

VectoLex[®] WSP

Technical Use Bulletin



VectoLex WSP is a Water Soluble Pouch containing VectoLex CG. (Bacillus sphaericus strain 2362; potency = 50 BsITU) Each 10-gram packet treats up to 50 square feet of mosquito breeding water. The formulation is ideal for treatment of catch basins and other small breeding sites. The product is applied by placement and is very useful for control of West Nile Virus (WNV) vectors in urban and suburban areas.

B. sphaericus is a naturally occurring, spore-forming bacterium found throughout the world in soil and aquatic environments. At the time of sporulation, *B. sphaericus* produces a d-endotoxin which is toxic to many species of mosquito larvae upon ingestion. Early development of *B. sphaericus* for mosquito control focused on strains isolated and maintained by the Pasteur Institute, WHO collaborating Center, Paris, France. VectoLex is based on strain 2362, which was isolated in Nigeria.

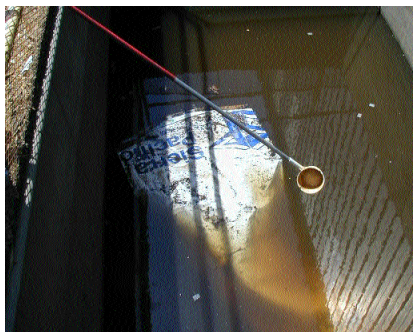
VectoLex WSP was developed at the request of Mosquito Control Professionals. With the spread of West Nile Virus in the United States, Valent BioSciences Corporation was asked by mosquito abatement programs to develop a VectoLex formulation that could be easily applied to catch basins for control of mosquito larvae. VectoLex CG was already popular with these agencies because of its favorable environmental profile and residual activity, but when faced with the challenge of treating hundreds of catch basins each day, an improvement to the delivery system was needed. In 2001, VectoLex WSP was introduced to fill this need.

Benefits of VectoLex WSP

- Effective
- Economical
- Environmentally Friendly
- Easy to apply (malleable, slips into tight spots, clean)
- Does not get hung up in debris or buried in sludge at the bottom of a catch basin

Once placed in water, VectoLex WSP dissolves in 2-5 minutes, releasing the VectoLex granules. The corn cob carrier disperses on the water surface and in the water column, distributing *Bsph* to the larval feeding zone.

Preliminary tests indicated that more than 30 days control could be expected from application of one pouch to a catch basin. Later field studies confirmed that in fact control could last much longer. This product has been used successfully nationwide, with results consistently supporting an estimated 30 day treatment interval.



Mode of Action

The d-endotoxin of *B. sphaericus* is only toxic to the larval stages of mosquitoes. It must first be ingested by the larvae, then partially digested before it becomes activated. The toxin's mode of action is similar to *Bti*, causing disruption of the midgut epithelium.

However, activity of the d-endotoxin of *B. sphaericus* differs from that of *Bti* in several important ways. The toxin is attached to the bacterial spore, while *Bti* toxins are not attached to the spore. The toxins of *B. sphaericus* and *Bti* bind to chemically different receptor sites on cells. They are not related immunologically, and are thought to have completely different molecular modes of action.

Operationally, the most important differences between the toxins of *B. sphaericus* and *Bti* are speed of action and persistence in the larval habitat. *B. sphaericus* toxin is much slower acting than *Bti* toxin. Larval mortality can take several days, but is usually expressed within 48 hours of ingestion. *B. sphaericus* toxin is also much more persistent in the larval habitat than *Bti*. This persistence is thought to be the result of the stability and slower settling rate of the *B. sphaericus* toxin, as well as the unique ability of *B. sphaericus* spores to germinate, grow and produce toxin in cadavers of mosquito larvae treated with the material. This process is known as recycling.

VectoLex WSP is labeled for the control of the following mosquitoes:

Culex (all species)

Aedes vexans

Ochlerotatus stimulans

Ochlerotatus nigromaculis

Ochlerotatus melanimon

Coquillettidia perturbans

Psorophora columbiae

Psorophora ferox

Ochlerotatus sollicitans

Aedes quadrimaculatus

Ochlerotatus triseriatus

Habitats

Stormwater/Drainage Systems:
Storm sewers, catch basins,
drainage ditches, retention, detention
and seepage ponds

Rate Range

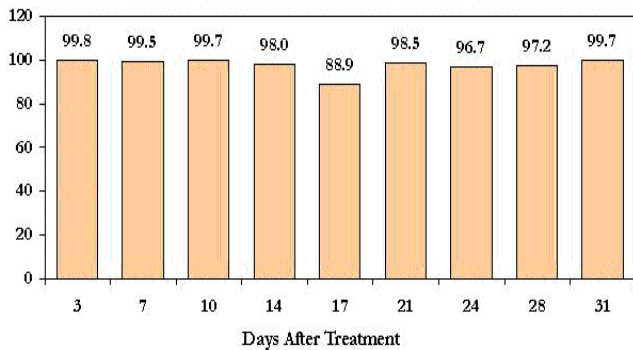
1 pouch/50 sq. ft ⁽¹⁾

(1) Treat on the basis of surface area of potential mosquito breeding sites by placing one (1) VectoLex WSP pouch per 50 square feet of treated area. Re-apply as needed after 1-4 weeks. Research indicates that the average catch basin and feeder lines' surface area is 50 square feet.

VectoLex WSP Performance

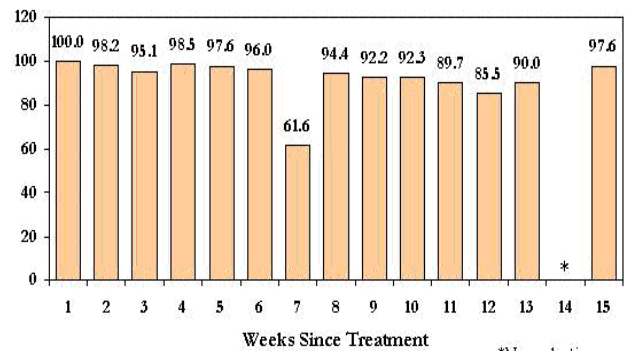
Percent Control of *Culex* Larvae (L₃₋₄)

Study Location: Key West, Florida
Habitat: Street Catch Basins



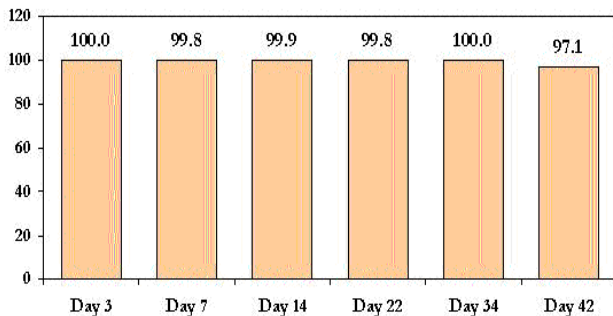
Species: *Culex quinquefasciatus*
 Sampling: sweep net
 Replications: 4 treated; 4 UTC – Whole study repeated 4X
Data Source: Shannon James

Study Location: Newton, Massachusetts
Habitat: Street Catch Basins



Species: *Culex pipiens*
 Sampling: Landers ladle (specially designed dipping device)
 Replications: 40 treated; 40 UTC
Data Source: Doug Bidlack, David Henley – East Middlesex MCP
 *No evaluation was made on Week 14

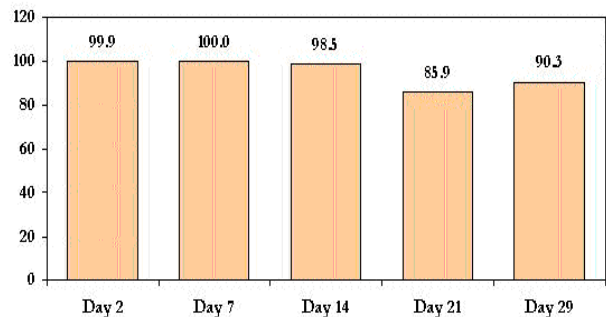
Study Location: Portland, Oregon
Habitat: Street Catch Basins



Species: *Culex pipiens*
 Sampling: sweep net
 Replications: 7 treated; 2 UTC
Data Source: Peter DeChant, VBC/Glenn Bissell, Alpine Pest Mgmt.

VectoLex WSP – 1 pouch per basin

Study Location: Corpus Christi, Texas
Habitat: Simulated Catch Basins



Species: *Culex quinquefasciatus*
 Sampling: Dipper
 Replications: 8 treated; 8 UTC
Data Source: Daniel Sprenger, Nueces County Health

VectoLex WSP – 1 pouch per basin

