

HELIMAX™

Reg. No. / Nr L11133 Act No. 36 of 1947 / Wet Nr 36 van 1947

READ THE LABEL BEFORE USE
KEEP OUT OF REACH OF
CHILDREN AND ANIMALS

LIVE BIOLOGICAL CONTROL AGENT

WARNINGS

- May cause an allergic skin reaction.

- No withholding period when used as indicated. • Store (in a refrigerator) away from food and animal feeds. • **HELIMAX™** must be kept refrigerated (at approximately 4°C) at all times until use. **HELIMAX™** must be used within 30 months of manufacture. While in use, the **HELIMAX™** container must be kept cool and in the shade. The container must not be exposed directly to sunlight.

- **HELIMAX™** is a highly specific naturally occurring pathogen of *Helicoverpa* species. The effectiveness is dependent on the number of important environmental conditions, application and feeding behaviour of the pest. It is because of this requirement for near perfect conditions that the performance of **HELIMAX™** is variable and may be below expectation. The speed of activity of **HELIMAX™** is also dependent on climatic conditions. **HELIMAX™** should provide more than 70% control and more than 60% reduction in damage. Under extremely high pest pressure additional control options should be considered. • **HELIMAX™** should not be used on its own to control heavy infestations of bollworm on any crop. For TREE CROPS include or use a chemical alternative if more than 60% of flower clusters are infested with bollworm. For OTHER CROPS consult the crops known production guidelines for threshold levels of bollworm activity. • Due to the UV sensitivity of **HELIMAX™** it must not be applied during the heat of the day.

DISCLAIMER

ALTHOUGH THIS REMEDY HAS BEEN EXTENSIVELY TESTED UNDER A LARGE VARIETY OF CONDITIONS, THE REGISTRATION HOLDER DOES NOT WARRANT THAT IT WILL BE EFFECTIVE UNDER ALL CONDITIONS, AS THE ACTION AND EFFECT THEREOF MIGHT BE AFFECTED BY FACTORS SUCH AS ABNORMAL CLIMATIC AND STORAGE CONDITIONS, QUALITY OF DILUTION WATER IN THE SPRAY TANK, COMPATIBILITY WITH OTHER SUBSTANCES NOT INDICATED ON THE LABEL AND THE OCCURRENCE OF RESISTANCE OF THE PEST AGAINST THE REMEDY CONCERNED AS WELL AS THE METHOD, TIME AND ACCURACY OF APPLICATION. FURTHERMORE, THE REGISTRATION HOLDER DOES NOT ACCEPT RESPONSIBILITY FOR DAMAGE TO CROPS, VEGETATION, THE ENVIRONMENT NOR HARM TO MAN OR ANIMAL. NEITHER DOES THE REGISTRATION HOLDER ACCEPT RESPONSIBILITY FOR LACK OF PERFORMANCE OF THE REMEDY CONCERNED, DUE TO FAILURE OF THE USER TO FOLLOW THE LABEL INSTRUCTIONS, NOR TO THE OCCURRENCE OF CONDITIONS WHICH COULD NOT HAVE BEEN FORESEEN IN TERMS OF THE REGISTRATION. CONSULT THE SUPPLIER IN THE EVENT OF ANY UNCERTAINTY.

PRECAUTIONS

- Avoid breathing spray.
- Wear protective clothing.
- Contaminated work clothing should not be allowed out of the workplace.

- Do not eat, drink or smoke whilst mixing or applying, nor before washing hands and face. • Prevent contamination of food, feeds and drinking water. • Prevent drift of spray mist onto other crops, grazing, rivers, dams, and areas not under treatment. • In case of spillage, absorb the liquid and scrub the area with 1-5% bleach solution. • Rinse empty container three times with a volume of water equal to 10% of the volume of the container. Add the rinsings to the contents of the spray tank. • Destroy empty container and do not use for any other purpose. • Dispose of in accordance with local regulations.

STORE IN REFRIGERATOR
SHAKE WELL BEFORE USE

HELIMAX™ is a suspension
concentrate biological insecticide for
the integrated control of bollworm
larvae on agriculture crops.

HELIMAX™ is 'n suspensie
konsentraat biologiese insekdoder
vir die integreerde beheer van
bollworm larwes op landbou gewasse.



WARNING

Hazard Statements
May cause an allergic skin reaction
Precautionary Statements
Wear protective clothing
Wash thoroughly after handling

ACTIVE INGREDIENT(S) / AKTIEWE BESTANDDEEL(ELE):

Helicoverpa armigera nucleopolyhedrovirus (HearNPV)

at least 5 x 10⁹ occlusion bodies (OBs)/ml / ten minste 5 x 10⁹ okklusie partikels (OPs)/ml

Net mass/volume



Netto massa/volume

REGISTRATION HOLDER / REGISTRASIEHOUER

RIVER BIOSCIENCE (PTY) LTD | REG NO. 2003/022759/07 REG NR
PO BOX 20388, Humewood, 6013 | T: +27 41 373 1409
E: admin@riverbio.com | W: www.riverbioscience.co.za



**River
Bioscience**

Batch No. :

Date of Manufacture:



Expiry Date:

Shelf Life:

30 months from date of manufacture

: Lot Nr.

: Datum van Vervaardiging

: Vervaldatum

: Raklewe



2024.09.20 v3

FIRST AID

- IF ON SKIN: Wash with plenty of water. Take off contaminated clothing and wash it before re-use. If skin irritation or rash occurs: Get medical help.

- If inhaled: Move person to fresh air.
- Rinse contaminated eyes with clean water for 15 minutes.

DIRECTIONS FOR USE - Use only as directed

HELIMAX™ does not harm bees, fish, birds, beneficial insects, or wildlife. **HELIMAX™** is fully compatible with an integrated pest management programme, as it is not harmful or disruptive to beneficial insects and other arthropods. Treated crops may be harvested shortly after application.

MIXING INSTRUCTIONS

Shake the container well before each use. For optimum performance, water pH should be neutral, between 5 and 7. Partially fill the spray tank with water, add the required amounts of **HELIMAX™** and adjuvant (buffer and/or wetter) while agitating and top up the spray tank with water to the required volume.

APPLICATION INSTRUCTIONS

HELIMAX™ should be applied immediately after mixing. Under no circumstances should it be left to stand overnight. **HELIMAX™** can be applied with mist blowers or with handheld spray guns. **HELIMAX™** must be applied as a medium cover film spray. Do not concentrate the mixture in mist blowers. Due to the UV sensitivity of **HELIMAX™**, it must not be applied during the heat of the day. Sprays must be applied during the early morning when bollworm feed most actively.

Aerial applications must include medium grade spray oil at the recommended rate for aerial application to prevent drift and vaporization of spray. See section of the addition of a feeding attractant.

Do not tank mix with copper-based fungicides.

ACTION

It is very important to note that larvae may not be killed immediately and may take in excess of two weeks to die. However, feeding and damage will still be significantly reduced during this time. Under extremely high pest pressure, additional control options should be considered.

GENERAL INSTRUCTIONS

HELIMAX™ (nucleopolyhedrovirus) is a highly specific naturally occurring pathogen of *Helicoverpa* spp. The effectiveness of **HELIMAX™** 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 **HELIMAX™** is variable and at times, the level of control may be below expectations. The speed of activity of **HELIMAX™** 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 **HELIMAX™**.

Good coverage of the feeding sites of the larvae is essential, as the product needs to be ingested to be effective. **HELIMAX™** 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.

LIFT HERE

GENERAL INSTRUCTIONS CONTINUED

Good coverage plus actively feeding larvae are the key factors in ensuring maximum performance of **HELIMAX™**. For this reason, apply **HELIMAX™** to coincide with optimum environmental conditions for application and larval activity, such as periods of high humidity and warm (>18°C) conditions. Under sub-optimal conditions where application cannot be delayed, increasing application volume and droplet size, and inclusion of (500 ml molasses + 150 g sugar + 200 ml spray oil + 140 ml water), should be considered.

Mixing: Shake the container well before use. Spray water pH should be neutral (pH 7.0) – spray water pH above 8 may damage the virus and performance will be reduced. If needed, use a suitable buffer or acidifier. If mixing with other pesticides or foliar fertilisers in water, add **HELIMAX™** to the spray tank after the other products are thoroughly diluted. **HELIMAX™** should be applied as soon after mixing as possible. The virus can be rendered inactive if the mixture is left to stand overnight. If using (500 ml molasses + 150 g sugar + 200 ml spray oil + 140 ml water), add the required amount after mixing **HELIMAX™** in the spray tank.

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 handheld 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 (such as a suitable petroleum oil or (500 ml molasses + 150 g sugar + 200 ml spray oil + 140 ml water)) to improve coverage. Aerial applications must include medium grade spray oil at the recommended rate for aerial application to prevent drift and vaporization of spray. See section on the addition of a feeding attractant.

Via Overhead Irrigation: **HELIMAX™** 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/chemigation 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 **HELIMAX™** is used within 10 hours of mixing. For one-pass mobile irrigators such as centre pivots and laterals, continuously introduce the required quantity of **HELIMAX™** into the irrigation water over the course of irrigation. Apply **HELIMAX™** in no more than 0.0 m of irrigation water for static irrigators, introduce the required amount of **HELIMAX™** into the irrigation water just prior to completion of the irrigation period, to maximise the concentration of **HELIMAX™** applied and the amount that remains on the crop.

Compatibility:

In water: **HELIMAX™** is highly compatible with the majority of herbicides, insecticides fungicides and fertilisers when mixed in water. Ensure that the mixture has a pH of 7 or less before adding **HELIMAX™** as alkaline mixtures will damage the virus.

In ULV: For ULV application in oil, **HELIMAX™** is not compatible with other pesticides, since the undiluted solvents in these products can damage the virus. **HELIMAX™** is compatible with (500 ml molasses + 150 g sugar + 200 ml spray oil +140 ml water) in ULV mixtures.

Do not tank mix with copper based fungicides.

Rain fastness:

The majority of virus uptake by larvae occurs within 1-hour post-application. For this reason, it is best to avoid applying **HELIMAX™** if heavy rain is expected within one hour following application. However, do not delay application if only moderate rain is expected, or heavy rain is not imminent.

*USE OF A FEEDING STIMULANT:

A feeding stimulant has been developed specifically as an additive for **HELIMAX™**. It contains 500 ml molasses, 150 g sugar and 200 ml petroleum oil mixed with 5 ml hydrochloric acid and 140 ml water, that can enhance the performance of **HELIMAX™** in some situations. Maximum control with **HELIMAX™** will primarily be achieved by closely following the directions on this label. The addition of this feeding stimulant to **HELIMAX™** should be considered where factors outside of the user's control could limit the performance of **HELIMAX™**. These factors may include:

- Application during cooler conditions (<18°C) that may cause reduced larval activity and feeding (typical in winter crops such as chickpeas).
- High UV light conditions.
- Hot, dry conditions during spraying that can cause droplet evaporation (where application cannot be delayed until conditions improve).
- When targeting high larval numbers or larvae at the larger end of the recommended size spectrum for **HELIMAX™** (7 to 13 mm in length).
- Alkaline or unfavourable plant chemistry (as for cotton and pulses).

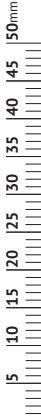
Optimal rates:

Application Volume	Optimal Rate
Less than 100 L/ha	1 L/ha
Greater than 100 L/ha	2 L/ha

Helicoverpa Growth Stage Identification

Showing the actual size of *H. armigera* larvae at a given age (days since egg hatch) when reared at 25°C.

Instar	Age (days)	Old size category	Length (mm)	Actual size	HELIMAX™ timing
First	0-2	Very small	1-3		✓✓
Second	2-4	Small	4-7		✓✓
Third	4-8	Medium (small)	8-13		✓
Fourth	8-11	Medium (large)	14-23		✗
Fifth	11-14	Large	24-28		✗
Sixth	14-18+	Large (snake)	29-40+		



RECOMMENDATIONS

CROP	PEST	RATE	REMARKS
Cereal Grains <i>including:</i> Maize Popcorn		150 ml/ha for light infestations. 300 ml/ha for heavy infestations. (Repeat after 7 days for heavy infestations).	All Crops: Thorough coverage of the crop is essential, as the nucleopolyhedrovirus (NPV) in HELIMAX™ must be ingested by larvae to be effective. NPV is most effective on smaller larvae. Target application when the majority of larvae are less than 7 mm in length. HELIMAX™ should not be used to control larvae larger than 13 mm in length. HELIMAX™ will provide between 60 and 90% control, with greater control expected on smaller larvae under ideal application conditions. Larvae will continue to feed for 1 to 3 days following virus infection. Larvae will take between 3 to 8 days to die, with slower control occurring with larger larvae and during cool conditions. Under high pest pressure or sub-optimal application conditions, or when immediate protection against damage is required, additional control options should be considered. Avoid applying HELIMAX™ if heavy rain is expected within 1 hour after application. Linseed: Use a non-ionic surfactant at the manufacturer's specified rate to improve coverage. Pulses: The addition of 500 ml molasses plus 250 ml sugar plus a non-ionic surfactant is likely to improve the performance of HELIMAX™ in pulse crops.
Lucerne (Alfalfa)			
Oilseed <i>including:</i> Linseed Peanut Canola Safflower Sunflower			
Potatoes			
Pulses <i>including:</i> Azuki bean Broad bean Cowpea Faba bean Field pea Kidney bean Lablab Lentil Lima bean Lupin Mung bean Navy bean Pigeon pea Soya bean Vetch	Larvae of: <i>Helicoverpa armigera</i> (Corn earworm/ Cotton bollworm/ Tobacco budworm) and <i>Helicoverpa punctigera</i> (Native budworm)		
Sorghum		150 to 300 ml/ha + (500 ml molasses plus 150 g sugar plus 200 ml medium grade spray oil plus 140 ml water) * at 1 L/ha when applied as an aerial application.	Use lower rates when targeting larvae smaller than 7 mm (1st and 2nd instar) in length or under lower pressure (near threshold) situations. Use the higher rates when targeting larvae larger than 7 mm in length (3rd instar). Applications that are targeted when 50% of heads have reached 100% flowering are likely to provide good control.
Sweetcorn		200 ml/ha	Application should be made from the early vegetative growth stage through to tasselling and prior to the emergence of silks. HELIMAX™ has short residual activity and re-treatment may be required at 2-to-3-day intervals, depending on egg counts and crop growth rates.

RECOMMENDATIONS CONTINUED

CROP	PEST	RATE	REMARKS
Cotton		200 ml/ha + (500 ml molasses plus 150 g sugar plus 200 ml medium grade spray oil)*. OR 200 ml/ha + (500 ml molasses plus 150 g sugar plus 200 ml medium grade spray oil) * + a registered larvicide at its label rate.	HELIMAX™ should not be applied on larvae larger than 7 mm in length in cotton. When applied as a stand-alone insecticide, HELIMAX™ is unlikely to reduce larval numbers below threshold if the initial population exceeds 4 per metre of row. Always include (500 ml molasses plus 150 g sugar plus 200 ml medium grade spray oil) * when using HELIMAX™ in cotton. HELIMAX™ should be used in accordance with the Cotton Best Management Practices Manual.
Chickpeas		150 ml/ha + (500 ml molasses plus 150 g sugar plus 200 ml medium grade spray oil + 140 ml water)*. 300 ml per hectare.	Use lower rates as a preventive measure in pre-podding chickpeas. Use the high rate when the pest population has reached economic threshold. The addition of (500 ml molasses plus 150 g sugar plus 200 ml medium grade spray oil) * is likely to improve the performance of HELIMAX™ in chickpeas. HELIMAX™ is unlikely to reduce larval numbers below threshold if the initial population exceeds 6 per metre of row – use alternative control options under these populations.
Pome fruit <i>including:</i> Apples Nashi Pears Almonds		150 to 300 ml/ha + Non-ionic surfactant at registered rate or Breakthru at 100 ml per hectare.	For Pome fruit: Low pest incidence, apply 150 ml with non-ionic surfactant at manufacturers registered rate or Breakthru at 100 ml per hectare in at least 1000 l water. Re-apply within 7 days for persistent infestation. Heavy pest incidence; apply at 300 ml per hectare plus a registered non-ionic surfactant or Breakthru at 100 ml per hectare in at least 1000 to 1500 l water.
Berryfruit <i>including:</i> Blackberries Blueberries Boysenberry Cranberry Currants Gooseberry Raspberries Strawberry Brassica vegetables <i>including:</i> Broccoli Brussels sprouts Cabbages Cauliflower Chinese broccoli Brassica leafy vegetables Celery Cucurbits <i>including:</i> Cucumber Melons Pumpkins Squash Watermelon Zucchini Fruiting vegetables <i>including:</i> Eggplant Peppers (capsicum and chilli) Tomato Leafy vegetables <i>including:</i> Endive Lettuce Roquette (Rucola) Silver beet Spinach Legume vegetables <i>including:</i> Green beans Green peas Snow peas Sugar snap peas Ornamental flowers and plants	Larvae of: <i>Helicoverpa armigera</i> (Corn earworm/ Cotton bollworm/ Tobacco budworm) and <i>Helicoverpa punctigera</i> (Native budworm)	200 to 300 mL/ha	Use a higher rate when flowers, fruit or economic parts of the crop are present, under high pest pressure conditions or to control larvae larger than 7 mm in length. Use lower rates during vegetative stages of crop production. HELIMAX™ 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. The addition of (500 ml molasses +150 g sugar +200 ml spray oil +140 ml water)* may increase the speed of kill and improve performance against larvae larger than 7 mm in length.
Tree crops <i>including:</i> Citrus and Nuts		12 ml per 100 L of water + non-ionic surfactant at registered rate (Breakthru 5 ml per 100 L water). Use the highest medium cover spray rate (6000 L/ha) for citrus.	Apply as a medium cover spray immediately after egg hatching and before larvae exceed 10 mm in length. Apply during early morning. Thorough coverage of the crop is essential as HELIMAX™ must be ingested. For heavy infestations where more than 60% of flower clusters are infested with bollworm larvae a chemical alternative should be considered or used in conjunction with HELIMAX™ for extended efficacy.