

Section 1 - Identification of Chemical Product and Company

Statement of Hazardous Nature

This product is classified as: Hazardous according to the criteria of NOHSC Australia.

Not a Dangerous Good according to the Australian Dangerous Goods (ADG) Code.

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Emergency response - Orica 1800 033 111

Substance: Acephate is an organophosphorus derivative.
Trade Name: Orthene Xtra Insecticide
Product Use: Agricultural insecticide for use as described on the product label.
Creation Date: January, 2003
Revision Date: January, 2003

Section 2 - Composition/Information on Ingredients

Ingredients	CAS No	Conc, %	TWA (mg/m ³)	STEL (mg/m ³)
Acephate	30560-19-1	97	not set	not set
Other non hazardous ingredients	secret	to 100	not set	not set

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

The TWA exposure value is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The STEL (Short Term Exposure Limit) is an exposure value that should not be exceeded for more than 15 minutes and should not be repeated for more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The term "peak" is used when the TWA limit, because of the rapid action of the substance, should never be exceeded, even briefly.

Section 3 - Hazards Identification

Risk Phrases: R22. Harmful if swallowed.

Safety Phrases: S20. When using, do not eat or drink.

SUSDP Classification: S6

ADG Classification: None allocated. Not a Dangerous Good.

UN Number: None allocated

Emergency Overview

Physical Description & colour: White or blue pellets.

Odour: Strong cabbage-like odour.

Major Health Hazards: The acute oral toxicity of Acephate to mammals is medium (LD₅₀ = 500-5,000 mg/kg) to high (LD₅₀ = 50-500 mg/kg), and acute toxicity from inhalation is medium (LC₅₀ = 2-20 mg/l). The acute dermal LD₅₀ for rabbits is 2,000 mg/kg; no irritation or sensitization was observed in skin tests on guinea-pigs. harmful if swallowed. Signs and symptoms associated with mild exposures to organophosphate and carbamate pesticides include: headache, fatigue, dizziness, loss of appetite with nausea, stomach cramps and diarrhoea; blurred vision associated with excessive tearing; contracted pupils of the eye; excessive sweating and salivation; slowed heartbeat, often fewer than 50 per minute; rippling of surface muscles just under the skin. These symptoms may be mistaken for those of flu, heat stroke or heat exhaustion, or upset stomach. Moderately severe organophosphate and carbamate insecticide poisoning cases exhibit all the signs and symptoms found in mild poisonings, but in addition, the victim: is unable to walk; often complains of chest discomfort and tightness; exhibits marked constriction of the pupils (pinpoint pupils); exhibits muscle twitching; has involuntary urination and bowel movement. Severe poisonings are indicated by incontinence, unconsciousness and seizures.

Potential Health Effects

See section 11 for Chronic exposure studies.

Repeated minor exposure may have a cumulative poisoning effect. The main health effects from repeated exposure would be toxic symptoms of cholinesterase inhibition as described above.

Inhalation

Short term exposure: Symptoms are described fully above.

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Skin Contact:

Short term exposure: Symptoms are described fully above.

Eye Contact:

Short term exposure: Available data shows that this product may be irritating to eyes, but is unlikely to cause anything more than mild transient discomfort.

Ingestion:

Short term exposure: Symptoms are described fully above.

Carcinogen Status:

NOHSC: No significant ingredient is classified as carcinogenic by NOHSC.

NTP: No significant ingredient is classified as carcinogenic by NTP.

IARC: No significant ingredient is classified as carcinogenic by IARC.

Section 4 - First Aid Measures

General Information:

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this MSDS with you when you call.

Atropine tablets 0.6mg and activated charcoal should be available in the area where this product is used, or in a nearby unlocked medicine cabinet. If swallowed, splashed on skin or inhaled, contact a Poisons Information Centre or a doctor at once. Remove any contaminated clothing and wash skin thoroughly. If swallowed, use of activated charcoal may be advised. Give atropine if instructed. The usual instruction is to give one atropine tablet every 5 minutes until dryness of the mouth occurs.

Inhalation: First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor. See instructions above about treatment with atropine.

Skin Contact: Irritation is unlikely. However, if irritation does occur, flush with lukewarm, gently flowing water for 5 minutes or until chemical is removed. See instructions above about treatment with atropine.

Eye Contact: No effects expected. If irritation does occur, flush contaminated eye(s) with lukewarm, gently flowing water for 5 minutes or until the product is removed.

Ingestion: If swallowed, do NOT induce vomiting. Wash mouth with water and contact a Poisons Information Centre, or call a doctor. See instructions above about treatment with atropine.

Section 5 - Fire Fighting Measures

Fire and Explosion Hazards: There is no risk of an explosion from this product under normal circumstances if it is involved in a fire. Violent steam generation or eruption may occur upon application of direct water stream on hot liquids.

Fire decomposition products from this product are likely to be toxic if inhaled. Take appropriate protective measures.

Extinguishing Media: Not Combustible. Use extinguishing media suited to burning materials.

Fire Fighting: When fighting fires involving significant quantities of this product, wear a fully encapsulated splash suit complete with self contained breathing apparatus.

Flash point: No data

Upper Flammability Limit: No data.

Lower Flammability Limit: No data.

Autoignition temperature: No data.

Flammability Class: No data.

Section 6 - Accidental Release Measures

Accidental release: In the event of a major spill, prevent spillage from entering drains or water courses. As a minimum, wear overalls, goggles and gloves. Suitable materials for protective clothing include rubber, PVC. Stop leak if safe to do so, and contain spill. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. After spills, wash area preventing runoff from entering drains. If a significant quantity of material enters drains, advise emergency services. Full details regarding disposal of used containers, spillage and unused material may be found on the label. If there is any conflict between this MSDS and the label, instructions on the label prevail. Ensure legality of disposal by consulting regulations prior to disposal. Thoroughly launder protective clothing before storage or re-use. Advise laundry of nature of contamination when sending contaminated clothing to laundry.

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Fire Decomposition: Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Nitrogen and its compounds, and under some circumstances, oxides of nitrogen. Occasionally hydrogen cyanide gas. Oxides of sulfur (sulfur dioxide is a respiratory hazard) and other sulfur compounds. Most will have a foul odour. Oxides of phosphorus and other phosphorus compounds. Water. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death. Hydrogen cyanide poisoning signs and symptoms are weakness, dizziness, headache, nausea, vomiting, coma, convulsions, and death. Death results from respiratory arrest. Hydrogen cyanide gas acts very rapidly; symptoms and death can both occur quickly.

Polymerisation: This product is unlikely to undergo polymerisation processes.

Section 11 - Toxicological Information

Toxicity: Acute Toxicity: The amount of Acephate that is lethal to one-half (50%) of experimental animals fed the material is referred to as its acute oral lethal dose fifty, or LD₅₀. The acute oral toxicity of Acephate to mammals is medium (LD₅₀ = 500-5,000 mg/kg) to high (LD₅₀ = 50-500 mg/kg), and acute toxicity from inhalation is medium (LC₅₀ = 2-20 mg/l). The acute dermal LD₅₀ for rabbits is 2,000 mg/kg; no irritation or sensitization was observed in skin tests on guinea-pigs. The effect of 900 mg/kg on cholinesterase inhibition in rats was not as severe as parathion at 15 mg/kg. Atropine sulfate is an effective antidote. The acute oral LD₅₀ for technical grade Acephate in female rats is 866 mg/kg; 945 mg/kg for male rats; 361 mg/kg for mice; 350 mg/kg for mallard ducks; 852 mg/kg for chickens; and 140 mg/kg for ringneck pheasants. The oral LDLo (Lethal Dose Low - lowest dose of a substance other than LD₅₀ introduced by any route other than inhalation, over any given period of time in one or more divided portions and reported to have caused death in humans or animals) for dogs is 681 mg/kg. The lethal concentration fifty, or LC₅₀, is that concentration of a chemical in air or water that kills half of the experimental animals exposed to it for a set period of time. The 96 hour LC₅₀ for rainbow trout is >1,000 mg/l; 2,050 mg/l for bluegill fish; 1,725 mg/l for largemouth black bass; 2,230 mg/l for channel catfish; and 9550 mg/l for goldfish. The toxicity of Acephate to rainbow trout increased with increasing temperature.

Chronic Toxicity: In 2-year feeding trials, dogs exhibited depression of cholinesterase at 100 mg/kg diet (maximum dose level) of Acephate but no other significant effects; rats showed depression of cholinesterase but no effect on weight gain or pathological effect at 30 mg/kg diet. Another feeding study noted that rats did not produce pathological changes over a 90-day period when fed up to 300 mg/kg body weight of Acephate. Acephate has a negligible chronic toxicity to fish.

Reproductive Effects: Acephate is considered a foetotoxin (can poison the foetus) and there is some evidence of hormonal effects.

Teratogenic Effects: No effects were observed in 2-year feeding trials on dogs.

Mutagenic Effects: No effects were observed in 2-year feeding trials on dogs.

Carcinogenic Effects: No effects were observed in 2-year feeding trials in dogs.

Organ Toxicity: Exposure effects of Acephate in humans can include: cardiac responses (bradycardia/tachycardia, heart block), central nervous system impairment, eye problems (miosis/mydriasis, loss of accommodation, ocular pain, sensation of retrobulbar pressure, tearing, dark or blurred vision, conjunctiva hyperemia, cataracts), gastrointestinal problems (abdominal cramps, heart burn, hyperperistalsis), respiratory effects (apnea, dyspnea, hypopnea, atelectasis, bronchoconstriction, bronchopharyngeal secretion, chest tightness, productive cough, rales/ronchi, wheezing, pulmonary oedema, laryngeal spasms, rhinorrhoea, oronasal frothing) and death due to respiratory failure.

Fate in Humans and Animals. Exposure to Acephate can result in alkyl phosphates in urine.

Section 12 - Ecological Information

Effects on Birds: Acephate is considered moderately toxic to upland game birds. The LD₅₀ for Acephate in mallard ducks is 350 mg/kg; 140 mg/kg in pheasants; > 5,000 ppm for the mallard and 1,280 ppm for the bobwhite quail. Acephate may affect behavior and breeding success.

Effects on Aquatic Organisms: The compound is considered relatively non-toxic to fish with an LC₅₀ for goldfish of 9,550 mg/l and rainbow trout >1,000 mg/l over 96 hours. Another study noted that the LC₅₀ was >1,000 ppm for both the rainbow trout and the bluegill. Acephate did not increase "coughing" (interruption of normal ventilating cycle, with a more rapid expansion and contraction of the buccal and opercular cavities, which serves the purpose of clearing the gills of accumulated debris) frequency of rainbow trout. In laboratory studies, the cholinesterase activity in the erythrocytes, gills, and serum of rainbow trout was reduced within 3 hours of exposure to Acephate. With methamidophos, the extent of brain and liver AChE inhibition in carp was proportional to the insecticide concentration and exposure time. Smaller fish started dying when the AChE inhibition was 40 to 50%, but very large fingerlings survived an inhibition of more than 80%. In field studies, however, subsequent to aerial spraying of Acephate to control spruce budworm, no significant depression of brain AChE activity of brook trout and salmon in streams near the target area occurred; but, there was a significant depression of brain AChE activity in suckers, which returned to normal by the eighth day.

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Effects on Other Animals (Nontarget species): Acephate is considered toxic to bees. The LC₅₀ for bees is 1.2 µg/bee. In studies examining the residual toxicity of insecticides on beneficial species in citrus, it was found that Acephate had the longest residual activity toward *Aphytis melinus*, DeBach, and that mortality with dimethoate treatment occurred for a shorter period of time than with Acephate treatment. This same study showed that residues of Acephate caused greater mortalities over a longer period of time to *A. melinus* than other materials tested. In some cases, there is no effect on fecundity of the beneficial, but survival of the offspring is affected. For example, fecundity of *Diaeretiella rapae* was not reduced by treatment of *Myzus persicae* host mummies with Acephate, but Acephate significantly affected survival for the first day after emergence. In studies of insecticides commonly used in cotton, Acephate was shown to be very toxic to adult *Microplitis croceipes* parasitoids, and caused 100% mortality at the lowest recommended field rates.

ENVIRONMENTAL FATE

Breakdown of Chemical in Soil and Groundwater: Acephate dissipates rapidly with half-lives of <3 and 6 days in aerobic and anaerobic soils, respectively. The major metabolite was CO₂ in both soil types. TLC and soil column studies indicate Acephate is mobile in most soils but that aged residues (excluding Acephate and its degradate methamidophos) are immobile in sandy loam soil. Most of the applied Acephate and degradate methamidophos degrade to immobile compounds in 20 days. Methamidophos and carbon dioxide were identified as the major soil metabolites.

Breakdown of Chemical in Surface Water: No information was currently available.

Breakdown of Chemical in Vegetation: Acephate is quickly absorbed, translocated, and transformed in pine seedlings and cotton plants. The chemical was metabolized via cleavage of the amide bond to form methamidophos and an unknown, but insecticidally active compound, which were identified in the roots, stems, and leaves. Methamidophos was also found in cotton leaves following a single application of Acephate. Four additional degradation products were formed - two of which were tentatively identified as O,S-dimethylphosphorothioate and S-methyl acetylphosphoramidothioate. The amount of methamidophos and the four products represented about 9% and 5% of the applied amount, respectively. In studies on tobacco leaves, citrus fruit, greenhouse tomatoes, and celery and lettuce, half-life disappearance of residues ranged from 1 to 15 days, depending on the crop species and the part of the plant analyzed. This same study showed residues of both Acephate and methamidophos on carrots and potatoes even though no direct spraying of the underground portion of these crops occurred. Carrots contained much higher residues (up to 5.2 mg/kg) than potatoes (up to 3.6 mg/kg). In contrast to carrots, potatoes and the fruit bearing vegetables studied, the amount of rainfall occurring was directly proportional to the disappearance of both Acephate and methamidophos residues on lettuce and celery. The level of residues on the eight crops studied on day 3 after application generally reflected the weight to volume ratios of the crops except where translocation appeared to give higher residues than would be expected. In carrots, potatoes, peppers and tomatoes, residues on day 7 were higher than on day 3 and day 14, thus suggesting absorption and translocation from foliage to root, tuber or fruit. Methamidophos was identified in the eight crops studied, at high levels on peppers, but at very low levels on lettuce and celery. Acephate is rapidly absorbed into the leaf tissue of cotton plants when applied foliarly, with nearly 40% of the applied Acephate present in the internal extract and 25% remaining on the leaf surface 24 hours after application. The unrecovered Acephate probably was translocated from the leaves or bound in unextractable form in the leaf tissue. The low vapor pressure of Acephate indicates that loss due to volatilization would be negligible. Translocation of Acephate into the fruiting body of the cotton plant following foliar application is not sufficient to be toxic to cotton insect pests. Little to no degradation of Acephate to methamidophos occurred on the leaf surface. Methamidophos was more persistent in plant tissue than Acephate (i.e. Acephate was degrading to methamidophos faster than methamidophos was degrading to another compound).

Section 13 - Disposal Considerations

Disposal: Instructions concerning the disposal of this product and its containers are given on the product label. These should be carefully followed.

Section 14 - Transport Information

ADG Code: This product is not classified as a Dangerous Good. No special transport conditions are necessary unless required by other regulations.

Section 15 - Regulatory Information

AICS: All of the significant ingredients in this formulation are to be found in the public AICS Database.

Section 16 - Other Information

Much of the Information in this MSDS came from Extoxnet, a Pesticide Information Project of Cooperative Extension Offices of Cornell University, Oregon State University, the University of Idaho, and the University of California at Davis and the Institute for Environmental Toxicology, Michigan State University.

This MSDS contains only safety-related information. For other data see product literature.

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Acronyms:

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail
AICS	Australian Inventory of Chemical Substances
CAS number	Chemical Abstracts Service Registry Number
Hazchem Number	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
IARC	International Agency for Research on Cancer
NOHSC	National Occupational Health and Safety Commission
NOS	Not otherwise specified
NTP	National Toxicology Program (USA)
R-Phrase	Risk Phrase
SUSDP	Standard for the Uniform Scheduling of Drugs & Poisons
UN Number	United Nations Number

THIS MSDS SUMMARISES OUR BEST KNOWLEDGE OF THE HEALTH AND SAFETY HAZARD INFORMATION OF THE PRODUCT AND HOW TO SAFELY HANDLE AND USE THE PRODUCT IN THE WORKPLACE. EACH USER MUST REVIEW THIS MSDS IN THE CONTEXT OF HOW THE PRODUCT WILL BE HANDLED AND USED IN THE WORKPLACE.

IF CLARIFICATION OR FURTHER INFORMATION IS NEEDED TO ENSURE THAT AN APPROPRIATE RISK ASSESSMENT CAN BE MADE, THE USER SHOULD CONTACT THIS COMPANY SO WE CAN ATTEMPT TO OBTAIN ADDITIONAL INFORMATION FROM OUR SUPPLIERS

OUR RESPONSIBILITY FOR PRODUCTS SOLD IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS, A COPY OF WHICH IS SENT TO OUR CUSTOMERS AND IS ALSO AVAILABLE ON REQUEST.

Please read all labels carefully before using product.

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