

Gemstar[®] LC

INSECTICIDAL VIRUS

GEMSTAR[®] IS AN AQUEOUS SUSPENSION CONCENTRATE BIOLOGICAL INSECTICIDE FROM CERTIS BIOLOGICALS, REGISTERED FOR USE ON A BROAD RANGE OF CROPS.

It contains a naturally occurring virus that infects and kills larvae of *Heliothis* and *Helicoverpa* species, such as corn earworm, tomato fruitworm, cotton bollworm and tobacco budworm.



PRODUCT HIGHLIGHTS

Liquid suspension concentrate bioinsecticide

Broad crop label: Sweet corn, tomatoes, peppers, leafy and other vegetables, cotton, tobacco, ornamental plants, soybeans, hemp, sorghum, peanut and many other crops

Not harmful to non-target or beneficial species, soil profile, or the environment.

Compatible with most agricultural chemicals

Laboratory studies have determined that a dose of only a few OBs is sufficient to initiate a lethal infection in newly-hatched larvae

OMRI Listed[®], NOP-compliant and can be used in organic agricultural production. 4 hour REI and 0 day PHI.



Always carefully read and follow label instructions.



1.800.250.5024

www.CertisBio.com

HOW IT WORKS

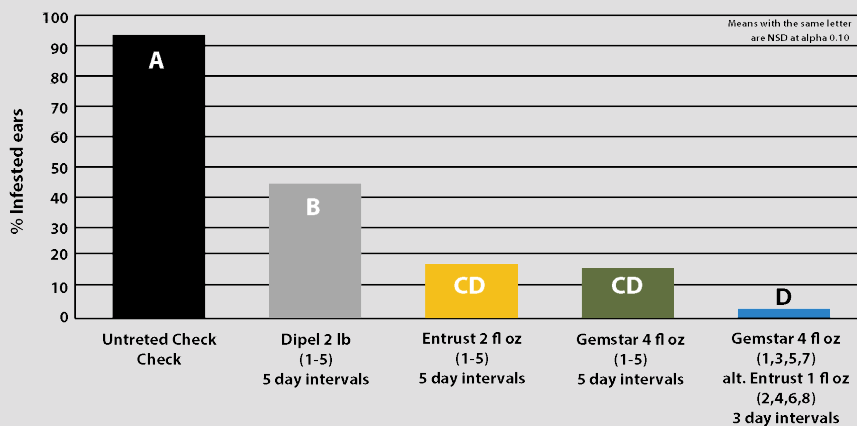
The scientific name for the active ingredient of Gemstar is *Helicoverpa zea* single capsid nucleopolyhedrovirus or HzSNPV. Multiple HzSNPV particles are naturally microencapsulated within a roughly spherical occlusion body (OB) that protects it to some degree from degradation. Each OB measures about 1 to 2 microns in diameter; a single layer of more than a million Gemstar OBs could fit on the head of a pin.

A larva must ingest OBs in order to become infected with the virus. The highly alkaline environment of the larval digestive tract (where pH can be as high as 10) dissolves the OBs and releases the virus, which penetrates the cells lining the midgut. Once inside, the viral DNA “hijacks” the cell’s nucleus, causing it to replicate numerous copies of the virus, which rapidly spread the infection to other organs. The infected larva stops feeding within a few days, becoming pale and sluggish as its internal organs fill with the virus. Upon death, the larva “melts,” its fragile outer skin disintegrating to release the liquefied remains of its internal organs, containing billions of new virus OBs. Each of these can initiate a new infection if ingested by another larva feeding at that site or wherever OBs have been deposited by raindrops, gravity, or by spraying Gemstar.

Organic Sweet Corn

Corn earworm (*Helicoverpa Zea*)

Eltopia, WA
CER-2008-063



•Randomized complete block design with 4 replications
•Application made via overhead sprinkler chemigation using 0.1 inches of water
•Cooperator: Dr. Alan Schreiber, Agriculture Development Group

TANK MIXING AND BEST PRACTICES

Gemstar can be mixed or applied in rotation with most chemical insecticides to provide a broader spectrum of control (including a more rapid knock-down effect), kill moths and eggs, larvae, or to control *Heliothis* or *Helicoverpa* larvae resistant to chemical insecticides. Due to Gemstar’s unique mode of action (viral infection), there is no known cross-resistance with chemical insecticides. Gemstar will infect and kill both susceptible and resistant larvae. Some agricultural chemicals, such as foliar fertilizers, may cause high pH in the spray tank, which could inactivate Gemstar by the premature dissolution of the viral OBs (similar to what occurs naturally in the gut of the target larva). Check the pH in the mix tank before adding Gemstar. If pH is 9 or higher, buffer to pH 7 to preserve bioactivity. In some areas, water used to mix sprays may itself be highly alkaline. Do not mix Gemstar with any pesticide bearing a label that prohibits tank mixing with other products.

RATE

4 to 10 fl. oz. per acre (see label for crop specific rate information.)

PHI/REI

4 hr REI; 0 day PHI

STORAGE

Gemstar can be stored at room temperature for up to two months without significant loss of bioactivity. Shelf life can be extended to one year by refrigeration. If necessary, Gemstar can also be frozen for longer-term storage (several years). The bioactivity of the virus can be reduced by prolonged exposure to temperatures above 90°F. Short-term exposure (a few days) will not immediately deactivate the virus. However, always store Gemstar in its original bottle in a cool, dry place, out of direct sunlight



ACTIVE INGREDIENT

Helicoverpa zea NPV

PESTS CONTROLLED

Heliothis spp.
Helicoverpa spp.
Corn earworm
Cotton bollworm
Tomato fruitworm
Tobacco budworm

MAIN CROPS

Alfalfa	Hemp
Asparagus	Onion
Beans	Peanuts
Beets	Peas
Broccoli	Peppers
Cabbage	Potatoes
Cauliflower	Sorghum
Corn	Tobacco
Cotton	Tomato

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