

Bayer Environmental Science



Innovative water dispersible granule insecticide for residual sprays

K-Othrine® WG 250

Broad-spectrum, fast-acting, water-dispersible insecticide for residual surface application, to be used for the control of adult mosquitoes, sand flies, flies, fleas and bed bugs.



K-Othrine® WG 250 is a 25% deltamethrin water dispersible granule formulation.

It is a better alternative to liquids (suspension concentrate) and a replacement for conventional wettable powders because of reduced operator exposure, reduced bulk thus reducing storage and transport costs, no staining and good residual activity.

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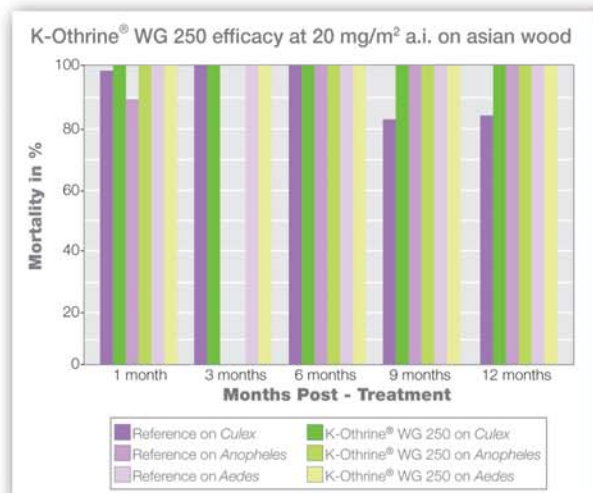
Innovative formulation

The WG formulation has been particularly designed for public health purpose as it offers – compared to other formulations

- Absence of dust during the preparation of the application
- The best fluidity over powders
- Ease to emptying the sachets leaving no residues

Bio-efficacy

Laboratory trials



Laboratory efficacy trials on asian wood: K-Othrine® WG 250 at 20 mg a.i./m² has proved to be very efficient and persistent by reaching 100% mortality after 12 months, equivalent to the reference pyrethroid against *Culex*, *Anopheles* and *Aedes*.

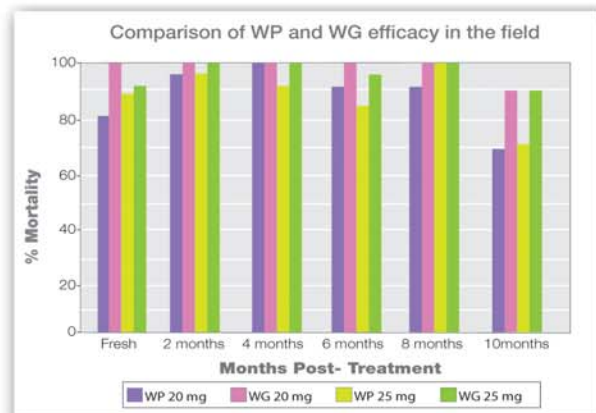


Laboratory efficacy trials on concrete: K-Othrine® WG 250 at 20 mg a.i./m² still shows same efficacy and long lasting effect as on wood for *Culex*, *Anopheles* and *Aedes* control while the reference is below expected efficacy level after 6 months.

WHO Evaluation Scheme (ref WHO/CDS/WHOPES/2002.6)

- In India, deltamethrin 25% WG was found effective against *An. fluviatilis*, causing > 90% mortality at least for 4 months on common sprayable surfaces at an application rate of 25 mg a.i./m². The spray in the modified traditional huts reduced the entry rate and feeding success of the vector species. The WG formulation was comparable with WP in its residual efficacy and killing effect.
- In Côte d'Ivoire, spraying of experimental huts with WG formulation showed a relatively high deterrent effect and induced exophily among *An. gambiae* and *An. funestus*, but with low mortality rates of entering mosquitoes. WG formulation was found better than WP in terms of causing more induced exophily and mortality rates of the two species. Contact bioassays provided more than 95% mortality for 4 months.
- In large-scale evaluations against *An. culicifacies* in India and *An. gambiae* in Côte d'Ivoire, deltamethrin WG sprayed at 20 mg a.i./m² at intervals of 3 and 6 months respectively, significantly reduced man biting rates, vectorial capacity and sporozoite inoculation rates. In experimental hut studies, no major side-effects were observed among volunteers who slept in deltamethrin-sprayed huts. The village-scale studies have shown that deltamethrin 25% WG spray was acceptable to the community and caused no major side effect on spraymen.

K-Othrine® WG 250 has successfully passed WHOPES and specifications will be published soon.



Field trials

Hut trials by VBCD in Thailand against *An. minimus* show the long lasting effect of the WG formulation which still achieved 90% mortality after 10 months even at 20 mg/m².

Recommendations for use

Target	Sites of Application	Dilution Rate	Application Rate	Nominal deposit level of active ingredient
Crawling & Flying insects	Surfaces (e.g. wood, concrete, mud, thatch etc.)	1 x sachet K-Othrine® WG250 to 10 L of water	4 L of diluted insecticide per 100 m ²	20 g sachet = 20 mg/m ²

Application rates

The subsequent residual life of K-Othrine® WG 250 depends on the:

- the species to be controlled
- the type surface sprayed
- the physical and chemical conditions to which the deposit is exposed

Method of application

K-Othrine® WG 250 is either packed in 20 g sachets which offer ease of use and accuracy of measurement.

For residual control of insects K-Othrine® WG 250 should be diluted with water and applied with any suitable compression sprayer producing coarse droplets.

The spray should be applied, typically, at a rate of 4 litres / 100m² or to a point of run-off.

On very absorbent surfaces run-off may not be attained and these surfaces should be thoroughly wetted.

For mosquito control and sand fly control in houses:

Firstly the furnishings, cooking utensils etc. should be removed outside or covered with protective sheets before spraying. The walls should be sprayed evenly in vertical spray pattern, spraying from top to bottom of all internal walls. Ensure even coverage.

Special attention should be paid to wall and roof eaves where gaps exist and mosquitoes may enter. If the roof is of thatch or similar then the internal surface of the roof should be sprayed.

Toxicity

K-Othrine® WG 250		
Oral (rat)	LD ₅₀ (mg/kg bw)	> 3 465
Dermal (rat)	LD ₅₀ (mg/kg bw)	> 2 090
Acute inhalation toxicity (rat)		
LC ₅₀ (mg/kg bw) from 1.474 to <4.062 mg/l air 4h		
<small>(Remarks: lab testing not relevant because of low dust formation)</small>		
Skin irritation (rabbit)	slightly and reversible irritating	
Eye irritation (rabbit)	slightly and reversible irritating	
Skin sensitisation (guinea pig)	Non-sensitizing (Buehler test)	
Further information :		
Cutaneous sensations may occur, such as burning or stinging on the face and mucosae.		
However, these sensations cause no lesions and are of a transitory nature (max. 24 hours).		

Environmental protection

- Prepare only the amount of required solution for immediate usage. Do not store diluted material.
- Do not dispose of any excess diluted product and rinsings of sprayers into waterways, ponds, streams etc... It disposed of on level ground away from any water sources and crops.

Soil

Persistence and Degradation:

Deltamethrin is rapidly degraded with an estimated realistic DT₅₀ for field dissipation of 3 weeks and a DT₅₀ < 1 year. Thus, Deltamethrin does not accumulate in soil and the risk of leaching into deep soil layers can be excluded.

Mobility:

As Deltamethrin is considered as having a low potential to leach through soils therefore it has a low potential to contaminate ground or surface waters.

Ecotoxicity

Fish (96h) Rainbow trout	LC ₅₀	0.26 µg/l
Daphnia (48h) semi-static	LC ₅₀	0.11 µg/l
Earthworm (14d)	LC ₅₀	>1 290 mg/kg soil



Safety advice

- Wear suitable protective clothing (coveralls), synthetic rubber/PVC gloves when handling the product and in addition eye protection (goggles or face shield) when applying the spray.
- Do not breathe spray mist. Otherwise wear respiratory protective equipment and eye protection.
- Wash splashes from skin and eyes immediately with plenty of water.
- Exclude all persons and animals during treatment. Unprotected persons and animals should be kept

away from treated areas until surfaces are dry.

- Do not apply directly to animals.
- When using do not eat, drink or smoke.
- Wash hands and exposed skin before meals and after work.
- Do not spray on food or surfaces on which food is stored, prepared or eaten. Cover all foodstuffs before application. Protect food-preparing equipment and eating utensils from contamination during application.

- Toxic to fish and other aquatic life. Do not contaminate ponds, waterways or ditches with the product or used container. Remove or cover fish tanks and bowls before application.
- Dispose of packaging in a safe way in accordance with local regulations..
- In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).



First Aid measures in case of exposure

Skin Contact:

Take off all contaminated clothing immediately. Wash off immediately with plenty of water and soap. After skin contact, apply Vitamin E cream or simple toilet milks. When symptoms persist or in all cases of doubt seek medical advice.

Eye contact:

In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Ingestion:

Do not induce vomiting. Wash out mouth with water. Keep at rest. Obtain medical attention.

Notes to physician

Symptoms:

Local. After skin contact: paresthesia (local), may cause skin and eye irritation. Inhalation may provoke the following symptoms: irritation, cough.

Symptoms:

Systemic. Excitement, gastrointestinal discomfort, tremor, dizziness, headache, listlessness, nausea and vomiting, epigastric pain, muscular fasciculation of limbs, unconsciousness, convulsions and coma (very high doses).

Risks:

This product/preparation contains a pyrethroid. Must not be confused with organophosphorus compounds!

Treatment:

Local: Initial treatment should be symptomatic and supportive. After eye contact, instillation of local anesthetic drops e.g. 1% Amethocaine Hydrochloride eye drops. Give analgesics as necessary.

Treatment:

Systemic: Endotracheal intubation should be done and gastric lavage performed followed by administration of charcoal.

Monitoring of respiratory and cardiac functions ECG – monitoring (electrocardiogram). Check for pulmonary oedema in event of inhalation.

Keep airway clear, administer artificial respiration if necessary.

Against convulsions, give Diazepam: for adults 5-10 mg intravenously as necessary until fully sedated. For children 2.5 mg i.v.

There is no antidote

Contraindication: atropine, derivatives of adrenaline

Recovery: spontaneous.

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