

Product Safety

After world-wide testing, lambda-cyhalothrin formulations are now registered and used in over 100 countries. They are approved by the Health and Safety Executive in the United Kingdom and the Environmental Protection Agency in the USA for the control of insect pests.

Mammalian toxicity

ICON EC Acute Toxicology	Classification
Acute Oral Median Lethal	male: 923 mg/kg female 923 – 1930 mg/kg
Acute Dermal Median Lethal Dose, Rat (mg/kg)	1780 mg/kg
Eye Irritation	severely irritating
Skin Irritation	severely irritating
WHO Class II (moderately hazardous)	

The active ingredient lambda-cyhalothrin is not a carcinogen or teratogen.

Fate in Soil

Lambda-cyhalothrin is readily degraded in most soils and the products of degradation are ultimately converted to carbon dioxide and other benign metabolites. It does not leach through the soil. It is almost insoluble in water. Therefore, it is unlikely to produce hazard in normal use.

Fate in Water

Although lambda-cyhalothrin can be shown to be toxic to fish and some aquatic invertebrate organisms under laboratory conditions, it presents little hazard to aquatic life under field conditions due to the intended manner of use (not expected to result in exposure to water) and very low application rates.

Applicator Exposure

When label recommendations are followed and appropriate personal protective equipment worn, there is negligible risk to the applicator.

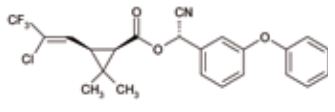
WHO Specification

Lambda-cyhalothrin and its formulations have successfully completed the joint FAO/WHO specification scheme under new procedure: Lambda-cyhalothrin technical ai:

WHO Specification 463/TC (2007)

Lambda-cyhalothrin EC: WHO Specification 463/EC (2007)

Physico-Chemical Properties of Active Ingredient

Chemical name (IUPAC):	α -cyano-3-phenoxybenzyl 3-(2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethylcyclopropane carboxylate, a 1:1 mixture of the (Z)-(1R,3R), S-ester and the (Z)-(1S,3S), R-ester
Chemical Abstract Registry Number:	91465-08-6
Common name:	Lambda-cyhalothrin (ISO)
Molecular formula:	$C_{23}H_{19}ClF_3NO_3$
Chemical Structure:	
Molecular weight:	449.9
Appearance:	White solid
Melting point:	49.2°C
Solubility (water):	0.005 mg/l
Solubility (other):	acetone, ethyl acetate, hexane, methanol, toluene, xylene
Vapour pressure:	2.0×10^{-10} kPa at 20°C



- Versatile formulation for vector control and management of public health pests
- Successfully evaluated and recommended by the world Health Organisation Pesticide Evaluation Scheme (WHOPES)
- Broad spectrum activity against public health pests, including those responsible for malaria and Dengue fever transmission



An effective broad spectrum insecticide for the control of public health pests

READ THE LABEL BEFORE YOU BUY: USE PESTICIDES SAFELY.
 ICON EC contains lambda-cyhalothrin
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Introducing ICON® EC

Insecticides are a vital element in the control of vector borne diseases, which remain a constant threat to a significant proportion of the world's population. In particular, the space spraying of insecticides such as ICON® EC, is still the key to controlling mosquito-borne viral diseases such as Dengue Fever or West Nile.

Space spraying, or fogging, is the treatment of open or residential spaces with airborne droplets of insecticide to kill flying mosquitoes. The timing of application is critical as it should coincide with the periods of peak flying activity. It is often used as part of an integrated management program alongside sanitation, source reduction and larviciding. The aim of integrating the approaches is

to reduce the overall mosquito population by killing both the biting and breeding adults and reducing the numbers of larvae reaching full development.

What is ICON EC?

ICON EC is an emulsifiable concentrate formulation containing lambda-cyhalothrin. This second generation pyrethroid is active at exceptionally low rates against a broad spectrum of insects, including those important as vectors of disease.

Fast Acting Control

Lambda-cyhalothrin rapidly penetrates the insect cuticle and disrupts nerve conduction resulting in quick insect knockdown. Disorientation and immobilization occurs within minutes followed by paralysis and death. Sub-lethal doses are repellent to most insects and cause an anti-feeding effect, both of which add to the immediate impact on insect populations in the treated area.

Product Information

- ICON EC is an emulsifiable concentrate (EC) formulation containing the second-generation, synthetic pyrethroid active ingredient, lambda-cyhalothrin
- ICON EC has been successfully evaluated by the World Health Organisation Pesticide Evaluation Scheme (WHOPEs) for use as a space spray for mosquito control
- ICON EC is a broad-spectrum, non-systemic insecticide with contact, residual and stomach action
- Icon EC can be used as part of a resistance management program alongside ACTELLIC® EC

Spectrum of Activity

- ICON EC is highly active against all mosquitoes, including those responsible for malaria and dengue fever transmission
- ICON EC is highly effective against other commonly found public health pests such as nuisance mosquitoes, houseflies, ticks, cockroaches, fleas, etc.

Technical Data

Active ingredient: lambda-cyhalothrin

- synthetic pyrethroid insecticide of the highest potency
- effective at exceptionally low application rates
- registered world-wide
- manufactured according to WHO specification 463/EC(2007)

Formulation: ICON EC

- available as two formulation strengths containing either 25 or 50 grams of lambda-cyhalothrin per liter (availability will vary by country)
- versatile formulation that can be applied via ULV or thermal fogging
- low odor

Application rates and use

Always follow the instructions on the label. The product should be applied by an appropriately trained operator.

Space Spray Applications

Treatment	Diluent	Application Rate	Application volume
Thermal FOG			
Hand-held	Kerosene or diesel oil	1-2 g a.i. / ha	2 l/ha
Vehicle-mounted		2g a.i. / ha	5 l/ha
Cold FOG			
Aerosol ULV	Kerosene or diesel oil	1-2g a.i. / ha	0.5 l/ha
Hand-held or vehicle-mounted			

General Pest Control

For the control of nuisance insect pests

Treatment	Diluent	Application rate (mg a.i./m ²)	Volume of diluted product to be applied
Residual	Water	20	40mls / m ²

Mixing

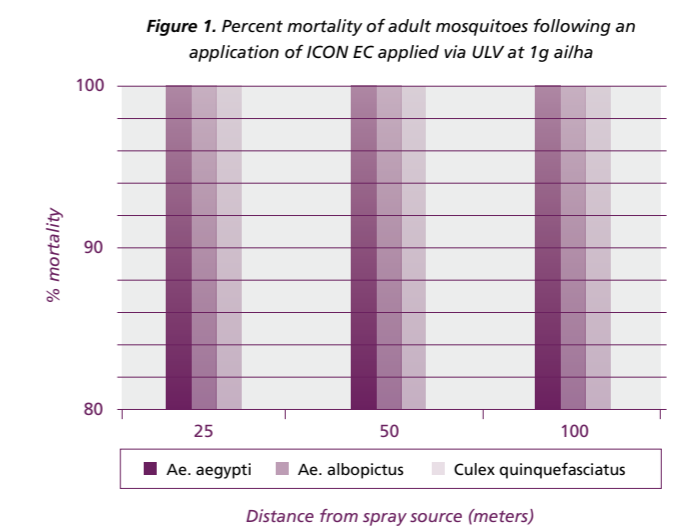
- Prepare no more spray mixture than is needed for the immediate operation.
- Add the measured quantity of concentrate to the appropriate diluent in the half-filled spray tank. Maintain agitation while topping up.
- Always stir the spray mixture well and apply within a few hours.



Performance

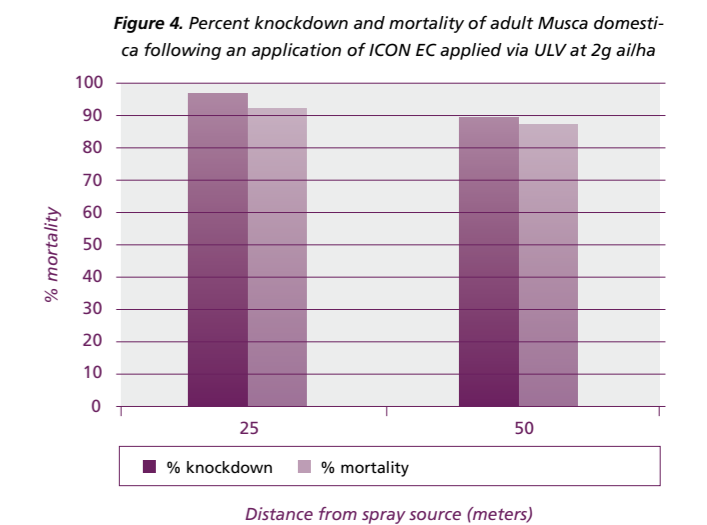
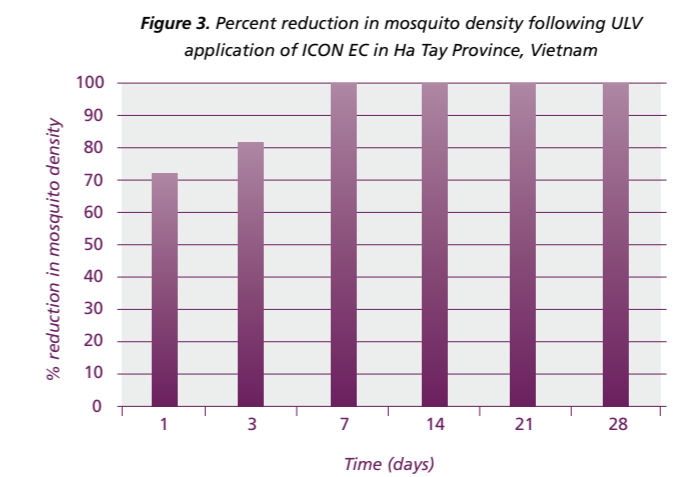
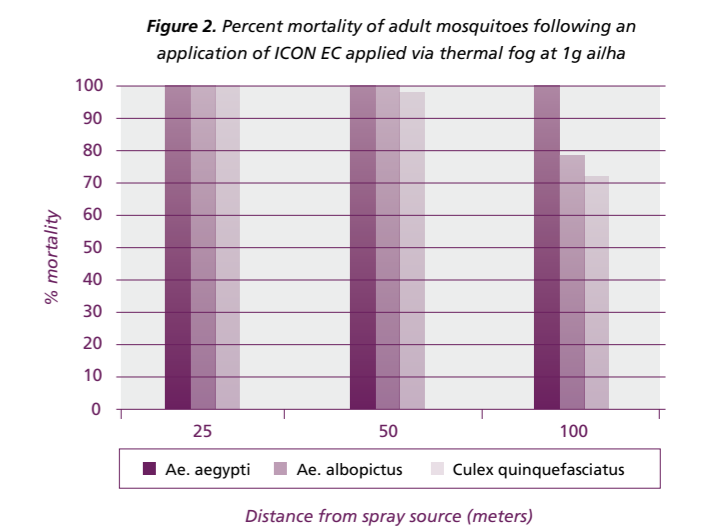
Field drift trials conducted by the Vector Control Research Unit, Universiti Sains Malaysia, demonstrated ICON EC to be a highly versatile product (Syngenta Internal Report, 2006). ICON EC was effective in controlling *Aedes aegypti*, *Ae.albopictus* and *Culex quinquefasciatus* when applied as either a ULV (figure 1) or thermal fog (figure 2) at a distance of up to 100 meters.

The excellent efficacy was further demonstrated in village scale field trials in Ha Tay Province, Vietnam, where ICON EC was applied at 2g a.i./ha via ULV to the indoor and exteriors of dwellings (Syngenta Internal Report, 1998). Collections of indoor resting mosquitoes were undertaken



2 days before treatment and at various intervals up to one month post treatment. The results demonstrated a 100% reduction in mosquitoes within one week of application (Figure 3.) The high level of control was maintained for at least 4 weeks post application.

ICON EC is also effective against many other public health pests. This is demonstrated by results of drift trials undertaken in Malaysia against the house fly, *Musca domestica* (Syngenta Internal Report, 1990). ICON EC provided high levels of knockdown and kill of adult flies up to 50 meters away from the spray source (figure 4).



References:

Syngenta Unpublished Report (2006) Field evaluation of ICON EC as space spray formulation. Report submitted by Vector Control Research Unit, Universiti Sains Malaysia.

Syngenta Unpublished Report (1998) Field evaluation of ICON 2.5 EC space spray against Dengue Vectors in the North of Vietnam. Report submitted by National Institute of Hygiene and Epidemiology, Vietnam.

Syngenta Unpublished Report (1990) Evaluation of ICON EC when applied as ULV for control of *Musca domestica*.