Heligen

Biological insecticide for the integrated control of Helicoverpa zea (corn earworm, cotton bollworm, tomato fruitworm) and Heliothis virescens (tobacco budworm) on specified food and non-food crops

FOR ORGANIC PRODUCTION

Active Ingredient*: Polyhedral occlusion bodies of Helicoverpa zea nucleopolyhedrovirus
ABA NPV-U: 32.0%
Other Ingredients: 68.0%
Total: 100.0%

*Contains 7.5 x 10^9 occlusion bodies per mL

KEEP OUT OF REACH OF CHILDREN
CAUTION
See additional precautionary and first aid statements on the back panel

EPA Registration No.: 87978-2
EPA Est. Number: 87978-AUS-01

Net Contents: 1 Gallon

Manufactured by
AgBiTech Pty Ltd
8 Roder Court, Glenview
Qld Australia 4510

OR 87978-2
Heligen

Active Ingredient:
Polyhedral occlusion bodies of *Haloferax volcanii*
32.0%
Other ingredients: 68.0%
TOTAL: 100.0%
*Contains 7.5 x 10^10 occlusion bodies per mL

EPA Registration No: 87378-2
EPA Est. Number: 87978-JUL-01

KEEP OUT OF REACH OF CHILDREN
CAUTION
See additional precautionary and first aid statements in the attached booklet

FIRST AID
If swallowed:
• Do not induce vomiting.
• If swallowed, call 911 or an ambulance.
• Provide artificial respiration if necessary.

If inhaled:
• Move person to fresh air.
• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
• Call a poison control center or doctor for treatment advice.

HOTLINE NUMBER
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For emergency information concerning this product, call the National Pesticide Information Center (NPIC) at 1-800-859-1378 seven days a week, 6:00 a.m. to 4:30 p.m. Pacific Time. During other times, call your poison control center at 1-800-222-1222.

CAUSES MILD EYE IRRITATION. AVOID INHALATION AND CONTACT WITH EYES, SKIN OR CLOTHING. AVOID BREATHING SPRAY MIST. WASH THOROUGHLY WITH SOAP AND WATER AFTER HANDLING. IN CASE OF CONTACT WITH THE EYES, RINSE EYES WITH LARGE AMOUNTS OF COLD WATER FOR 15 MINUTES OR MORE. IF CONGESTED, RINSE NOSE WITH LARGE AMOUNTS OF COLD WATER. AVOID INHALATION. AVOID INHALATION OF SPRAY MIST. WASH THOROUGHLY WITH SOAP AND WATER AFTER HANDLING AND BEFORE EATING, DRINKING, CHEWING GUM, USING TOBACCO, OR USING THE TOILET. REMOVE AND WASH CONTAMINATED CLOTHING BEFORE REUSE.

STORAGE AND DISPOSAL
Do not contaminate water, food, or feed by storage and disposal.

PESTICIDE STORAGE
Store in the closed, original container out of direct sunlight at or below 40°F. Storage in a domestic freezer (at 0°F) is suitable - the product will remain liquid. The product is stable for at least 2 years if stored as indicated. The product can be stored for short periods (-24 hours) below 80°F. Reclose containers of unused portions of Heligen.

PESTICIDE DISPOSAL
To avoid wastes, use material in this container by application according to label directions. If wastes cannot be avoided, refer remaining product to waste disposal facility or pesticide disposal program (often such programs are run by state or local governments or by industry).

CONTAINER HANDLING
Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 64 full with water and recap. Shake for 10 seconds. Pour rinse into application equipment or a mix tank, or store rinse for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinance. If burned, stay out of smoke.

Manufactured and distributed by:
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AuStalia
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Crops, Application Rates and Crop Specific Information

**Crop**

- **Sorghum**
  - Rate: 0.7 to 1.6 fl. oz.
  - Use lower rates when targeting larvae smaller than 0.3 inches in length. Use higher rates when larvae are larger than 0.3 inches in length. Apply as needed to control and prevent infestation in crops and vegetables. Apply as a pre-emergence spray to prevent seedling germination and stem cuttings. For control of weeds, use a registered broad-spectrum herbicide.

- **Cereal Grains** (Maize, Popcorn, Attila, Osbend)
  - Rate: 1.0 to 1.5 fl. oz.
  - Use high rates as a preventative measure in agricultural crops. Use the high rate when the pest population has reached economic threshold.

- **Potatoes** (French, Broad bean, Chickpea, Cowpea, Fava bean, Pinto bean, Kidney bean, Lilac bean, Lentil, Lima bean, Lupin, Mung bean, Navy bean, Pea, Soybean, Vegan)
  - Rate: 2.0 fl. oz.
  - High leaf roll in cotton causes rapid NPV decimation, giving Helgon very short residual activity and resulting in high variability problems in cotton. Helgon should not be solely relied upon when larval numbers are above economic threshold in cotton.

- **Sawtooth**
  - Rate: 1.2 to 2.4 fl. oz.
  - Application should be made from the vegetative stage until silking. Applications during silking should be applied as high as possible and be congruent with current pest control measures. Application of low rates at regular intervals (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in reducing silking.

- **Barnyard** (Blackwater, Bluebonnet, Boydsprout, Cranberry, Crabgrass, Groclock, Rupernia, Stinkweed, Swamp)
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate when grass in the ornamental area is present, under high pest pressure conditions, or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Brassica vegetables** (Brocko, Brussels sprouts, Calabrese, Cauliflower, Chinese cabbage, Kales)
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate for flowers of flowers, fast or ornamental parts of the crop, and other vegetables. Under high pest pressure conditions or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Brassica leafy vegetables**
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate for flowers, fast or ornamental parts of the crop, and other vegetables. Under high pest pressure conditions or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Celery** (Cucumber, Melon, Pumpkins, Squash, Watermelons, Zucchini)
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate for flowers, fast or ornamental parts of the crop, and other vegetables. Under high pest pressure conditions or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Feeding vegetables** (Eggplant, Onions, Peppers, Tomato)
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate for flowers, fast or ornamental parts of the crop, and other vegetables. Under high pest pressure conditions or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Leafy vegetables** (Endive, Lettuce, Radicchio, Spinach)
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate for flowers, fast or ornamental parts of the crop, and other vegetables. Under high pest pressure conditions or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Lettuce**
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate for flowers, fast or ornamental parts of the crop, and other vegetables. Under high pest pressure conditions or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Potato blossoms and plants**
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate for flowers, fast or ornamental parts of the crop, and other vegetables. Under high pest pressure conditions or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Pome fruit** (Apple, Pear, Nashi, Peach)
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate for flowers, fast or ornamental parts of the crop, and other vegetables. Under high pest pressure conditions or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Mowing grasses**
  - Rate: 1.2 to 2.4 fl. oz.
  - Use a higher rate for flowers, fast or ornamental parts of the crop, and other vegetables. Under high pest pressure conditions or to control larvae larger than 0.5 inches in length. Use lower rates during vegetative stage of crop production. Application of low rates (3 to 5 day) intervals, particularly via overhead irrigation waters, is an effective strategy in controlling crops.

- **Compatibility**
  - In water: Helgon is compatible with the majority of herbicides, insecticides, fungicides and fertilizer formulations when mixed in water. Ensure that the mixture has a pH of 6 or less and adding Helgon at higher pH levels will damage the mixture.

- **Chemigation** (via overhead irrigation water)
  - Helgon can be effectively applied to crops in overhead irrigation water. The product should be introduced to the irrigation water at the appropriate rate using a nozzle or a spray nozzle equipped with a spray nozzle. If the product is dispersed in water prior to injection into the irrigation water, ensure that the dilution water is clean and clear. High-quality water is also recommended. Potassium hydroxide should be used for dilution. Ensure any diluted Helgon is used within 24 hours.

- **General Requirements**
  - 1. Apply product only through sprinkler (including center pivot, lateral move, end tow, side/center tow, travel, travel, and fixed sprayer) or rain spray systems. Do not apply this product through any other type of irrigation system including drip (trickle) systems.
  - 2. Prevent electrical contamination or any form of unsanitary distribution of treated water.

- **Storage and Disposal**
  - Do not contaminate ponds, waterways, wells, ditches or any other water source.

- **Pesticide Storage**
  - Store the original container out of direct sunlight or below 40°F. Store in a domestic refrigerator (4°F) is suitable. The product will remain liquid in the refrigerator.

- **CONTAINER HANDLING**
  - Nonflammable containers. Do not burn or incinerate this container. Only pour in a suitable container according to local regulations. This product is not hazardous when handled properly. For any spills or leaks, contact your local authorities.

- **WARRANTY STATEMENT**
  - This product is supplied by AGT Tech Pty Ltd and is sold with the understanding that it is suitable for the purposes for which it is not designed, and that no person shall be responsible for the performance of the product as climatic, geographic or biological variables and of the developer's knowledge or experience may affect the results obtained. AGT Tech Pty Ltd accepts no responsibility in respect of this product.
PRESCAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Causes moderate eye irritation. Avoid inhalation and contact with eyes, skin or clothing. Avoid breathing spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

FIRST AID

If inhaled:

- More person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
- Call a poison control center or doctor for treatment advice.

HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor for treatment. For emergency information concerning this product, call the National Poison Information Center (NPIC) at 1-800-222-1222 seven days a week, 24 hours per day.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and others handling this material or the equipment must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Gloves
- Hooded coveralls

Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions are available, use detergent and hot water for washables. Keep and wash PPE separately from other laundry.

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to areas that are not within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to protect agricultural plants on farms, nurseries, or greenhouses.

PRODUCT INFORMATION

This product contains a biological insecticide for the control of the following three species as a wide range of stages:

- Core earworm (Helicoverpa armigera)
- Tobacco budworm (Heliotis virescens)

GENERAL INSTRUCTIONS

Heligoan is a highly specific, naturally occurring species of Helicoverpa armigera. Its effectiveness depends on a number of factors: larval size, environmental conditions, application and the feeding behaviour of the pest. Because of the requirement for good conditions, the performance of Heligoan is variable and at times, the level of control may be below expectations.

The speed of activity of Heligoan is also dependent on climatic conditions. Larvae can take up to 6 days to die, though the level of damage by Heligoan to Heliothis virescens is generally reduced within 15 to 3 days post-infection, depending on larval size. Daytime temperatures of 72°F to 95°F ideal for the activity of NV.

Insecticidal larvae will spread across large areas and cause large amounts of viral silkworms that can result in ongoing larval control, particularly under environmental conditions suitable for NV.

Good coverage of the feeding sites of the larvae is essential, as the product needs to be biologically effective. Heligoan will not control lercher that do not feed on treated areas, including when larvae are feeding inside protected feeding sites such as cotton bolls, lettuce hearts, bean pods, corn ears and flowers.

Heligoan should only be used to treat larvae less than 0.5 inches in length (3rd instar - 1.3 mm), though most effective on larvae less than 0.5 inches in length (3rd instar - 1.3 mm). Larvae at the highest level of damage will take longer to die and cause more significant damage prior to death.

Good coverage of the feeding sites of the larvae is essential, as the product needs to be biologically effective. Heligoan will not control lercher that do not feed on treated areas, including when larvae are feeding inside protected feeding sites such as cotton bolls, lettuce hearts, bean pods, corn ears and flowers.

HELIgene Testing

- First: Very Small
- Age: 0-2
- Heligoan Testing:
  - 1-3 mm
  - 4-7 mm
  - 8-13 mm
  - 14-23 mm
  - 24-40 mm

USES

Heligoan only effective against larvae of Helicoverpa armigera (corn earworm, cotton bollworm, tomato fruitworm) and Heliothis virescens (tobacco budworm). Thorough coverage of the crop is essential. As the rodheadphorid virus (NV) in Heligoan must be ingested by larvae to be effective, NV is most effective on smaller larvae. Target application when the majority of larvae are less than 0.5 inches in length (3rd instar). Heligoan 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 drier 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 Heligoan if heavy rain is expected within 1 hour after application.
Active Ingredient:
Polyhedral occlusion bodies of Helicoverpa zea nucleopolyhedrovirus ABA-NPV-2
Other Ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABA-NPV-2</td>
<td>92.9%</td>
</tr>
<tr>
<td>Other</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100.0%</td>
</tr>
</tbody>
</table>

*Contains 7.5 x 10^6 occlusion bodies per mL

EPA Registration No: 87009-3
EPA Est. Number: 87009-AUS-01

**STORAGE AND DISPOSAL**

Do not contaminate water, food, or feed by storage and disposal.

**PESTICIDE STORAGE**
Store in the closed, original container out of direct sunlight at or below 40°F. Storage in a domestic freezer (at 0°F) is suitable – the product will remain liquid. The product is stable for at least 2 years if stored as indicated. The product can be stored for short periods (<24 hours) below 80°F. Dispose of unused portions of Heligen.

**PESTICIDE DISPOSAL**
To avoid wastes, use material in this container by application according to label directions. If wastes cannot be avoided, offer remaining product to waste disposal facility or pesticide disposal program (often such programs are run by state or local governments or by industry).

**CONTAINER HANDLING**
Nonrefillable containers. Do not reseal or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 16 seconds. Then pour 16 seconds of water into the drain. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances, if burned, stay out of smoke.

**HOTLINE NUMBER**
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For emergency information concerning this product, call the National Pesticide Information Center (NPIC) at 1-800-858-7378 seven days a week, 6:00 am to 6:30 pm Pacific Time. During other times, call your poison control center at 1-800-222-1222.

Causes moderate eye irritation. Avoid inhaling and contact with skin or clothing. Avoid breathing spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

**FIRST AID**

If inhaled:
- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
- Call a poison control center or doctor for treatment advice.

If swallowed:
- Do not induce vomiting.
- Do not give anything by mouth to an unconscious person.
- Call a poison control center or doctor for treatment advice.

If eye contact occurs:
- Hold eyelids open and flush eyes with large amounts of cool water for 15 minutes. Do not rub.
- Call a poison control center or doctor for treatment advice.

If skin contact occurs:
- Wash exposed areas thoroughly with soap and water. Do not rub. Do not use paper towels. Do not remove contaminated clothing unless it is rinsed off or washed immediately.
- Call a poison control center or doctor for treatment advice.

If contact with clothing:
- Remove contaminated clothing.
- Wash the cloth contaminated with the product in warm soapy water. Do not rinse off.
- Call a poison control center or doctor for treatment advice.

If contact with eyes:
- Wash exposed areas thoroughly with soap and water for 15 minutes. Do not rub.
- Call a poison control center or doctor for treatment advice.

If skin is irritated:
- Wash exposed areas thoroughly with soap and water. Do not rub.
- Call a poison control center or doctor for treatment advice.

If skin is sensitive:
- Wash exposed areas thoroughly with soap and water. Do not rub.
- Call a poison control center or doctor for treatment advice.

If inhaled:
- Remove victim to fresh air. If breathing is difficult, give oxygen. If breathing stops, call 911 or an ambulance and begin CPR immediately. Call a poison control center or doctor for treatment advice.

If on skin:
- Wash exposed areas thoroughly with soap and water. Do not rub. Do not remove contaminated clothing unless it is rinsed off or washed immediately.
- Call a poison control center or doctor for treatment advice.

If on clothing:
- Remove contaminated clothing. Wash the cloth contaminated with the product in warm soapy water. Do not rinse off.
- Call a poison control center or doctor for treatment advice.

If on eyes:
- Wash exposed areas thoroughly with soap and water for 15 minutes. Do not rub.
- Call a poison control center or doctor for treatment advice.

If on skin:
- Wash exposed areas thoroughly with soap and water. Do not rub.
- Call a poison control center or doctor for treatment advice.

If on clothing:
- Remove contaminated clothing. Wash the cloth contaminated with the product in warm soapy water. Do not rinse off.
- Call a poison control center or doctor for treatment advice.

If on eyes:
- Wash exposed areas thoroughly with soap and water for 15 minutes. Do not rub.
- Call a poison control center or doctor for treatment advice.

If on skin:
- Wash exposed areas thoroughly with soap and water. Do not rub.
- Call a poison control center or doctor for treatment advice.

If on clothing:
- Remove contaminated clothing. Wash the cloth contaminated with the product in warm soapy water. Do not rinse off.
- Call a poison control center or doctor for treatment advice.

If on eyes:
- Wash exposed areas thoroughly with soap and water for 15 minutes. Do not rub.
- Call a poison control center or doctor for treatment advice.