SUMITOMO CHEMICAL

FOR INTERNAL
CIRCULATION ONLY

Insect Growth Regulator

Sumilarv® 0.5G

Try Sumilarv for Perfect Pest Control, Toward a World without Pest Problems.

As a new generation insecticide, Insect Growth Regulator (IGR), Sumilarv, provides you with a new approach to insect control.
Stop pest propagation with Sumilarv. For nonrecurring populations, no more problems with pests. Forever!
Now why Sumilarv? Because it breaks the life cycle of the insect, prevents a pre-adult from maturing into an adult. Thus, it can't reproduce, resulting in a decreased population.
If a faster, stronger and longer lasting pest elimination system is desired, Sumilarv should be used in combination with adulticides. The choice of Sumilarv is a key to success in the control of fly, mosquito, flea and other insect populations.

Thanks to Sumilarv . . .

- Long-term pest population elimination, by subtly altering insects' life cycle.
- At low levels, it promises surprisingly effective control.
- Won't harm man and animals.

Thanks to Sumilarv . . .

Long-Term Pest Population Elimination, by Subtly Altering Insects' Life Cycle.

What is Sumilarv?

Sumilarv is an insect growth regulator with unique modes of action.
Sumilarv affects the physiology of morphogenesis, reproduction and embryogenesis of insects.
The morphogenetic effect of Sumilarv is primarily seen during larval-pupal or nymphal-adult transformation. Under the presence of Sumilarv, various degrees of incomplete metamorphosis can been seen.
Due to such unique modes of action, Sumilarv prevents successful growth of insect population.

What Happens with the Application of Sumilarv?

Against flies and mosquitoes, Sumilarv inhibits their life cycles at the pupal stages. Where applied, larvae develop normally to pupation, but they cannot become adults. That is, normal maturing into an adult capable of reproduction is inhibited. And thus, the target population gradually decreases.

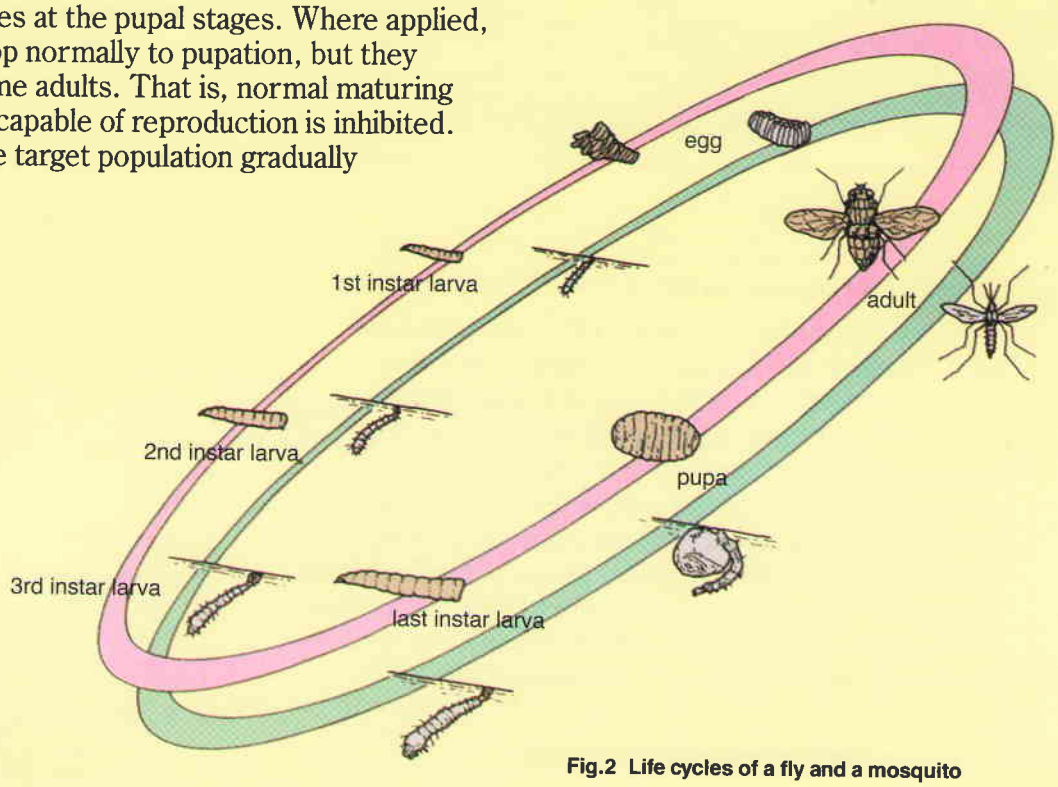


Fig.2 Life cycles of a fly and a mosquito

Sumilarv 0.5G

Formulation: Granule

Composition:

Sumilarv (Pyriproxyfen)	0.5
Adjuvants	4.0
Carrier	balance
	100.0 (% $^{w}/_{w}$)

Thanks to Sumilarv . . .

At Low Levels, It Promises Surprisingly Effective Control.

Sumilarv is much more effective than organophosphates, pyrethroids or other IGR against larvae of flies and mosquitoes, being active at substantially lower rates. Moreover, it provides the long-lasting control you have been seeking.
If combined with adulticides, you can easily attain optimum perfect pest control.

Extremely High Biological Activity in Lab.

Sumilarv is several 100 × more effective against housefly larvae (*Musca domestica*, 4-day-old larvae) than other compounds.
Sumilarv shows similar superiority against mosquitoes (*Culex pipiens pallens*, 4th instar larvae).

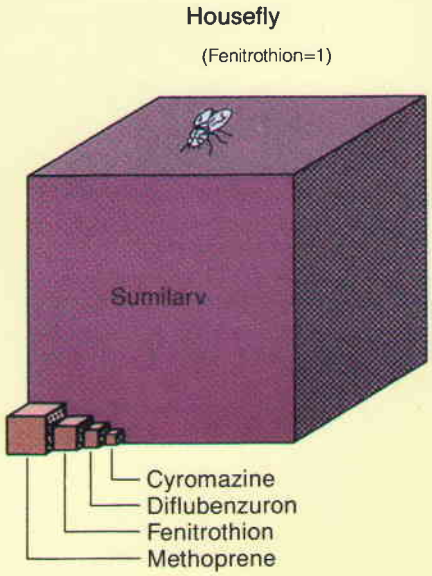


Fig.3 Relative emergence inhibition efficacy of Sumilarv and various insecticides

High Performance in the Field

Sumilarv has demonstrated its high potency in field tests. Sumilarv 0.5G is effective against flies in a waste treatment facility at a rate of 40g per square meter. Furthermore, a pig house trial showed that Sumilarv 0.5G combined with an adulticide space spray gave more rapid and complete control of flies. Similarly, with mosquito control, Sumilarv provided 100% inhibition of emergence for 12 weeks in a fire pond. This powerful larvicidal action allows long term control of flies and mosquitoes, thus promoting a more healthy and comfortable environment for all to enjoy.

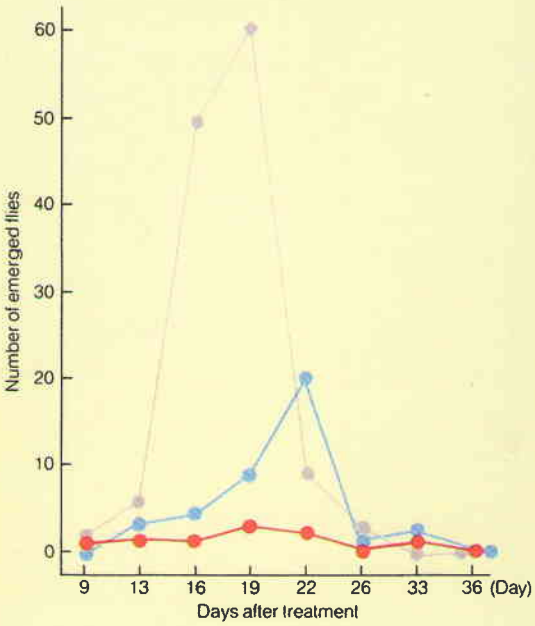
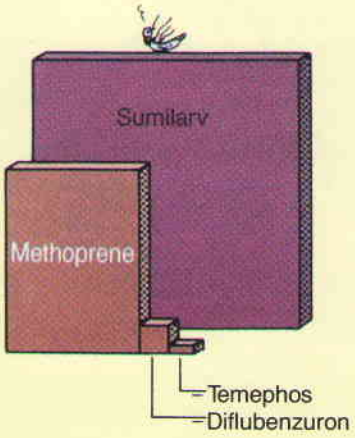


Fig.4 Field evaluation of Sumilarv for flies in a waste treatment facility

- Sumilarv 0.5G 40g/m² (0.2g A.I./m²)
- Diflubenzuron 25WP 4g/2ℓ/m² (1g A.I./m²)
- Control

Mosquito
(Sumilarv=1)



Test method: Housefly Artificial medium method
Mosquito Immersion method

The efficacies are shown by IC_{50} (μg/g medium) for Sumilarv and Methoprene, and by LC_{50} (μg/g medium) for other compounds.

Thanks to Sumilarv . . .

Won't Harm Man and Animals.

Sumilarv will not harm man and animals.
Unlike conventional insecticides, Sumilarv acts only against insects. It is insect-specific.
It only controls insects and has no effect upon non-target animals, such as livestock, pets, birds and fish.

Sumilarv is an ideal insecticide which can safely be used for the long-lasting control of houseflies and mosquitoes.

Toxicity of Sumilarv 0.5G (F-5099)

Acute toxicity:	Oral LD_{50} (rats)	> 5000 mg/kg
	Dermal LD_{50} (rats)	> 2000 mg/kg
Skin sensitization:	Negative (guinea pigs)	
Aquatic toxicity:	Acute LC_{50} (carp) at 96 hrs of observation time	832 mg/L
	Acute LC_{50} (*Daphnia* sp.) at 3 hrs of observation time	> 2000 mg/L

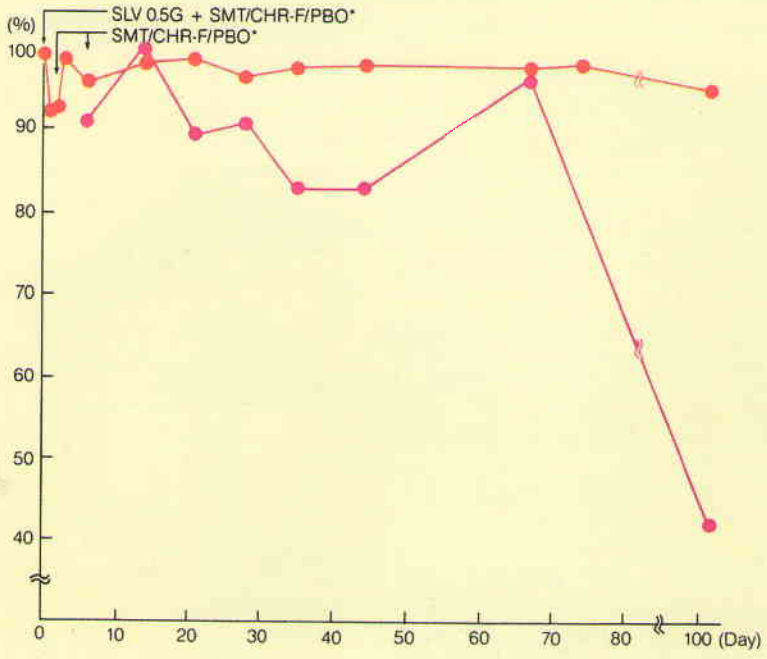


Fig.5 Field evaluation of Sumilarv for flies in a pig house

Test material: Larvicide—Sumilarv 0.5G, 20g/m², single treatment
*Adulticide—Sumithion/Chrysron-Forte/ PBO (5/5/15%EC), 15mℓ/m², three treatments

Method: Number of adults in a certain area was counted and RI was calculated. Larvae and pupae were collected from the test site. Number of emerged adults was counted and EI was calculated.

RI: Recovery Inhibition (%)

$$=\left(1-\frac{\text{No. of adults counted after treatment}}{\text{No. of adults counted before treatment}}\right)\times 100$$

EI: Emergency Inhibition (%)

$$=\left(1-\frac{\text{No. of emerged adults}}{\text{No. of collected larvae and pupae}}\right)\times 100$$

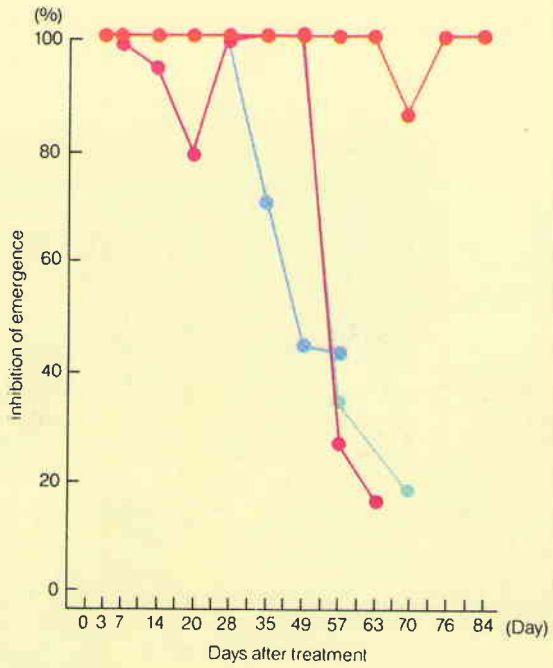


Fig.6 Field evaluation of Sumilarv for mosquitoes in a fire pond (24m³)

Sumilarv 0.5G	20g/m³ (0.1 ppm A.I.)
Sumilarv 0.5G	10g/m³ (0.05 ppm A.I.)
Methoprene 10F	5g/m³ (0.5 ppm A.I.)
Diflubenzuron 25WP	2g/m³ (0.5 ppm A.I.)

How to Use Sumilarv 0.5G, for Successful Pest Control

For Fly Control

Learn Fly Habits, Prior to Using Sumilarv

The most harmful insect in an animal house or a waste treatment facility is the housefly. Knowing its life cycle and habits is vital to attaining more efficient fly control.
An adult housefly lays 50 ~ 150 eggs five or six times during its lifetime. The eggs hatch in a day, and the resulting larvae moult twice to become pupae and then adults.
Housefly larvae prefer the dark and will dig down into a dung/garbage pile to breed, particularly, the upper part of the pile near surface, which has the optimum temperature of 20 ~ 28°C for growth.
On the contrary, larvae can't survive at the lower central region of the pile, due to high temperatures 50 ~ 60°C.
Last instar larvae are willing to metamorphose to pupae in dry places. So, they crawl out of the interior and move about on the surface or dry soil around garbage piles when pupating.

Sumilarv 0.5G is a larvicide subtly utilizing the above-mentioned housefly larval habits. Once it contacts last instar larvae, development will be inhibited.

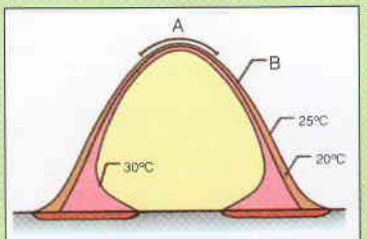


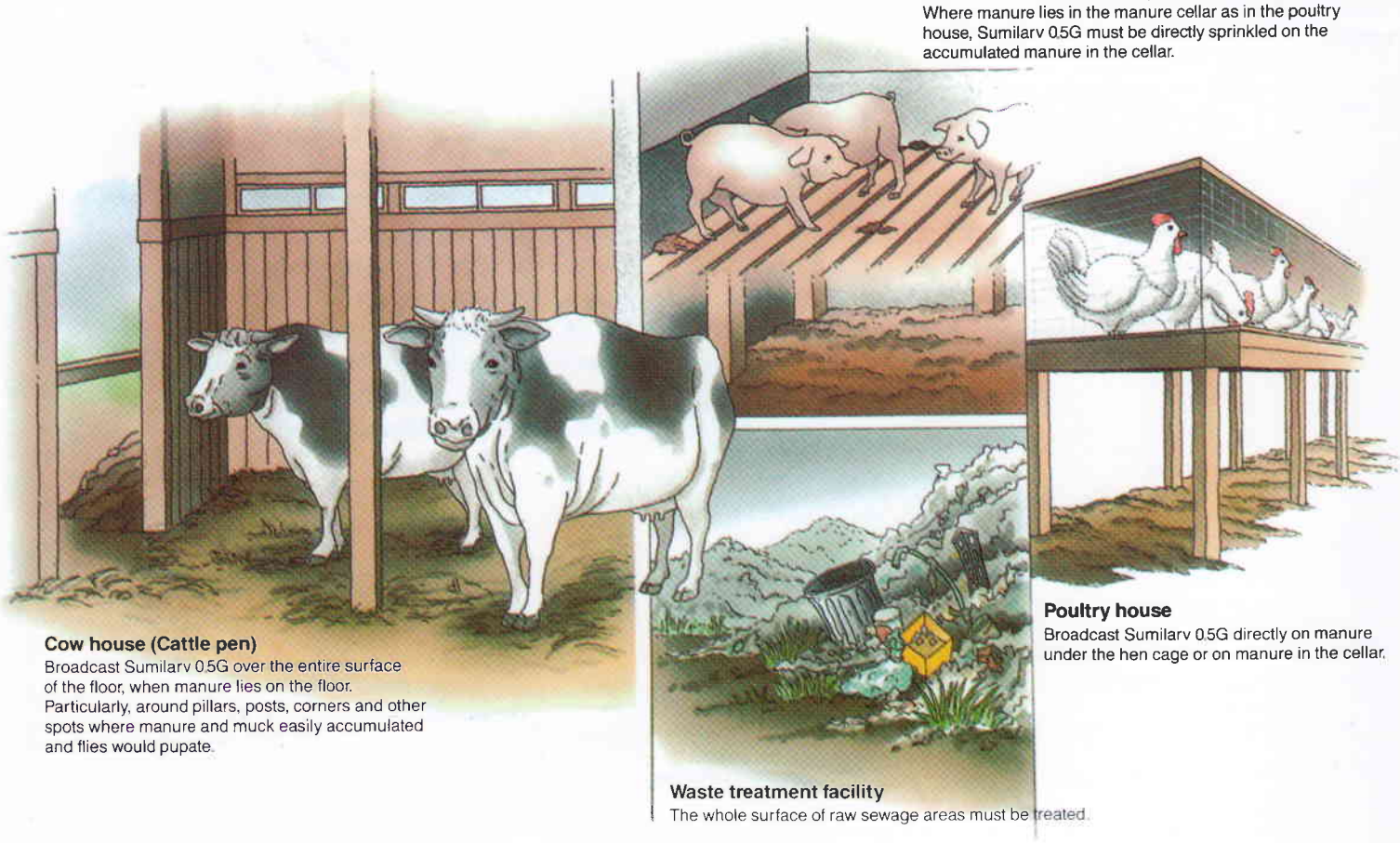
Fig.7 Cross-section of manure compost pile showing area inhabited by housefly larvae (Gotaas, 1956)

A : Area too hot to be inhabited
B : Area too dry to be inhabited
: Inhabited area
: Area in loose soil into which larvae sometimes migrate

Where to use Sumilarv 0.5G?

Sprinkle Sumilarv 0.5G all over housefly breeding sites such as livestock and poultry houses or waste treatment facilities, as uniformly as possible.

Pig house
Sprinkle Sumilarv 0.5G over the whole surface of floor, where manure lies on the floor, as in the cow house. Where manure lies in the manure cellar as in the poultry house, Sumilarv 0.5G must be directly sprinkled on the accumulated manure in the cellar.



Cow house (Cattle pen)
Broadcast Sumilarv 0.5G over the entire surface of the floor, when manure lies on the floor. Particularly, around pillars, posts, corners and other spots where manure and muck easily accumulated and flies would pupate.

Poultry house
Broadcast Sumilarv 0.5G directly on manure under the hen cage or on manure in the cellar.

Waste treatment facility
The whole surface of raw sewage areas must be treated.

When and how often to use Sumilarv 0.5G?

The time required for fly growth depends upon temperature. For a housefly, it takes about 10 days at 25°C, from egg-laying to the birth of a new fly. The higher the temperature, the faster it develops. Where it is below 10°C or beyond 35°C, they can't breed.
Sumilarv 0.5G must be applied at the beginning of fly propagation, to attain the most effective control. For example, it should be applied before the adult fly population reaches a nuisance level as follows:

4–5 flies/board (m^2) in a poultry house
4–5 flies/head in a pig house
12–25 flies/head in a cow house

If the manure depth is over 20 cm, another Sumilarv 0.5G treatment is required.

What amount is required to achieve results?

Sumilarv 0.5G should be applied at the rate of 20 g/m^2 single application or at 10 g/m^2 double applications with 2 weeks interval

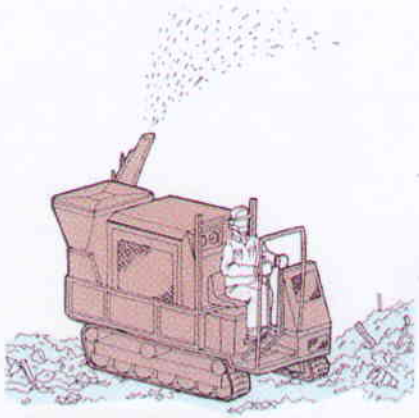
Poultry house (80 m × 10 m)	≧ 8 kg/house
Farrowing unit (2 m × 3 m)	≧ 60 g/unit
Breeding pen (4 m × 5 m)	≧ 200 g/pen
Others	≧ 10 g/m^2

How to use?

Sumilarv 0.5G can be easily applied manually or by machinery.

Hand granule sprader
Effective reach: 5 ~ 8 m
Outlet capacity: ~ 4 kg/min

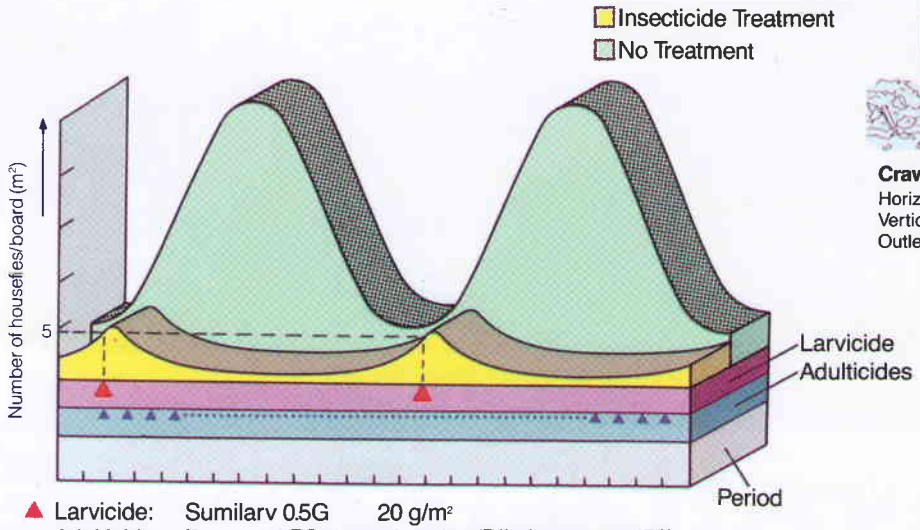
Blower with granule nozzle (with engine)
Effective reach: 15 m
Outlet capacity: ~ 12 kg/min



Crawler mount type power granuler
Horizontal throw (in still air): 30 m
Vertical throw (in still air): 20 m
Outlet capacity: ~ 25 kg/min

Recommended control system against houseflies, by the combination of Sumilarv 0.5G and adulticides

To reduce the overall fly population more quickly and surely, one needs an effective control system. A combination of Sumilarv 0.5G with adulticides offers such a system.
A recommended control system is shown below.



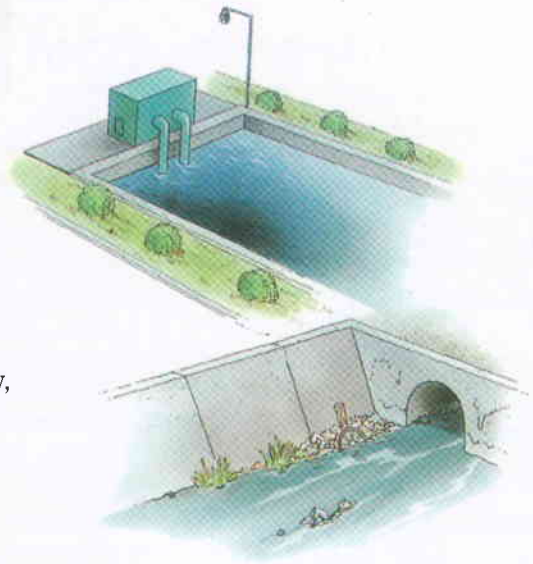
▲ Larvicide: Sumilarv 0.5G 20 g/m^2
▲ Adulticides: Pesguard FG161 50 mℓ/m^2 (Dilution rate × 150)
Sumithion-NP 20 ~ 25 mℓ/m^2 (Dilution rate × 100)
Spray adulticides, Pesguard FG161 and SMT-NP, alternately once every two weeks.

Fig.8 Recommended fly control system in a poultry house (80 m × 10 m)

For Mosquito Control

Where to use Sumilarv 0.5G?

Apply Sumilarv 0.5G at mosquito breeding sites:
standing water: reservoir, swamp, rain pool, pond, cistern, etc.
running water: drain, ditch, creek, stream, river, etc.



What amount is required to achieve results?

Standing water

Sumilarv 0.5G should be used as shown in the table below, based upon a target concentration of 0.01–0.05 ppm A.I. (2–10 g/m^3 of Sumilarv 0.5G).

Depth (cm)	Sumilarv 0.5G (kg/ha)
10	2–10
20	4–20
30	6–30
50	10–50

*Water volume in the treated area (t) = length (m) × width (m) × average depth (m)

Running water

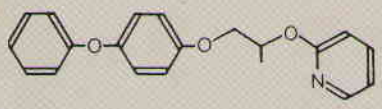
Sumilarv 0.5G should be used as shown in the table above, based upon a target concentration of 0.01–0.05 ppm A.I. (2–10 g/m^3 of Sumilarv 0.5G) against flow volume per hour.

*Running water volume (t)/hour = width (m) × depth (m) × flow rate (m/hour)

How often to use Sumilarv?

Apply Sumilarv 0.5G once a month.

Physical and Chemical Properties

Trade name	Sumilarv® 0.5G
Common name of A.I.	Pyriproxyfen
Chemical structure of A.I.	
Appearance	Pale yellowish granule
Content of A.I.	More than 0.5% (w/w)
Particle size distribution	Between 300 μm to 1,000 μm for more than 95% of the product
Bulk density	Loosely packed 0.71 g/ml Tightly packed 0.93 g/ml
Moisture content	Less than 1%
Stability	Stable at least 6 months at 40°C and 50°C, and 3 years under normal room temperatures. Sumilarv 0.5G is quite stable under these conditions.

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