



# New Residual Mosquito Larvacides Containing Novaluron

## MOSQUIRON®

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# ORIGINAL FORMULATION

**Trade Name:** Rimon 10EC

**Common Name:** novaluron

**Chemical Name:** N-[[[3-chloro-4-[1, 1, 2-(trifluoro-2-trifluoromethoxy)ethoxy]phenyl] amino]carbonyl]-2,6-difluorobenzamide

**Family:** Benzoyl Urea

**Mode of Action:** Chitin Synthesis Inhibitor

# WHO RESEARCH REPORT 2004

## Conclusions:

1. “Given its considerable activity against all developmental stages of mosquitoes, novaluron offers the flexibility of timing of application against asynchronous broods.”
2. “Field studies in artificial and natural habitats showed that novaluron 10EC was effective against populations of *Ae. aegypti* (Mexico and Thailand), *Anopheles* species (Mexico and Sri Lanka) and *Culex* species (India, Mexico and USA) at application rates of 10-50 ppb.”

# WHO RESEARCH REPORT 2004

## Conclusions (cont'd):

3. “Studies on the efficacy of this formulation in water-storage containers against *Ae. aegypti* provided long-lasting residual activity for 5-6 months.”
4. “ Similarly, in confined sources of larvae such as gem pits and disused wells, novaluron at practical dosages provided control for up to 4 months.”

## Recommendations:

1. The use of novaluron larvacide for application in temporary mosquito habitats, polluted water and non-drinking water-storage containers at 10-50 ppb a.i. The higher dosages are needed for polluted and vegetated habitats.

# WHO RESEARCH REPORT 2004

## Recommendations (cont'd):

3. Although the 10% EC formulation of novaluron has been found to show a high level of activity against larvae of various groups of mosquitoes, there is a critical need for the development and evaluation of other formulations (e.g. granules and tablets) operationally suitable for use in specific larval habitats such as containers and other confined sources of larvae.
4. WHO should conduct an assessment of the safety of novaluron for use in drinking water as a mosquito larvicide.

## WHO RECOMMENDATION 2007

- ✓ Novaluron is recommended for use in drinking water.

# CURRENT OPERATIONAL USE NOVALURON 10EC

Operational use for mosquito larvaciding is limited.

Brazil, however, uses novaluron extensively in drinking water containers as opposed to -

temephos resistance

Bti formulations short residual effect

Brazil's comment:

“there is a critical need for the development and evaluation of other formulations (e.g. granules and tablets) operational suitable for use in specific larval habitats such as containers and other confined sources of larvae.”



Formed in 1999

▶ Vector Management

- ▶ Larval habitat surveillance
- ▶ Larval and adult mosquito monitoring & identification
- ▶ Larviciding of catch basins and surface standing water
- ▶ RT-PCR analysis
- ▶ RESEARCH & PATENTS (Long Term Residual Carriers)

▶ Distributor of Control Products and Equipment

Sales Agent for Tumaini Products

# MOSQUIRON LABORATORY STUDIES

## 2005 TO 2009

- ▶ 200 litre drums with water, with and without organic matter, each treated with 1 CRD with various concentrations of novaluron
- ▶ At bi-weekly intervals 1 litre of water drawn out the drum into stainless steel trays; water drawn down to 10 cm from the bottom of the drum and refilled with fresh water
- ▶ *Aedes aegypti* eggs introduced into the steel trays and monitored daily for mortality until all the hatched larvae were dead or there was successful adult emergence
- ▶ With the full strength CRD successful adult emergence was not achieved for a six month period after treatment







# MOSQUIRON<sup>®</sup>

## PRODUCT DETAILS

- ✓ Addresses “the critical need for the development and evaluation of other formulations (e.g. granules and tablets) operationally suitable for use in specific larval habitats such as containers and other confined sources of larvae.”
- ✓ Registered for use in drinking water by the E.P.A. in the U.S.A.



# MOSQUIRON



- ✓ Increases solubility of novaluron in water from 3 ppb to 10-15 ppb vs WHO Report, “Field studies in artificial and natural habitats showed that novaluron 10EC was effective .....at application rates of 10-50 ppb.”
- ✓ Increases residual activity in excess of 6 months regardless of polluting organic matter vs WHO Report, “50 ppb a.i. dosages are needed for polluted and vegetated habitats.”

These new properties are attributed to the formulations utilizing a novel carrier technology (involving food grade inerts) which has been patented in numerous countries.



# EFFICACY OF NOVALURON AGAINST *AE. AEGYPTI* • NATHALIA GIGLIO FONTOURA

Control



larva

After exposure to novaluron (mortality)



white



distended



visible adult inside



pupa



adult



partially emerged



tarsi deformed





# TUMAINI CONTROLLED RELEASE TECHNOLOGIES INC.

Formed in 2009 (Spin-off from Pestalto)

## Responsibilities

- Registration Support
- Manufacturing
- Research

# Mosquiron 2010 Field Trials in Canada and the United States

Marshall - WI site



Meansville - GA site





# Mosquiron 2010 Field Trials in Canada and the United States

Panama City -FL Site

