appeal a civil penalty to the Occupational Safety and Health Appeals Board.

**APPENDIX Q: PESTICIDE INGREDIENTS FOR WHICH
CLOSE TO OR MORE THAN 1,000,000 POUNDS WERE
SOLD IN CALIFORNIA IN 1980 FOR USE IN AGRICULTURE***

In 1980, agricultural pesticides accounted for 68.96%† (264,609,855 pounds) of the total number of pounds of pesticides sold in California. The following agricultural pesticides and/or pesticide ingredients accounted for close to or much more than 1,000,000 pounds each.

PESTICIDE	NUMBER OF LBS SOLD IN 1980
ALIPHATIC PETROLEUM HYDROCARBONS	64,397,897
ALKYLARYL POLY- OXYETHELENE GLYCOL	1,376,297
AROMATIC PETROLEUM HYDROCARBONS	5,543,432
CALCIUM HYDROXIDE	7,441,969
CALCIUM POLYSULFIDE	1,468,306
CAPTAN	2,014,348
CARBARYL	1,367,089
CHLOROPICRIN**	1,367,089
CHLOROTHAL DIMETHYL	1,148,397
COPPER (elemental)	3,042,558
COPPER SULFATE	3,157,543
CYANURIC ACID	1,943,670
CRYOLITE	3,701,201
DIAZINON	1,636,114
DICOFOL	1,042,593
DIMETHOATE	1,180,261
DINOSEB	2,403,437

EDB**	3,381,715
EPTC	1,917,797
PARATHION (ethyl)	954,922
MALATHION	1,507,324
METHOMYL	1,246,831
METHYL BROMIDE**	8,837,608
1,3-DICHLOROPROPENE**	11,214,020
(TELONE II)	
PROPARGITE	1,122,584
SIMAZINE	951,096
SODIUM CHLORATE	6,110,882
SULFUR	76,205,900
SULFUR DIOXIDE	1,010,037
TRIFLURALIN	1,374,487

*Taken from the CDFA Division of Pest Management's *Report of Pesticides Sold in California for 1980* (figures have been rounded off to the nearest pound).

**These materials are applied before planting to fumigate soil; there should be no risk of exposure to field workers, especially if worker safety regulations are adhered to; do not enter fields until tarps have been removed, and keep tarps in place for three (3) days.

†The 68.96 is derived after eliminating three chlorinated products (anhydrous chlorine, chlorine dioxide, and sodium hypochlorite which are mainly used for treatment of water in the domestic water supplies, sewage treatment plants, and swimming pools.)

APPENDIX R: MAJOR CHEMICAL GROUPS USED AS PESTICIDES AND THEIR USES†

The following table lists major chemical groups used in California and the rest of the country as FUNGICIDES (including soil fumigants), HERBICIDES, and INSECTICIDES (including miticides or acaricides).

Listed under examples for each chemical group and subgroup are many of the pesticides elsewhere discussed in this book as well as others. Well-known but currently unregistered pesticides are also listed as examples of the appropriate chemical group and subgroup for the reader's information.

USE	CHEMICAL GROUP (ALTERNATIVE NAMES)	SUBGROUP	EXAMPLES
FUNGICIDES	ARSENIC, INORGANIC		Sodium arsenate,* lead arsenate*
	COPPER, INORGANIC		Bordeaux mixture, paris green
	DITHIOCARBAMATES	METHYLDITHIOCARBAMATES	Ziram, ferbam
		ETHYLENE BISDITHIO-CARBAMATES	Maneb,* zineb
		DISULFIRAM COMPOUNDS	Thiram*
	HALOGENATED ALIPHATICS ¹ (HALOGENATED HYDROCARBONS)		Chloropicrin,* methyl bromide,* ethylene dibromide (EDB),* DBCP,* D-D,* Telone II*
	NITROGEN COMPOUNDS	ALIPHATICS	Dodine
		BENZIMIDAZOLES ³	Benomyl,* thiabendazole
		THIAZOLES	Terrazole
		TRIAZINES	Anilazine

USE	CHEMICAL GROUP (ALTERNATIVE NAMES)	SUBGROUP	EXAMPLES
HERBICIDES	ORGANOTINS		Cyhexatin, fentin hydroxide
	OXATHIINS ³		Carboxin, oxycarboxin
	NITROPHENOLS		Dinocap
	PHTHALIMIDES		Captan,* captafol,* ** folpet* **
	QUINONES		Dichlone
	SUBSTITUTE AROMATICS		Hexachlorobenzene, PCNB, chlorothalonil*
	SULFUR		Sulfur*
	ALIPHATIC ACIDS		Dalapon, TCA
	ARSENIC, ORGANIC		MSMA, cacodylic acid
	NITROGEN COMPOUNDS	ACETAMIDES	Allidochlor
		ANILIDES	Alachlor,* propanil, propachlor
		DIPYRIDYLS	Paraquat,* diquat, morfamquat
		NITROANILINES	Trifluralin,* profluralin, benefin
		NITRITES	Dichlorbenil, bromoxynil
		PHOSPHATES	Mevinphos,* dicrotophos,* phosphamidon,* monocrotophos,* sulfotepp,* TEPP**

USE	CHEMICAL GROUP (ALTERNATIVE NAMES)	SUBGROUP	EXAMPLES
		PHOSPHONATES	Trichlorfon*
		PHOSPHONODITHIOATES	Fonofos*
		PHOSPHOROAMIDATES	Fenamiphos*
		PHOSPHOROAMIDOTHIOATES	Acephate*
		PHOSPHORODITHIOATES	Malathion,* ethion,* dimethoate,* dioxathion,* disyston,* ⁴ fensulfothion,* ethoprop*
		PHOSPHOROMIDATES	Crufomate
		PHOSPHOROTHIOATES	Parathion,* fenitrothion, Metasystox-R,* ⁴ demeton,* ⁴ methyl parathion,* phorate*
		PHOSPHOROTRITHIOATES	DEF,* FOLEX*
		PHOSPHOTHIOLATES	EPN,* leptophos,* **
PYRETHROIDS			Allethrin, decamethrin
PROPARGITE			Propargite*
SUBSTITUTED AROMATICS (ORGANOCHLORINES, CHLORINATED HYDROCARBONS)		BIS(BIPHENYL) AROMATICS	Methoxychlor,* chlorobenzilate,* dicofol,* DDT,* ** DDD*
		CYCLIC	Kepone,* mirex*
		CYCLODIENES	Dieldrin,* chlordane,* aldrin,* ** endosulfan,* heptachlor*

USE	CHEMICAL GROUP (ALTERNATIVE NAMES)	SUBGROUP	EXAMPLES
		PHYLUREAS	Monuron, chlorxuron, linuron, diuron
		PYRIDINES	Picloram
		TRIAZINES	Atrazine, simazine, propazine, prometon, prometryne, atraton, ametryn, desmetryn, terbutryn, cynazine, cyprazine
		TRIAZOLES	Amitrole
		URACILS	Bromacil, terbacil
			Dinoseb, * DNOC, DNBP*
	NITROPHENOLS		Kerosene
	PETROLEUM OILS		2,4-D, * 2,4,5-T, * 2,4-DB, Silvex, * MCPA, MCPB, erbon, bifenox
	PHENOXYALIPHATIC ACIDS (CHLOROPHENOXYs)		Endothall, DCPA
	PHTHALATES		EPTC, butylate, diallate*
INSECTICIDES	THIOCARBAMATES		
	N-METHYL CARBAMATES		Methomyl, * carbaryl, * aldicarb, * methiocarb, * carbofuran, formen- tenate hydrochloride
	ORGANOPHOSPHATES	HETEROCYCLIC DERIVATIVES	Chlorpyrifos, * diazinon*

USE	CHEMICAL GROUP (ALTERNATIVE NAMES)	SUBGROUP	EXAMPLES
		CYCLOHEXANES	Lindane* (gamma-hexachlorocyclohexane)
		TERPENES	Toxaphene*
	SULFUR		Sulfur*

*Pesticides mentioned elsewhere in this book.

**These products are no longer registered.

†Classification scheme was developed from: Morgan, *Recognition and Management of Pesticide Poisonings*, EPA 1977; Marion Moses, "Pesticides and Public Health," draft chapter for 12-edition Maxcy-Rosenau, *Public Health and Preventive Medicine*, edited by John M. Last, M.D., Appleton-Croft (1980), the *Farm Chemicals Handbook*, 1981 edition; and CDFA yearly reports of pesticides that caused illness in California.

¹Most Halogenated Aliphatics (elsewhere termed Halogenated Hydrocarbons) are used as soil fumigants.

²Most Substituted Aromatics are also referred to as Organochlorines elsewhere in this book. Another name for them is Chlorinated Hydrocarbons.

³These classes of fungicides are systemics; that is, they are taken up by the plant itself.

⁴These organophosphates are systemic which means they are taken up by the plant and translocated into foliage and sometimes fruit (Morgan).

APPENDIX S: EPA SIGNAL WORDS

HAZARD INDICATOR	I DANGER-POISON or DANGER (highly toxic)	II WARNING (moderately toxic)	III CAUTION (slightly toxic)	IV CAUTION (relatively non-toxic)
Oral LD ₅₀	up to and including 50 mg/ kg body weight	50-500 mg/kg body weight	500-5,000 mg/kg body weight	greater than 5,000 mg/kg body weight
Inhalation LD ₅₀	up to and including .2 mg/ liter	.2-2 mg/liter	2-20 mg/liter	greater than 20 mg/ liter
Dermal LD ₅₀	up to and including 200 mg/kg body weight	200-2,000 mg/kg body weight	2,000-20,000 mg/kg body	greater than 20,000 mg/kg body weight
EYE EFFECTS	corrosive: corneal opacity not reversible within 7 days	corneal opacity reversible within 7 days; irritation persists addi- tional 7 days	no corneal opacity; but irritation which is reversible within 7 days	no irritation
SKIN	corrosive	severe irritation at 72 hours	moderate irritation at 72 hours	mild or slight irritation at 72 hours

APPENDIX T: GLOSSARY **TRADE NAMES AND COMMON NAMES**

In Parts III and IV, all pesticides are listed according to their common name. However, many times these substances may be known by their trade name instead. If you are unable to locate a particular pesticide in either of these sections, you may need to use the following table. Trade names are listed first, with their common name listed in the adjacent column. Use the corresponding common name when looking up a pesticide in this book.

Trade Name	Common Name	Trade Name	Common Name
AAtack	Thiram	Delnav	Dioxathion
Acaraben	Chlorobenzilate	Dibrom	Naled
Acquinite	Chloropicrin	Difolatan	Captafol
Arasan	Thiram	Dimecron	Phosphamidon
Avadex	Diallate	Dimethylamine salt	2,4-DB
Azodrin	Monocrotophos	Dipterex	Trichlorfon
BAAM	Amitraz	Di-Syston	Disulfoton
Benlate	Benomyl	Dithane-M-22	Maneb
Bidrin	Dicrotophos	Dithio	Sulfotepp
Bladafume	Sulfotepp	Dithione	Sulfotepp
Boracil	Bromacil	DNC	DNOC
Borea	Bromacil	Dowfume	Methyl Bromide
Botran	Dicloran, DCNA	Dowfume W-85	Ethylene Dibromide
Bravo	Chlorothalonil	Dursban	Chlorpyrifos
Bromofume	Ethylene Dibromide	Dyfonate	Fonofos
Brom-O-Gas	Methyl Bromide	Dylox	Trichlorfon
Carzol	Formetanate	Dymid	Diphenamid
Comite	Propargite	Dyrene	Anilazine
Cygon	Dimethoate	EDB	Ethylene Dibromide
Cythion	Malathion	Enide	Diphenamid
Daconil	Chlorothalonil	Fermate	Ferbam
Danex	Trichlorfon	Folex	DEF
Dasanit	Fensulfothion	Fonofos	Dyfonate
D-D Soil Fumigant	Dichloropropane-Dichloropropene (D-D)	Furadan	Carbofuran
DDVP	Dichlorvos	Guthion	Azinphosmethyl
Defend	Dimethoate	Hexadrin	Endrin

Trade Name	Common Name	Trade Name	Common Name
Hydrochloride	Formetanate	Premerge	Dinoseb, DNBP
Imidan	Phosmet	Prolate	Phosmet
Kayafume	Methyl Bromide	Roundup-R	Glyphosate
Kelthane	Dicofol	Sevin	Carbaryl
Kill-All	Sodium Arsenite	Sinox	DNOC
Lannate	Methomyl	Soilbrom	Ethylene Dibromide
Larvacide	Chloropicrin	Spectracide	Diazinon
Manzate	Maneb	Supracide	Methidathion
Marlate	Methoxychlor	Systox	Demeton
MeBr	Methyl Bromide	Telone II	Dichloropropene
Merpan	Captan	Temik	Aldicarb
Mesurol	Methiocarb	Terrachlor	PCNB
Mocap	Ethoprop	Terr-O-cide	Ethylene Dibromide
Monitor	Methamidophos	Terr-O-Gas 100	Methyl Bromide
Nemacur	Fenamiphos	Tersan	Benomyl, Thiram
Nemafene	Dichloropropane- Dichloropropene (D-D)	Thimet	Phorate
Nudrin	Methomyl	Thiodan	Endosulfan
Omite	Propargite	Thiophos	Parathion
Ordram	Molinate	Thiotepp	Sulfotepp
Orthene	Acephate	Thylate	Thiram
Orthocide 406	Captan	TMTDS	Thiram
Permethrin	Aldicarb	TOK-25	Nitrofen
Pestmaster	Ethylene Dibromide	Toxaphene	Toxakil
Pestmaster	Methyl Bromide	Trefian	Trifluralin
Fumigant I		Trithion	Carbophenothion
Phosdrin	Mevinphos	Ultracide	Methidathion
Phoskil	Parathion	Vapona	Dichlorvos
Plictran	Cyhexatin	Vendex	Fenbutatin
Polyram-M	Maneb	Zolone	Phosalone



Photographs © 1979 Ken Light