DATE: **April 26, 2006**

SUBJECT: **Chemicals Evaluated for Carcinogenic Potential by the Office of Pesticide Programs**

FROM: **Jess Rowland, Chief**
Science Information Management Branch
Health Effect Division (7509C)
Office of Pesticide Programs

TO: **Division Directors AD, BPPD, EFED, FEAD, HED, RD and SRRD**

The attached list provides an overview of chemicals evaluated for carcinogenic potential by the Health Effects Division (HED) of the Office of Pesticide Programs (OPP) through December 2005. Applying the Agency's Guidelines for Carcinogen Risk Assessment, the classification of the chemical is made by HED's Cancer Assessment Review Committee (CARC). In addition to the OPP classification, this list includes those chemicals evaluated by peer review committees in two other Agency workgroups (indicated in the table by their acronyms): the Carcinogen Assessment Group (CAG); and the Carcinogen Risk Assessment Verification Endeavor (CRAVE).

This list includes the chemical name, CAS Number, PC code, the cancer classification, reviewing organization, date reviewed, species, tumor types, and, if required, the human equivalency potency factor (Q1*). The potency factor (Q1*), unless otherwise indicated, is based on the oral route. The Q1* is expressed as $(mg/kg/day)^{-1}$ for the oral route and as $(mg/m^3)^{-1}$ for the inhalation route.

It should be noted that the evaluation of many of these chemicals is an ongoing process, therefore, the information in this list (i.e., classification and/or the quantification) may be subject to change as new and/or additional data are submitted to OPP. This list should not be used as the single source for either the classification or quantification of the carcinogenic potential. This list will be updated annually.

If further information is required please contact Brenda S. May (Phone: 703-308-6175; E-mail: may.brenda@epa.gov) or me (Phone: 703-308-2719; E-mail: rowland.jess@epa.gov).

Chemicals Evaluated for Carcinogenic Potential
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs
U.S. Environmental Protection Agency

BACKGROUND

What is this list?

The Chemicals Evaluated for Carcinogenic Potential provides an overview of the compounds evaluated for carcinogenicity by the Health Effects Division of the Office of Pesticide Programs. It also includes evaluations by other groups that HED may use until HED completes its evaluation.

NOTE: As new information becomes available, the list may become out-of-date. Therefore, it should not be used as the sole reference regarding the carcinogenic potential for a pesticide. EPA intends to update the list each year to include new evaluations or re-evaluations.

How does EPA review pesticides for potential carcinogenicity?

The Health Effects Division of the Office of Pesticide Programs performs an independent review of studies conducted in mice and rats to evaluate the carcinogenic potential of pesticides. The results of the independent review are peer-reviewed by the Cancer Assessment Review Committee. This committee recommends a cancer classification. The classification will determine how the Agency regulates the pesticide and will include methods for quantification of human risk. In some cases, EPA also requests review by the FIFRA Scientific Advisory Panel. For some chemicals, other groups of EPA scientists have provided the assessment, and OPP uses these assessments.

What factors does EPA consider in its review of cancer risk?

When assessing possible cancer risk posed by a pesticide, EPA considers how strongly carcinogenic the chemical is (its potency) and the potential for human exposure. The pesticides are evaluated not only to determine if they cause cancer in laboratory animals, but also as to their potential to cause human cancer. For any pesticide classified as a potential carcinogen, the risk would depend on the extent to which a person might be exposed (how much time and to what quantity of the pesticide). The factors considered include short-term studies, long-term cancer studies, mutagenicity studies, and structure activity concerns. (The term Aweight-of-the-evidence@ is used in referring to such a review. This means that the recommendation is not based on the results of one study, but on the results of all studies that are available.)

When does EPA review pesticides for potential carcinogenicity?

EPA reviews studies submitted when a pesticide is proposed for registration. Studies are required in two species (mice and rats) and two sexes (males and females). These studies are required for all pesticides used on food and some non-food pesticides that could lead to long-term exposures in humans. These studies may be reviewed again when a pesticide undergoes reregistration and the cancer classification may be re-evaluated, particularly if new studies have been submitted.

Why are there several different cancer classifications in the list?

EPA's guidelines for evaluating the potential carcinogenicity of chemicals have been updated over the years to reflect increased understanding of ways chemicals may cause cancer. The current guidelines call for greater emphasis on characterization discussions for hazard, dose-response assessment, exposure assessment, and risk characterization, as well as the use of mode of action in the assessment of potential carcinogenesis. EPA does not have the resources to re-evaluate every chemical to determine how it would be described under new guidelines, and there is no reason to re-evaluate chemicals unless there is some new information that could change the basic understanding of that chemical.

How have the guidelines changed?

EPA issued its first set of principles to guide evaluation of human cancer potential in1976. In 1986, EPA issued updated guidance, which included a letter system (A-E) for designating degree of carcinogenic potential. In the 1986 guidelines, hazard identification and the weight-of-evidence process focused on tumor findings. The human carcinogenic potential of agents was characterized by a six-category alphanumeric classification system (A, B1, B2, C, and D).

In 1996, EPA released AProposed Guidelines for Carcinogen Risk Assessment,@ which used descriptive phrases rather than the alphanumeric classification to classify carcinogenic potential. In the 1996 classification structure, increased emphasis was placed on discussing characterization of hazard, dose-response, and exposure assessments. The hazard and weight of evidence process embraced an analysis of all relevant biological information and emphasized understanding the agent's mode of action in producing tumors to reduce the uncertainty in describing the likelihood of harm.

By 1999, the science related to carcinogens had advanced significantly. EPA issued draft guidelines that continued the greater emphasis on characterization discussions for hazard, dose-response assessment, exposure assessment, risk characterization and the use of mode of action in the assessment of potential carcinogenesis. In addition, the guidelines included consideration of risk to children, as well as addressing other issues such as nuances related to the amount and adequacy of data on a chemical.

In March, 2005, EPA released its final *Guidelines for Carcinogen Risk Assessment* (EPA/630/P-03/001B). These guidelines represent the culmination of a long development process, replacing EPA's original cancer risk assessment guidelines (1986) and its interim final guidelines (1999). http://www.epa.gov/IRIS/cancer032505.pdf

How do the different designations compare?
The short answer is that they cannot be directly compared. Each system's designations refer to the reviews and criteria it contains. A substance that is, for example, a AC@ in the 1986 system may not be directly translatable to any particular category in the later systems. The designation for any substance must be considered in the context of the system under which it was reviewed.

A list of the descriptors from the various classification systems and their definitions follows.

Carcinogenicity Classification of Pesticides:
Derivation and Definition of Terms

CLASSIFICATION – 2005

The following descriptors from the 2005 Guidelines for Carcinogen Risk Assessment can be used as an introduction to the weight of evidence narrative in the cancer risk assessment. The examples presented in the discussion of the descriptors are illustrative. The examples are neither a checklist nor a limitation for the descriptor. The complete weight of evidence narrative, rather than the descriptor alone, provides the conclusions and the basis for them.

CARCINOGENIC TO HUMANS. This descriptor indicates strong evidence of human carcinogenicity. It covers different combinations of evidence.

- This descriptor is appropriate when there is convincing epidemiologic evidence of a causal association between human exposure and cancer.

- Exceptionally, this descriptor may be equally appropriate with a lesser weight of epidemiologic evidence that is strengthened by other lines of evidence. It can be used when all of the following conditions are met: (a) there is strong evidence of an association between human exposure and either cancer or the key precursor events of the agent's mode of action but not enough for a causal association, and (b) there is extensive evidence of carcinogenicity in animals, and (c) the mode(s) of carcinogenic action and associated key precursor events have been identified in animals, and (d) there is strong evidence that the key precursor events that precede the cancer response in animals are anticipated to occur in humans and progress to tumors, based on available biological information. In this case, the narrative includes a summary of both the experimental and epidemiologic information on mode of action and also an indication of the relative weight that each source of information carries, e.g., based on human information, based on limited human and extensive animal experiments.

LIKELY TO BE CARCINOGENIC TO HUMANS. This descriptor is appropriate when the weight of the evidence is adequate to demonstrate carcinogenic potential to humans but does not reach the weight of evidence for the descriptor "Carcinogenic to Humans." Adequate evidence consistent with this descriptor covers a broad spectrum. As stated previously, the use of the term "likely"as a weight of evidence descriptor does not correspond to a quantifiable probability. The examples below are meant to represent the broad range of data combinations that are covered by this descriptor; they are illustrative and provide neither a checklist nor a limitation for the data that might support use of this descriptor. Moreover, additional information, e.g., on mode of action, might change the choice of descriptor for the illustrated examples. Supporting data for this descriptor may include:

- an agent demonstrating a plausible (but not definitively causal) association between human exposure and cancer, in most cases with some supporting biological, experimental evidence, though not necessarily carcinogenicity data from animal experiments;
- an agent that has tested positive in animal experiments in more than one species, sex, strain, site, or exposure route, with or without evidence of carcinogenicity in humans;
- a positive tumor study that raises additional biological concerns beyond that of a statistically significant result, for example, a high degree of malignancy, or an early age at onset;
- a rare animal tumor response in a single experiment that is assumed to be relevant to humans; or
- a positive tumor study that is strengthened by other lines of evidence, for example, either plausible (but not definitively causal) association between human exposure and cancer or evidence that the agent or an important metabolite causes events generally known to be associated with tumor formation (such as DNA reactivity or effects on cell growth control) likely to be related to the tumor response in this case.

SUGGESTIVE EVIDENCE OF CARCINOGENIC POTENTIAL. This descriptor of the database is appropriate when the weight of evidence is suggestive of carcinogenicity; a concern for potential carcinogenic effects in humans is raised, but the data are judged not sufficient for a stronger conclusion. This descriptor covers a spectrum of evidence associated with varying levels of concern for carcinogenicity, ranging from a positive cancer result in the only study on an agent to a single positive cancer result in an extensive database that includes negative studies in other species. Depending on the extent of the database, additional studies may or may not provide further insights. Some examples include:

- a small, and possibly not statistically significant, increase in tumor incidence observed in a single animal or human study that does not reach the weight of evidence for the descriptor "Likely to Be Carcinogenic to Humans." The study generally would not be contradicted by other studies of equal quality in the same population group or experimental system (see discussions of *conflicting evidence* and *differing results*, below);
- a small increase in a tumor with a high background rate in that sex and strain, when there is some but insufficient evidence that the observed tumors may be due to intrinsic factors that cause background tumors and not due to the agent being assessed. (When there is a high background rate of a specific tumor in animals of a particular sex and strain, then there may be biological factors operating independently of the agent being assessed that could be responsible for the development of the observed tumors.) In this case, the reasons for determining that the tumors are not due to the agent are explained;
- evidence of a positive response in a study whose power, design, or conduct limits the ability to draw a confident conclusion (but does not make the study fatally flawed), but where the carcinogenic potential is strengthened by other lines of evidence (such as structure-activity relationships); or
- a statistically significant increase at one dose only, but no significant response at the other doses and no overall trend.

INADEQUATE INFORMATION TO ASSESS CARCINOGENIC POTENTIAL. This descriptor of the database is appropriate when

available data are judged inadequate for applying one of the other descriptors. Additional studies generally would be expected to provide further insights. Some examples include:

- little or no pertinent information;
- conflicting evidence, that is, some studies provide evidence of carcinogenicity but other studies of equal quality in the same sex and strain are negative. Differing results, that is, positive results in some studies and negative results in one or more different experimental systems, do not constitute *conflicting evidence*, as the term is used here. Depending on the overall weight of evidence, differing results can be considered either suggestive evidence or likely evidence; or
- negative results that are not sufficiently robust for the descriptor, "Not Likely to Be Carcinogenic to Humans."

NOT LIKELY TO BE CARCINOGENIC TO HUMANS. This descriptor is appropriate when the available data are considered robust for deciding that there is no basis for human hazard concern. In some instances, there can be positive results in experimental animals when there is strong, consistent evidence that each mode of action in experimental animals does not operate in humans. In other cases, there can be convincing evidence in both humans and animals that the agent is not carcinogenic. The judgment may be based on data such as:

- animal evidence that demonstrates lack of carcinogenic effect in both sexes in well-designed and well-conducted studies in at least two appropriate animal species (in the absence of other animal or human data suggesting a potential for cancer effects),
- convincing and extensive experimental evidence showing that the only carcinogenic effects observed in animals are not relevant to humans,
- convincing evidence that carcinogenic effects are not likely by a particular exposure route (see Section 2.3), or
- convincing evidence that carcinogenic effects are not likely below a defined dose range.

A descriptor of "not likely" applies only to the circumstances supported by the data. For example, an agent may be "Not Likely to Be Carcinogenic" by one route but not necessarily by another. In those cases that have positive animal experiment(s) but the results are judged to be not relevant to humans, the narrative discusses why the results are not relevant.

MULTIPLE DESCRIPTORS. More than one descriptor can be used when an agent's effects differ by dose or exposure route. For example, an agent may be "Carcinogenic to Humans" by one exposure route but "Not Likely to Be Carcinogenic" by a route by which it is not absorbed. Also, an agent could be "Likely to Be Carcinogenic" above a specified dose but "Not Likely to Be Carcinogenic" below that dose because a key event in tumor formation does not occur below that dose.

CLASSIFICATION – 1999 Draft

The terms used to describe carcinogenic potential in the July 1999 AReview Draft of the Guidelines for Carcinogen Risk Assessment.@ are listed

and defined as follows:

CARCINOGENIC TO HUMANS. This descriptor is appropriate when there is convincing epidemiologic evidence demonstrating causality between human exposure and cancer. This descriptor is also appropriate when there is an absence of conclusive epidemiologic evidence to clearly establish a cause and effect relationship between human exposure and cancer, but there is compelling evidence of carcinogenicity in animals and mechanistic information in animals and humans demonstrating similar mode(s) of carcinogenic action. It is used when all of the following conditions are met:

- There is evidence in a human population(s) of association of exposure to the agent with cancer, but not enough to show a causal association, and
- There is extensive evidence of carcinogenicity, and
- The mode(s) of carcinogenic action and associated key events have been identified in animals, and
- The keys events that precede the cancer response in animals have been observed in the human population(s) that also shows evidence of an association of exposure to the agent with cancer.

LIKELY TO BE CARCINOGENIC TO HUMANS. This descriptor is appropriate when the available tumor effects and other key data are adequate to demonstrate carcinogenic potential to humans. Adequate data are within a spectrum. At one end is evidence for an association between human exposure to the agent and cancer and strong experimental evidence of carcinogenicity in animals; at the other, with no human data, the weight of experimental evidence shows animal carcinogenicity by a mode or modes of action that are relevant or assumed to be relevant to humans.

SUGGESTIVE EVIDENCE OF CARCINOGENICITY, BUT NOT SUFFICIENT TO ASSESS HUMAN CARCINOGENIC POTENTIAL. This descriptor is appropriate when the evidence from human or animal data is suggestive of carcinogenicity, which raises a concern for carcinogenic effects but is judged not sufficient for a conclusion as to human carcinogenic potential. Examples of such evidence may include: a marginal increase in tumors that may be exposure-related, or evidence is observed only in a single study, or the only evidence is limited to certain high background tumors in one sex of one species. Dose-response assessment is not indicated for these agents. Further studies would be needed to determine human carcinogenic potential.

DATA ARE INADEQUATE FOR AN ASSESSMENT OF HUMAN CARCINOGENIC POTENTIAL. This descriptor is used when available data are judged inadequate to perform an assessment. This includes a case when there is a lack of pertinent or useful data or when existing evidence is conflicting, e.g., some evidence is suggestive of carcinogenic effects, but other equally pertinent evidence does not confirm a concern.

NOT LIKELY TO BE CARCINOGENIC TO HUMANS. This descriptor is used when the available data are considered robust for deciding that there is no basis for human hazard concern. The judgment may be based on:

- Extensive human experience that demonstrates lack of carcinogenic effect (e.g., phenobarbital).
- Animal evidence that demonstrates lack of carcinogenic effect in at least two well- designed and well-conducted studies in two appropriate animal species (in the absence of human data suggesting a potential for cancer effects).
- Extensive experimental evidence showing that the only carcinogenic effects observed in animals are not considered relevant to humans (e.g., showing only effects in the male rat kidney due to accumulation of "2u-globulin).
- Evidence that carcinogenic effects are not likely by a particular route of exposure
- Evidence that carcinogenic effects are not anticipated below a defined dose range.

CLASSIFICATION – 1996

In April 1996, EPA released the AProposed Guidelines for Carcinogen Risk Assessment.@ This scheme varied from the earlier 1986 scheme in that it used descriptors rather than letters to classify carcinogenic potential. The descriptors are:

KNOWN/LIKELY. This category of descriptors is appropriate when the available tumor effects and other key data are adequate to convincingly demonstrate carcinogenic potential for humans.

CANNOT BE DETERMINED. This category of descriptors is appropriate when available tumor effects or other key data are suggestive or conflicting or limited in quantity and, thus, are not adequate to convincingly demonstrate carcinogenic potential for humans. In general, further agent specific and generic research and testing are needed to be able to describe human carcinogenic potential.

NOT LIKELY. This is the appropriate descriptor when experimental evidence is satisfactory for deciding that there is no basis for human hazard concern, as follows (in the absence of human data suggesting a potential for cancer effects).

1986 CLASSIFICATION

The following cancer classification scheme was first introduced in 1986. It was used until 1996.

GROUP A – HUMAN CARCINOGEN. This group is used only when there is sufficient evidence from epidemiologic studies to support a causal association between exposure to the agents and cancer.

GROUP B – PROBABLE HUMAN CARCINOGEN. This group includes agents for which the weight of evidence of human carcinogenicity based on epidemiologic studies is "limited" and also includes agents for which the weight of evidence of carcinogenicity based on animal studies is "sufficient." The group is divided into two subgroups. **Group B1** is reserved for agents for which there is limited evidence of carcinogenicity

from epidemiologic studies. **Group B2** is used for Agents for which there is "sufficient: evidence from animal studies and for which there is “inadequate evidence" or "no data" from epidemiologic studies.

GROUP C – POSSIBLE HUMAN CARCINOGEN. This group is used for agents with limited evidence of carcinogenicity in animals in the absence of human data.

GROUP D – NOT CLASSIFIABLE AS TO HUMAN CARCINOGENICITY. This group is generally used for agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.

GROUP E – EVIDENCE OF NON-CARCINOGENICITY FOR HUMANS. This group is used for agents that show no evidence for carcinogenicity in at least two adequate animal tests in different species or in both adequate epidemiologic and animal studies.

OTHER DEFINITIONS

Quantification of Cancer Risk - Carcinogenic Potency Factor (Q_1*)

Q_1 STAR (Q_1*) - In the classification of human or probable-human carcinogens, mathematical models are used to estimate an upper-bound excess cancer risk associated with lifetime ingestion in the diet. The data used in these estimates usually come from lifetime exposure studies in animals. The USEPA generally uses the linearized multistage model for its cancer risk assessment. This model fits linear dose-response curves to low doses and is consistent with a no-threshold model of carcinogenesis, i.e., exposure to even a very small amount of the substance produces a finite increased risk of cancer.

The linearized multistage model uses dose-response data from the most appropriate carcinogenic study to calculate a carcinogenic potency factor (q_1*) for humans. The q_1* is then used to determine the concentrations of the chemical in the diet that are associated with theoretical upper-bound excess lifetime cancer risks of 1 in 10,000, 1 in 100,000, and 1 in 1,000,000 (10^{-4}, 10^{-5}, 10^{-6} respectively) individuals over a lifetime of exposure.

Mode of Action (MOA) - The key cellular and biochemical events that have to happen for a biological effect to develop. Mode of action is contrasted with mechanism of action which is a more complete understanding of the step by step pathway leading to a biological effect. Some established MOAs include:

Androgen Dependent - The chemical disrupts the normal levels of reproductive hormones (e.g., testosterone, luteinizing hormone) which in turn stimulates the target tissue (e.g., leydig cells, testicular tissue) to divide which may lead to hyperplasia and neoplasia. For agents to pose a hazard to humans by this MOA, sufficient exposure levels need to be encountered which produce the same level of biological effect as seen in rodents. This is consistent with the MOA for Leydig cell tumorigenesis.

Cytotoxicity and Regenerative Proliferation - Continuous exposure to a chemical or its metabolite causes persistent cell killing which in turn may result in a persistent regenerative proliferative response in the damaged tissue. For irreversible tissue alterations to occur in humans, including cancer by this mode of action, a sufficient exposure must be encountered over a prolonged period.

Mitogenesis - Mitogenic chemicals act by promoting the clonal expansion of preneoplastic cells by stimulating cell proliferation. This mode of action is frequently found in the rodent liver where it is generally associated with an increase in metabolizing enzymes. A mitogenic chemical stimulates cell proliferation in the target organ without obvious cytotoxicity or cell death. Another important feature of this MOA is that the mitogenic effect is not persistent over time; instead it is resolved and then is manifested within proliferative foci which are considered preneoplastic lesions. Through continuous exposure, it is these preneoplastic lesions that develop into tumors. At this time, the adverse health effects caused by this MOA are presumed to be relevant to humans.

Mutagenesis - The chemical or a metabolite has the ability to react with or bind DNA in a manner that causes mutations. It is usually positive in multiple test systems for different genetic endpoints (particularly gene mutations and structural chromosome aberrations) and in tests performed *in vivo* and *in vitro*. Adverse health effects in rodents from these chemicals are considered relevant for human health risk.

Neuroendrocrine Disruption - Chemicals that disrupt hypothalamic control of pituitary function leading to a decrease in hormone release (e.g., luteinizing hormone) and the disruption of the ovarian cycle. This may result in an increase in cell proliferation in the mammary gland due to a hyperstimulation by estrogen. In the case of chloro-s-triazines, this neuroendocrine MOA is not considered relevant to humans because it depends on a rodent specific reproductive process.

PPAR-alpha Agonism - Chemicals that bind to and activate the Peroxisome Proliferator-Activated Receptor (PPAR) stimulate biological responses in the liver (e.g., peroxisome proliferation, induction of lipid metabolizing enzymes, oxidative stress, and hepatocyte mitogenesis). Activation of PPAR–alpha results in an increase in cell proliferation and clonal expansion of preneoplastic foci in the liver. While the human relevance of this MOA has not been definitively determined, most of the evidence indicates that this mode of action is not operative in the human liver.

Thyroid Hormone Disruption - Disruption of normal levels of thyroid hormones may lead to an increase of thyroid stimulating hormone (TSH) which results in an increase in cell proliferation of the thyroid gland. If exposure is continuous in the animal, thyroid follicular cell tumors can potentially develop. However, the development of thyroid cancer by this mode of action in humans is considered unlikely since prolonged stimulation of the thyroid gland by TSH has not been associated with tumorigenesis in humans. However, this MOA is relevant as an indicator for potential noncancer health effects (e.g., goiter, neurodevelopmental, etc) due thyroid disruption in humans.

Chemicals Evaluated for Carcinogenic Potential
Science Information Management Branch
Health Effects Division
Office of Pesticide Programs
U.S. Environmental Protection Agency

April 26, 2006

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
1,3-Dibromo-5,5-dimethylhydantoin	77-48-5	006317	Not Likely to Be Carcinogenic to Humans	OPP (8/28/00)	Not Required (N/R)	Not Applicable
1,3-dichloro-5-methylhydantoin	89415-87-2	128826	Not Likely to Be Carcinogenic to Humans	OPP (8/28/00)	NR	Not Applicable
1,4-Naphthalenedione, 2-(acetyloxy)-3-dodecyl-	57960-19-7	006329	Not Likely to Be Carcinogenic to Humans	OPP (11/13/03)	NR	Not Applicable
2-Benzyl-4-chlorophenol	120-32-1	062201	Group CBPossible Human Carcinogen	OPP (9/5/95)	RfD Approach	Renal tubule combined adenomas/carcinomas; B6C3F1 mice (M). Renal transitional cell carcinomas; F344//N rats (F)
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7	030001	Group D--Not Classifiable as to Human Carcinogenicity	OPP (1/29/97)	NR	Not Applicable
2,4-DB 2,4-DB-DMA	94-82-6	030801	Not Likely to Be Carcinogenic to Humans	OPP (6/13/03)	NR	Not Applicable
2,4-Imidazolidinedione, 1-bromo-3-chloro-5,5-dimethyl-	16079-88-2	006315	Not Likely to Be Carcinogenic to Humans	OPP (8/28/00)	NR	Not Applicable
Acephate	30560-19-1	103301	Group C--Possible Human Carcinogen	OPP (5/8/85)		Hepatocellular carcinomas; CD-1 mice (F)
Acetaldehyde	75-07-0	202300	Group B2--Probable Human Carcinogen	CRAVE[3] (1/13/88)	Q1* = 2.2 E-6 (Inhalation)	Nasal tumors; SPF Wistar rats (M & F). Laryngeal tumors; Syrian Golden hamsters (M & F).
Acetamide	60-35-5	111101	Group C--Possible Human Carcinogen	OPP (5/29/90)	NR	Liver tumors; Wistar rats (M); F344 rats (M & F).
Acetamiprid	135410-20-7	099050	Not Likely to Be Carcinogenic to Humans	OPP (12/11/01)	NR	Not Applicable
Acetochlor	34256-82-1	121601	Likely to be Carcinogenic to Humans	OPP (8/31/04)	Q1* = 3.27 E-2	Pulmonary adenomas in CD-1 mice (M & F); ovarian histiocytic sarcomas (F) mice; rare nasal adenomas and carcinomas in Sprague-Dawley rats (M &F)

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Acetone	67-64-1	044101	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (12/6/89)	NR	Not Applicable
AcetopheNone	98-86-2	129033	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (11/7/90)	NR	Not Applicable
Acibenzolar-S-methyl	135158-54-2	061402	Not Likely to be Carcinogenic to Humans	OPP (12/9/99)	NR	Not Applicable
Acifluorfen, sodium	62476-59-9	114402	Likely to be Carcinogenic to Humans at High Doses Not Likely to be Carcinogenic to Humans at Low Doses	OPP (5/21/03)	MOE Approach	Liver; B6C3F1 & CD-1 mice (M & F). .
Acrinathrin	101007-06-1	129141	Group D--Not Classifiable as to Human Carcinogenicity	OPP (7/15/96)	NR	Not Applicable
Acrolein	107-02-8	000701	Group CBPossible Human Carcinogen	CRAVE (12/2/87)	NR	Adrenal cortical adenomas; Fischer 344 rats (F).
Acrylamide	79-06-1	600008	Group B2BProbable Human Carcinogen	CRAVE (5/25/88)	Q1* = 4.5 E+0 (Oral); Q1* = 1.3 E-3 (Inhalation)	Benign &/or malignant tumors at multiple sites in M & F rats (F344), & carcinogenic effects in a series of 1-year limited bioassays in mice (SENCAR, Swiss-ICR & A/J strains) by several routes of exposures
Acrylonitrile	107-13-1	000601	Group B1BProbable Human Carcinogen	CRAVE (2/11/87)	Q1* = 5.4 E-1 (Oral); Q1* = 6.8 E-5 (Inhalation)	Significant increase in incidence of lung cancer in exposed workers & observation of tumors, generally astrocytomas in the brain, in 2 rat strains exposed by various routes (water, gavage, inhalation).
Alachlor	15972-60-8	090501	Likely to be Carcinogenic to Humans (High Doses); Not Likely to be Carcinogenic to Humans (Low Doses)	OPP (6/27/97)	MOE Approach	Increased incidences of malignant & combined benign/malignant multi- ple tumor types in both sexes; Long Evans rat
Aldicarb	116-06-3	098301	Group E--Evidence of Non-carcinogenicity for Humans	OPP) (9/15/98)	NR	Not Applicable
Aldrin	309-00-2	045101	Group B2--Probable Human Carcinogen	CRAVE (3/22/87)	1.7 E+1 (Oral); 4.9 E-3 (Inhalation)	Liver carcinomas; C3HeB/Fe mice (M & F); Hepatic hyperplasia & begnign hepatomas; C3H mice (M & F); Hepatocellular carcinomas; B6C3F1 mice (M).
Alkyl dimethyl benzyl ammonium chloride (ADBAC)	68424-85-1	069105	Not Likely to be Carcinogenic to Humans	OPP (11/18/99)	NR	Not Applicable
Ametryn	834-12-8	080801	Data are Inadequate for an Assessment of Human Carcinogenic Potential	OPP (9/17/04)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Aminopyridine, 4-	504-24-5	069201	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (5/30/89)	NR	Not Applicable
Amitraz	33089-61-1	106201	Group C--Possible Human Carcinogen	OPP (10/31/90)	2.83 E-2 (3/4)	Lymphoreticular tumors; CFLP mice (F). Hepatocellular adenomas, carcinomas & adenomas/carcinomas combined; B6C3F1 mice (F); Lung adenomas; B6C3F1 mice (M).
Amitrole	61-82-5	004401	Group B2--Probable Human Carcinogen	OPP (8/20/90)	1.13 E+0	Thyroid, liver & pituitary tumors in Charworth Farms, Fischer 344 & Wistar rats (M & F). Liver & thyroid tumors in B6C3F1 & NMRI mice (M & F).
Aniline	62-53-3	251400	Group B2--Probable Human Carcinogen	CRAVE (6/3/87)	5.7 E-3 (Inhalation)	Induction of tumors of the spleen and the body cavity in 2 strains of rat (CD-F & Fischer 344).
Aramite	140-57-8	062501	Group B2--Probable Human Carcinogen	CRAVE (1/10/91)	2.5 E-2 (Oral); 7.1 E-6 (Inhalation)	Liver tumors &/or neoplastic nodules in three strains of M & F rats (FDRL, CFN & Osborne-Mendel) & M of one strain of mice (C57BL/6XC3H/Anf)F1. Extrahepatic biliary system tumors in dogs (mongrel).
Arsenic acid Arsenic pentoxide Arsenate, sodium	7778-39-4 1303-28-2 13464-38-5	006801 006802 013505	Group ABHuman Carcinogen	IRIS (4/10/1998)	NR	Evidence from human data. An increased lung cancer mortality was observed in multiple human populations exposed primarily through inhalation. Also, increased mortality from multiple internal organ cancers (liver, kidney, lung, and bladder) and an increased incidence of skin cancer were observed in populations consuming drinking water high in inorganic arsenic.
Assert	69969-22-8	128841 128842 128843	Group D--Not Classifiable as to Human Carcinogenicity	OPP (6/11/87)	NR	Not Applicable
Asulam	3337-71-1	106901	Group C--Possible Human Carcinogen	OPP (2/17/88)	NR	Malignant thyroid C-cell tumors; Benign adrenal pheochromocytomas; Sprague-Dawley rats (M).
Atrazine, hydroxyatrazine	1912-24-9	080803	Not Likely to be Carcinogenic to Humans	OPP (12/13/00)	NR	Neuroendocrine Disruption MOA.
Avermectin B1	65195-55-3	122804	Group E--Evidence of Non-carcinogenicity for humans)	OPP (6/27/96	NR	Not Applicable
Azafenidin	68049-83-2	119016	Data are Inadequate for an Assessment of Human Carcinogenic Potential	OPP (10/18/99)	NR	Not Applicable
Azinphos-methyl	86-50-0	058001	Not Likely to be Carcinogenic to Humans	OPP (12/7/93)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Azobenzene	103-33-3	007401	Group B2--Probable Human Carcinogen	CRAVE (2/3/88)	1.1 E-1 (Oral); 3.1 E-5 (Inhalation)	Invasive sarcomas in the spleen & other abdominal organs; F344 rats (M & F).
Azoxystrobin	131860-33-8	128810	Not Likely to be Carcinogenic to Humans	OPP (1/14/97)	NR	Not Applicable
Bardac 22 (also 2250, 2280)	7173-51-5	069149	Not Likely to be Carcinogenic to Humans	OPP (4/11/00)	NR	Not Applicable
BAS 510 F	188425-85-6	128008	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (9/25/02)	NR	Thyroid follicular cell adenomas, male and female Wistar rats.
BAS 670 H	210631-68-8	123009	Not Likely to be Carcinogenic to Humans at Doses that Do Not Alter Rat Thyroid Hormone Homeostasis	OPP (5/19/05)	NR	Thyroid follicular cell in Wistar rats (both sexes, adenoma driven); Antithyroid MOA.
Bendiocarb	22781-23-3	105201	Group E--Evidence of Non-carcinogenicity for Humans)	OPP (12/16/97)	NR	Not Applicable
Benfluralin	1861-40-1	084301	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (12/27/01)	NR	Liver tumors in female B6C3F1 mice
Benomyl	17804-35-2	099101	Group C--Possible Human Carcinogen	OPP (09/21/00)	2.39 E-3 (3/4)	Liver tumors (hepatocellular adenomas & carcinomas) in 2 genetically related strains of mice (CD-1 & Swiss SPF) (M & F)
Bensulide	741-58-2	009801	Not Likely to be Carcinogenic to Humans	OPP (6/10/97)	NR	Not Applicable
Bentazon	25057-89-0	275200	Group E--Evidence of Non-carcinogenicity for Humans	OPP (11/10/93)	NR	Not Applicable
Benthiavalicarb-isopropyl	177406-68-7	098379	Likely to be Carcinogenic to Humans	OPP (10/18/05)	6.2795 E-2 (3/4)	Malignant uterine tumors in female Fisher 344 rats; Liver tumors in both sexes of B6C3F1 mice with some supporting evidence of liver tumors in male rats; Tthyroid follicular cell tumors in male B6C3F1 mice.
Benzene	71-43-2	008801	Carcinogenic to Humans	IRIS (1/19/00)	1.5 E-2 to 5.5 E-2 (Oral); 2.2 E-6 to 7.8 E-6 (Inhalation)	Acute Nonlymphocytic leukemia (ANLL), suggestive evidence for chron- ic Nonlyphocytic leukemia (CNLL) & chroni lymphocytic leukemia (CLL) Other neoplastic conditions associated with an incr risk in humans are hematologic neoplasms, blood disorders (preleukemia & aplastic anemia), Hodgkin's

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
						lymphoma & myelodysplastic syndrome (MDS).
Benzoic acid	65-85-0	009101	Group D--Not Classifiable as to Human Carcinogenicity)	CRAVE (3/1/89)	NR	Not Applicable
Bifenazate	149877-41-8	000586	Not Likely to be Carcinogenic to Humans	OPP (8/28/01)	NR	Not Applicable
Bifenthrin	82657-04-3	128825	Group C--Possible Human Carcinogen	OPP (4/29/92)	RfD Approach	Hemangiopericytomas in the urinary bladder; Hepatocellular carcin- omas & combinded hepatocellular adenomas & carcinomas; Swiss Webster mice (M)
Biphenyl, 1,1-	92-52-4	017002	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (12/6/90)	NR	Not Applicable
Bis(chloroethyl)ether (BCEE)	111-44-4	029501	Group B2--Probable Human Carcinogen	CRAVE (7/23/86)	1.1 E+0 (Oral); 3.3 E-4 (Inhalation)	Increased evidence of hepatomas; (C57B1/6 x C3H/Anf)F1 mice (M & F) and (C57B1/6 x AKR)F1 mice (M).
Bispyribac-Sodium	125401-92-5	078906	Not Likely to be Carcinogenic to Humans	OPP (8/2/01)	NR	Not Applicable
Borax	1303-96-4	011102	Group E--Evidence of Non-carcinogenicity for humans	OPP (11/24/93)	NR	Not Applicable
Boric acid	10043-35-3	011001	Group E--Evidence of Non-carcinogenicity for humans	OPP (11/24/93)	NR	Not Applicable
Boron	7440-42-8	128945	Group E--Evidence of Non-carcinogenicity for humans	OPP (11/24/93)	NR	Not Applicable
Bromacil	314-40-9	012301	Group C--Possible Human Carcinogen	OPP (1/13/93)	RfD Approach	Liver tumors (carcinomas & combined adenomas/carcinomas); CD-1 mice (M). Thyroic tumors (C-cell adenomas & follicular cell combined adenomas/carcinomas); Crl:CD (BR) rats (M).
Bromotrichloromethane	75-62-7	008708	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (1/10/91)	NR	Not Applicable
Bromoxynil	1689-84-5	035301	Group C--Possible Human Carcinogen	OPP (3/12/97)	1.03 E-1 (3/4)	Statistically significant increases in hepatocellular adenomas and/ or carcinomas and combined adenomas/carcinomas; CD-1 mice (M & F).
Bromuconazole	116255-48-2	120503	Group E--Evidence of Non-carcinogenicity for humans	OPP (4/24/95)	NR	Not Applicable
Bronopol	52-51-7	216400	Group E--Evidence of Non-carcinogenicity for humans	OPP (6/16/95)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Buprofezin	69327-76-0	275100	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (3/15/00)	NR	Significant increase by pair-wise comparison w/the controls for combined hepatocellular adenomas/carcinomas in females; CD-1 mice
Butafenacil	134605-64-4	122004	Not Likely to be Carcinogenic to Humans	OPP (7/11/03)	NR	Not Applicable
Butylate (Sutan)	2008-41-5	041405	Group E--Evidence of Non-carcinogenicity for humans	OPP (11/25/92)	NR	Not Applicable
Cacodylic acid	75-60-5	012501	Group B2--Probable Human Carcinogen	OPP (12/14/99)	6.23 E-2 (3/4)	Urinary bladder tumor; Fischer 344 rats (M & F). Fibrosarcomas (multiple organs); B6C3F1 mice (F).
Cadmium	7440-43-9	NR	Group B1--Probable Human Carcinogen	CRAVE (11/12/86)	1.8 E-3 (Inhalation)	Limited evidence from occupational epidemiologic studies. Evidence of carcinogenicity in rats mice by inhalation and intramuscular & subcutaneous injection.
Cadusafos	95465-99-9	128864	Group E--Evidence of Non-carcinogenicity for humans	OPP (5/28/92)	NR	Not Applicable
Captafol	2939-80-2	081701	Group B2--Probable Human Carcinogen	OPP (5/15/89)	5.1 E-2 (2/3)	Lymphosarcomas & hemangiosarcomas (M & F), harderian gland adenomas (M) CD-1 mice. Mammary fibroadenoma (M & F), renal adenomas/carcin- omas (combined) (M); Sprague-Dawley rats (M).
Captan	133-06-2	081301	Likely to be carcinogenic to humans following prolonged, high-level exposures causing cytotoxicity and regenerative cell hyperplasia in the proximal region of the small intestine (oral exposure) or the respiratory tract (inhalation exposure), but not likely to be a human carcinogen at dose levels that do not cause cytotoxicity and regenerative cell hyperplasia.	OPP (9/22/04)	NR	Intestinal adenomas and adenocarcinomas in CD-1 mice (M & F). Cytotoxicity and Regenerative Proliferation MOA established.
Carbaryl	63-25-2	056801	Likely to be Carcinogenic to Humans	OPP (2/12/02)	8.75 E-4 (3/4)	Hemangiosarcomas (malignant vascular tumors) & combined hemagiomas/ hemangiosarcomas; CRL:CD-1 (ICR)BR mice (M).
Carbofuran	1563-66-2	090601	Not Likely to be Carcinogenic to Humans	OPP (6/17/97)	NR	Not Applicable
Carbon tetrachloride	56-23-5	016501	Group B2--Probable Human	CRAVE (12/4/86)	1.3 E-1 (Oral);	Hepatocellur carcinomas; Osborne-Mendel,

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
			Carcinogen		1.5 E-5 (Inhalation)	Japanese & Wistar rats; B6C3F1, C3H, A, Y, C and L mice; Syrian golden hamsters.
Carboxin	5234-68-4	090201	Not Likely to be Carcinogenic to Humans	OPP (6/5/03)	NR	Not Applicable
Carfentrazone-ethyl	128639-02-1	128712	Not Likely to be Carcinogenic to Humans	OPP (3/24/98)	NR	Not Applicable
Chlordane	57-74-9	058201	Group B2--Probable Human Carcinogen	CRAVE (4/1/87)	1.3 E+0 (Oral); 3.7E-4 (Inhalation)	Benign & malignant liver tumors; C57B1/6N, CD-1, B6C3F1 & ICR mice (M & F); F344 rats (M).
Chlordimeform	6164-98-3	059701	Group B2--Probable Human Carcinogen	OPP (12/20/85)	1.3 E+0 (Diet); 9.4 E-1 (occup.)	Malignant hemangioendothelomas; Tif:MAG:SPF mice (M & F).
Chlorethoxyfos	54593-83-8	129006	Group D--Not Classifiable as to Human Carcinogenicity	OPP (3/9/95)	NR	Not Applicable
Chlorfenapyr	122453-73-0	129093	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (3/18/03)	NR	The overall evidence in animals was Not persuasive, but could Not be dismissed. Increased in tumors in rats occurred with significant positive trends only, and mainly at the highest dose.
Chloroaniline, p-	106-47-8	017203	Group B2--Probable Human Carcinogen	OPP (4/27/95)	1.12 E-1 (3/4)	Spleen (fibrosarcomas, hemangiosarcomas & osteosarcomas) (M); Adrenal (pheochromocytomas) (M & F); F344/N rats. Hepatocellular adenomas/carcinomas (M); Hemangiosarcomas in spleen and/or liver (M) in B6C3F1 mice.
Chlorobenzene	108-90-7	056504	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (4/4/90)	NR	Not Applicable
Chloroform	67-66-3	020701	Group B2--Probable Human Carcinogen	CRAVE (8/26/87)	6.1 E-3 (Oral); 2.3E-5 (Inhalation)	Kidney tumors; Osborne-Mendel rats (M). Hepatocellular carcinomas; B6C3F1 mice (M & F); Hepatomas; A and NLC strain mice (F).
Chloroneb	2675-77-6	027301	Data Are Inadequate for an Assessment of Carcinogenic Potential	OPP (12/18/03)	NR	Not Applicable
Chlorothalonil	1897-45-6	081901	Group B2--Probable Human Carcinogen	OPP (10/27/97)	7.66 E-3 (3/4)	Renal adenomas & carcinomas, both sexes of rats & mice; rarity of the tumor response in the kidney; papillomas and/or carcinomas of the forestomach in rats & mice; CD-1 mice; Fischer 344 & Osborne-Mendel rats.
Chlorpropham (CIPC)	101-21-3	018301	Group E--Evidence of Non-carcinogenicity for humans	OPP (10/11/94)	NR	Not Applicable
Chlorpyrifos	2921-88-2	059101	Group E--Evidence of	OPP (11/23/93)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
			Non-carcinogenicity for humans			
Chlorpyrifos-methyl	1351032	059102	Not Likely to be Carcinogenic to Humans	OPP (5/17/99)	NR	Not Applicable
Chlorsulfuron	64902-72-3	118601	Group E--Evidence of Non-carcinogenicity for humans	OPP (7/17/02)	NR	Not Applicable
Chromium (VI) Sodium dichromate	18540-29-9 10588-01-9	021101 068304	Group ABHuman Carcinogen by Inhalation Group D--Not Classifiable as to Human Carcinogenicity by Oral Route	IRIS (9/3/98) OPP (8/28/01)	NR	Dose-response relationships have been established for chromium exposure and lung cancer in humans. Hexavalent chromium compounds are carcinogenic in animal bioassays, producing the following tumor types: intramuscular injection site tumors in rats and mice, intrapleural implant site tumors for various Cr(VI) compounds in rats, intrabronchial implantation site tumors for various Cr(VI) compounds in rats, and subcutaneous injection site sarcomas in rats. The oral carcinogenicity of Cr(VI) cannot be determined. No data were located in the available literature that suggested that Cr(VI) is carcinogenic by the oral route of exposure.
Clodinafop-propargyl	105512-06-9	125203	Suggestive Evidence of Carcinogenic Potential	OPP (2/8/06)	NR	Prostate gland adenomas in male Tif:RAIf(SPF) rats at the high dose only cannot be discounted; Peroxisome Proliferator-Activated Receptor Agonism MOA for liver tumors in mice.
Clofencet (MON 21200)	82697-71-0	128726	Group C--Possible Human Carcinogen	OPP (7/23/96)	RfD Approach	Statistically significant increase in histiocytic sarcomas (F); CD-1 mice.
Clofentezine	74115-24-5	125501	Group C--Possible Human Carcinogen	OPP (4/3/90)	3.76 E-2 (3/4)	Increased incidence of benign & malignant thyroid follicular cell adenoma/carcinoma in male Sprague-Dawley rat
Clomazone	81777-89-1	125401	Not Likely to be Carcinogenic to Humans	OPP (1/31/01)	NR	Not Applicable
Clopyralid	1702-17-6	117403	Not Likely to be Carcinogenic to Humans	OPP (12/20/99)	NR	Not Applicable
Cloquintoced-Methylhexyl	99607-70-2	700099	Not Likely to be Carcinogenic to Humans	OPP (11/24/98)	NR	Not Applicable
Cloransulam-methyl	147150-35-4	129116	Group E--Evidence of Non-carcinogenicity for humans	OPP (9/30/97)	NR	Not Applicable
Cocamide Diethanolamine	68603-42-9	224600	Likely to be Carcinogenic to Humans	OPP (7/25/01)	4.01 E-1 (3/4)	Liver adenomas, carcinomas hepatoblastomas; B6C3F1 mice (M & F) and kidney tumors (F)
Copper (metallic)	7440-50-8	022501	Group D--Not Classifiable as to	CRAVE (9/15/87)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
			Human Carcinogenicity			
Coumaphos	56-72-4	036501	Not Likely to be Carcinogenic to Humans	OPP (6/25/99)	NR	Not Applicable
Creosote	8001-58-9	025004	Group B1--Probable Human Carcinogen	CRAVE (5/13/87)	NR	Limited evidence of the association between occupational creosote contact & subsequent tumor formation, sufficient Evidence of local & distant tumor formation after dermal application to mice.
Cresol, p-Chloro-m-	59-50-7	064206	Group D--Not Classifiable as to Human Carcinogenicity	OPP (11/28/95)	NR	Not Applicable
Cryolite	15096-52-3	075101	Group D--Not Classifiable as to Human Carcinogenicity	OPP (1/26/93)	NR	Not Applicable
Cyanazine	21725-46-2	100101	Group C--Possible Human Carcinogen	OPP (7/30/91)	1.66 E-1 (2/3)	Mammary gland tumors (adenocarcinoma, carcinosarcoma); Sprague- Dawely rat (F).
Cyclanilide	113136-77-9	026201	Not Likely to be Carcinogenic to Humans	OPP (4/9/97)	NR	Not Applicable
Cycloate	1134-23-2	041301	Not Likely to be Carcinogenic to Humans	OPP (9/25/03)	NR	Not Applicable
Cyfluthrin	68359-37-5	128831	Not Likely to be Carcinogenic to Humans	OPP (2/11/01)	NR	Not Applicable
Cyhalothrin	68085-85-8	128867	Group D--Not Classifiable as to Human Carcinogenicity	OPP (9/15/94)	NR	Not Applicable
Cyhalothrin, gamma	76703-62-3	128807	Not Likely to be Carcinogenic to Humans	OPP (3/01/04)	NR	Not Applicable
Cyhexatin (TCTH)	13121-70-5	101601	Data are Inadequate for an Assessment of Human Carcinogenic Potential	OPP (4/7/05)	NR	Not Applicable
Cymoxanil	57966-95-7	129106	Not Likely to be Carcinogenic to Humans	OPP (1/21/98)	NR	Not Applicable
Cypermethrin & z-Cypermethrin	NR 52315-07-8	109702 129064	Group C--Possible Human Carcinogen	OPP (9/27/88)	NR	Benign lung adenomas (increase in both adenomas and adenomas/ carcinomas combined); Alderly Park SPF Swiss strain mice (F).
Cyproconazole	94361-06-5	128993	Group B2--Probable Human Carcinogen	OPP (12/04/92)	3.0 E-1 (2/3)	Hepatocellular adenomas & carcinomas; CD-1 mice (M & F).
Cyprodinil	121552-61-2	288202	Not Likely to be Carcinogenic to Humans	OPP (1/14/98)	NR	Not Applicable
Cyromazine	66215-27-8	121301	Group E--Evidence of	OPP (1/6/95)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
			Non-carcinogenicity for humans			
Dacthal (DCPA)	1861-32-1	078701	Group C--Possible Human Carcinogen	OPP (2/10/95)	1.49 E-3 (3/4)	Thyroid tumors (M & F); Hepatocellular adenoma/carcinoma/hepato-choloangiocarcinoma (F); Sprague-Dawley rats. Hepatocellular adenomas & combined adenoma/carcinoma; CD-1 mice (F).
Daminozide	1596-84-5	035101	Group B2--Probable Human Carcinogen	OPP (9/27/91)	8.7 E-3 (2/3)	Multiple sites (eg. lungs, vessels, liver & kidney); Multiple species, strains & studies.
Dazomet	533-74-4	035602	Group D B Not Classifiable as a Human Carcinogen	OPP (12/7/93)	NR	Not Applicable
DDD	72-54-8	029101	Group B2--Probable Human Carcinogen	CRAVE (6/24/87)	2.4 E-1 (Inhalation)	Lung tumors (M & F), liver tumors (M); CF-1 mice. Thyroid tumors (follicular cell adenomas & carcinomas); Osborne-Mendel rats (M).
DDE	72-55-9	NR	Group B2--Probable Human Carcinogen	CRAVE (6/24/87)	3.4 E-1 (Inhalation)	Liver tumors; B6C3F1 mice (hepatocellular carcinomas) (M & F); CF-1 mice (hepatomas) (M & F). Liver (neoplastic nodules); Syrian Golden Hamsters (M & F). Thyroid tumors; Osborne-Mendel rats (F).
DDT	50-29-3	029201	Group B2--Probable Human Carcinogen	CRAVE (6/24/87)	3.4 E-1 (Oral); 9.7 E-5 (Inhalation)	Tumors (generally of the liver) were observed in 7 studies in various mouse strains [BALB/C, CF-1, A strain, Swiss/Bomaby & (C57B1)x(C3HxAkR)] and in 3 rat studies (Wistar, MRC Porton & Osborne-Mendel).
DEET	134-62-3	080301	Group D--Not Classifiable as to Human Carcinogenicity	OPP (1/4/96)	NR	Not Applicable
Deltamethrin	52918-63-5	097805	Not Likely to be Carcinogenic to Humans	OPP (9/9/03)	NR	Not Applicable
Desmedipham	13684-56-5	104801	Group E--Evidence of Non-carcinogenicity for humans	OPP (7/26/94)	NR	Not Applicable
Di(2-ethylhexyl)phthalate	117-81-7	295200	Group B2--Probable Human Carcinogen	CRAVE (10/7/87)	1.4 E-2 (I)	Hepatocellular carcinomas & combined incidence of carcinomas & adenoma; Fischer 344 rats (F) and B6C3F1 mice (M & F). Neoplastic nodules & hepatocellular carcinomas; Fischer 344 rats (M).
Diazinon	333-41-5	057801	Not Likely to be Carcinogenic to Humans	OPP (6/17/97)	NR	Not Applicable
Dibromochloropropane (DBCP)	96-12-8	011301	Group B2--Probable Human Carcinogen	(CAG)I	1.2 E-5 (2/3)	Liver, kidney, stomach, nasal; Osborne-Mendel & Fischer 344 rats.

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Dibromoethane, 1,2-	106-93-4	042002	Group B2--Probable Human Carcinogen	CRAVE (5/13/87)	8.5 E+1 (Oral); 2.2 E-4 (Inhalation)	Increased incidence of a variety of tumors in rats & mice by 3 routes of administration at both the site of application and at distant sites. EDB is mutagenic in various in vitro and in vivo assays.
Dibutyl phthalate	84-74-2	028001	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (8/26/87)	NR	Not Applicable
Dicamba	1918-00-9	029801	Group D--Not Classifiable as to Human Carcinogenicity	OPP (7/29/96)	NR	Not Applicable
Dichlobenil	1194-65-6	027401	Group C--Possible Human Carcinogen	OPP (7/18/95)	RfD Approach	Adenomas alone & in combined adenoma/carcinoma at the HDT only (F); Hepatocellular adenomas and carcinomas, alone and combined (M & F); Fischer 344 rats.
Dichlorobenzamide, 2,6-	2008-88-4	027402	Group D--Not classifiable as to human carcinogenicity	OPP (11/28/95)	NR	Not Applicable
Dichlorobenzene, 1,2-	95-50-1	059401	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (12/6/89)	NR	Not Applicable
Dichloroethane, 1,2-	107-06-2	042003	Group B2--Probable Human Carcinogen	CRAVE (12/4/86)	9.1 E-2 (Oral); 2.6E-5 (Inhalation)	Induction of several tumor types in Osborne-Mendel rats & B6C3F1 mice treated by gavage and lung papillomas in ICR/HA Swiss mice after topical application.
Dichloroethylene, 1,1-	75-35-4	600033	Group C--Possible Human Carcinogen	CRAVE (1/7/87)	NR	Kidney adenomacarcinoma; Swiss mice (M)
Dichloromethane	75-09-2	042004	Group B2--Probable Human Carcinogen	CRAVE (4/6/89)	7.5 E-3 (Oral); 4.7 E-7 (Inhalation)	Hepatocellular neoplasms & alveolar/bronchiolar neoplasms; B6C3F1 mice (M & F). Benign mammary tumors (M & F), salivary gland sarcomas (M), leukemia (F); F344 rats.
Dichloropropene, 1,3- Telone II	542-75-6	029001	Group B2--Probable Human Carcinogen	OPP (4/15/99)	1.3 E-5 (3/4) (Inhalation)	Forestomach, liver, mammary, thyroid, adrenal, urinary & lung tumors; Fischer 344 rats & B6C3F1 mice (M & F). Bronchioloaveolar adenomas; B6C3F1 mice (M).
Dichlorvos (DDVP)	62-73-7	084001	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (3/1/00)	NR	Mononuclear cell leukemia in male rats and forestomach tumors (squamous cell papilloma and/or carcinoma) in female mice.

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Diclofop-methyl	51338-27-3	110902	Likely to be Carcinogenic to Humans	OPP (5/24/00)	7.36 E-2 (3/4)	Liver tumors were seen in both sexes of two species including both benign & malignant liver tumors in Wistar rats & B6C3F1 mice. Increases in the incidence of thyroid follicular cell tumors in F rats & Leydig cell tumors in M rats were possibly treatment-related.
Diclosulam	145701-21-9	129122	Not Likely to be Carcinogenic to Humans	OPP (11/9/99)	NR	Not Applicable
Dicofol	115-32-2	010501	Group C--Possible Human Carcinogen	OPP (4/15/92)	NR	Liver tumors (adenomas/carcinomas); B6C3F1 mice (M)
Dicrotophos	141-66-2	035201	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (10/18/99)	NR	Increasing trend for thyroid follicular cell adenomas; C57BL/10 J CD-1 Alpk mice (M & F)
Dieldrin	60-57-1	045001	Group B2--Probable Human Carcinogen	CRAVE (3/5/87)	1.6 E+1 (O); 4.6 E-3 (I)	Effects range from benign liver tumors to hepatocarcinomas with transplantation confirmation, to pulmonary metastases; M & F mice (C3HeB/Fe, C3H, CF1, B6C3F1, C3H/HE & C57B1/6J)
Diethyl phthalate	84-66-2	128947	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (8/26/87)	NR	Not Applicable
Difenoconazole	119446-68-3	128847	Group C--Possible Human Carcinogen	OPP (7/27/94)	NR	Statistically significant increases in liver adenomas, carcinomas & combined adenomas/carcinomas; CD-1 mice (M & F).
Difenzoquat methyl sulfate	43222-48-6	106401	Group E--Evidence of Non-carcinogenicity for humans	OPP (5/24/94)	NR	Not Applicable
Diflubenzuron	35367-38-5	108201	Group E--Evidence of Non-carcinogenicity for humans	OPP (4/27/95)	NR	Not Applicable
Diflufenzopyr-sodium	109293-98-3	005107	Not Likely to be Carcinogenic to Humans	OPP (10/6/98)	NR	Not Applicable
Dimethenamid	87674-68-8	129051	Group C--Possible Human Carcinogen	OPP (9/15/95)	RfD Approach	Statistically significant increasing trend for benign combined and/ or malignant liver tumors; Sprague-Dawley rat (M). Unresolved issues regarding nasal tumors, strong mutagenicity data & SAR.
Dimethipin	55290-64-7	118901	Group C-- Possible Human Carcinogen	OPP (1/5/90)	NR	Lung adenomas & carcinomas; CD-1 mice (M)

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Dimethoate	60-51-5	035001	Group C--Possible Human Carcinogen	OPP (8/29/91)	RfD Approach	Hemolymphoreticular tumors; B6C3F1 mice (M). Spleen (hemangioma & hemangiosarcoma) skin (hemangiosarcoma), lymph (angioma and angiosarcoma) tumors; Wistar rats (M).
Dimethomorph	110488-70-5	268800	Not Likely to be Carcinogenic to Humans	OPP (5/11/98)	NR	Not Applicable
Dimethoxane	828-00-2	001001	Suggestive Evidence for Carcinogenicity in Humans	OPP (12/21/00)	NR	Not Applicable
Dimethyl ether	115-10-6	900382	Group D--Not Classifiable as to Human Carcinogenicity	OPP (1/12/94)	NR	Not Applicable
Dimethyl phthalate	131-11-3	028002	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (8/26/87)	NR	Not Applicable
Dimethylhydantoin, 5,5 -	118-52-5	028501	Not Likely to be Carcinogenic to Humans	OPP (8/14/2000)	NR	Not Applicable
Dinocap (Karathane)	39300-45-3	036001	Group E--Evidence of Non-carcinogenicity for Humans	OPP (6/22/94)	NR	Not Applicable
Dinoseb	88-85-7	037505	Group C--Possible Human Carcinogen	OPP (6/19/86)	NR	Liver adenomas; CD-1 mice (F).
Dinotefuran	165252-70-0	044312	Not Likely to be Carcinogenic to Humans	OPP (3/5/04)	NR	Not Applicable
Diphenylamine	122-39-4	038501	Not Likely to be Carcinogenic to Humans	OPP (4/1/97)	NR	Not Applicable
Diquat dibromide	85-00-7	032201	Group E--Evidence of Non-carcinogenicity for Humans	OPP (5/12/94)	NR	Not Applicable
Disulfoton (Disyston)	298-04-4	032501	Group E--Evidence of Non-carcinogenicity for Humans	OPP (4/21/97)	NR	Not Applicable
Dithiopyr (MON 7200)	97886-45-8	128994	Group E--Evidence of Non-carcinogenicity for Humans	OPP (10/13/93)	NR	Not Applicable
Diuron	330-54-1	035505	Known/Likely	OPP (5/8/97)	1.91 E-2 (3/4)	Urinary bladder carcinomas (M&F); Kidney carcinomas (M); Wistar rat (M & F). Mammary gland carcinomas; NMRI mice (F). .
DSMA	144-21-8	013802	Not Likely to be Carcinogenic to Humans	OPP (7/26/00)	NR	Not Applicable
Emamectin	137512-74-4	122806	Not Likely to be Carcinogenic to Humans	OPP (3/19/98)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Endosulfan	115-29-7	079401	Not Likely to be Carcinogenic to Humans	OPP (1/31/00)	NR	Not Applicable
Endrin	72-20-8	041601	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (10/19/88)	NR	Not Applicable
Epichlorohydrin	106-89-8	097201	Group B2--Probable Human Carcinogen	CRAVE (10/29/86)	9.9 E-3 (Oral); 1.2 E-6 (Inhalation)	Multiple studies in rats & mice administered epichlorohydrin by various routes were positive. As Epichlorohydrin is a strong alkylating agent, tumors are produced at the site of application.
Epoxiconazole	106325-08-0 133855-98-8	123909	Likely to be Carcinogenic to Humans	OPP (1/24/01)	3.04E-2 (3/4)	Combined hepatocellular tumors in male or female mice
EPTC	759-94-4	041401	Not Likely to be Carcinogenic to Humans	OPP (8/31/99)	NR	Not Applicable
Bioallethrin Esbiothrin	584-79-2 28434-00-6	004003 004004	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (10/29/03)	NR	Renal tubular adenomas in male Sprague-Dawley Crl-CD-SD(BR) rats
Esfenvalerate	66230-04-4	109303	Group E--Evidence of Non-carcinogenicity for Humans	OPP (7/1/96)	NR	Not Applicable
Ethalfluralin	55283-68-6	113101	Group C--Possible Human Carcinogen	OPP (9/14/94)	8.9 E-2 (3/4)	Mammary tumors (F); Suggestion of bladder tumors (F) and kidney tumors (M & F); Fischer 344 rats
Ethephon	16672-87-0	099801	Group D--Not Classifiable as to Human Carcinogenicity	OPP (5/5/94)	NR	Not Applicable
Ethion	563-12-2	058401	Group E--Evidence of Non-carcinogenicity for humans	OPP (1/26/94)	NR	Not Applicable
Etofenprox	80844-07-1	128965	Not Likely to be Carcinogenic to Humans at Doses that Do Not Alter Rat Thyroid Hormone Homeostasis	OPP (2/8/06)	NR	Combined thyroid follicular cell adenomas/carcinomas; Sprague-Dawley rats (M & F). Antithyroid MOA.
Ethofumesate	26225-79-6	110601	Group D--Not Classifiable as to Human Carcinogenicity	OPP (2/24/94)	NR	Not Applicable
Ethoprop (Ethoprophos)	13194-48-4	041101	Likely to be Carcinogenic to Humans	OPP (10/7/98)	2.81 E-2 (3/4)	Pheochromocytoma - adrenal glands (malignant); Sprague-Dawley rat rat (M); Cell carcinomas - thyroid gland; Sprague-Dawley & Fischer 344 rat (M);
Ethylene diamine	107-15-3	004205	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (7/25/91)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Ethylene thiourea (ETU)	96-45-7	600016	Group B2--Probable Human Carcinogen	OPP (3/19/90)	6.1 E-2 (3/4)	Thyroid adenoma, carcinoma, & combined adenoma/carcinoma; F344 & CRCD rats (M & F). Thyroid adenomas & carcinoma, pituitary & liver tumors; B6C3F1 & C57BL/6 x AKR mice (M & F).
Etoxazole	153233-91-1	107091	Not Likely to be Carcinogenic to Humans	OPP (8/7/03)	NR	Not Applicable
Famoxadone	131807-57-3	113202	Not Likely to be Carcinogenic to Humans	OPP (4/16/03)	NR	Not Applicable
Ferdam	128-04-1	034804	Likely to be Carcinogenic to Humans	OPP (4/6/00)	NR	C-cell thyroic tumors and hemangiomas; F344 & CD rats (M) Alveolar/bronchiolar adenomas & combined adenomas/carcinomas; B6C3F1 mice (F)
Fenamidone	161326-34-7	046679	Not Likely to be Carcinogenic to Humans	OPP (7/12/02)	NR	Not Applicable
Fenamiphos (Nemacur)	22224-92-6	100601	Group E--Evidence of Non-carcinogenicity for Humans	OPP (11/23/93)	NR	Not Applicable
Fenarimol	60168-88-9	206600	Not Likely to be Carcinogenic to Humans	OPP (9/5/01)	NR	Not Applicable
Fenbuconazole (Fenethanil)	114369-43-6	129011	Group C--Possible Human Carcinogen	OPP (4/15/96)	3.59 E-3 (3/4)	Thyroid follicular cell adenomas &/or combined adenomas/carcinomas; Sprague-Dawley rats (M). Hepatocellular carcinomas (M); Hepatocell- ular adenomas & combinded adenomas and/or carcinomas (F); CD-1 mice.
Fenbutatin oxide (Vendex)	13356-08-6	104601	Group E--Evidence of Non-carcinogenicity for Humans	OPP (10/8/92)	NR	Not Applicable
Fenhexamid	126833-17-8	090209	Not Likely to be Carcinogenic to Humans	OPP (3/4/99)	NR	Not Applicable
Fenitrothion (Sumithion)	122-14-5	105901	Group E--Evidence of Non-carcinogenicity for Humans	OPP (7/13/93)	NR	Not Applicable
Fenoxycarb	72490-01-8	125301	Likely to be Carcinogenic to Humans	OPP (12/22/97)	7.00 E-2 (3/4)	Lung adenomas, carcinomas & combined adenoma/carcinoma; Harderian gland adenomas; CD-1 mice (M).

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Fenpropathrin (Danitol)	39515-41-8	127901	Not Likely to be Carcinogenic to Humans	OPP (12/22/03)	NR	Not Applicable
Fenpryroximate	134098-61-6	129131	Not Likely to be Carcinogenic to Humans	OPP (2/19/97)	NR	Not Applicable
Fenthion	55-38-9	053301	Group E--Evidence of Non-carcinogenicity for Humans	OPP (3/11/96)	NR	Not Applicable
Fenvalerate (Pydrin)	51630-58-1	109301	Group E--Evidence of Non-carcinogenicity for Humans	OPP (7/1/96)	NR	Not Applicable
Fipronil	120068-37-3	129121	Group C--Possible Human Carcinogen	OPP (7/18/95)	RfD Approach	Thyroid follicular cell adenomas, carcinomas & combined adenomas/ carcinomas (M); thyroid follicular cell adenomas and combined adenomas/carcinomas (F); Charles River CD rats.
Flonicamid	158062-67-0	128016	Suggestive Evidence of Carcinogenicity, but not sufficient to assess human carcinogenic potential	OPP (2/24/05)	NR	Nasal lacrimal duct squamous cell carcinomas possibly treatment-related in female Wistar rats; Mitogenesis MOA accepted for lung tumors in CD-1 mice (both sexes).
Fluazinam	79622-59-6	129098	Suggestive Evidence of Carcinogenicity to Humans	OPP (3/29/01)	NR	An increase in thyroid gland follicular cell tumors in male rats, and an increased incidence of hepatocellular tumors observed in the male mice was treatment-related
Flucarbazone sodium	181274-17-9	114009	Not Likely to be Carcinogenic to Humans	OPP (7/19/00)	NR	Not Applicable
Fludioxonil (Maxim)	131341-86-1	071503	Group D--Not Classifiable as to Human Carcinogenicity	OPP (9/19/96)	NR	Not Applicable
Flufenpyr-ethyl	188489-07-8	108853	Not Likely to be Carcinogenic to Humans	OPP (6/8/03)	NR	Not Applicable
Flumetsulam (XRD-498)	98967-40-9	129016	Group E--Evidence of Non-carcinogenicity for Humans	OPP (6/23/93)	NR	Not Applicable
Flumiclorac pentyl	87546-18-7	128724	Group E--Evidence of Non-carcinogenicity for Humans	OPP (9/7/94)	NR	Not Applicable
Flumioxazin	103361-09-7 141490-50-8	129034	Not Likely to be Carcinogenic to Humans	OPP (2/22/01)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Fluometuron	2164-17-2	035503	Group C--Possible Human Carcinogen	OPP (8/28/96)	1.80 E-2 (3/4)	Statistically significant increases in combinded adenomas/carcinomas of the lung (M); Malignant lymphocytic lymphomas (F); CD-1 mice.
Fluridone	59756-60-4	112900	Group E--Evidence of Non-carcinogenicity for Humans	OPP (7/1/85)	NR	Not Applicable
Fluroxypyr	69377-81-7	128959 128968	Not Likely to be Carcinogenic to Humans	OPP (1/28/98)	NR	Not Applicable
Fluthiacet-methyl	117337-19-6	108803	Likely to be Carcinogenic to Humans	OPP (12/8/98)	2.O7 E-1 (3/4)	Pancreatic cell tumors (exocrine adenomas, islet cell adenomas, and combined islet cell tumors); Sprague-Dawley rats (M). Hepatocellular tumors (adenomas and combined adenoma/carcinoma); CD-1 mice (M & F). CD-1 mice (M & F).
Flutolanil	66332-96-5	128975	Group E--Evidence of Non-carcinogenicity for Humans	OPP (6/9/94)	NR	Not Applicable
Folpet	133-07-3	081601	Group B2--Probable Human Carcinogen	OPP (9/4/86)	1.86 E-3 (3/4)	Duodenum (carcinoma & adenoma); CD-1 & B6C3F1 mice (M & F); Hyperkeratosis/acanthosis; B6C3F1 mice (M).
Fomesafen	108731-70-0	123802	Not Likely to be Carcinogenic to Humans	OPP (11/3/05)	NR	Peroxisome Proliferator-Activated Receptor Agonism MOA for liver tumors in mice.
Fonofos	944-22-9	041701	Group E--Evidence of Non-carcinogenicity for Humans	OPP (11/10/93)	NR	Not Applicable
Foramsulfuron	173159-57-4	122020	Not Likely to be Carcinogenic to Humans	OPP (9/19/01)	NR	Not Applicable
Formaldehyde	50-00-0	043001	Group B1--Probable Human Carcinogen	CRAVE (2/3/88)	1.3 E-5 (Inhalation)	Statistically significant associations between site-specific respiratory neoplasms & exposure to formaldehyde; Humans. Nasal squamous cell carcinomas; Sprague-Dawley & Fischer 344 rats, B6C3F1 mice.
Formetanate hydrochloride	23422-53-9	097301	Group EBEvidence of Non-carcinogenicity for Humans	OPP (5/20/96)	NR	Not Applicable
Fosetyl-Al	39148-24-8	123301	Not Likely	OPP (4/22/99)	NR	Not Applicable
Fosthiazate	98886-44-3	129022	Not Likely to be Carcinogenic to Humans	OPP (9/15/03)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Furmecyclox	60568-05-0	122601	Group B2BProbable Human Carcinogen	OPP (7/3/85)	2.98 E-2 (2/3)	Liver tumors (M & F); Urothelial tumors (M); Sprague-Dawley rats.
Furilazole (MON 13900)	121776-33-8	911596	Likely to be Carcinogenic to Humans	OPP (9/21/99)	2.74 E-2 (3/4)	Multiple tumors were seen at multiple sites in two species including both benign & malignant liver tumors in Sprague- Dawley rats (M&F) and CD-1 mice, rare tumors such as stomach & testicular tumors in rats (M) & lung tumors in mice (M & F).
Glufosinate ammonium	77182-82-2	128850	Not Likely to be Carcinogenic to Humans	OPP (5/17/99)	NR	Not Applicable
Glyphosate trimesium	81591-81-3	128501	Group EBEvidence of Non-carcinogenicity for Humans	OPP (7/26/94)	NR	Not Applicable
Glyphosate	1071-83-6	417300	Group EBEvidence of Non-carcinogenicity for Humans	OPP (12/16/91)	NR	Not Applicable
Clothianidin	210880-92-5	044309	Not Likely to be Carcinogenic to Humans	OPP (1/6/03))	NR	Not Applicable
Halosulfuron-methyl	100784-20-1	128721	Not Likely to be Carcinogenic to Humans	OPP (2/26/98)	NR	Not Applicable
Haloxyfop-methyl (Verdict)	690806-40-2	125201	Group B2BProbable Human Carcinogen	OPP (9/18/89)	7.39 E+0 (2/3)	Liver tumors [adenomas (M), carcinomas (F) & adenomas/carcinomas (M & F)]; B6C3F1 mice.
Heptachlor	76-44-8	044801	Group B2BProbable Human Carcinogen	CRAVE (4/1/87)	4.5 E+0 (Oral); 1.3 E-3 (Inhalation)	Benign and malignant liver tumors (M & F) in mice (C3H & B6C3F1),
Heptachlor epoxide	1024-57-3	044801	Group B2BProbable Human Carcinogen	CRAVE (4/1/87)	9.1 E+0 (2/3) (Oral); 2.6 E-2 (2/3) (Inhalation)	Liver carcinomas; C3H & CD-1 mice (M & F); CFN rats (F).
Hexachlorobenzene (HCB)	118-74-1	061001	Group B2BProbable Human Carcinogen	CRAVE (3/1/89)	1.02 E+0 (3/4) (Oral)	Tumors in the liver, thyroid & kidney in rats (Sprague-Dawley, Agus & Wistar), mice (Swiss & ICR) and hamsters (Syrian Golden).
Hexachlorocyclohexane	608-73-1	008901	Group B2BProbable Human Carcinogen	CRAVE (12/17/86)	1.8 E+0 (Oral); 5.1 E-4 (Inhalation)	Benign hepatic nodules & hepatocellular carcinomas; Swiss mice (M). Liver nodules hepatomas; dd mice (M & F). Hepatomas; ICR-JCL mice (M & F).
Hexachlorocyclopentadiene	77-47-4	027502	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (10/5/89)	NR	Not Applicable
Hexachloroethane	67-72-1	045201	Group C--Possible Human Carcinogen	CRAVE (7/23/86)	NR	Hepatocellular carcinoma; B6C3F1 mice (M & F).

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Hexaconazole (Anvil)	79983-71-4	128925	Group C--Possible Human Carcinogen	OPP (1/21/99)	1.6 E-2 (3/4)	Benign Leydig cell tumors; Wistar (Alpk:APfSD) rat (M)
HexaziNone	51235-04-2	107201	Group D--Not Classifiable as to Human Carcinogenicity	OPP (7/27/94)	NR	Not Applicable
Hexythiazox (Savey)	78587-05-0	128849	Group C--Possible Human Carcinogen	OPP (3/16/88)	2.22 E-2 (3/4)	Liver (hepatocellular carcinomas & carcinomas/adenomas combined); B6C3F1 mice (F).
HOE 107892	135590-91-9	811800	Not Likely to be Carcinogenic to Humans	OPP (10/13/98)	NR	Not Applicable
HydramethylNon (Amdro)	67485-29-4	118401	Group C--Possible Human Carcinogen	OPP (3/28/91)	RfD Approach	Lung adenomas & combined adenomas/carcinomas; CD-1 mice (F).
Hydrogen cyanamide	420-04-2	014002	Group C--Possible Human Carcinogen	OPP (9/15/93)	6.64 E-2 (3/4)	Ovarian granulosa-theca tumors; CRL:CD-1 (ICR)BR mice (F) [Hydrogen cyanamide]. Positive trend in hemangiosarcomas; B6C3F1 mice (M) [Calcium cyanamide].
Hydroprene (Altozar)	41096-46-2	486300	Group D--Not Classifiable as to Human Carcinogenicity	OPP (6/8/95)	NR	Not Applicable
Imazalil	35554-44-0	111901	Likely to be Carcinogenic to Humans	OPP (12/7/99)	6.11 E-2 (3/4)	An increase (both trend and pair-wise) in combined liver adenomas/ carcinomas in male Swiss albino mice & male Wistar rats and an increase in combined thyroid follicular adenomas/carcinomas in male Wistar rats.
Imazapic	81334-60-3	129041	Group E--Evidence of Non-carcinogenicity for Humans	OPP (9/27/95)	NR	Not Applicable
Imazamox	114311-32-9	129171	Not Likely to be Carcinogenic to Humans	OPP (2/27/97)	NR	Not Applicable
Imazapyr	81334-34-1	128821	Group E--Evidence of Non-carcinogenicity for Humans	OPP (10/5/95)	NR	Not Applicable
Imazethapyr	81335-77-5	128922	Not Likely to be Carcinogenic to Humans	OPP (1/31/02)	NR	Not Applicable
Imidacloprid	105827-78-9	129099	Group E--Evidence of Non-carcinogenicity for Humans	OPP (11/10/93)	NR	Not Applicable
Indoxacarb (DPX-MP062)	173584-44-6	067710	Not Likely to be Carcinogenic to Humans	OPP (7/17/00)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Iodomethane	74-88-4	000011	Not Likely to be Carcinogenic to Humans at Doses that Do Not Alter Rat Thyroid Hormone Homeostasis	OPP (11/10/05)	NR	Thyroid follicular cell tumors in male rats and mice; Antithyroid MOA.
Iodosulfuron	144550-36-7	122021	Not Likely to be Carcinogenic to Humans	OPP (1/5/04)	NR	Not Applicable
Iprodione (Glycophene)	36734-19-7	109801	Likely to be Carcinogenic to Humans	OPP (11/19/97)	4.39 E-2 (3/4)	Hepatocellular tumors (M&F); Ovarian luteomas (F); CD-1 mice. Testicular interstitial cell tumors (Leydig cell); Crl:CD(SD)BR rats (M).
Iprovalicarb	140923-17-7	098359	Likely to be Carcinogenic to Humans	OPP (2/6/02)	4.47E-4	Osteosarcomas, (M) transitional cell papillomas of the urinary bladder (F), mixed Mullerian tumors of the uterus,(F) and follicular cell adenomas/carcinomas of the thyroid gland (F) in Wistar (Hsd/WIN:WU) rats
Isofenphos	25311-71-1	109401	Group E--Evidence of Non-carcinogenicity for Humans	OPP (1/13/98)	NR	Not Applicable
Isophorone	78-59-1	047401	Group C--Possible Human Carcinogen	OPP (9/2/99)	6.08 E-4 (3/4)	Preputial gland carcinomas; F344/N rats (M)
Isoxaben	82558-50-7	125851	Group C--Possible Human Carcinogen	OPP (1/4/89)	NR	Hepatocellular adenomas; B6C3F1 mice (M & F).
Isoxadifen-ethyl	NR	823000	Not Likely to be Carcinogenic to Humans	OPP (1/29/01)	NR	Not Applicable
Isoxaflutole	141112-29-0	123000	Likely to be Carcinogenic to Humans	OPP (8/6/97)	1.02 E-2 (3/4)	Statistically significant increases in liver tumors in both sexes of CD-1 mice & Spague-Dawley rats; statistically significant increases in thyroid tumors in male rats.
Kathon 886	55965-84-9	107106	Group D--Not Classifiable as to Human Carcinogenicity	OPP (6/30/95)	NR	Not Applicable
KBR 3023 (propidine)	119515-38-7	070705	Not Likely to be Carcinogenic to Humans	OPP (6/9/99)	NR	Not Applicable
Kresoxim-methyl	143390-89-0	129111	Likely to be Carcinogenic to Humans	OPP (8/19/99)	2.90 E-3 (3/4)	Liver tumors (hepatocellular adenomas, hepatocellular carcinomas & combined adenomas/carcinomas); Wistar rats (M & F).

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Lactofen (Cobra)	77501-63-4	128888	Likely to be Carcinogenic in Humans at High Doses Not Likely to be Carcinogenic to Humans at Low Doses	OPP (4/8/02)	1.19 E-1 (3/4)	Hepatocellular carcinomas (M); Hepatocellular adenomas & carcinomas (M & F); CD-1 mice. Liver neoplastic nodules; Sprague-Dawley rats (M & F). MOE approach should be used for estimating human cancer risk, using a NOAEL of 2 ppm (0.3 mg/kg/day)
lambda-cyhalothrin	91465-08-6	128897	Group D--Not classifiable as to Human Carcinogenicity	OPP (9/12/02)	NR	Not Applicable
Lindane	58-89-9	009001	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (11/29/01)	NR	lung tumors (benign) in female mice only
Linuron	330-55-2	035506	Group C--Possible Human Carcinogen	OPP (11/20/01)	NR	Testicular tumors; CD rats (M); Hepatocellular adenomas; CD-1 mice (M & F).
Malathion	121-75-5	057701	Suggestive Evidence of Carcinogenicity but Not Sufficient to Assess Human Carcinogenic Potential	OPP (4/28/00)	NR	Occurrence of liver tumors in male & female B6C3F1 mice & in female Fischer 344 rats only at excessive doses. Presence of a few rare tumors, oral palate mucosa in F & nasal respiratory epithelium in M&F Fischer 344 rats. Malaoxon is Not carcinogenic in M&F Fischer 344 rats.
Maleic hydrazide	123-33-1	051501	Group E--Evidence of Non-carcinogenicity for Humans	OPP (11/10/93)	NR	Not Applicable
Mancozeb	8018-01-7	014504	Group B2--Probable Human Carcinogen	OPP (7/7/99)	6.01 E-2 (3/4). Based on ETU	Thyroid follicular cell adenomas & carcinomas, combined thyroid follicular cell adenomas and/or carcinomas; Crl:CD(BR) rats (M & F).
Maneb	12427-38-2	014505	Group B2--Probable Human Carcinogen	OPP (7/7/99)	6.01 E-2 (3/4) Based on ETU	Thyroid follicular cell adenomas & carcinomas, combined thyroid follicular cell adenomas and/or carcinomas; Crl:CD(BR) rats (M & F).
MB46513 (photodegradate of Fipronil)	120067-83-6	600050	Not Likely to be Carcinogenic to Humans	OPP (12/6/00)	NR	Not Applicable
MBC (Carbendazim)	10605-21-7	128872	Group C--Possible Human Carcinogen	OPP (4/7/89)	2.39 E-3 (3/4)	Liver tumors (hepatocellular adenomas & carcinomas) in 2 genetically related strains of mice (CD-1 & Swiss SPF) (M & F).
MCPA (and salts and esters)	94-74-6	030501	Not Likely to be Carcinogenic to Humans	OPP (10/29/03)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Mecroprop-p	16484-77-8	129046	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (1/15/03)	NR	Hepatocellular adenomas and carcinomas in female B6C3F1/CrlBR mice.
Mefenoxam	70630-17-0	113502	Not Likely to be Carcinogenic to Humans	OPP (5/17/00)	NR	Not Applicable
Melamine	108-78-1	777201	Group D--Not Classifiable as to Human Carcinogenicity	OPP (7/29/92)	NR	Not Applicable
Mepanipyrim	110235-47-7	288203	Likely to be Carcinogenic to Humans	OPP (4/20/04)	1.35 E-2 (3/4)	Benign and malignant liver tumors in Fischer 344 rats (F) and $B_6C_3F_1$ mice (M & F) at multiple doses.
Mepiquat chloride	24307-26-4	109101	Not likely to be carcinogenic to Non-humans	OPP (2/19/03)	NR	Not Applicable
Mercaptobenzothiazole, 2-	149-30-4	051701	Group C--Possible Human Carcinogen	OPP (11/19/92)	RfD Approach	Adrenal gland tumors (M & F), some evidence of preputial gland tumors (M) & equivocal evidence for pituitary gland tumors (M); F344/N rats.
Mercury (Inorganic)	7439-97-6	052301	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (1/13/88)	NR	Not Applicable
Mesosulfuron Methyl	208465-21-8	122009	Not Likely to be Carcinogenic to Humans	OPP (3/4/04)	NR	Not Applicable
Mesotrione	104206-82-8	122990	Not Likely to be Carcinogenic to Humans	OPP (4/12/01)	NR	Not Applicable
Metalaxyl	57837-19-1	113501	Group E--Evidence of Non-carcinogenicity for Humans	OPP (12/31/85)	NR	Not Applicable
Metaldehyde	108-62-3	053001	Suggestive Evidence of Carcinogenic Potential	OPP (6/23/05)	NR	Benign liver tumors in female SD CD rats and in both sexes of CD-1 mice
Metam sodium Metam potassium	137-42-8	039002 039003	Group B2--Probable Human Carcinogen	OPP (5/1/95)	1.98 E-1 (3/4)	Malignant angiosarcomas (by both pair-wise & trend analysis); C57BL/10JfCD-1/Alpk mice (M & F). Malignant hemangiosarcomas; Hsd/Ola: Wistar rats (M).
Metconazole	125116-23-6	125619	Not Likely to be Carcinogenic to Humans	4/19/06	NR	Mitogenesis MOA for liver tumors in CD-1 mice
Methamidophos (Monitor)	10265-92-6	101201	Not Likely to be Carcinogenic to Humans	OPP (2/12/98)	NR	Not Applicable
Methanearsonic Acid	5902-95-4	013806	Not Likely to be Carcinogenic to Humans	OPP (12/14/00)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Methidathion	950-37-8	100301	Group C--Possible Human Carcinogen	OPP (2/19/88)	NR	Liver tumors (benign and malignant); CD-1 mice (M).
Methiocarb (Mesurol)	2032-65-7	100501	Group D--Not Classifiable as to Human Carcinogenicity	OPP (3/2/93)	NR	Not Applicable
Methomyl	16752-77-5	090301	Group E--Evidence of Non-carcinogenicity for Humans	OPP (10/26/96)	NR	Not Applicable
Methoxychlor	72-43-5	034001	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (10/7/87)	NR	Not Applicable
Methoxyfenozide	161050-58-4	121027	Not Likely to be Carcinogenic to Humans	OPP (7/1/99)	NR	Not Applicable
Methyl ethyl ketone (MEK)	78-93-3	044103	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (5/30/89)	NR	Not Applicable
Methyl isothiocyanate	6317-18-6	068103	Group B2--Probable Human Carcinogen -- Based on Metam Sodiam Data	OPP (2/2200)	3.5 E-1 Molar equivalent of MITC	Based on Metam Sodium data: Malignant angiosarcomas (by both pair-wise & trend analysis); C57BL/10JfCD-1/Alpk mice (M & F). Malignant hemangiosarcomas; Hsd/Ola: Wistar rats (M).
Methyl bromide	74-83-9	053201	Not Likely	OPP (8/4/92)	NR	Not Applicable
Methyl parathion	298-00-0	053501	Not Likely to be Carcinogenic to Humans	OPP (12/1/97)	NR	Not Applicable
Methylene bis(thiocyanate)	6317-18-6	068102	Group B2--Probable Human Carcinogen -- Based on Metam Sodiam Data	OPP (2/22/00)	NR	Not Applicable
Methylphenol, 3-	108-39-4	022102	Group C--Possible Human Carcinogen	CRAVE (10/5/89)	NR	Increased incidence of skin papillomas in mice in an initiation- promotion study.
Metiram	9006-42-2	014601	Group B2--Probable Human Carcinogen	OPP (7/7/99)	6.01 E-2 (3/4). Based on ETU	Thyroid follicular cell adenomas & carcinomas, combined thyroid follicular cell adenomas and/or carcinomas; Crl:CD(BR) rats (M & F).
Metolachlor and S-Metolachlor	51218-45-2 87392-12-9	108800 108801	Group C Possible Human Carcinogen	(OPP (11/16/94)	MOE Approach	Liver adenomas and combined adenomas/carcinomas; Charles River CD (SD)BR rats (F).
Metribuzin (Sencor)	21087-64-9	101101	Group D--Not Classifiable as to Human Carcinogenicity	OPP (5/16/95)	NR	Not Applicable
Metsulfuron	74223-64-6	122010	Not Likely to be Carcinogenic to Humans	OPP (3/14/02)	NR	Not Applicable
MGK Repellent 326	136-45-8	047201	Group B2--Probable Human Carcinogen	OPP (11/12/02)	1.6 E-3 (3/4)	Multiple malignant & benign tumors [liver (M & F), kidney (M & F), testes (M) & uterine (F);

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
						CD rats. Multiple malignant tumors [liver (M & F) & lung/bronchiolar tumors (M)]; CD-1 mice.
MGK-264	113-48-4	057001	Group C--Possible Human Carcinogen	OPP (6/7/95)	RfD Approach	Statistically significant increases in hepatocellular adenomas; CD-1 mice (M & F). Statistically significant increases for thyroid follicular cell adenomas; Crl:CDBR rats (M).
Molinate	2212-67-1	041402	Suggestive Evidence of Carcinogenicity to Humans	OPP (12/14/00)	NR	Statistically significant increase in combined adenomas & carcinomas in the kidney; Crl:CD(SD)BR rat (M). There was equivocal evidence that Molinate induced an increase in testicular tumors.
MON 4660	71526-07-3	600046	Likely to be Carcinogenic to Humans	OPP (12/9/99)	4.88 E-2 (3/4)	Hepatocellular adenomas, carcinomas & combined adenomas/carcinomas; (M&F) Sprague-Dawley rats & CD-1 mice. Stomach squamous cell papillomas & combined papillomas/carcinomas; M rats & M&F mice. Bile duct cholangiomas/carcinomas; M rats. Bronchio-alveolar adenomas, combined adenomas/ carcinomas; M mice.
MSMA	2163-80-6	013803	Not likely to Carcinogenic to Humans	OPP (7/26/00)	NR	Not Applicable
Myclobutanil	88671-89-0	128857	Group E--Evidence of Non-carcinogenicity for Humans	OPP (6/16/94)	NR	Not Applicable
Naled	300-76-5	034401	Group E--Evidence of Non-carcinogenicity for Humans	OPP (8/31/94)	NR	Not Applicable
Naptalam Naptalam, sodium salt	132-66-1 132-67-2	030702 030703	Group D--Not Classifiable as to Human Carcinogenicity	OPP (9/7/94)	NR	Not Applicable
Nicosulfuron	111991-09-4	129008	Group E--Evidence of Non-carcinogenicity for Humans	OPP (9/1/98)	NR	Not Applicable
Nitrapyrin	1929-82-4	069203	Likely to be Carcinogenic to Humans	OPP (3/26/05)	4.25 E-2 (3/4)	Increase in liver tumors in B6C3F mice (M & F); epididymal sarcomas in M mice.
Nitrobenzene	98-95-3	056501	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (11/8/89)	NR	Not Applicable
Norflurazon	27314-13-2	105801	Group C--Possible Human Carcinogen	OPP (11/2/90)	NR	Statistically significant increase in comparison to controls in liver adenomas & combined liver adenomas & carcinomas, as well as the statistically significant positive trend for these

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
						hepatocellular adenomas & combined adenomas & carcinomas; CD-1 mice (M).
Novaluron	116714-46-6	124002	Not Likely to be Carcinogenic to Humans	OPP (2/4/04)	NR	Not Applicable
Orthophenylphenol Sodium salt	90-43-7 132-27-4	064103 064104	Not Likely to be Carcinogenic to Humans	OPP (10/12/05)	NR	Not Applicable
Oryzalin	19044-88-3	104201	Likely to be Carcinogenic to Humans	OPP (5/14/03)	7.79 E-3 (3/4)	Multiple sites (thyroid, mammary); F344 rats (M & F).
Oxadiazon	19666-30-9	109001	Group C--Possible Human Carcinogen	OPP (5/1/01)	7.11 E-2 (3/4)	Liver tumors (malignant, combined malignant & benign); CD CD-1 mice (M & F), Wistar rats (M)
Oxadixyl	77732-09-3	126701	Group C--Possible Human Carcinogen	OPP (1/4/89)	5.3 E-2 (2/3)	Hepatocellular adenomas (by pair-wise comparison & with a dose- related trend); Han-Wistar rats (M & F).
Oxamyl	23135-22-0	103801	Group E--Evidence of Non-carcinogenicity for Humans	OPP (11/5/96)	NR	Not Applicable
Oxydemeton-methyl	301-12-2	058702	Not Likely to be Carcinogenic to Humans	OPP (7/24/97)	NR	Not Applicable
Oxyfluorfen	42874-03-3	111601	Group C--Possible Human Carcinogen	OPP (9/29/89)	7.32 E-2 (3/4)	Liver (adenomas, carcinomas & combined adenomas and/or carcinomas); CD-1 mice (M).
Oxytetracycline	2058-46-0	006308	Group D--Not Classifiable as to Human Carcinogenicity	OPP (12/18/92)	NR	Not Applicable
Oxythioquinox	2439-01-2	054101	Group B2--Probable Human Carcinogen	OPP (2/15/96)	3.42 E-2 (3/4)	Lung tumors; NMRI mice (M). Hepatocellular tumors (M & F) and rare kidney tumors (F); F344 rats. Data showing chemical has clastogenic acticity provided additional support.
Paclobutrazol	76738-62-0	125601	Group D--Not Classifiable as to Human Carcinogenicity	OPP (6/23/94)	NR	Not Applicable
Paradichlorobenzene	106-46-7	061501	Group C--Possible Human Carcinogen	OPP (4/27/89)	NR	Liver (adenomas and carcinomas); B6C3F1 mice (M & F).
Paranitrophenol	100-02-7	056301	Group D--Not Classifiable as to Human Carcinogenicity	OPP (5/14/96)	NR	Not Applicable
Paraquat dichloride	1910-42-5	061601	Group E--Evidence of Non-carcinogenicity for Humans	OPP (3/15/89)	NR	Not Applicable
Parathion, ethyl	56-38-2	057501	Group C--Possible Human Carcinogen	OPP (9/11/91)	RfD Approach	Adrenal cortical tumors (adenomas + carcinomas; Thyroid follicular cell adenomas &

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
						pancreatic cell carcinomas; Osborne-Mendel rat (M) Benign pancreatic tumors; Wistar rat (M)
Pebulate	1114-71-2	041403	Not Likely to be Carcinogenic to Humans	OPP (12/7/98)	NR	Not Applicable
Pendimethalin	40487-42-1	108501	Group C--Possible Human Carcinogen	OPP (7/24/92)	RfD Approach	Thyroid follicular cell adenomas; Sprague-Dawley rats (M & F).
Penoxulam	219714-96-2	119031	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (3/24/2004)	NR	Mononuclear cell leukemia in Male Fischer 344 rats. Although dosing in male mice was not considered to be adequate, an additional mouse carcinogenicity study was not required.
Pentachloronitrobezene	82-68-8	056502	Group C--Possible Human Carcinogen	OPP (12/18/92)	RfD Approach	Thyroid follicular cell adenomas (by both pair-wise and trend analysis) in males with a positive trend in females; CD rats.
Pentachlorophenol	87-86-5	063001	Group B2--Probable Human Carcinogen	OPP (1/3/91)	1.3 E-1 (2/3)	Hepatocellular adenomas & carcinomas, adrenal medulla pheochromo- cytomas & malignant pheochromocytomas, &/or hemangiosarcomas & hemangiomas in one or bothe sexes of B6C3F1 mice.
Permethrin	52645-53-1	109701	Likely to be Carcinogenic to Humans	OPP (10/23/02)	9.567 E-3^{-} (2/3)	Lung (benign) tumors in female and liver tumors in both sexes of CD-1 mice.
Phenmedipham	13684-63-4	098701	Group D--Not Classifiable as to Human Carcinogenicity	OPP (4/28/93)	NR	Not Applicable
Phenol	108-95-2	064001	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (8/2/89)	NR	Not Applicable
Phorate (Thimet)	298-02-2	057201	Group E--Evidence of Non-carcinogenicity for Humans	OPP (12/30/93)	NR	Not Applicable
Phosalone	2310-17-0	097701	Not Likely to be Carcinogenic to Humans	OPP (8/12/99)	NR	Not Applicable
Phosmet	732-11-6	059201	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (10/27/99)	NR	Increase (both trend & pair-wise) in combined liver adenomas/carcin- omas in male B6C3F1 mice but only trends for increase of liver adenomas/carcinomas & mammary adenocarcinomas in female B6C3F1 mice. There was no Evidence of carcinogenicity in an acceptable study in Charles River rats.
Phosphamidon	13171-21-6	018201	Group C--Possible Human Carcinogen	OPP (5/31/89)	NR	Bladder transitional cell carcinoma; Hepatocellular carcinoma; Sprague-Dawley rats (M).

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Phosphine	7803-51-2	066500	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (3/31/92)	NR	Not Applicable
Phostebupirim (Bay mat 7484)	96182-53-5	129086	Group E--Evidence of Non-carcinogenicity for Humans	OPP (4/27/97)	NR	Not Applicable
Picloram Acid -triisopropanolamine salt -ethylhexyl ester -potassium salt	1918-02-1 6753-47-5 2545-60-0 35832-11-2	005101 005102 005103 005104	Group E--Evidence of Non-carcinogenicity for Humans	OPP (2/10/89)	NR	Not Applicable
Pinoxaden	243973-20-8	147500	Data are Inadequate for an Assessment of Human Carcinogenic Potential	OPP (5/18/05)	NR	Not Applicable
Piperonyl butoxide	51-03-6	067501	Group C--Possible Human Carcinogen	OPP (6/7/95)	RfD Approach	Increased incidence of hepatocellular tumors (M & F) (adenomas, carcinomas, combined adenomas/carcinomas in M and adenomas in F; CD-1 mice
Pirimicarb	23103-98-2	106101	Likely to be Carcinogenic to Humans	OPP (7/13/05)	3.526 E-2 (3/4)	Multiple benign and/or malignant tumors (liver, lung, ovary, mammary gland) seen in male and female Swiss mice; Lung tumors in female CD-1 mice
Pirimiphos-methyl	29232-93-7	108102	Not Yet Determined	OPP (1/29/98)	NR	Not Applicable
Poly(hexamethylenebiguanide) (PHMB)	32289-58-0	111801	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (4/9/03)	NR	Vascular tumors in female Wistar rats, male & female C5B1/10J$_f$CD-1/Alpk mice following oral exposure; vascular tumors in female Alderley Park mice following dermal exposure.
Polychlorinated biphenyls	1336-36-3	017801	Group B2--Probable Human Carcinogen	CRAVE (4/22/87)	7.7 E+0 (Inhalation)	Hepatocellular carcinomas; Fischer 344, Sprague-Dawley & Wistar rat; dd & BALB/cJ mice. Inadequate yet suggestive Evidence of excess risk of liver cancer in humans by ingestion, inhalation or dermal contact.
Potassium dichromate	7778-50-9	068302	Not Likely to be Carcinogenic to Humans	OPP (8/28/01)	NR	Not Applicable
Prallethrin	23031-36-9	128722	Not Likely to be Carcinogenic to Humans	OPP (6/27/03)	NR	Not Applicable
Primisulfuron-methyl	86209-51-0	128973	Group D--Not Classifiable as to Human Carcinogenicity	OPP (5/3/90)	NR	Not Applicable
Prochloraz	67747-09-5	128851	Group C--Possible Human Carcinogen	OPP (7/1/88)	1.5 E-1 (2/3)	Hepatocellular adenoma & carcinoma, combined adenoma/carcinoma; CD-1 (M & F).
Procymidone	32809-16-8	129044	Group B2--Probable Human	OPP (4/5/91)	2.4 E-2 (2/3) (F);	Interstitial cell adenoma (M); Pituitary adenoma

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
			Carcinogen		1.91 E-2 (2/3) (M)	(F); Osborne-Mendel rats. Liver adenomas & combined adenomas/carcinomas; B6C3F1 mice (F). Additionally, a rare variant of hepatocellular carcinoma, hepatoblastoma, had a significant increasing trend in M B6C3F1 mice.
Prodiamine	29091-21-2	110201	Group CBPossible Human Carcinogen	OPP (7/15/91)	RfD Approach	Thyroid follicular cell neoplasia (M & F); Pancreatic adenomas (F) in Sprague- Dawley rats. Fibrosarcomas; CD-1 mice (M).
Profenofos	41198-08-7	111401	Group EBEvidence of Non-carcinogenicity for Humans	OPP (2/6/95)	NR	Not Applicable
Prohexadione Calcium	127277-53-6	112600	Not Likely to be Carcinogenic to Humans	OPP (4/14/00)	NR	Not Applicable
Prometon	1610-18-0	080804	Group D--Not Classifiable as to Human Carcinogenicity	OPP (9/17/92)	NR	Not Applicable
Prometryn	7287-19-6	080805	Group E--Evidence of Non-carcinogenicity for Humans	OPP (7/25/94)	NR	Not Applicable
Pronamide (Kerb)	23950-58-5	101701	Group B2--Probable Human Carcinogen	OPP (5/26/93)	2.59 E-2 (3/4)	Benign testicular interstitial cell tumors (M); Uncommon thyroid follicular cell adenomas (M&F); Crl:CD(SD)BR rats. Hepatocellular carcinomas; B6C3F1 mice (M).
Propachlor	1918-16-7	019101	Likely to be Carcinogenic to Humans	OPP (10/16/97)	3.2 E-2 (3/4)	Multiple tumors/multiple sites; Rare stomach tumor; Fischer 344 rat (M); Thyroid tumors & ovarian granulosa/theca cell tumors; Sprague-Dawley rats (M & F). Hepatocellular tumors; CD-1 mice (M).
Propamocarb hydrochloride	25606-41-1	119302	Not Likely	OPP (5/31/00)	NR	Not Applicable
Propanil	709-98-8	028201	Suggestive Evidence of Carcinogenicity but Not Sufficient to Assess Human Carcinogenic Potential	OPP (6/19/01)	NR	Testicular interstitial cell adenomas in male rats. Hepatocellular adenomas in female rats at an excessively toxic doses
Propargite (Omite)	2312-35-8	097601	Group B2--Probable Human Carcinogen	OPP (7/23/92)	1.92 E-1 (3/4)	Statistically significant increases in undifferentiated sarcomas in the jejunum; Crl:CDBR rat (M & F).
Propazine	139-40-2	080808	Not Likely to be Carcinogenic to Humans	OPP (12/8/05)	NR	Neuroendocrine Disruption MOA
Propetamphos	31218-83-4	113601	Not Likely to be Carcinogenic to Humans	OPP (12/2/98)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Propoxur	114-26-1	047802	Group B2BProbable Human Carcinogen	OPP (6/17/96)	3.69 E-3 (3/4)	Bladder carcinomas (rare), papillomas & combined combined carcinoma/ papilloma (M&F); Wistar rats. Statistically significant increases in hepatocellar adenomas & adenomas & combined adenoma/carcinoma; B6C3F1 mice (M).
Propoxycarbazone sodium	181274-15-7	122019	Not Likely to be Carcinogenic to Humans	OPP (4/6/04)	NR	Not Applicable
Propiconazole	60207-90-1	122101	Group CBPossible Human Carcinogen	OPP (9/14/92)	RfD Approach	Hepatocelluar adenomas, carcinomas, & adenomas/carcinomas combined; CD-1 mice (M).
Propylene oxide	75-56-9	042501	Group B2BProbable Human Carcinogen	CRAVE (4/5/90)	2.4 E-1 (Oral); 3.7 E-6 (Inhalation)	Benign & malignant tumors at the site of exposure when exposed by subcutaneous injections (NMRI mice), by inhalation (F344/N, CpB:WU Wistar rats & B6C3F1 mice) & by gavage (Sprague-Dawley rats).
Prosulfuron	94125-34-5	129031	Data Are Inadequate for an Assessment of Human Carcinogenic Potential	OPP (1/24/00)	NR	Not Applicable
PT807-HC1 (Ecolyst)	NR	069089	Not Likely to be Carcinogenic to Humans	OPP (10/19/99)	NR	Not Applicable
Pymetrozine	123312-89-0	101103	Likely to be Carcinogenic to Humans	OPP (8/24/99)	1.19 E-2 (3/4)	Liver tumors- Hepatomas and combined adenomas and/or carcinomas; Tif:RAIf(SPF) Sprague-Dawley rats (F). Liver carcinomas and combined hepatomas and/or carcinomas; Tif:MAGf(SPF) mice (M & F).
Pyraclostrobin	175013-18-0	099100	Data Are Inadequate for an Assessment of Human Carcinogenic Potential	OPP (9/10/03)	NR	Not Applicable
Pyraflufen-Ethyl	129630-19-9	030090	Likely to be Carcinogenic to Humans	OPP (10/8/02)	3.32 E-2 (3/4)	Hepatocellular adenomas and combined adenomas, carcinomas and/or hepatoblastomas in male and female (SPF) ICR (Crj:CD-1) mice.
Pyrethrins	8003-34-7	069001	Suggestive Evidence of Carcinogenicity but Not Sufficient to Assess Human Carcinogenic Potential	OPP (6/22/04)	NR	Minimal, benign, liver tumors in CD rats (F). Thyroid Hormone Disruption MOA established.
Pyridaben	96489-71-3	129105	Group E--Evidence of Non-carcinogenicity for Humans	OPP (5/11/94)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Pyrimethanil	53112-28-0	288201	Group C--Possible Human Carcinogen	OPP (2/12/97)	MOE Approach	Thyroid follicular cell adenomas & combined adenoma/carcinoma (M); Thyroid cell adenomas (F); Sprague-Dawley rats.
Pyriproxyfen	95737-68-1	129032	Group E--Evidence of Non-carcinogenicity for Humans	OPP (9/15/95)	NR	Not Applicable
Pyrithiobac-sodium	123343-16-8	078905	Group C--Possible Human Carcinogen	OPP (9/5/95)	1.05 E-3 (3/4)	Liver adenomas, carcinomas & combined adenoma/carcinoma; CD-1 mice (M). Rare kidney tubular adenomas, carcinomas & combined adenoma/ carcinoma; Crl:CDBR rats (M).
Quinclorac	84087-01-4	128974	Group D--Not Classifiable as to Human Carcinogenicity	OPP (8/26/92)	NR	Not Applicable
Quinoxyfen	124495-18-7	055459	Not Likely to be Carcinogenic to Humans	OPP (1/28/03)	NR	Not Applicable
Quizalofop ethyl	76578-14-8	128201	Group D--Not Classifiable as to Human Carcinogenicity	OPP (3/17/88)	NR	Not Applicable
Resmethrin	10453-86-8	097801	Likely to be Carcinogenic to Humans	OPP (5/25/05)	5.621 E-2 (3/4)	Increased incidence of benign and malignant liver tumors in SD Rats (F) and CD-1 Mice (M).
Rimsulfuron (DPX-E9636)	122931-48-0	129009	Not Likely to Be Carcinogenic to Humans	OPP (2/19/98)	NR	Not Applicable
RoteNone	83-79-4	071003	Group E--Evidence of Non-carcinogenicity for Humans	OPP (10/5/88)	NR	Not Applicable
Selenium and compounds	7782-49-2	072001	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (3/7/90)	NR	Not Applicable
Sethoxydim	74051-80-2	121001	Not Likely to Be Carcinogenic in Humans	OPP (3/19/03)	NR	Not Applicable
Silver	7440-22-4	072501	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (9/22/88)	NR	Not Applicable
Silvex (2,4,5-TP)	93-72-1	082501	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (12/2/87)	NR	Not Applicable
Simazine	122-34-9	080807	Not Likely to Be Carcinogenic to Humans	OPP (4/14/05)	NR	Neuroendocrine Disruption MOA
Sodium omadine	15922-78-8	088004	Group D--Not Classifiable as to Human Carcinogenicity	OPP (5/16/95)	NR	Not Applicable
Sodium dichromate	3173233	068304	Not Likely to be Carcinogenic to Humans	OPP (8/28/01)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Spinosad (XDE-105)	131929-60-7	110003	Not Likely to be Carcinogenic to Humans	OPP (6/17/97)	NR	Not Applicable
Spirodiclofen	148477-71-8	124871	Likely to be Carcinogenic to Humans	OPP (6/10/04)	1.49 E-2 (3/4)	Tumors seen in both sexes of two species: testicular Leydig cell tumors in Wistar rat (M); uterine tumors in Wistar rat (F); and liver tumors in CD-1 mouse (M & F).
Spiroxamine	118134-30-8	120759	Not Likely to be Carcinogenic to Humans	OPP (11/14/03)	NR	Not Applicable
Sulfentrazone	122836-35-5	129081	Group E--Evidence of Non-carcinogenicity for Humans	OPP (5/7/96)	NR	Not Applicable
Sulfluramid	4151-50-2	128992	No Data Available		NR	Not Applicable
Sulfosulfuron	141776-32-1	085601	Likely to be Carcinogenic to Humans	OPP (10/28/98)	1.03 E-3 (3/4)	Rare transitional cell papilloma & carcinoma of the urinary bladder in females; Sprague-Dawley rats. Rare mesenchymaltumors of the urinary bladder in male as well as renal adenomas in male and female CD-1 mice.
Sulfuryl fluoride	2699-79-8	078003	Not Likely to be Carcinogenic to Humans	OPP (5/24/01)	NR	Not Applicable
Sulprofos	35400-43-2	111501	Group E--Evidence of Non-carcinogenicity for Humans	OPP (3/26/96)	NR	Not Applicable
Surfonic AGM-550	NR	870401	No Data Available	NR	NR	Not Applicable
TCMTB (Busan 72)	21564-17-0	035603	Group C--Possible Human Carcinogen	OPP (8/28/96)	RfD Approach	Testicular interstitial cell adenomas (M); Thyroid c-cell adenomas (F); Sprague-Dawley rats.
Tebuconazole	107534-96-3	128997	Group C--Possible Human Carcinogen	OPP (9/15/93)	RfD Approach	Statistically significant increase in the incidence of hepatocell- ular adenomas, carcinomas & combined adenomas/carcinomas both by positive trend & pairwise comparisons; NMRI mice (M & F).
Tebufenozide	112410-23-8	129026	Group E--Evidence of Non-carcinogenicity for Humans	OPP (8/29/94)	NR	Not Applicable
Tebufenpyrad	119168-77-3	090102	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential	OPP (5/15/02)	NR	Hepatocellular adenomas in male and female F344 rats
Tebuthiuron	34014-18-1	105501	Group D--Not Classifiable as to	OPP (3/1/91)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
			Human Carcinogenicity			
Tefluthrin	79538-32-2	128912	Not Yet Evaluated	OPP (11/14/97)	NR	Not Applicable
Temephos	3383-96-8	059001	Not Yet Determined	OPP (5/12/98)	NR	Negative in rats; no data in second species. Non food use
Tepraloxydim	149979-41-9	121005	Data Are Inadequate for an Assessment of Human Carcinogenic Potential	OPP (2/26/01)	NR	Not Applicable
Terbacil	5902-51-2	012701	Group E--Evidence of Non-carcinogenicity for Humans	OPP (9/30/94)	NR	Not Applicable
Terbufos	13071-79-9	105001	Group E--Evidence of Non-carcinogenicity for Humans	OPP (2/1/94)	NR	Not Applicable
Terbuthylazine	5915-41-3	080814	Group D--Not Classifiable as to Human Carcinogenicity	OPP (8/24/94)	NR	Not Applicable
Terbutryn	886-50-0	080813	Group C--Possible Human Carcinogen	OPP (3/3/88)	NR	Mammary (adenomas/adenocarcinomas); Liver (adenomas/carcinomas) (F); Thyroid follicular (adenomas/carcinomas); Testicular interstitial cell adenoma (M); CR CD rat.
Terrazole	2593-15-9	084701	Group B2--Probable Human Carcinogen	OPP (1/9/91)	3.33 E-2 (M)	Multiple tumors (liver, bile duct, mammary gland, thyroid & testes) & cholangiocarcinoma (a rare tumor); Sprague-Dawley rats (M & F).
Tetrachloroethane, 1,1,2,2-	79-34-5	078601	Group C--Possible Human Carcinogen	CRAVE (6/26/86)	NR	Hepatocellular carcinomas; B6C3F1 mice (M & F).
Tetrachlorvinphos	961-11-5	083701	Likely to be Carcinogenic to Humans	OPP (3/7/02)	1.83 E-3 (3/4)	Hepatocellular carcinomas & combined adenomas/carcinomas; B6C3F1 mice (F). Thyroid C-cell adenomas & adrenal pheochromocytomas; Sprague-Dawley rats (M).
Tetraconazole	112281-77-3	120603	Likely to be Carcinogenic to Humans	OPP (1/11/00)	2.3 E-2 (3/4)	Hepatocellular adenomas, carcinomas and combined adenomas/carcinomas in both sexes; Crl:CD-1 (ICR) mice
Tetramethrin	7696-12-0	069003	Group CBPossible Human Carcinogen	OPP (12/11/89)	NR	Interstitial cell adenomas in the testes (M); CR CD-1 & CRCD Sprague-Dawley, Long-Evans Hooded rats.
Thallium(I) sulfate	7446-18-6	080001	Group DBNot Classifiable as to Human Carcinogenicity	CRAVE (11/8/89)	NR	Not Applicable
Thiabendazole	148-79-8	060101	Likely to be Carcinogenic to Humans at High Does; Not Likely to be Carcinogenic to	OPP (3/8/02)	MOE Approach	Thyroid follicular cell adenomas and combined adenomas/carcinomas; Sprague-Dawley Crl:CD BR rats (M & F)

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
			Humans at Low Doses			
Thiacloprid	111988-49-9	014019	Likely to be Carcinogenic to Humans	OPP (3/26/03)	4.06 E-2 (3/4)	Thyoid follicular cell adenomas in male Wistar rats; uterine adenomas, adenocarcinomas and/or adenosquamous carcinomas in female Wistar rats; ovarian luteomas in female B6C3F mice.
Thiafluamide (FOE 5043)	142459-58-3	121903	Not Likely to be Carcinogenic to Humans	OPP (7/16/97)	NR	Not Applicable
Thiamethoxam	153719-23-4	060109	Not Likely to be Carcinogenic to Humans	OPP (6/13/05)	NR	Cytotoxicity and Regenerative Proliferation MOA established for mice liver tumors.
Thiazopyr (MON 13200)	117718-60-2	129100	Group CBPossible Human Carcinogen	OPP (5/25/94)	MOE Approach	Statistically significant increase in thyroid follicular cell tumors (M). Increases in renal tubular adenomas (M & F); however statisti-cally significant positive trend in F only; Sprague-Dawley rats.
Thiobencarb (Bolero)	28249-77-6	108401	Group DBNot Classifiable as to Human Carcinogenicity	OPP (6/10/96)	NR	Not Applicable
Thiocyclam hydrogen oxalate	31895-22-4	128868	Group DBNot Classifiable as to Human Carcinogenicity	OPP (9/15/94)	NR	Not Applicable
Thiodicarb	59669-26-0	114501	Group B2BProbable Human Carcinogen	OPP (6/10/96)	1.88 E-2 (3/4)	Liver tumors (malignant & benign); CD-1 mice (M & F). Testicular interstitial cell tumors; Sprague-Dawley rat (M).
Thiophanate-methyl	23564-05-8	102001	Likely to be Carcinogenic to Humans	OPP (12/8/01)	1.16 E-2 (3/4)	Hepatocellular adenomas (M & F); Combined adenomas, carcinomas and/or hepatoblastomas (M); CD-1 mice. Thyroid follicular cell adenomas (M & F); Thyroid follicular cell carcinomas as well as combined adenomas and/or carcinomas (M); F344 rats.
Thiram	137-26-8	079801	Not Likely to be Carcinogenic to Humans	OPP (4/14/03)	NR	Not Applicable
Toluene	108-88-3	080601	Group DBNot Classifiable as to Human Carcinogenicity	CRAVE (9/15/87)	NR	Not Applicable
Tolylfluanid	731-27-1	309200	Likely to be Carcinogenic to Humans	OPP (5/01/02)	1.59 E-3 (3/4)	Thyroid tumors in male and female Wistar rats. Linear low-dose extrapolation approach recommended.
Toxaphene	8001-35-2	080501	Group B2--Probable Human Carcinogen	CRAVE (3/5/87)	1.1 E+0 (Oral); 3.2 E-4 (Inhalation)	Hepatocellular carcinomas & neoplastic nodules (adenomas); B6C3F1 B6C3F1 mice (M & F). Thyroid tumors (adenomas & carcinomas); Osborne-Mendel rats (M & F).

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Tralkoxydim	87820-88-0	121000	Likely to be Carcinogenic to Humans	OPP (10/22/98)	1.68 E-2 (3/4)	Benign Leydig cell tumors at all dose levels with the incidences at the high dose exceeding the concurrent & historical control; Wistar rats (M).
Triadimefon	43121-43-3	109901	Group C--Possible Human Carcinogen	OPP (12/4/96)	RfD Approach	Borderline statistically significant increase thyroid adenomas; Wistar rats (M). Hepatocelular adenomas; NMRI mice (M & F).
Triadimenol	55219-65-3	127201	Group C--Possible Human Carcinogen	OPP (1/29/88)	NR	Liver (hepatocellular adenomas); CF1/W74 mice (F).
Tralkoxydim	87820-88-0	121000	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential Likely to be Carcinogenic to Humans	OPP (6/30/04)	NR	Benign testicular tumors in male rats and equivocal evidence of benign sex cord stromal tumors in female hamsters.
Triallate	2303-17-5	078802	Group C--Possible Human Carcinogen	OPP (1/12/94)	7.17 E-2 (3/4)	Hepatocellular carcinomas (M); Positive trend & a boderline signifi- cant increase in these tumors in females; B6C3F1 mice. Increased incidence of renal tubular cell adenoma (rare tumor type); Sprague-Dawley rat (M)
Triasulfuron	82097-50-5	128969	Group E--Evidence of Non-carcinogenicity for Humans	OPP (3/11/91)	NR	Not Applicable
Triazamate	112143-82-5	128100	Not Likely to be Carcinogenic to Humans	OPP (12/1/97)	NR	Not Applicable
Tribenuron methyl	101200-48-0	128887	Group C--Possible Human Carcinogen	OPP (7/14/89)	NR	Mammary gland adenocarcinomas; Sprague-Dawley rats (F).
Tribufos (Tribuphos/DEF)	78-48-8	074801	Likely to be Carcinogenic to Humans (High Doses); Not Likely to be Carcinogenic to Humans (Low Doses)	OPP (5/22/97)	8.38 E-2 (3/4)	Liver (hemangiosarcoma) (M), Lung (alveolar/bronchiolar adenoma) (F), Small intestine (adenocarcinoma) (M & F); CD-1 mice.
Trichlorfon (Trichlorphon)	52-68-6	057901	Likely to be Carcinogenic to Humans (High Doses), Not Likely to be Carcinogenic to Humans (Low Doses)	OPP (7/15/99)	NR	Tumors of the kidneys (adenomas) in male F344 rats & tumors of the lungs in both sexes (adenomas/carcinomas in M; carcinomas in F). Mammary tumors in female CD-1 mice.
Trichlorobenzene, 1,2,4-	120-82-1	081101	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (10/19/88)	NR	Not Applicable
Trichloroethane, 1,1,2-	79-00-5	081203	Group C--Possible Human Carcinogen	CRAVE (7/26/86)	NR	Hepatocellular carcinomas (M & F) and pheochromocytomas (F); B6C3F1 mice.
Trichloroethane, 1,1,1-	71-55-6	081201	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (8/5/87)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Trichlorophenol, 2,4,6-	88-06-2	064212	Group B2--Probable Human Carcinogen	CRAVE (9/7/89)	1.1 E-2 (Oral); 3.1 E-6 (Inhalation)	Lymphomas or leukemias; F344 rats (M). Hepatocellular adenomas or carcinomas; B6C3F1 mice (M & F).
Triclopyr (salts & esters)	55335-06-3	116001	Group D--Not Classifiable as to Human Carcinogenicity	OPP (5/8/96)	NR	Not Applicable
Triclosan	3380-34-5	054901	Not Yet Determined.	OPP (10/22/98)	NR	Negative in rats; no second data in second species.
Tridiphane	58138-08-2	123901	Group C--Possible Human Carcinogen	OPP (4/22/86)	NR	Liver (hepatocellular adenomas, adenomas/carcinomas combined); B6C3F1 mice (F).
Triforine	26644-46-2	107901	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential Likely to be Carcinogenic to Humans	OPP (6/29/04)	NR	Liver tumors in CD-1 mice (M) and lung tumors (F) only at the limit dose.
Trifloxystrobin	141517-21-7	129112	Not Likely to be Carcinogenic to Humans	OPP (6/16/99)	NR	Not Applicable
Trifloxysulfuron-sodium	290332-10-4	119009	Not Likely to be Carcinogenic to Humans	OPP (7/22/03)	NR	Not Applicable
Triflumizole	68694-11-1	128879	Group E--Evidence of Non-carcinogenicity for Humans	OPP (8/10/93)	NR	Not Applicable
Trifluralin (Treflan)	1582-09-8	036101	Group C--Possible Human Carcinogen	OPP (4/11/86)	2.93 E-3 (3/4)	Thyroid (follicular cell adenomas & carcinomas); Neoplasms of the renal pelvis (M); Benign urinary bladder tumors (F); Fischer 344 rats.
Triflusulfuron-methyl	126535-15-7	129002	Group C--Possible Human Carcinogen	OPP (5/28/96)	RfD Approach	Testicular interstitial cell adenomas; CD-1 rat (M).
Triphenyltin hydroxide	76-87-9	083601	Group B2--Probable Human Carcinogen	OPP (5/24/90)	1.83 E 1 (3/4)	Pituitary gland adenoma (F); Leydig cell tumors (M); Wistar rat. Hepatocellular adenomas (M & F); combined hepatocelluar (adenomas and/or carcinoma) (F); NMRI mice.
Troysan polyphase (IPBC)	55406-53-6	107801	Not Likely to be Carcinogenic to Humans	OPP (12/4/96)	NR	Not Applicable
UDMH	57-14-7	600018	Group B2--Probable Human Carcinogen	OPP (7/26/91)	4.6 E-1 (2/3) (M); 3.1 E-1 (2/3) (F)	Multiple sites (eg. lungs, vessels, liver & kidney); Multiple species, strains & studies.
UMP-488 (PAL 6000)	111578-32-6	129025	Group E--Evidence of Non-carcinogenicity for Humans	OPP (5/6/94)	NR	Not Applicable

CHEMICAL	CAS No.	PC CODE	CANCER CLASSIFICATION[1]	REPORT DATE	QUANTIFICATION METHOD[2]	SPECIES & TUMOR-TYPES
Uniconazole	83657-22-1	128976	Group C--Possible Human Carcinogen	OPP (10/11/90)	NR	Hepatocellular adenomas, carcinomas & adenomas/carcinomas combined; CD-1 mice (M).
Vinclozolin	50471-44-8	113201	Group C--Possible Human Carcinogen	OPP (6/20/00)	MOE Approach	Leydig cell adenomas; Wistar rats (M)
White phosphorus	7723-14-0	066502	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (6/15/90)	NR	Not Applicable
Xylene	1330-20-7	086802	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (12/2/87)	NR	Not Applicable
Zinc and compounds	7440-66-6	129015	Group D--Not Classifiable as to Human Carcinogenicity	CRAVE (6/15/90)	NR	Not Applicable
Ziram	137-30-4	034805	Suggestive Evidence of Carcinogenicity, but Not Sufficient to Assess Human Carcinogenic Potential Likely to be Carcinogenic to Humans	OPP (2/6/03)	NR	Hemangiomas in male CD(SD)BR rats; increasing trend in preputial gland adenomas in male F344 rats
Zoxamide	156052-68-5	101702	Not Likely to be Carcinogenic to Humans	OPP (12/16/99)	NR	Not Applicable

FOOTNOTES

1 = **CANCER CLASSIFICATION:** Unless otherwise indicated, chemicals were evaluated and classified by one of the Office of Pesticide Programs (OPP) HED peer review committees (e.g., CARC, CPRC., HIARC, etc.).

2 = QUANTIFICATION METHOD: Indicates the method used to quantify the human cancer risk. The terms used to describe the quantification method are: Not Required (NR); RfD Approach; MOE Approach; or Low Dose Linear Extrapolation (Q1*).

Not Required: *Term used when a chemical is classified as Group D, Group E, Not Likely, Group C with no Q1*, or Suggestive Evidence of Carcinogenicity*

RfD Approach: *Term used when a comparison of the chronic dietary exposure level is made to the Chronic Reference Dose (cRfD) for that chemical.*

MOE Approach *Term used when Margins of Exposure are calculated using estimated human exposure levels and the Points of Departure (i.e, NOAEL) for cancer or pre-neoplastic effects.*

Low Dose Linear (Q1)*: *The Q_1* is the human equivalency potency factor for cancer risk and is based on oral exposure unless otherwise indicated. The units used to express the Q_1* for oral exposure are $(mg/kg/day)^{-1}$. The units used to express the Q_1* for inhalation exposure are $(\Phi g/cu\ m)^{-1}$.*

*The **2/3** or **3/4** powers (shown in parenthesis following the Q_1*) indicate the interspecies scaling factor used to extrapolate from animal to human. The 3/4 scaling factor has been the Agency standard since 7/8/94. Prior to that time, the 2/3 scaling factor was used. The animal body weight is raised to the 3/4 power before the estimates are put through the appropriate model(s) to determine cancer potency and generate the unit risk, or Q_1*. Chemicals with values based on the old 2/3 scaling factors will be converted to 3/4 only if/when the chemical is re-reviewed by the Cancer Assessment Review Committee.*

3 = CRAVE/CAG: Chemicals were evaluated and classified by other Peer Review Committees within the US EPA: the Carcinogen Risk Assessment Validation Effort (CRAVE); or the Cancer Assessment Group (CAG).