READ SAFETY DIRECTIONS BEFORE OPENING OR USING

Helicovex

Biological Insecticide

ACTIVE CONSTITUENT: 7.5×10^9 POLYHEDRAL INCLUSION BODIES OF THE NUCLEOPOLYHEDROVIRUS OF *Helicoverpa armigera* PER MILLILITRE

For the control of *Helicoverpa* spp larvae in various crops as specified in Directions For Use

Distributed by Organic Crop Protectants
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Directions for Use

Restraints and Mandatory Downwind No-Spray Zones

DO NOT apply within 48 hours of expected precipitation or during heavy rainfall to minimise the risk from soil erosion and run-off.
DO NOT disturb soil for 48 hours after application.
DO NOT generate run-off during the application via overhead irrigation.
DO NOT apply when wind speed is less than 3 or more than 20 kilomtres per hour as measured at the application site.
DO NOT apply during surface temperature inversion conditions at the application site.
DO NOT apply if there are native forests, aquatic and wetland areas including acquacultural ponds or surface streams and rivers downwind from the application area and within the mandatory no-spray zone shown in the table below.

No-Spray Zones for Protection of the Terrestrial and Aquatic Environment

Wind Speed Range at Time of Application	Downwind Mandatory No-Spray Zone		
FOR AERIAL APPLICATION			
	Fixed-Wing (droplet size not smaller than fine)	**Helicopter (droplet size not smaller than fine)**	**Ultra-Low Volume (very fine droplet size)**
From 3 to 8 km/hr	250m	140m	180m
From 8 to 14 km/hr	350m	180m	300m
From 14 to 20 to km/hr	350m	140m	450m
FOR GROUND APPLICATION			
From 3 to 20 km/hr	20m		

Crop / Situation	Pest	Rate (L / ha)	Critical Comments
Cereal grains *including:* Maize Popcorn Sorghum Lucerne (Alfalfa) Oilseed *including:* Canola Linseed Mustard seeds Peanut Safflower Sesame seed Sunflower Potatoes Pules *including:* Azuki bean Broad bean Chick pea Cowpea Faba bean Field pea Kidney bean Lablab	*Helicoverpa armigera* Corn earworm/ Cotton bollworm/ Tobacco budworm AND *Helicoverpa punctigera* Native budworm	100 mL/ha	**All Crops:** Thorough coverage of the crop is essential as HELICOVEX needs to be ingested to be effective. Refer to the General Instructions and Application sections for additional application advice. HELICOVEX should be applied between 25 and 35°C when larvae are actively feeding. HELICOVEX is more effective on smaller larvae. Target application to coincide with neonate larvae emerging from their eggs. HELICOVEX should not be applied on larvae larger than 13 mm in length. HELICOVEX will provide between 60 and 90% control. Under extremely high pest pressure or sub-optimal application conditions, or when protection against damage is vital, additional control options should be considered. **Sorghum:** Application should be made 3 days after 50% of panicles have reached 100% flowering. **Linseed:** Use a non-ionic surfactant at the manufacturer's specified rate to improve coverage.

Crop / Situation	Pest	Rate (L / ha)	Critical Comments
Lentil Lima bean Lupin Mung bean Navy bean Pigeon pea Soybean Vetch			**Chickpeas:** The addition of powdered milk at a rate of 1.0 kg/ha may improve the performance of HELICOVEX in this crop. HELICOVEX is unlikely to reduce larval numbers below threshold if the initial population exceeds 6 per metre of row. **Cotton:** HELICOVEX should not be applied on larvae larger than 7 mm in length. When applied alone, HELICOVEX is unlikely to reduce larval numbers below threshold if the initial population exceeds 4 per metre of row. HELICOVEX should be used in accordance with the Cotton Best Management Practices Manual. **Sweetcorn:** Application should be made from the early vegetative growth stage through to tasselling and prior to the emergence of silks. HELICOVEX has short residual activity and re-treatment may be required at 2 to 3 day intervals, depending on egg counts and crop growth rates. **Horticultural crops:** Use a higher rate when flowers, fruit or economic parts of the crop are present, under high pest pressure conditions or to control larvae greater than 7 mm in length. Use lower rates during vegetative stages of crop production. HELICOVEX has a short residual activity and re- treatment may be required at 2 to 3 day intervals. Use a non-ionic surfactant at the manufacturer's specified rate to improve coverage.
Cotton		130 mL/ha OR 130 mL/ha + a registered larvicide at its label rate	
Sweetcorn		130 mL/ha	
Berryfruit *including:* Blackberries Blueberries Boysenberry Cranberry Currants Gooseberry Raspberries Strawberry Brassica vegetables *including:* Brassica leafy vegetables Broccoli Brussels sprouts Cabbages Cauliflower Chinese broccoli Celery Cucurbits *Including:* Cucumber Melons Pumpkins Squash Watermelon Zucchini Fruiting vegetables *including:* Eggplant Peppers (capsicum and chilli) Tomato Leafy vegetables		100 to 200 mL/ha	

Crop / Situation	Pest	Rate (L / ha)	Critical Comments
including: Endive Lettuce Roquette (Rucola) Silver beet Spinach Legume Vegetables *including:* Green beans Green peas Snow peas Sugar snap peas Ornamental flowers and plants Pome fruit *including:* Apples Nashi Pears			

NOT TO BE USED FOR ANY PURPOSE, OR IN ANY MANNER, CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION

General Instructions

HELICOVEX (nucleopolyhedrovirus) is a highly specific naturally occurring pathogen of *Helicoverpa* spp. The effectiveness of HELICOVEX is dependent on a number of important factors; environmental conditions, application and the feeding behaviour of the pest. It is because of the requirement for near perfect conditions that the performance of HELICOVEX is variable and at times, the level of control may be below expectations. The speed of activity of HELICOVEX is also dependent on climatic conditions. Larvae can take up to 8 days to die. Daytime temperatures of 25°C to 35°C are ideal for the activity of HELICOVEX.

Good coverage of the feeding sites of the larvae is essential, as the product needs to be ingested to be effective. HELICOVEX will not control larvae that do not feed on treated areas, e.g. when larvae are feeding in protected feeding sites such as inside cotton bolls, lettuce hearts, bean pods, corn cobs and flowers.

Temperature and Larval Size Spray Decision Table

Larval Size	Temperature (°C)			
	<18	**18-25**	**25-35***	**>35**
0-3 mm	X	33	33	X
4-7 mm	X	3	33	X
8-13 mm	X	3	3	X
>13 mm	X	X	X	X

33 Ideal Conditions; 3 Good Conditions; X Consider options

* Avoid spraying or increase application volume when temperature is above 30°C and humidity is below 40%.

Good coverage is the key factor in ensuring maximum performance of HELICOVEX. For this reason, apply HELICOVEX to coincide with optimum environmental conditions, such as periods of high humidity that can occur in the early hours of the

morning (2 to 8 am). This should still coincide with warm (>25°C) conditions to ensure high larval activity. If HELICOVEX is applied during hot and dry conditions, increase application volumes and droplet size to improve the level of coverage achieved.

Mixing: Shake the container well before use. Spray water pH should be between 5 to 8.5 - spray water pH above 9 will damage the virus and performance will be reduced. If needed, use a suitable buffer or acidifier. Partially fill the spray tank with water, add the required amount of HELICOVEX while agitating and top up the spray tank with water to the required volume. HELICOVEX should be applied as soon after mixing as possible. The virus can be rendered inactive if the mixture is left to stand overnight.

Application: Use application parameters (nozzles, swath width, pressure, boom height, speed, etc) to ensure thorough coverage of the target area.

Horticultural crops:
Apply by ground rig or hand held equipment in a minimum of 400 litres of water per hectare.

Broadacre crops:
Ground Rig: Apply in a minimum of 100 litres of water per hectare.

Aerial - High Volume: Apply in a minimum of 30 litres of water per hectare. This application method is particularly susceptible to droplet evaporation, especially during hot and dry conditions (temperature greater than 30°C and humidity less than 40%). Droplet evaporation will reduce coverage, which can have a detrimental impact on performance. During hot and dry conditions avoid using this application method - wait until conditions favour good coverage or apply in ULV (see below). Alternatively, if application in water by air during hot and dry conditions cannot be avoided, increase application volume and/or use an anti-evaporation additive to improve coverage.

Aerial - Ultra-Low Volume (ULV): Use an approved carrier such as Synertrol Horti oil at 1-2 Litres per hectare; or D-C-Tron, Canopy or Biopest Oil applied in a minimum volume of 3 litres per hectare. When applying HELICOVEX in ULV, do not tank mix with other pesticides or fertilisers (refer to Compatibility).

Via Overhead Irrigation
HELICOVEX can be effectively applied to crops in overhead irrigation water. The product should be introduced to the irrigation water at the appropriate rate using fertigation equipment. If the product is diluted in water prior to injection into the irrigation water, ensure that the dilution water is clean and not silty with a pH of 7 or less and ensure there is constant agitation. Preferably, rainwater should be used for dilution. Ensure any diluted HELICOVEX is used within 10 hours of mixing. For one-pass mobile irrigators such as centre pivots and laterals, continuously introduce the required quantity of HELICOVEX into the irrigation water over the course of irrigation. Apply HELICOVEX in no more than 10 mm of irrigation water. For static irrigators, introduce the required amount of HELICOVEX into the irrigation water just prior to completion of the irrigation period, to maximise the concentration of HELICOVEX applied and the amount that remains on the crop.

Compatibility:
In water HELICOVEX is highly compatible with the majority of pesticides and fertilisers when mixed in water. Ensure that the mixture has a pH between 5 and 8.5 before adding HELICOVEX as alkaline pH (greater than 9) will damage the virus.

In ULV: For ULV application in oil, HELICOVEX is not compatible with other pesticides because the undiluted solvents in these products can damage the virus.

PRECAUTIONS

Re-entry: Do not allow entry into treated areas until spray has dried. When prior entry is necessary, wear cotton overalls buttoned to the neck and wrist (or equivalent clothing) and chemical resistant gloves. Clothing must be laundered after each day's use.

Flaggers: Do not use human flaggers/markers unless they are protected by engineering controls such as enclosed cabs.

PROTECTION OF WILDLIFE, FISH, CRUSTACEANS AND ENVIRONMENT

Do not contaminate streams, rivers or waterways with the product, including via run-off, spray drift or disposal of used containers.

STORAGE AND DISPOSAL

Storage: Keep out of reach of children. Store in the closed, original container out of direct sunlight at or below 4°C. The product is stable for 2½ years if stored as indicated.

Disposal: Triple or preferably pressure rinse containers before disposal. Add rinsings to spray tank. Do not dispose of undiluted product on site. Break, crush or puncture and bury empty containers in a local authority landfill. If no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers and product should not be burnt.

SAFETY DIRECTIONS

May irritate the eyes and skin. Avoid contact with eyes and skin and open wounds. Repeated exposure may cause allergic disorders.
Sensitive workers should use protective clothing. When opening the container, preparing spray and using the prepared spray, wear cotton overalls buttoned to the neck and wrist and a washable hat, elbow length PVC gloves and a face shield or goggles. Wash hands after use. After each day's use, wash gloves, face shield or goggles and contaminated clothing.

FIRST AID

If poisoning occurs contact a doctor or Poisons Information Centre (Ph. 131126).

MATERIAL SAFETY DATA SHEET

Additional information is listed in the Material Safety Data Sheet which can be obtained from the supplier.

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