

SAFETY DATA SHEET

Product Name: Genfarm Triallate Gold 500 Selective Herbicide

This revision issued: October, 2012

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Section 1 - Identification of The Material and Supplier

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Chemical nature: Tri-allate is a thiocarbamate derivative.
Trade Name: **Genfarm Triallate Gold 500 Selective Herbicide**
Product Use: Agricultural herbicide for use as described on the product label.
Creation Date: **March, 2008**
This version issued: **October, 2012** and is valid for 5 years from this date.

Section 2 - Hazards Identification

Statement of Hazardous Nature

This product is classified as: Xi, Irritating. T, Toxic. N, Dangerous to the environment. Hazardous according to the criteria of SWA.

Not subject to the ADG Code when transported in Australia by Road or Rail in packages 500kg(L) or less; or IBCs (refer to SP AU01). However if transported by Air or Sea, this provision does not apply. Then the product is classed as Dangerous (Class 9 Environmentally Hazardous) by IATA and IMDG respectively. See details below and in Section 14 of this MSDS.

Risk Phrases: R22, R43, R65, R66, R67, R36/38, R48/22, R50/53. Harmful if swallowed. May cause sensitisation by skin contact. Harmful: May cause lung damage if swallowed. Repeated exposure may cause skin dryness or cracking. Vapours may cause drowsiness and dizziness. Irritating to eyes and skin. Harmful: danger of serious damage to health by prolonged exposure if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment.

Safety Phrases: S2, S13, S20, S23, S28, S46, S24/25, S36/37/39. Keep out of reach of children. Keep away from food, drink and animal feeding stuffs. When using, do not eat or drink. Do not breathe vapours or spray mists. After contact with skin, wash immediately with plenty of soap and water. If swallowed, contact a doctor or Poisons Information Centre immediately and show this MSDS or label. Avoid contact with skin and eyes. Wear suitable protective clothing, gloves and eye/face protection.

SUSMP Classification: S5

ADG Classification: Class 9: Miscellaneous dangerous goods.

UN Number: 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Emergency Overview

Physical Description & Colour: Amber to brown coloured liquid.

Odour: Characteristic solvent odour.

Major Health Hazards: Technical Triallate is harmful by ingestion and practically nontoxic via dermal exposure or inhalation. Inhalation exposure to large amounts of thiocarbamates may cause itching, scratchy throat, sneezing, and coughing. Triallate is moderately irritating to the skin and is a mild eye irritant. This product is irritating to eyes and skin, harmful if swallowed, possible skin sensitiser, if aspirated, may cause lung damage, repeated exposure may cause skin dryness or cracking, vapours may cause drowsiness and dizziness.

Potential Health Effects

See section 11 for Chronic exposure studies.

Inhalation:

Short Term Exposure: 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.

Skin Contact:

Short Term Exposure: Classified as a potential sensitiser by skin contact. Exposure to a skin sensitiser, once sensitisation has occurred, may manifest itself as skin rash or inflammation, and in some individuals this reaction can be severe. In addition 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.

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Eye Contact:

Short Term Exposure: Available data shows that this product is not harmful. 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.

Ingestion:

Short Term Exposure: Significant oral exposure is considered to be unlikely. Because of the low viscosity of this product, it may directly enter the lungs if swallowed, or if subsequently vomited. Once in the lungs, it is very difficult to remove and can cause severe injury or death. However, this product is an oral irritant. Symptoms may include burning sensation and reddening of skin in mouth and throat. Other symptoms may also become evident, but all should disappear once exposure has ceased.

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)
Triallate	2303-17-5	500g/L	not set	not set
Liquid hydrocarbon		471g/L	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 SWA 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 may be equalled (but should not be exceeded) for no longer than 15 minutes and should not be repeated 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: Wash gently and thoroughly with warm water (use non-abrasive soap if necessary) for 10-20 minutes or until product is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g. watchbands and belts) and completely decontaminate them before reuse or discard. If irritation persists, repeat flushing and seek medical attention.

Eye Contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes or until the product is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain medical attention immediately. Take special care if exposed person is wearing contact lenses.

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 C1 combustible product. There is little risk of an explosion from this product if commercial quantities are 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.

Extinguishing Media: Try to contain spills, minimise spillage entering drains or water courses.

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Fire Fighting: If a significant quantity of this product is involved in a fire, call the fire brigade. There is little danger of a violent reaction or explosion if significant quantities of this product are involved in a fire. Recommended personal protective equipment is full fire kit and breathing apparatus.

Flash point: >62°C

Upper Flammability Limit: No data.

Lower Flammability Limit: No data.

Autoignition temperature: No data.

Flammability Class: C1

Section 6 - Accidental Release Measures

Accidental release: In the event of a major spill, prevent spillage from entering drains or water courses. Wear full protective clothing including eye/face protection. All skin areas should be covered. See below under Personal Protection regarding Australian Standards relating to personal protective equipment. Suitable materials for protective clothing include rubber, PVC. Eye/face protective equipment should comprise as a minimum, protective goggles. 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. It should be fitted with a cartridge suitable for agricultural chemicals. 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. Because of the environmentally hazardous nature of this product, special care should be taken to restrict release to waterways or drains. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. Recycle containers wherever possible after careful cleaning. Refer to product label for specific instructions. 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: This product is a Scheduled Poison. Observe all relevant regulations regarding sale, transport and storage of this schedule of poison. 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/m ³)	STEL (mg/m ³)
Exposure limits have not been established by SWA for any of the significant ingredients in this product.		

The ADI for Triallate is set at 0.005mg/kg/day. The corresponding NOEL is set at 0.5mg/kg/day. ADI means Acceptable Daily Intake and NOEL means No-observable-effect-level. Values taken from Australian ADI List, Sept 2011.

No special equipment is usually needed when occasionally handling small quantities. The following instructions are for bulk handling or where regular exposure in an occupational setting occurs without proper containment systems.

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: If you believe you may have a sensitisation to this product or any of its declared ingredients, you should 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.

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

Section 9 - Physical and Chemical Properties:

Physical Description & colour:	Amber to brown coloured liquid.
Odour:	Characteristic solvent odour.
Boiling Point:	160°C at 100kPa
Freezing/Melting Point:	No specific data. Liquid at normal temperatures.
Volatiles:	No specific data. Expected to be low at 100°C.
Vapour Pressure:	Negligible at normal ambient temperatures (Tri-allate).
Vapour Density:	No data.
Specific Gravity:	1.053
Water Solubility:	Emulsifiable.
pH:	No data.
Volatility:	Negligible at normal ambient temperatures.
Odour Threshold:	No data.
Evaporation Rate:	No data.
Coeff Oil/water Distribution:	4.6 (log P octanol/water)
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 acids, strong bases, strong oxidising 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 in reducing atmospheres. Oxides of sulfur (sulfur dioxide is a respiratory hazard) and other sulfur compounds. Most will have a foul odour. 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 will not undergo polymerisation reactions.

Section 11 - Toxicological Information

Toxicity: An information profile for Triallate is available at <http://extoxnet.orst.edu/pips/ghindex.html>

Acute toxicity: The oral LD₅₀ for technical Triallate in rats is 800 to 2165 mg/kg, and in mice is 930 mg/kg. The oral LD₅₀ in rats for emulsifiable concentrate formulations is 2700 mg/kg, and for granular formulations is greater than 12,000 mg/kg. The dermal LD₅₀ for technical Triallate is 8200 mg/kg in rabbits, and 3500 mg/kg in rats. The inhalation 4-hour LC₅₀ in cats is 0.4 mg/L. In rats fed Triallate at doses of 50 to 2000 mg/kg, abnormal behaviour was observed at doses of 100 mg/kg and above. No changes in nerve tissue occurred. At doses of 600 mg/kg and above, death and reduced body weight occurred. Although Triallate is a carbamate, it does not inhibit cholinesterase activity. No symptoms occurred, and cholinesterase activity was not affected in rats fed single doses of 1500 and 3000 mg/kg.

Chronic toxicity: Prolonged or repeated exposure to Triallate may cause symptoms similar to those caused by acute exposure. Oral doses of 100 mg/kg/day Triallate to hamsters for 22 months resulted in decreased body weight gain, changes in blood chemistry, slight anaemia, increased liver weights, and decreased spleen weights. Mice fed 3 and 12.5 mg/kg/day Triallate for 2 years exhibited increased liver and heart weights, changes in the liver and spleen, and mineralization in the brain and cornea. No adverse effects were observed in dogs fed 1.5, 5, and 15 mg/kg/day Triallate for 2 years.

Reproductive effects: Reduced body and pup weights, reduced pregnancy rate and length, reduced pup survival, and effects on other reproductive parameters occurred when rats were fed 30 mg/kg/day Triallate during mating, pregnancy, and nursing for two successive generations. This suggests that Triallate can cause reproductive effects at high doses.

Teratogenic effects: No birth defects were observed in the offspring of rabbits given Triallate doses of 5, 15, and 45 mg/kg/day on days 6 to 28 of pregnancy. These and other data indicate that Triallate is not teratogenic.

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Mutagenic effects: No genetic changes occurred in tests using live animals (fruit flies, hamsters, and mice). In tests using bacterial and animal cell cultures, both positive and negative results have been reported. This suggests that Triallate is either nonmutagenic or weakly mutagenic.

Carcinogenic effects: Several long-term feeding studies showed no incidence of tumours. Triallate did not produce tumours in rats fed up to 12.5 mg/kg/day for 2 years. No tumours appeared when hamsters were fed dietary doses of up to 100 mg/kg Triallate for 22 months. These data indicate that Triallate is not carcinogenic.

Organ toxicity: Changes in the cellular processes of the brain, liver and spleen were observed in pigs given Triallate. Studies on other species have indicated the thymus, kidneys and reproductive organs are potential targets as well.

Fate in humans and animals: In general, thiocarbamates, the chemical class in which Triallate is included, are rapidly absorbed into the bloodstream from the gastrointestinal tract, readily broken down into metabolites, and then excreted by treated animals. It is rarely possible to detect thiocarbamates in the blood. A single oral dose of 500 mg/kg of Triallate was rapidly absorbed from the gastrointestinal tract of rabbits. It was then found to be present in all organs tested within 15 to 20 minutes after dosing. The largest amount of the herbicide accumulated in the liver, lungs, kidneys, and spleen. All traces were gone by the 7th day. Triallate was reported to be completely eliminated from the body of rabbits within 7 to 10 days.

Section 12 - Ecological Information

Very toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment. This product is biodegradable. It will not accumulate in the soil or water or cause long term problems.

Effects on birds: Triallate is slightly toxic to relatively nontoxic to birds. The acute oral LD₅₀ for Triallate in bobwhite quail is 2251 mg/kg. The 8-day dietary LD₅₀ is greater than 5000 ppm in both mallards and bobwhite quail.

Effects on aquatic organisms: Triallate is highly toxic to fish and other aquatic organisms. The 48-hour EC₅₀ in *Daphnia magna*, is 0.06 to 0.10 mg/L for the 95% technical material and the LC₅₀ is 0.05 to 0.07 mg/L for the 46% emulsifiable concentrate. The 96-hour LC₅₀ in algae is 0.12 mg/L. The 96-hour LC₅₀ for technical material has been reported as 0.62 mg/L in rainbow trout (1.0 mg/L for the emulsifiable concentrate), and 1.7 mg/L in channel catfish (1.1 mg/L for the emulsifiable concentrate). When technical Triallate concentrations were measured in bluegill sunfish over a 7-week period, marked bioaccumulation occurred. The concentration in the fish was 1600 times the ambient water concentration. However, after 2 weeks in water without Tri-allate, the compound was nearly completely eliminated by the fish.

Effects on other organisms: Triallate is nontoxic to bees.

Environmental Fate:

Breakdown in soil and groundwater: Triallate has a moderate persistence in the soil environment. It adsorbs strongly to loam and clay soils and is not readily dissolved in water. This indicates that Triallate is not likely to move through the soil, even though it has an average soil half-life of 82 days. However, if there is significant moisture and/or a low level of organic matter in the soil, leaching and groundwater contamination may be possible.

Breakdown in water: Triallate is stable to ultraviolet degradation and will probably be found adsorbed to suspended sediment in the water column or in hydrosols due to its slight water solubility and its ability to bind to particulates. Typical breakdown times in hydrosols may be longer than in terrestrial systems due to lower oxygen availability for microbial degradation.

Breakdown in vegetation: Studies indicate that Triallate does not bioaccumulate in plants. Triallate is absorbed and metabolized by plants.

Section 13 - Disposal Considerations

Disposal: Special help is available for the disposal of Agricultural Chemicals. The product label will give general advice regarding disposal of small quantities, and how to cleanse containers. However, for help with the collection of unwanted rural chemicals, contact ChemClear 1800 008 182 <http://www.chemclear.com.au/> and for help with the disposal of empty drums, contact DrumMuster <http://www.drummuster.com.au/> where you will find contact details for your area.

Section 14 - Transport Information

Not subject to the ADG Code when transported by Road or Rail in Australia, in packages 500kg(L) or less; or IBCs, but classed as Dangerous by IATA and IMDG when carried by Air or Sea transport (see details below).

Not subject to the ADG Code when transported in Australia by Road or Rail in packages 500kg(L) or less; or IBCs (refer to SP AU01).

ADG Code: 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Hazchem Code: •3Z

Special Provisions: 179, 274, AU01

Limited quantities: ADG 7 specifies a Limited Quantity value of 5 L for this class of product.

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Dangerous Goods Class: Class 9: Miscellaneous Dangerous Goods.

Packaging Group: III

Packaging Method: P001, IBC03, LP01

Class 9 Miscellaneous Dangerous Goods shall not be loaded in the same vehicle or packed in the same freight container with Dangerous Goods of Class 1 (Explosives).

Section 15 - Regulatory Information

AICS: All of the significant ingredients in this formulation are compliant with NICNAS regulations. The following ingredients: Triallate, Liquid hydrocarbon, are mentioned in the SUSMP.

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 (7 th edition)
AICS	Australian Inventory of Chemical Substances
SWA	Safe Work Australia, formerly ASCC and NOHSC
CAS number	Chemical Abstracts Service Registry Number
Hazchem Code	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
IARC	International Agency for Research on Cancer
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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