

MATERIAL SAFETY DATA SHEET

Product Name: Genfarm Triadimefon 125 Fungicide

This revision issued: September, 2010

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Section 1 - Identification of The Material and Supplier

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Chemical nature: Triademefon is an azole derivative.
Trade Name: Genfarm Triadimefon 125 Fungicide
Product Use: Agricultural fungicide for use as described on the product label.
Creation Date: December, 2003
This version issued: September, 2010 and is valid for 5 years from this date.

Section 2 - Hazards Identification

Statement of Hazardous Nature

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

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

Risk Phrases: R22, R36/38. Harmful if swallowed. Irritating to eyes and skin.

Safety Phrases: S2, S46, S24/25. Keep out of reach of children. If swallowed, contact a doctor or Poisons Information Centre immediately and show this container or label. Avoid contact with skin and eyes.

SUSMP Classification: S6

ADG Classification: None allocated. Not a Dangerous Good.

UN Number: None allocated

Emergency Overview

Physical Description & colour: Brown liquid.

Odour: Mild chemical odour.

Major Health Hazards: The 4-hour inhalation LC₅₀ for Triadimefon is greater than 0.48 mg/L in rats and approximately the same in mice. Acute toxicity through skin exposure is also fairly low. The LD₅₀ values for the dermal toxicity of technical Triadimefon are greater than 1000 mg/kg in rats and 2000 mg/kg in rabbits. Studies of acute effects in rats have indicated a potential to induce neurobehavioral effects. Data regarding eye and skin irritation are inconclusive. Irritating to eyes and skin, harmful if swallowed largely due to solvents.

Potential Health Effects

Inhalation

Short term exposure: Significant inhalation exposure is considered to be unlikely. Available data indicates that this product is not harmful. However product may be mildly irritating, although unlikely to cause anything more than mild transient discomfort.

Long Term exposure: No data for health effects associated with long term inhalation.

Skin Contact:

Short term exposure: Available data indicates that this product is not harmful. However product is a skin irritant. Symptoms may include itchiness and reddening of contacted skin. Other symptoms may also become evident, but all should disappear once exposure has ceased.

Long Term exposure: No data for health effects associated with long term skin exposure.

Eye Contact:

Short term exposure: Exposure via eyes is considered to be unlikely. This product is an eye irritant. Symptoms may include stinging and reddening of eyes and watering which may become copious. Other symptoms may also become evident. If exposure is brief, symptoms should disappear once exposure has ceased. However, lengthy exposure or delayed treatment may cause permanent damage.

Long Term exposure: No data for health effects associated with long term eye exposure.

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Ingestion:

Short term exposure: Significant oral exposure is considered to be unlikely. Available data shows that this product is harmful, but symptoms are not available. This product is unlikely to cause any irritation problems in the short or long term.

Long Term exposure: No data for health effects associated with long term ingestion.

Carcinogen Status:

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

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

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

Section 3 - Composition/Information on Ingredients

Ingredients	CAS No	Conc,%	TWA (mg/m ³)	STEL (mg/m ³)
Triadimefon	43121-43-3	12.5	not set	not set
Hydrocarbon liquid	secret	69	not set	not set
N-Methyl-2-pyrrolidone	872-50-4	10	103	309
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 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.

Inhalation: No first aid measures normally required. However, if inhalation has occurred, and irritation has developed, remove to fresh air and observe until recovered. If irritation becomes painful or persists more than about 30 minutes, seek medical advice.

Skin Contact: Quickly and gently, blot or brush away excess chemical. Wash gently and thoroughly with water (use non-abrasive soap if necessary) for 20 minutes or until product is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g. watchbands and belts). Completely decontaminate clothing, shoes and leather goods before reuse or discard. If irritation persists, repeat flushing and obtain medical advice.

Eye Contact: Quickly and gently blot or brush away product. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water until the product is removed or until a few minutes after irritation has ceased, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain medical advice if irritation becomes painful or lasts more than a few minutes.

Ingestion: If swallowed, do NOT induce vomiting. Wash mouth with water and contact a Poisons Information Centre, or call a doctor.

Section 5 - Fire Fighting Measures

Fire and Explosion Hazards: This product is classified as a C2 combustible product. 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. Vapours from this product are heavier than air and may accumulate in sumps, pits and other low-lying spaces, forming potentially explosive mixtures. They may also flash back considerable distances. Fire decomposition products from this product may be toxic if inhaled. Take appropriate protective measures.

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Extinguishing Media: Preferred extinguishing media are carbon dioxide, dry chemical, foam, water fog.

Fire Fighting: If a significant quantity of this product is involved in a fire, call the fire brigade.

Flash point: No data

Upper Flammability Limit: No data.

Lower Flammability Limit: No data.

Autoignition temperature: No data.

Flammability Class: C2

Section 6 - Accidental Release Measures

Accidental release: In the event of a major spill, prevent spillage from entering drains or water courses. Evacuate the spill area and deny entry to unnecessary and unprotected personnel. Immediately call the Fire Brigade. Wear full protective clothing including eye/face protection. All skin areas should be covered. See above under Personal Protection regarding Australian Standards relating to personal protective equipment. Suitable materials for protective clothing include PVC, polyvinyl alcohol, Teflon, PE/EVAL. Eye/face protective equipment should include a full face shield. If there is a significant chance that vapours or mists are likely to build up in the cleanup area, we recommend that you use a respirator. Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned above. Otherwise, not normally necessary. Stop leak if safe to do so, and contain spill. Absorb onto sand, vermiculite or other suitable absorbent material. If spill is too large or if absorbent material is not available, try to create a dike to stop material spreading or going into drains or waterways. 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.

Section 7 - Handling and Storage

Handling: Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this MSDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.

Storage: Note that this product is combustible and therefore, for Storage, meets the definition of Dangerous Goods in some states. If you store large quantities (tonnes) of such products, we suggest that you consult your state's Dangerous Goods laws in order to clarify your obligations regarding their storage.

Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight. Make sure that the product does not come into contact with substances listed under "Materials to avoid" in Section 10. Some liquid preparations settle or separate on standing and may require stirring before use. Check packaging - there may be further storage instructions on the label.

Section 8 - Exposure Controls and Personal Protection

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Occupational Protective Clothing: AS/NZS 4501 set 2008, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

SWA Exposure Limits **TWA (mg/m³)**
N-Methyl-2-pyrrolidone 103

STEL (mg/m³)
309

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The ADI for Triadimefon is set at 0.03mg/kg/day. The corresponding NOEL is set at 2.5mg/kg/day. ADI means Acceptable Daily Intake and NOEL means No-observable-effect-level. Values taken from Australian ADI List, Dec 2002.

Ventilation: No special ventilation requirements are normally necessary for this product. However make sure that the work environment remains clean and that vapours and mists are minimised.

Eye Protection: Protective glasses or goggles should be worn when this product is being used. Failure to protect your eyes may cause them harm. Emergency eye wash facilities are also recommended in an area close to where this product is being used.

Skin Protection: Prevent skin contact by wearing impervious gloves, clothes and, preferably, apron. Make sure that all skin areas are covered. See below for suitable material types.

Protective Material Types: We suggest that protective clothing be made from the following materials: PVC.

Respirator: Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned above. Otherwise, not normally necessary. Eyebaths or eyewash stations and safety deluge showers should be provided near to where this product is being used.

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Section 9 - Physical and Chemical Properties:

Physical Description & colour:	Brown liquid.
Odour:	Mild chemical odour.
Boiling Point:	Not available.
Freezing/Melting Point:	No specific data. Liquid at normal temperatures.
Volatiles:	No specific data. Expected to be low at 100°C.
Vapour Pressure:	No data.
Vapour Density:	No data.
Specific Gravity:	Approx 0.93
Water Solubility:	Emulsifiable.
pH:	No data.
Volatility:	No data.
Odour Threshold:	No data.
Evaporation Rate:	No data.
Coeff Oil/water distribution:	No data.
Autoignition temp:	No data.

Section 10 - Stability and Reactivity

Reactivity: This product is unlikely to react or decompose under normal storage conditions. However, if you have any doubts, contact the supplier for advice on shelf life properties.

Conditions to Avoid: Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight.

Incompatibilities: strong reducing agents.

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. Hydrogen chloride gas, other compounds of chlorine. Water. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death.

Polymerisation: This product is unlikely to undergo polymerisation processes.

Section 11 - Toxicological Information

Toxicity: Acute toxicity: At 92.6%, Triadimefon has an acute oral LD₅₀ of 300 to 600 mg/kg in rats, about 1000 mg/kg in mice, and about 500 mg/kg in rabbits and dogs. Triadimefon has a potential to cause adverse chronic effects at low to moderate dose levels. Lower potency formulations of Triadimefon have lower acute toxicities (higher LD₅₀ values). Acute inhalation toxicity of the compound is moderate. The 4-hour inhalation LC₅₀ is greater than 0.48 mg/L in rats and approximately the same in mice. Acute toxicity through skin exposure is also fairly low. The LD₅₀ values for the dermal toxicity of technical Triadimefon are greater than 1000 mg/kg in rats and 2000 mg/kg in rabbits. Studies of acute effects in rats have indicated a potential to induce neurobehavioral effects. Data regarding eye and skin irritation are inconclusive.

Chronic toxicity: A number of 2-year studies have indicated that there are several toxic responses to low to moderate doses of the compound. Long-term studies of Triadimefon in several species (rat, mouse, dog) over a range of doses indicated a reduction in body weight, changes in red blood cell counts, an increase in blood cholesterol levels, and increased liver weights. Increased liver weights may be seen as an adaptation to toxic stress, rather than a toxic endpoint related to exposure.

Reproductive effects: Female rats fed up to 90 mg/kg/day of 92.6% Triadimefon over three generations showed a number of adverse effects. No effects were noted in the foetuses at maternal doses below 2.5 mg/kg/day. At the middle doses tested (around 15 mg/kg/day) the second-generation offspring experienced a decrease in weight gain. At the highest dose, the females experienced a reduction in body weight and a decrease in fertility. In another study conducted over two generations, the female rats showed decreased ovary weight at the 2.5 mg/kg/day dose. At 90 mg/kg/day reductions in litter size, reduced offspring viability and lower birth weight were observed in second-

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generation offspring. This evidence suggests it is unlikely that Triadimefon will cause reproductive toxicity in humans under normal circumstances.

Teratogenic effects: The teratogenic potential of Triadimefon is relatively low. Doses causing birth defects in rats were high enough to also produce maternal toxicity. Cleft palates were noted in the offspring of female rats fed moderate doses of 75 mg/kg/day for an unspecified time period. In a second study, no teratogenic effects were noted in the offspring of female rats fed 50 mg/kg/day of 92.6% Triadimefon in the form of an emulsion. In another teratogenic study in rats, rib deformities were noted at high maternal doses of 90 mg/kg/day. A study of occupationally-exposed female workers showed that the highest combined dermal and inhalation level of exposure for workers was around 60 µg which corresponds to approximately 0.008 mg/kg/shift for a 70 kg worker, a value considerably lower than the lowest dose that caused teratogenic effects in test animals. Thus, it is unlikely that Triadimefon will cause birth defects in humans under normal circumstances.

Mutagenic effects: Six separate studies indicate that the 92.6% Triadimefon compound is nonmutagenic. Several other tests were inconclusive. It is unlikely that the compound poses a significant mutagenic risk.

Carcinogenic effects: In a 2-year dietary study with mice, the highest dose tested (600 mg/kg/day) did not produce significant increases in tumor incidence. Due to high mortality, the reliability of this data is suspect. Another 2-year dietary study in mice showed increased liver cell hypertrophy (which may be related to tumor formation) at doses of greater than 36 mg/kg/day in males and 6 mg/kg/day for females. Increased liver cell adenoma was detected at all levels, but carcinoma was not detected at any level in this study. Based on this evidence, no conclusion can be drawn about the overall carcinogenicity of Triadimefon.

Organ toxicity: Triadimefon has been associated with changes in the liver, decreased kidney weights, and altered urinary bladder structure in laboratory animals exposed to 18 to 60 mg/kg/day. There is evidence that acute effects on the central nervous system may also occur.

Fate in humans and animals: After oral administration of a single dose of Triadimefon, most of the compound was eliminated unchanged in the urine and faeces within 2 to 3 days. Some breakdown of a small amount of the compound occurred in the liver. The compound has a very short residence time in the blood stream, about 2 ½ hours. When applied to the skin of rats, 40% of the applied amount was excreted in urine and faeces within 8 days. Additional amounts (up to 40%) were recovered unabsorbed from the skin surface and in the cage.

Section 12 - Ecological Information

Effects on birds: Triadimefon ranges from slightly toxic to practically nontoxic to birds. For instance, the compound has an LD₅₀ value of greater than 4000 mg/kg in mallard ducks. Japanese quail are less tolerant of the compound (LD₅₀ of 2000 mg/kg) and canaries are even less tolerant (LD₅₀ >1000 mg/kg). Even the most tolerant species exhibited some compound-related acute toxicity such as diarrhoea and regurgitation within 5 minutes of administration of the highest doses. At the lowest dose tested (500 mg/kg) no signs of diarrhoea were noted.

Effects on aquatic organisms: The compound is slightly toxic to fish, indicating that they are more susceptible to the presence of the compound than are birds. Bluegill sunfish are the most susceptible, followed closely by goldfish, with 96-hour LC₅₀ values of 11 mg/L and 10 to 50 mg/L, respectively. The compound is only slightly toxic to rainbow trout, with a reported LC₅₀ of 14 mg/L.

Effects on other organisms: The compound is nontoxic to honeybees.

Environmental Fate:

Breakdown in soil and groundwater: Triadimefon has low to moderate persistence in soils. In a sandy loam type of soil, half of the initial amount of the compound was lost within 18 days. In loamy soil the half-life was much shorter (about 6 days), which indicates that breakdown of the compound varies with soil type. Other reported soil half-lives are 14 to 60 days with an average of 26 days. Triadimefon and its residues are moderately mobile and may have potential to leach to groundwater.

Breakdown in water: In water with a pH 3.0, 6.0, or 9.0, almost 95% of the compound remained after 28 weeks. The compound is very stable in water and does not readily undergo hydrolysis.

Breakdown in vegetation: In plants, a breakdown product is triadimenol, and translocation and metabolism may vary according to plant species. Triadimenol is of comparable toxicity to Triadimefon.

Section 13 - Disposal Considerations

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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.

The following ingredients: Triadimefon, Hydrocarbon liquid, N-Methyl-2-pyrrolidone are mentioned in the SUSMP.

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Section 16 - Other Information

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

Acronyms:

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail, 7th Edition
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
SWA	Safe Work Australia, formerly ASCC and NOHSC
NOS	Not otherwise specified
NTP	National Toxicology Program (USA)
R-Phrase	Risk Phrase
SUSMP	Standard for the Uniform Scheduling of Medicines & 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.

This MSDS is prepared in accord with the SWA document "National Code of Practice for the Preparation of Material Safety Data Sheets" 2nd Edition [NOHSC:2011(2003)]

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