

INSECTICIDE

CHLORFLUAZURON

Insect growth regulator

Chlorfluazuron is one of the leading benzoylphenylurea IGR insecticides. This compound, discovered and developed by ISK, was launched in the late 1980's. Since then, chlorfluazuron has been globally used under the trademark of Atabron for controlling Lepidopteran pests on cotton, bean, vegetables and fruit trees, etc.

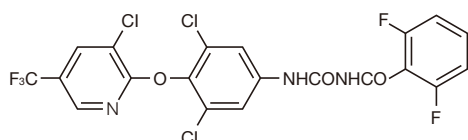
Chlorfluazuron is an insect growth regulator that inhibits chitin synthesis and provides good control of various pest insects, especially Lepidoptera, at a low dose rate.

Chlorfluazuron has very little negative impact on natural enemies and pollinating insects, and can be used in integrated pest management programs.



Physico-Chemical Properties

Chemical structure



Class : benzoylurea

IUPAC name : 1-[3,5-dichloro-4-(3-chloro-5-trifluoromethyl-2-pyridyloxy) phenyl]-3-(2,6-difluorobenzoyl)urea

Molecular weight : 540.7

Molecular formula : C₂₀H₉Cl₃F₅N₃O₃

Vapour pressure : 1.599x10⁻³ mPa (20°C)

Water solubility : 0.012 mg/L (20°C)

Form : White solid

Development code : IKI-7899

Toxicology & Ecotoxicology

Rat LD₅₀ (oral) : > 8,500 mg/kg (m/f)

Rat LD₅₀ (dermal) : > 1,000 mg/kg (m/f)

Rat LC₅₀ (inhalation) : > 2.4 mg/L (4 h) (x/f)

Skin irritation : non irritant (rabbit)

Eye irritation : irritant but also physical irritant (rabbit)

Skin sensitization : not a sensitizer (guinea pig)

Avian LD₅₀ (acute oral) : > 2,510 mg/kg (quail)

Avian LD₅₀ (acute oral) : > 2,510 mg/kg (mallard ducks)

Fish LC₅₀ : > 1,071 mg/L (bluegill, 96 h)

Bees LD₅₀ (oral) : >100 µg/bee

Daphnia magna EC₅₀ : 0.304 µg/L (48 h)

Application

Control of Lepidoptera such as *Helicoverpa*, *Spodoptera* and *Pseuda-plusia* on soybean; and *Plutella*, *Spodoptera* and thrips on vegetables; *Adoxophyes*, *Ascotis* on tea and fruit trees. Also used on potatoes, ornamentals and turf. Application rate : 10-100 g a.i./ha

Mode of Action

Chlorfluazuron, which acts as an anti-molting agent, inhibits biosynthesis of chitin in the insect cuticle, which causes loss of cuticle elasticity and firmness, and results in abortive molting. It belongs to IRAC Group 15.

Product

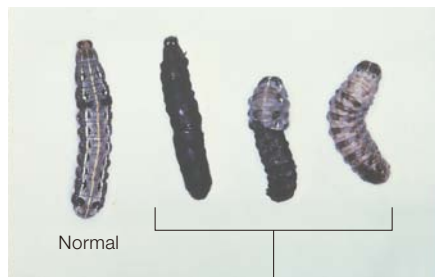
| | | |
|-----------------------------|---|--|
| Trade Names | ATABRON, ISHIPRON, NICE EAGLE, 愛扶農, 抑太保, etc. | |
| Formulations | 5%EC, 10%SC | |
| Registered Countries | Asia | China, India, Japan, Philippines, South Korea, Taiwan, Thailand, Vietnam, etc. |
| | Americas | Argentina, Brazil, Peru, etc. |
| Crops | Corn, Cotton, Fruit trees, Soybean, Tea, Turf, Vegetables, etc. | |



ISHIHARA SANGYO KAISHA, LTD.

URL : <http://www.iskweb.co.jp> E-mail : isk.bio@iskweb.co.jp
1-3-15 Edobori, Nishi-ku, Osaka 550-0002 TEL +81-6-6444-7154

Inhibition of Larval Molting of *Spodoptera litura* by Chlorfluazuron Application



Abnormal molting when chlorfluazuron was treated at 5th instar larvae

Characteristics

- Chitin synthesis inhibitor
- Interrupts insect molting and growth
- Active against larval stages of a broad spectrum of Lepidopteran insects
- Long residual activity
- Active against certain Coleoptera, Hemiptera, Thysanoptera and Blattodea
- Stomach toxin - active through ingestion
- Effective at low rates (10-100 g a.i./ha)
- Easy to use (liquid formulation)
- Safe to beneficial insects



The Efficacy of Chlorfluazuron on DBM (7 days after application)



Untreated cabbage



Chlorfluazuron 5%EC/1 L/ha (50 g a.i./ha)



Pest Spectrum

| | | | | |
|--------------|----------|----------------------------------|----------------------------------|-----------------------------------|
| Lepidoptera | | <i>Acrolepiopsis nagaimo</i> | <i>Adoxophyes honmai</i> | <i>Adoxophyes orana</i> |
| | | <i>Agrotis ipsilon</i> | <i>Alabama argilacea</i> | <i>Anticarsia gemmatilis</i> |
| | | <i>Archips audax</i> | <i>Archips breviplicanus</i> | <i>Archips fuscocupreanus</i> |
| | | <i>Ascia monuste</i> | <i>Ascotis selenaria</i> | <i>Autographa nigrisigna</i> |
| | | <i>Diaphania indica</i> | <i>Helicoverpa armigera</i> | <i>Hellula undalis</i> |
| | | <i>Homona magnanima</i> | <i>Mamestra brassicae</i> | <i>Orygia thyellina</i> |
| | | <i>Parapediasia teterrella</i> | <i>Pieris rapae</i> | <i>Plutella xylostella</i> |
| | | <i>Pseudoplusia includens</i> | <i>Rachiplusia nu</i> | <i>Rhopobota naevana</i> |
| | | <i>Spodoptera depravata</i> | <i>Spodoptera exigua</i> | <i>Spodoptera frugiperda</i> |
| | | <i>Spodoptera litura</i> | <i>Stathmopoda masinissa</i> | <i>Tuta absoluta</i> |
| Hemiptera | Whitefly | <i>Bemisia tabaci</i> | <i>Trialeurodes vaporariorum</i> | |
| Thysanoptera | Thrips | <i>Thrips palmi</i> | <i>Thrips tabaci</i> | <i>Frankliniella occidentalis</i> |
| | | <i>Ponticlothrips diospyrosi</i> | | |
| Blattodea | Termite | <i>Coptotermes formosanus</i> | <i>Reticulitermes speratus</i> | |
| Coleoptera | | <i>Anomala octiescostata</i> | <i>Cassida nebulosa</i> | <i>Phyllotreta striolata</i> |
| | | <i>Popillia japonica</i> | <i>Sphenophorus venatus</i> | |



Helicoverpa armigera



Spodoptera litura



Plutella xylostella