

Biological Insecticide

**VectoBac® 12AS**

*Technical Use  
Bulletin*

# Nuisance Fly Control in Wastewater Treatment Systems and in Lakes and Ponds

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VectoBac 12AS is Valent BioSciences' trademark for its *Bacillus thuringiensis* H-14 product. It is an effective, environmentally compatible product for use against nuisance midges (*Chironomus* spp.; Chironominae) and mothfly larvae (*Psychoda* spp.) in sewage treatment facilities utilizing trickling filter systems. Studies have shown it does not damage the zoogloea in wastewater filters, and adds no chemicals to the discharges of receiving rivers or streams. VectoBac 12AS is widely used in mosquito and blackfly control programs throughout the world and has been shown to be compatible with natural predators feeding on nuisance fly larvae.

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## Background

Non-biting psychodine flies and chironomid midges are considered to be beneficial and nonpestiferous when their populations are low, but when heavy populations occur, they become nuisance and economic problems. Nuisance fly larvae are able to build up in great numbers in trickling filters by burrowing into the zoogloea, the gelatinous mass of aerobic organisms consisting of bacteria, fungi, algae and protozoa growing on the natural or synthetic filter media. When peak populations occur, adult flies can become health problems to filter plant workers, interfere with plant operations, become a nuisance to individuals in adjacent neighborhoods, and, in general, present an unsanitary appearance to the public. VectoBac is easily applied over a period of time at the activated sludge mixing chamber prior to the trickling filters.

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## Chironomids Controlled with VectoBac

Only a small percentage of the thousands of pestiferous species of Chironomids have been tested for susceptibility to Bt-H14. Members of the subfamily Chironomini and Tanytarsini are generally susceptible; members of the subfamily Tanypodinae are not susceptible at the VectoBac labeled-use rate (Ali, 1995; Mulla, 1990). When initially using VectoBac in a Chironomid control program, it is recommended that only a small test area be treated if the species of Chironomid to be controlled has not been identified.

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## Suggested Use Recommendations

Trickling filter systems: Application rates of VectoBac are related to the nuisance pest species being controlled, the size of the larvae, and the method of application employed. The *Chironomus* spp. larvae are generally harder to kill than the psychodine flies and require the high rate (20 mg/liter) for effective population reduction. For both groups of insects, larvae in the early developmental stages are more susceptible to a given quantity of B.t. H-14 than are those in the later stages.

VectoBac should be applied with a pre-calibrated pump or other device at 10-20 mg/liter a.i.(0.833-1.67 ml) per liter of wastewater feed to the filter for a period of 30 minutes. Although systems vary in their design and the best injection location will vary, generally a mixing chamber prior to entry to the filters is the best application site.

Control of *Chironomus* spp. may take up to 1-2 weeks and repeat applications may be necessary, especially if the larval population treated are found to be in all stages of development.

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## Application Procedure / Trickling Filter Systems-VectoBac 12AS

- Step 1** Determine species of nuisance fly to be treated. The Psychodine larvae inhabiting trickling filters are usually white, cylindrical, and have a short breathing tube on the last body segment; the Chironomid larvae are generally whitish, brownish, greenish or reddish color and the last segment bears a pair of pedestals each with an apical tuft of setae.
- Step 2** Determine volume of waste water going to the filters in liters or gallons per second.
- Step 3** To dose at a concentration of 20 mg/l a.i., use 1.67 ml of undiluted VectoBac 12AS per liter of sewage wastewater. To dose at a concentration of 10 mg/l, use 0.833 ml of undiluted VectoBac 12AS per liter of sewage wastewater.
- Step 4** Apply with a pre-calibrated pump or other device timed for an application period of 30 minutes.

### Example:

After careful calculation, it is determined that the sewage flow to the filters is 25 liters/sec. Therefore, the total flow in 30 minutes = 25 liters/sec x 60 sec/min x 30 min = 45,000 liters. Treating for Psychodids @ 10 mg/l volume of VectoBac 12AS requires: 45,000 liters x 0.833 ml = 37.5 liters or 10 gallons