NEMATICIDE

FOSTHIAZATE
Contact nematicide

Fosthiazate is a nematicide discovered and developed by ISK.

Fosthiazate provides a good and stable control of cyst, root-knot, root lesion and free-living nematodes in a wide range of crops such as potatoes, bananas, tomatoes, and other vegetables.
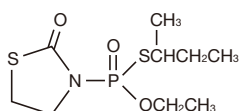
The control activities of fosthiazate remain unaffected by soil type, soil pH and soil temperature.

Since the early 1990's, ISK has commercialized fosthiazate in multiple countries.

Physico-Chemical Properties

Chemical structure

Class : organophosphate
IUPAC name : (RS)-S-sec-butyl-O-ethyl-2-oxo-1,3-thiazolidin-3-ylphosphonothioate
Molecular weight : 283.3
Molecular formula : $C_9H_{18}NO_3PS_2$
Vapour pressure : 5.6×10^{-1} mPa (25°C)
Water solubility : 9.00 g/L (pH 7, 25°C)
Form : Liquid, slightly yellow
Development code : IKI-1145

Toxicology & Ecotoxicology

Rat LD_{50} (oral) : 73 mg/kg (m), 57 mg/kg (f)
Rat LD_{50} (dermal) : 2,396 mg/kg (m), 861 mg/kg (f)
Rat LC_{50} (inhalation) : 0.83 mg/L (m), 0.56 mg/L (f)

Skin irritation : slight irritant (rabbit)
Eye irritation : irritant (rabbit)
Skin sensitization : sensitizer (guinea pig)

Avian LD_{50} (acute oral) : 10 mg/kg bw (quail)
Avian LD_{50} (acute oral) : 20 mg/kg (mallard duck)

Fish LC_{50} : 114 mg/L (trout, 96 h)
Fish LC_{50} : 171 mg/L (bluegill, 96 h)

Bees LD_{50} (acute oral) : 0.61 µg/bee (48 h)
Bees LD_{50} (acute contact) : 0.26 µg/bee (48 h)

Daphnia magna EC_{50} : 0.47 mg/L (48 h)

Application

Broadcast and soil incorporation to control nematodes (*Meloidogyne* spp., *Heterodera* spp. and *Pratylenchus* spp.), aphids, mites, thrips, etc in vegetables, potatoes, tomatoes and bananas, etc. Applied mainly at 1.5-3.0 kg a.i./ha.

Mode of Action

Inhibition of acetylcholine esterase in nematodes and other pests.
Its excellent systemic action also provides high performance against nematodes and foliar insect pests.
Acts against motile larval stages of nematodes in the soil and prevents invasion to roots of crops.

Product

Trade Names	NEMATHORIN, CIERTO, NEMABUSTER, 福氣多, etc.		
Formulations	1.5%G, 5%G, 10%G, 30%SL, 150EC		
Registered Countries	Asia	China, Japan, South Korea, Taiwan, Philippines, etc.	
	Europe	Belgium, France, Germany, Hungary Romania, Italy, Morocco, Netherlands, Spain, Turkey, UK, etc.	
Crops	Vegetables, Potatoes, Sweet potatoes, Bananas, Pine tree, etc.		

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The Efficacy of Fosthiazate on Root-knot nematodes in Tomato

Untreated

Fosthiazate (2 kg a.i./ha)

Damaged Melon by *Meloidogyne incognita*

Untreated   Fosthiazate

Characterisitics

Excellent control of major plant prasitic nematode pests such as root-knot, root-lesion, cyst, burrowing nematodes

It exhibits nematicidal and nemastatic activities.

Stable activities in various soil conditions (soil pH, temperature, moisture, etc.)

Improves yield and quality of crops

Excellent selectivity on crops

Applied at relatively lower dose rates compared with other soil applied insecticides & nematicide (1.5 to 3.0 kg a.i./ha)

Pest Spectrum

Nematodes	Root-knot nematode	*Meloidogyne* spp.
	Root-lesion nematode	*Pratylenchus* spp.
	Cyst nematode	*Globodera* spp., *Heterodera* spp.
	Burrowing nematode	*Radopholus simils*
	Potato rot nematode, Iris nematode	*Ditylenchus destructor*
	Spiral nematode	*Helicotylenchus sp.*
	Stylet nematode	*Tylenchorhynchus spp.*
	Chrysanthemum folier nematode	*Aphelenchoides ritzemabosi*
	Pine wood nematode	*Bursaphelenchus xylophilus*
	Rice white-tip nematode	*Aphelenchoides besseyi Christie*
Other insects	Thrips, Aphids, Mites, Whiteflies, Bugs, Beetles	

Meloidogyne incognita

Globodera rostochiensis