



**Material Safety Data Sheet**

**BAYER ADVANCED 24 HOUR GRUB KILLER PLUS  
READY-TO-SPREAD GRANULES**

MSDS Number: 102000012263  
MSDS Version 2.0  
Revision Date: 03/03/2005

**SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION**

**Product Name** BAYER ADVANCED 24 HOUR GRUB KILLER PLUS READY-TO-SPREAD GRANULES  
**MSDS Number** 102000012263  
**Chemical Family** Organophosphorus Insecticide  
**EPA Registration No.** 72155-33  
**Product Use** Insecticide for control of White Grubs, Mole Crickets, Sod Webworms and Cutworms.

Bayer Environmental Science  
2 T.W. Alexander Drive  
Research Triangle PK, NC 27709  
USA

For MEDICAL, TRANSPORTATION or other EMERGENCY call 1-800-334-7577 (24 hours/day)  
For Product Information call 1-800-331-2867

**SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS**

<u>Hazardous Component Name</u>	<u>CAS-No.</u>	<u>Average % by Weight</u>
Trichlorfon	52-68-6	6.20

**SECTION 3. HAZARDS IDENTIFICATION**

*NOTE: Please refer to Section 11 for detailed toxicological information.*

**Emergency Overview** Caution! Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Causes eye irritation. Avoid breathing dust or spray mist. Avoid contact with skin, eyes and clothing. Cholinesterase inhibitor.

**Physical State** granular  
**Odor** sweet  
**Appearance** tan  
**Routes of Exposure** Inhalation, Skin contact, Skin Absorption, Eye contact  
**Immediate Effects**  
**Eye** Moderate eye irritation Do not get in eyes.  
**Skin** Avoid contact with skin, eyes and clothing.



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<b>Ingestion</b>	Harmful if swallowed. Do not take internally.
<b>Inhalation</b>	Do not breathe dust.
<b>Chronic or Delayed Long-Term</b>	This product is not listed by NTP, IARC or regulated as a carcinogen by OSHA.
<b>Medical Conditions Aggravated by Exposure</b>	No specific medical conditions are known which may be aggravated by exposure to this product. Any disease, medication or prior exposure which reduces normal cholinesterase activity may increase susceptibility to the toxic effects of the active ingredient.

**SECTION 4. FIRST AID MEASURES**

<b>General</b>	Have the product container or label with you when calling a poison control center or doctor or going for treatment.  This product causes reversible cholinesterase inhibition. Repeated overexposure may cause more severe cholinesterase inhibition with more pronounced signs and symptoms. Inhalation, dermal absorption or ingestion of this material may result in systemic intoxication due to inhibition of the enzyme cholinesterase. Symptoms of poisoning may only appear several hours later.
<b>Eye</b>	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
<b>Skin</b>	Wash off immediately with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a poison control center or doctor for treatment advice.
<b>Ingestion</b>	Never give anything by mouth to an unconscious person. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Have person sip a glass of water if able to swallow. Call a poison control center or doctor immediately for treatment advice.
<b>Inhalation</b>	If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice. Take affected person to fresh air.
<b>Notes to Physician Signs and Symptoms</b>	The symptoms of cholinesterase inhibition include:  nausea  salivation



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	lachrymation
	blurred vision
	constriction of pupils
<b>Hazards</b>	Cholinesterase inhibitor. Allow no further exposure to any cholinesterase inhibitor until full recovery is assured.
<b>Treatment</b>	2-PAM is also antidotal and may be administered in conjunction with atropine. ANTIDOTE: Administer atropine sulfate in large therapeutic doses. Repeat as necessary to the point of tolerance.

**SECTION 5. FIRE FIGHTING MEASURES**

<b>Flash Point</b>	not applicable
<b>Suitable Extinguishing Media</b>	water
<b>Fire Fighting Instructions</b>	Keep out of smoke. Fight fire from upwind position. Equipment or materials involved in pesticide fires may become contaminated. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.  In the event of fire, wear self-contained breathing apparatus.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

<b>Methods for Cleaning Up</b>	Keep unnecessary people away, isolate hazard area and deny entry. Avoid contact with spilled product or contaminated surfaces.
<b>Additional Advice</b>	Rinse with water. Avoid dust formation. Place in covered container for reuse or disposal. Contaminated soil may have to be removed and disposed. Use recommended protective equipment while carefully sweeping up spilled material. Scrub contaminated area with detergent and bleach solution. Do not allow material to enter streams, sewers, or other waterways or contact vegetation. Repeat.

**SECTION 7. HANDLING AND STORAGE**

<b>Handling Procedures</b>	Handle and open container in a manner as to prevent spillage.  Do not get in eyes, on skin, or on clothing.
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<b>Storing Procedures</b>	Do not contaminate water, food, or feed by storage or disposal.  Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area.
<b>Work/Hygienic Procedures</b>	Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.  Remove and wash contaminated clothing before re-use.
<b>Min/Max Storage Temperatures</b>	The 30 day temperature average is not to exceed 100°F.

**SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

<b>Engineering Controls</b>	Use with local exhaust ventilation.		
<b>Eye/Face Protection</b>	Safety glasses with side-shields or goggles		
<b>Hand Protection</b>	Suitable chemical resistant gloves		
<b>Body Protection</b>	Long-sleeved shirt and long pants Shoes plus socks		
<b>General Protection</b>	In case of contact, immediately flush eyes or skin with plenty of water fo clothing and shoes.  Educate and train employees in safe use of the product. Follow all label instructions.		
<b>Exposure Limits</b>	52-68-6	ACGIH	TWA
Trichlorfon		Form of Exposure	Inhalable fraction. 1 mg/m3

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance</b>	tan
<b>Physical State</b>	granular
<b>Odor</b>	sweet
<b>pH</b>	4.6 (1% in distilled water)



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**Bulk Density** 30 - 35 lbs/cu-ft

**SECTION 10. STABILITY AND REACTIVITY**

<b>Chemical Stability</b>	Stable
<b>Conditions to Avoid</b>	Exposure to moisture. Sustained temperatures above 100°F.
<b>Incompatibility</b>	strong oxidizing agents bases alkaline
<b>Hazardous Decomposition Products</b>	Phosphorus pentoxide (P2O5) Chloral Dimethyl hydrogen phosphite Carbon monoxide
<b>Hazardous Reactions</b>	Will not occur.

**SECTION 11. TOXICOLOGICAL INFORMATION**

Only acute studies have been performed on this product as formulated. The non-acute information pertains to the active ingredient, trichlorfon.

<b>Acute Oral Toxicity</b>	male rat: LD50: > 5,100 mg/kg  female rat: LD50: > 5,000 mg/kg
<b>Acute Dermal Toxicity</b>	male/female rat: LD50: > 5,000 mg/kg
<b>Acute Inhalation Toxicity</b>	male/female rat: LC50: 4-hr exposure to dust: > 2 mg/l (extrapolated based on EPA's assessment of the inhalation hazard of DYLOX 5% Granular Bait)  male/female rat: LC50: > 2 mg/l Exposure time: 1 h Exposure to Dust
<b>Skin Irritation</b>	rabbit: No skin irritation
<b>Eye Irritation</b>	rabbit: Mild eye irritation
<b>Sensitization</b>	guinea pig: Non-sensitizing
<b>Subchronic Toxicity</b>	In a 3-week inhalation study, rats were exposed to trichlorfon at aerosol concentrations of 12.7, 35.4 or 103.5 mg/m <sup>3</sup> for 6 hours/day, 5 days/week.



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Cholinesterase inhibition occurred in animals at concentrations of 35.4 mg/m<sup>3</sup> and greater. The no-observed-effect-level (NOEL) was 12.7 mg/m<sup>3</sup>. In a 3 week dermal toxicity study, rabbits were treated with trichlorfon at levels of 100, 300 or 1000 mg/kg for 6 hours/day, 5 days/week. The only effect observed was erythrocyte cholinesterase inhibition. Under the conditions of this study, the NOEL was 100 mg/kg.

**Chronic Toxicity**

Trichlorfon was administered by oral gavage to Rhesus monkeys at doses of 0.2, 1.0 or 5.0 mg/kg, 6 days/week for 10 years. Effects observed included reduced body weight gain, cholinesterase inhibition and anemia (reductions in hematocrit, hemoglobin and erythrocyte counts). The NOEL for cholinesterase inhibition was 0.2 mg/kg. Excluding cholinesterase inhibition, the overall NOEL was 1.0 mg/kg. In chronic feeding using rats, trichlorfon was administered for 2 years at dietary concentrations ranging from 100 to 2500 ppm. Effects observed at the high dose of these studies included decreased body weight gain and feed consumptions, cholinesterase inhibition, anemia, hypercholesterolemia, nonglandular gastritis, duodenal hyperplasia, increased liver and kidney weights, and histopathological changes in the lung and kidney. The dose of 2500 ppm was a dose considered to exceed the maximum tolerated dose (MTD). The overall NOEL from these studies was 100 ppm.

**Assessment Carcinogenicity**

Trichlorfon was investigated for carcinogenicity in chronic feeding studies using rats and mice at maximum levels of 2500 and 2700 ppm, respectively. There was no evidence of carcinogenic potential observed in either species.

**ACGIH**

Trichlorfon

52-68-6

Group A4

**NTP**

None.

**IARC**

Trichlorfon

52-68-6

Overall evaluation: 3

**OSHA**

None.

**Reproductive &  
Developmental Toxicity**

**REPRODUCTION:** In a reproduction study on rats, trichlorfon was administered at dietary concentrations of 150, 500 or 1750 ppm. At the maternally toxic concentration of 1750 ppm, reproductive effects observed in the offspring included decreased body weight gain and dilated renal pelves. Effects observed in parental animals included reduced body weights, cholinesterase inhibition, kidney effects, and increased organ weights for liver, lung and kidney. The NOELs for parental and reproductive effects were 150 and 500 ppm, respectively.

**DEVELOPMENTAL TOXICITY:** In a developmental toxicity study using rats, trichlorfon was administered at dietary concentrations of 500, 1125 or 2500 ppm. Maternal toxicity was observed at all levels tested. At 2500 ppm, there was an increased incidence of developmental toxicity as indicated by delayed ossification involving elements of the skull, ribs, vertebrae and pelvis, and by an

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increased incidence of wavy, curved and/or bulbous ribs. The NOELs for maternal and developmental toxicity were less than 500 and 1125 ppm, respectively. When rats were administered trichlorfon by oral gavage at doses of 10, 30 or 100 mg/kg, there was no indication of maternal or developmental toxicity. In a developmental toxicity study using rabbits, trichlorfon was administered by oral gavage at doses of 10, 35 or 110 mg/kg. There was an increased incidence of resorptions, lagging ossifications and decreased fetal weights at the maternally toxic level of 110 mg/kg. The NOELs for maternal and developmental toxicity were 10 and 35 mg/kg, respectively.

**Neurotoxicity**

In an acute oral study, hens revealed no evidence of neurotoxicity when treated with the active ingredient at dose levels up to and including 185 mg/kg (highest dose tested). In a 3 month study in which hens received the active ingredient daily at oral doses of 3, 9 or 18 mg/kg, there was no evidence of delayed neurotoxicity. In an acute neurotoxicity screening study using rats, technical grade trichlorfon was administered as a single oral dose at doses of 10, 50, or 200 mg/kg. Compound-related deaths occurred at the high-dose for both sexes. All but one of the high-dose females died on the day of treatment. All clinical signs and neurobehavioral effects observed were ascribed to acute cholinergic toxicity, occurring at dose levels that produced substantial inhibition of cholinesterase activity. There were no compound-related microscopic lesions in skeletal muscle or neural tissues of high-dose males or mid-dose females and the one surviving high-dose female. Excluding cholinergic responses, the NOEL for neurotoxicity was 200 mg/kg for males and 50 mg/kg for females. In a 13 week neurotoxicity study, technical grade trichlorfon was administered to rats at dietary concentrations of 100, 500 and 2500 ppm. Effects observed at the high-dose included decreased body weights, decreased feed consumptions, perianal stains, urine stains, slightly uncoordinated righting response, reduced levels of activity, and cholinesterase inhibition (erythrocyte, plasma and brain). Microscopic examinations revealed minimal degeneration of myelin in the dorsal and ventral root fibers in cervical and lumbar regions of the spinal cord without degeneration of the axon. All clinical signs and neurobehavioral effects are ascribed to cholinergic neurotoxicity, occurring at exposure levels that produced substantial inhibition of cholinesterase activity. The minimal micropathologic findings at the high dose are not ascribed to the inhibition of cholinesterase activity. The NOEL for neurotoxicity was 500 ppm based on cholinergic effects and neuropathology. The overall NOEL was 100 ppm based on cholinesterase inhibition.

**Mutagenicity**

Numerous mutagenicity studies have been conducted on trichlorfon, some of which are positive.

**SECTION 12. ECOLOGICAL INFORMATION**



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**Environmental  
Precautions**

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. This pesticide is toxic to fish, birds, and other wildlife. Apply this product only as specified on the label. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Do not apply where runoff is likely to occur.

**SECTION 13. DISPOSAL CONSIDERATIONS**

**General Disposal  
Guidance**

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Pesticide Disposal:

**Container Disposal**

Empty remaining contents. If burned, stay out of smoke. Then dispose of empty container in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning.

**SECTION 14. TRANSPORT INFORMATION**

**DOT CLASSIFICATION:**

Not regulated for Domestic Surface Transportation

**IMDG CLASSIFICATION:**

NON-BULK-A Max. Capacity of 450L(119 gallons)or less, or 400Kg(882 pounds) or less  
Not Regulated for Ocean Transport

BULK-A Max. Capacity Greater than 450L(119 gallons) or Greater than 400Kg(882 pounds)  
Environmentally Hazardous Substances, Solid, N.O.S.(Trichlorfon)// 9 // UN3077 // PG III // Marine Pollutant

**FREIGHT CLASSIFICATION:**

Insecticides or Fungicides, N.O.I.; other than poison

**SECTION 15. REGULATORY INFORMATION**

**EPA Registration No.** 72155-33

**US Federal Regulations**

**TSCA list**

None.

**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

None.

**SARA Title III - Section 302 - Notification and Information**

None.

**SARA Title III - Section 313 - Toxic Chemical Release Reporting**

Trichlorfon

52-68-6

1.0%

**US States Regulatory Reporting**



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**CA Prop65**

This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

**US State Right-To-Know Ingredients**

Trichlorfon 52-68-6 CA, CT, IL, NJ, PA

**Canadian Regulations**

**Canadian Domestic Substance List**

Trichlorfon 52-68-6

**Environmental**

**CERCLA**

Trichlorfon 52-68-6 100 lbs

**Clean Water Section 307 Priority Pollutants**

None.

**Safe Drinking Water Act Maximum Contaminant Levels**

None.

**International Regulations**

**European Inventory of Existing Commercial Substances (EINECS)**

Trichlorfon 52-68-6

**SECTION 16. OTHER INFORMATION**

**NFPA**

Health - 2 Flammability - 1 Reactivity - 1 Others - none

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason to Revise: Revised Transportation information; renumbering due to systems changes.

Revision Date: 03/03/2005

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