



# Efficacy of spraying against adult mosquitoes in northern Italy



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## Aim:

In 2013 a spraying campaign against adult mosquitoes was organized in sites where human cases of WNV were reported. The struggle was carried out in Veneto Region and sampling was done to evaluate the mosquito's reduction. Data on the efficacy of adulticide applications performed in Mantova (Lombardia Region) during 2007 and 2008 are also reported. ULV is not permitted in Italy and two are the techniques used to apply adulticides. A two years (2011-2012) long study was carried out to compare the relative effectiveness on tiger mosquito *Aedes albopictus* of two different kinds of application (Atomizer mist sprayer versus stretcher power sprayer) and two different insecticides (Microsin versus Etox 20/20).

## Veneto Region, 2013

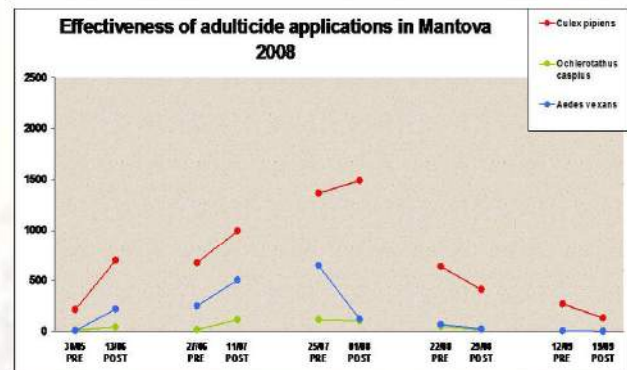
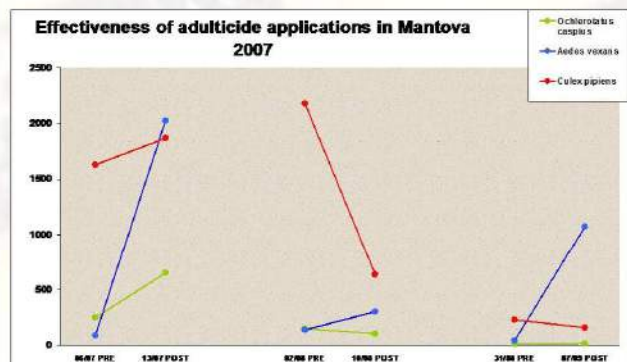
In 2013 an adulticide campaign against adult mosquitoes was organized in sites where human cases of WNV were reported. The tests were carried out in the municipality of Jesolo (J) (Venice) and in two neighbouring municipalities, Erbè (E) and Isola della Scala (IS) (Verona). An area of 10 km<sup>2</sup> in J and two areas of 2 km<sup>2</sup> in E and in IS were treated. Two bordering areas were left untreated as UControl. Three sampling using CDC-CO2 traps were performed in treated and in untreated areas, during the night before and after treatment. In the treated areas the following protocols were used: 1) Tetramethrin (T)10%-Piperonyl butoxide (PBO)10% (1% dilution, total volume 330l) in J, 2) Cypermethrin (C)10%-T2%-PBO15% (0.5% dilution, total volume 400l) in E, 3) C10%-T2%-PBO5% (0.5% dilution, total volume 600l) in IS. Treatments were performed through atomizer

Sites	Area	Pre treatment mean <i>Cx. pipiens</i>	Post treatment mean <i>Cx. pipiens</i>	% of reduction
Jesolo (J)	Treated Tetramethrin	968.0	890.5	8.01%
	Untreated	1096.0	913.0	16.64%
Erbè	Treated Cypermethrin	348.7	298.0	14.53%
Isola d. Scala	Treated Cypermethrin	527.7	108.7	79.41%
Erbè/Isola d. Scala	Untreated	571.3	510.7	10.62%

A significant reduction (ANOVA test, p=0.05) of *Cx. pipiens* density was achieved only in site Isola della Scala.

## Mantova 2007 - 2008

In the 2007 and 2008 in Mantova (Regione Lombardia – North West Italy) the control of mosquitoes was based on adulticides only, trapping with CDC CO2 traps was performed before and a few days after treatments to evaluate the effect of the applications on the different species of mosquitoes. Applications were done by the use of Atomizers, the used insecticides were pyrethroids, mainly Cypermethrin and permethrin based.



## Results:

Adulticides performed by mist sprayer are not really effective against good flying species like *Cx pipiens*, *Ae vexans* and *Oc caspius* while can control *Aedes albopictus* for a couple of weeks. After only one day the population of mosquitoes is not different if compared to the day before the application. The asian tiger mosquito seems to be the only species on which adulticides are effective. The stretcher power sprayer permits a longer control probably due to the higher volume of solution applied per surface unit and the reduced loss of product for drifting. Not a big difference was found between the two tested insecticides.

## Conclusions:

The use of adulticides is still common in many situations even if there are clear indications they are not effective against good flying mosquitoes. In Italy ULV is forbidden because of the high drift which causes the uncontrolled dispersal of the insecticide in large areas. Atomizer applications are effective only against the Asian Tiger Mosquito even if it is more effective the use of the Stretcher Power Sprayer probably because the application can be better controlled and the droplet size is bigger, permitting to reduce the loss of insecticide and to better wet the vegetation, enhancing the lasting action.



## Atomizer versus Stretcher power sprayer

Mosquito control in large areas is usually performed in Italy using Atomizer mist sprayer which produces droplet size around 50-100 µm. In small surfaces like private gardens the stretcher power sprayer is used as it has a very small drift because of the smaller spray and the larger size of the droplet which are around 150 – 200 µm. Human landing assessments were carried out in a green areas divided in parcels were adulticides were applied with the two different techniques. Monitoring were done in the next weeks to evaluate residuality. Two different insecticides were used: Microsin® (Cypermethrin 10%, Tetramethrin 2% and Piperonyl butossid 5%) and Etox® 20/20 CE (Etofenprox 20%, Tetramethrin 3% and Piperonyl Butossid 15%). Throughout 2011 and 2012 6 repetitions were performed. The target species was the asian tiger mosquito *Aedes albopictus*.

