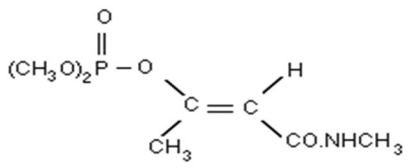
TECHNICAL BULLETIN
MONOCROTOPHOS TECHNICAL

1. INTRODUCTION

Monocrotophos is an organophosphate with broad-spectrum contact and systemic activity against insects and mites. It is applied using aerial, ground-rig and directed sprays and penetrates plant tissue rapidly and has residual activity.

2. ACTIVE INGREDIENT

Common name	Monocrotophos, (Approved by BSI, E-ISO, F-ISO)
IUPAC Name	Dimethyl (E)1-methyl-2- (methylcarbamoyl) vinylphosphate; 3-(dimethoxyphosphinyl-oxy)- N-methylisocrotonamide
Chemical Abstracts name	(E)-dimethyl-1-methyl-3-(methylamino)-3-oxo-1-propenyl phosphate (9Cl); dimethyl phosphate ester withn(E)-3-hydroxy- N-methylcrotonamide (8 Cl)
Molecular formula	$C_7H_{14}NO_5P$
CAS number	6923-22-4
Structural formula	
Molecular weight	223.2
Purity	72% w/w Min

3. PHYSICOCHEMICAL PROPERTIES

Physical state	Colorless to reddish-brown solid with a mild, ester odor
Melting Point	54-55
Boiling Point	125
Vapour Pressure	0.29 mPa
Specific gravity/Density	1.22 mg/l
Partion co-efficient	K_{OW} logP = -0.22 (calc.)
Solubility	In Water 1 kg/litre. Methanol – 100 %, Acetone – 70 %, n-octanol – 25 %, toluene – 6 % Sparingly soluble in kerosene and diesel oil.
Stability	On hydrolysis @ 20 °C, the calculated half-life at pH 5 = 96 days, at pH 7 = 66 days, and at pH 9 = 17 days.

4. MODE OF ACTION & USES

Monocrotophos is a broad-spectrum, fast-acting insecticide with both systemic and residual contact actions. It is particularly effective against Lepidoptera, Homoptera, and certain Coleoptera. The main use of monocrotophos is for foliar application to cotton. To a certain extent, monocrotophos is also effective against mites.

When applied under cool conditions, monocrotophos has been known to cause phytotoxic effects in apples, cherries, peaches, and sorghum.

Monocrotophos is available in a variety of formulations. There are the 200, 400, and 600 g a.i./litre concentrates, the 400, 500, and 600 g a.i./litre water-soluble concentrates, and the 250 g a.i./litre ULV formulation. Monocrotophos is also available inmixtures with other pesticides.

5. TOXICITY

Acute oral LD50 : 18 mg/kg (Male) & 20 mg/kg (Female) body wt

Acute dermal LD50 : 130 - 250mg./kg body weight.

Acute Inhalation LC50 : 0.08 mg/l air (4 hour)

Skin irritation : Not irritant to rabbits

Eye irritation : Non irritant to rabbits

Carcinogenicity : Non – Carcinogenic

Mutagenic : May be weakly Mutagenic

Reproductive Toxicity : No effect on reproduction at recommended field application doses.

6. ECOTOXICITY

LC_{50} (48 h) for Fish (a.i.)	Monocrotophos is moderately toxic to fish. 7 mg/l (Rainbow trout) and 23 mg/l(Bluegill sunfish)
EC_{50} (48 h) for Daphnia	0.023 mg of a.i./l.
Acute Oral LD_{50}.	0.94 mg/kg for bobwhite quail. 4.76 mg/kg for mallard ducks.
Bee Toxicity LD_{50}	Highly toxic to bees. (oral) 0.028 – 0.033; (topical) 0.025 – 0.35 mg a.i./bee.
% Biodegradability	Degradation in soil is very rapid; DT_{50}(lab.) 1-5 days
Sewage Toxicity	Toxic

7. COMPATIBILITY

Avoid contamination with oxidizing agents i.e., nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

8. HANDLING & STORAGE

Handling:

Use appropriate (impervious) clothing, gloves and closed foot ware to prevent the repeated contact with skin. Use flash proof and dust resistant goggles to prevent the contact with eyes.

Storage:

Technical monocrotophos and its formulations should be stored in the original labelled containers in locked, well-ventilated storage areas, preferably dedicated to insecticides. Do not expose to direct sunlight. Keep products out of reach of children and unauthorized personnel. Do not store near animal feed or foodstuffs.

9. DISPOSAL CONSIDERATIONS

Large amounts should be incinerated at high temperature in a unit with effluent gas scrubbing. When no incinerator is available, bury in an approved dump, or in an area where there is no risk of contamination of surface or groundwater. Before burying, liberally mix with sodium carbonate (washing soda) crystals to help neutralize the product, and with soil rich in organic matter. Comply with any local legislation.

Manufactured by:

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