

# Control of native mosquitoes in wetlands and invasive mosquitoes in urban areas







### 65 species in european territories 200 species in french overseas territories

#### Natural areas



Salt marshes :Ochlerotatus caspius Ochlerotatus detritus Ochlerotatus mariae

#### **Urban areas**

Culex pipiens Aedes albopictus

**Tree hole** : Ochlerotatus geniculatus Anopheles sp



Floodplain

Ochlerotatus rusticus Ochlerotatus cantans Aedes cinereus Aedes vexans Aedes vittatus Ochlerotatus sticticus Ochlerotatus punctor Ochlerotatus pullatus Culex modestus Coquillettidia sp. Culiseta sp. Anopheles sp.







Mosquito control in european and overseas territories







# Life + program IMCM

- Entomological studies
- 1 Breeding sites mapping
- 2 Appropriate technics
- 3 Dosage assement
- 4 Control strategy





# Mosquito control program stones - Mapping









E.I.Démoustication Rhône-Alpes



## Mosquito control program stones – physical /cultural control





### Mosquito control program stones – larvae control





## Mosquito control program stones – larvae control

Wetlands

Arbovirus transmission Control of nuisance mosquitoes

Bacillus thuringiensis ser. H14 (Vectobac/Aquabac) Bt/Bacillus sphaericus (VectoMax)

180 000 ha 40 % aerial 60 % ground Hand-operated sprayer

Mist blower (ground/aerial) Granule blower (ground /aerial)

Cold fogger (ground /testing)





#### Long term effect treatment wished

Larviciding with residual effect : VectoMax G



Treatments for urban breeding sites after a positive ovitrap in the neighborhood Retreatment every 4-5 weeks





### Mosquito control program stones – adults control

#### Wetlands



Arbovirus/Malaria transmission Or Eradication of non-native mosquito

deltametrhin (Aqua K-othrine Cold fogging Thermalfogging

Residual treatment Ethofenprox (paint : testing)

100 % ground application











### Mosquito control program stones – trapping

### Wetlands



#### Urban areas







Figure 1 : Nombre de moustiques capturés

### Mosquito control program stones – dosage assement

calibrate processing equipment use metering pump = reduce effluents





A. Buse hydraulique, par exemple pulvérisateur à dos avec vanne de commande





Hydraulic nozzle

B. Buse pneumatique, par exemple pulvérisateur motorisé à dos ou pulvérisateur monté sur pot d'échappement





Pneumatic nozzle

C. Atomiseur rotatif, par exemple disque ou cage rotatif ou dentelé









Droplet size (µm)	Time for a fall of 10 m	Droplet density / cm <sup>3</sup>
1	93,7 h	19 120
5	3,7 h	152
10	56 min	19,2
20	14 min	2,38
50	135 sec	0,15
100	36 sec	0,0192

### Mosquito control program stones



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#### Mosquito Control : a need for permanent improvements

PLAN Establish the objectives and processes necessary to deliver results in accordance with the expected output.

DO Implement the plan, execute the process, make the product. Collect data for charting and analysis in the following steps.

CHECK Study the actual results (measured and collected in "DO") and compare against the expected results .

ACT If the CHECK shows that the PLAN that was implemented in DO is an improvement to the prior standard (baseline),







# Thank you for your attention





