

BEFORE USING THIS PRODUCT, READ THE LABEL CAREFULLY. KEEP OUT OF REACH OF CHILDREN AND ANIMALS.



Insecticide

DELTA-THRIN 25 EC

Reg. No. L 7426 Act No. 36 of 1947
N-AR 0992 / W1301406

6: 18/1/2023 – Feb2023

An emulsifiable concentrate contact and stomach insecticide for the control of insects mentioned on the crops listed.

ACTIVE INGREDIENT

deltamethrin (pyrethroid) 25 g/l

GROUP 3A INSECTICIDE

REFER TO DETAILS AS PRINTED ON CONTAINER / BAG



Hazard Statements:

Combustible liquid.
May be harmful if swallowed.
May be fatal if swallowed and enters airways.
Causes mild skin irritation.
Causes serious eye damage.
Toxic if inhaled.
Very toxic to aquatic life with long lasting effects.

Precautionary Statements:

Wear impervious rubber gloves and boots, protective clothing and chemical safety goggles.
Avoid release into the environment.

DANGER



UN Number: 3352

Registration holder: VILLA CROP PROTECTION (PTY) LTD.
Co. Reg. No. 1992/002474/07
PO Box 10413, Aston Manor, 1630
Tel. (011) 396 2233
Website: www.villacrop.co.za

24 HR EMERGENCY NUMBERS:
Griffon Poison Centre: +27 82 446 8946
24 HR Transport / Spill Emergency no: (Hazcall24) +27 86 044 4411
(Client: Villa Crop Protection)

DIRECTIONS FOR USE ENCLOSED
Batch Number:
Date of Manufacture:

DELTA-THRIN 25 EC

Reg. No. L 7426 Act No. 36 of 1947

N-AR 0992 / W1301406

IRAC INSECTICIDE GROUP CODE: 3A

ACTIVE INGREDIENT:

deltamethrin (pyrethroid) 25 g/l

Registration holder:

VILLA CROP PROTECTION (PTY) LTD.

Co. Reg. No. 1992/002474/07

P.O. Box 801

KEMPTON PARK, 1620 Tel. (011) 396 2233

WARNINGS

Allow the following number of days between last application and harvest or grazing of the crops listed below:	
Cotton, Grain Sorghum, Grapes & Mangoes	28 days
Peaches (Nectarines), Plums & Wheat	21 days
Maize	14 days
Apples, Beans, Groundnuts, Pears & Paprika	7 days
Cruciferae, Lettuce, Lupins, Lucerne, Pastures, Peas & Cactus Pears	3 days
Onions, Potatoes, Sweet potatoes & Tomatoes	2 days
Pineapples	14 days

NOTE

THE MAXIMUM RESIDUE LEVELS (MRL'S) WILL NOT BE EXCEEDED PROVIDED APPLICATIONS ARE APPLIED AS HEREWITH PRESCRIBED. WHEN FRUIT IS DESTINED FOR THE EXPORT MARKET, THE EXPORT INSTITUTION OF CONCERN MUST BE CONTACTED, PRIOR TO THE USE OF DELTA-THRIN 25 EC IN A SPRAY PROGRAMME.

Hazard statements:

Combustible liquid.
May be harmful if swallowed.
May be fatal if swallowed and enters airways.
Causes mild skin irritation.
Causes serious eye damage.
Toxic if inhaled.
Very toxic to aquatic life with long lasting effects.

- Handle with care.
- Toxic to wildlife.
- Use the product according to directions to limit the risk towards bees, beneficial pest parasites, beneficial predators and fish.
- Do not apply when bees are most active. Do not direct spray towards beehives or allow spray drift in their vicinity. **Deltamethrin** residues have no visible effect upon foraging honeybees, provided the dosage rate of 300 ml per hectare is not exceeded.
- Do not spray over or allow drift to contaminate water bodies such as dams, ponds, rivers, streams or fish hatcheries.
- Do not allow spray to drift to citrus orchards under integrated biological control for Red scale.
- Allow a buffer strip of minimum 100 metres between a cotton field and a citrus orchard.
- Store in a cool, dry place away from food and feedstuffs.
- Keep out of reach of children, uninformed persons and animals.
- Re-entry: Do not enter treated area within one (1) day after treatment unless wearing protective clothing.
- **In case of poisoning immediately call a doctor and make this label available to him/her.**

Aerial application:

Notify all inhabitants in the immediate vicinity of the area to be sprayed and issue the necessary warnings. Do not spray over or allow drift to contaminate water or adjacent areas.

Although this remedy has been extensively tested under a large variety of conditions, the registration holder does not warrant that it will be efficacious under all conditions. The action and effect thereof may be affected by factors such as abnormal soil, climatic and storage conditions, quality of dilution water, compatibility with other substances not indicated on the label, the occurrence of resistance of the pest against the remedy concerned, as well as by the method, time and accuracy of application. The registration holder furthermore does not accept responsibility for damage to crops, vegetation, the environment or harm to man or animal or for lack of performance of the remedy concerned due to failure of the user to follow the label instructions or 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

Precautionary statements:

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Avoid breathing fumes, mists, vapours or spray.
Wash hands thoroughly after handling. Do not touch eyes.
Use only outdoors or in a well-ventilated area.
Avoid release into the environment.
Wear impervious rubber gloves and boots, protective clothing and chemical safety goggles.
IF SWALLOWED OR INHALED: Get emergency medical help immediately.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical help.
Do NOT induce vomiting.
If skin irritation occurs: get medical help.
Collect spillage.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container to suitable landfill in accordance with local regulations.

- Wash with soap and water after use or after accidental skin contact.
- Wash contaminated clothing after use.
- Do not eat, drink or smoke whilst mixing or applying the product or before washing hands and face and change of clothing.
- Prevent drift onto other crops, grazing, rivers, dams or areas not under treatment.
- Thoroughly clean spraying equipment directly after use and dispose of wash water where it will not contaminate food, grazing, boreholes, rivers or dams.
- **TRIPLE RINSE THE EMPTY CONTAINER AS FOLLOWS:** Invert the empty container over the spray or mixing tank and drain for at least 30 seconds after the flow has slowed down to dripping. Thereafter rinse the empty container three (3) times in succession with one quarter of the container volume fresh water and decant the rinsate into the spray or mixing tank. Puncture the triple rinsed container and dispose of via an approved collector or recycler (www.croplife.co.za). Do not bury, burn or donate the container to any other parties that may use it as a container for food or beverages.
- Prevent contamination of food, feeds, drinking water and eating utensils.

Relevant hazardous components	
Deltamethrin TC	25 g/l
Aromatic Solvent	<850 g/l
Calcium Dodecyl Benzene Sulphonate	<50 g/l

SYMPTOMS OF HUMAN POISONING

May cause burning, itching or tingling sensations of the skin, which readily disappear within 24 hours after exposure. Inhalation causes nasal discharge, scratchy throat, as well as ataxia, convulsions and tremors. Systemic symptoms include dizziness, headache, nausea, listlessness and vomiting.

FIRST AID TREATMENT

- Remove the victim from the area of exposure. Wash off remaining material with plenty of water. In the event of any complaints or symptoms, avoid further exposure.

- **Skin:** Remove contaminated clothing, shoes and leather goods. Wash skin gently and thoroughly with cold water and non-abrasive soap. Application of olive oil to the affected area will afford prompt relief. After the affected area is washed with soap and water, dry off and apply olive oil. **Obtain medical attention if irritation occurs.**
- **Eyes:** Flush eyes immediately with large amounts of gently flowing cold water, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15 to 20 minutes). **Get medical attention.**
- **Inhalation:** Remove person from contaminated area to fresh air and assist breathing as needed. **Obtain medical attention immediately.**
- **Ingestion:** **Seek medical attention immediately** or call a poison control centre for treatment advice. **Do not induce vomiting due to the aromatic solvent.** Do not give anything by mouth to an unconscious person. If the person is alert, rinse mouth thoroughly with water.

NOTE TO PHYSICIAN

There is no specific antidote available. In cases of ingestion, consider gastric lavage with water, or 5 % sodium bicarbonate solution. Treatment should be symptomatic. Convulsions should be treated with anti-convulsants. Vomiting may be induced by using Ipecac Syrup. Over-exposure may cause local irritation of the skin (burning sensation on the face and elsewhere) and irritation of the respiratory tract causing rhinorrhoea, chest tightness or dyspnoea.

RESISTANCE WARNING

DELTA-THRIN 25 EC is a group code 3A insecticide. Any insect population may contain individuals naturally resistant to **DELTA-THRIN 25 EC** and other group code 3A insecticides. The resistant individuals can eventually dominate the insect population if these insecticides are used repeatedly. These resistant insects may not be controlled by **DELTA-THRIN 25 EC** or any other group code 3A insecticide.

To delay insecticide resistance:

- avoid exclusive repeated use of insecticides from the same insecticide group code. Alternate or tank mix with products from different insecticide group codes,
- integrate other control methods (chemical, cultural, biological) into insect control programmes.

For specific information on resistance management contact the registration holder of this product.

RESISTANCE MANAGEMENT

- Resistance of the African bollworm (*Helicoverpa armigera*) to synthetic pyrethroids has been confirmed. As part of a strategy to prevent development of widespread resistance, the following guidelines must be adhered to for the control of *Helicoverpa armigera*:
Cotton: Synthetic pyrethroids must only be applied to cotton during the period 1st January to 1 March.
All Other Crops: Do not apply more than two applications per growing season.
- **For optimal control of susceptible bollworm populations, the larvae should not exceed 10 mm (1 cm) in length, at time of application.**
- If a pyrethroid spray gave ineffective control, do not re-spray with any synthetic pyrethroid, even at a corrective dosage rate. Use a product from a different chemical group.

Mode of Action:

DELTA-THRIN 25 EC contains **deltamethrin**, a pyrethroid that belongs to IRAC mode of action group 3A. It is a non-systemic insecticide that is active through contact and ingestion. It causes modulation of voltage-gated sodium channels, which prevents the channels from closing and results in hyperexcitation.

DIRECTIONS FOR USE: Use only as directed.

Compatibility:

- **DELTA-THRIN 25 EC** is compatible with **Charge** and Villa approved buffer + surfactant adjuvants.
- Do not add wetting- or sticking agents or oils to **DELTA-THRIN 25 EC** when spraying deciduous fruit.
- Do not mix with seaweed extracts, **Amitraz**, **Chinomethionat** and **Prothiophos**.
- Flocculation occurs when mixed with wettable powder herbicide formulations in a tank mixture.
- The compatibility of **DELTA-THRIN 25 EC** with other products may be influenced by several factors. As changing factors may vary, a physical compatibility test must always be performed before such tank mixtures are sprayed.
- When **DELTA-THRIN 25 EC** is used in conjunction with any other agricultural remedy, adhere to all **WARNINGS, PRECAUTIONS** and **DIRECTIONS FOR USE** mentioned on that label.

Mixing instructions:

- Half fill the spray tank with clean water.
- Shake the **DELTA-THRIN 25 EC** container well before use.
- Effectiveness of **DELTA-THRIN 25 EC** can be affected by very hard water (> 1000 ppm. solutes), and/or water with a high or low pH value.
- Use **Commodobuff** buffer at the registered rate to adjust the pH of the water if not in the ideal range.
- **Commodobuff** buffer must be mixed with the water prior to the addition of **DELTA-THRIN 25 EC**.
- For use in **Cruciferae**, a Villa approved buffer + surfactant adjuvant can be used instead of **Commodobuff**, as it buffers and supplies wetting and spreading properties.
- Take approximately 10 litres of this pH-corrected water from the mixing tank and thoroughly mix the required volume **DELTA-THRIN 25 EC** therewith.
- If any other product is to be mixed with **DELTA-THRIN 25 EC**, the required volume of this product must be pre-mixed in a similar way.
- Agitate the water in the spray tank and then add the product(s) to the tank in the following sequence (as applicable): **Commodobuff**, suspension concentrate, water-soluble concentrate, emulsifiable concentrate.
- Fill the spray tank with water to the required level while maintaining agitation, to ensure thorough mixing.
- Maintain agitation while spraying.
- Prepared spray mixture must not be left in the spray tank for any length of time, e.g., overnight.

Instructions for application:

- When **DELTA-THRIN 25 EC** is applied to dense crops, the efficacy of the spray mixture may be adversely affected.
- Therefore, ensure that thorough penetration and wetting is obtained.
- Monitor efficacy within 3 days after application. A further application may be necessary if unacceptable levels of control have been obtained.
- **DELTA-THRIN 25 EC** resists wash-off by rain if the spray mixture was allowed to completely dry on the plants.
- It is important that all applications be performed with suitable equipment that is in good working order and correctly calibrated, to give the desired coverage for that particular method of application.

Aerial application:

Aerial application of **DELTA-THRIN 25 EC** may only be done by a registered aerial application operator using a correctly calibrated, registered aircraft according to the instructions of SANS Code 10118 (Aerial Application of Agricultural Pesticides). Ensure that the spray mixture is distributed evenly over the target area and that the loss of spray material during application is restricted to a minimum. It is therefore essential that the following criteria be met:

- Volume: A spray mixture volume of 30 litres per hectare is recommended. As this product has not been evaluated at a reduced volume rate, the registration holder cannot guarantee efficacy, or be held responsible for any adverse effects if this product is applied aurally at a lower volume rate than recommended above.
- Droplet coverage: 30 to 40 droplets per cm² must be recovered at the target area.
- Droplet size: A droplet spectrum with a VMD of 250 to 280 micron is recommended. Limit the production of fine droplets less than 150 micron (high drift and evaporation potential) to a minimum.
- Flying height: Maintain the height of the spray boom at 3 to 4 metres above the target. Do not spray when aircraft dives, is in a climb or when banking.
- Use suitable atomising equipment that will produce the desired droplet size and coverage, but which will ensure the minimum loss of product. The spraying system must produce a droplet spectrum with the lowest possible Relative Span.
- Position all the atomisers within the inner 60 to 75 % of the wingspan to prevent droplets from entering the wingtip vortices.
- The difference in temperature between the wet and dry bulb thermometers, of a whirling hygrometer, should not exceed 8 °C.
- Stop spraying if the wind speed exceeds 15 km per hour.
- Stop spraying under turbulent, unstable and dry conditions during the heat of the day.
- Spraying under temperature inversion conditions (spraying in or above the inversion layer) and/or high humidity conditions (relative humidity 80 % and above) may lead to the following:
 - a) reduced efficacy due to suspension and evaporation of small droplets in the air (inadequate coverage),

- b) damage to other sensitive crops and/or non-target areas through drifting of the suspended spray cloud away from the target field.
- Ensure that the aerial spray operator knows exactly which fields to spray.

Obtain an assurance from the aerial spray operator that the above requirements will be met and that relevant data will be compiled in a logbook and kept for future reference.

Pivot chemigation:

- The system must have a functional check valve, vacuum relief valve and low-pressure drain appropriately located on the irrigation pipeline, to prevent contamination of the water source from back flow.
- The pesticide injection pipeline must have a functional automatic quick-closing check valve, to prevent the flow of liquid back towards the injection pump.
- The pesticide injection line should also have a functional, normally closed, solenoid-operated valve, located on the intake side of the injection pump and connected to the system interlock, to prevent fluid from being withdrawn out of the supply tank, when the irrigation system is either automatically or manually closed down.
- The system must have functioning interlocking controls, to shut off the pesticide injector pump automatically, when the water-pump motor stops.
- The irrigation line or water-pump must include a functional pressure switch, which will stop the water-pump motor, when the water pressure decreases to the point where pesticide distribution is adversely affected.
- Systems must use a metering pump, such as a positive displacement injection pump (e.g. diaphragm pump), effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
- Do not apply when wind conditions favour drift beyond the area intended for treatment.
- **IMPORTANT**
Use very clean water for pivot irrigation application. Water must be free of silt, clay and organic material, as pyrethroids tend to adhere to these particles and adversely affect the efficacy.

USE RESTRICTIONS

- **Warning Against Resistance:** Refer to “**RESISTANCE WARNING**” as described above.
- Cutworms tend to feed sub-surface when the soil surface is dry. Damage to seedlings is usually not visible, until the plants start to wither. When planting in dry soil, or when the soil shortly after plant rapidly desiccate, poor control of Cutworms can be expected, since the pest does not come into contact with the product, applied to the soil surface. Follow-up application will not necessarily ensure control, unless the soil surface is moist.

APPLICATION RATES

Crop / Pest	Dosage Rate	Remarks
Apples & Pears African bollworm (<i>Helicoverpa armigera</i>)	The volume spray mixture per hectare required depends on the tree size and leaf coverage. Early Codling moth, Bollworm, and Weevil sprays, will suppress Fruit nibbler.	
	Warning Against Resistance: Refer to “RESISTANCE MANAGEMENT” above. Apply after 75 % petal drop when the larvae are smaller than 10 mm in length. Apply as a medium cover spray. Weevil sprays control bollworm.	
	12 ml / 100 ℓ water (1.2 ml / 10 ℓ water)	High volume application: Apply 300 to 420 ml DELTA-THRIN 25 EC per hectare.
	300 to 420 ml / ha	Low volume application: Apply in a quarter to an eight of the volume for high volume application.
Antestia	12 ml / 100 ℓ water (1.2 ml / 10 ℓ water)	High volume application: Apply as medium cover spray to wet the leaves and trusses. Sprays for Codling moth and Weevils will control Antestia.
Codling moth (<i>Cydia pomonella</i>)	Apply the first spray at 75 % petal drop. Apply a second spray 14 to 18 days later.	
	10 ml / 100 ℓ water (1 ml / 10 ℓ water)	High volume application: Apply 250 to 350 ml DELTA-THRIN 25 EC per hectare at 2500 to 3500 litres spray mixture per hectare.
	250 to 350 ml / ha	Low volume application: Apply in a quarter to an eight of the volume for high volume application.
Banded fruit weevil (Snout beetle) (<i>Phlyctinus callosus</i>)	Apply two sprays: Apply the first at 75 % petal drop and repeat 3 to 4 weeks later. If necessary, a third application can be applied in middle of January. The interval between a Weevil spray and the next Codling moth spray can be extended to 28 days. Controls African bollworm.	
	25 ml / 100 ℓ water (2.5 ml / 10 ℓ water)	High volume application: Apply 2500 to 3500 litres spray mixture per hectare as a full cover spray. Ensure thorough wetting of the trunk and scaffold branches.
All Row Crops Cutworms (<i>Agrotis</i> spp.)	For both preventive (pre-emergence) and corrective (post-emergence) treatments. a) In case of re-infestation, apply a second application. b) For minimum tillage practices, refer to directions below.	
	A. PREVENTIVE (pre-emergence): a) For fields with history of Cutworm problems or where pest is expected. b) Apply to a well-prepared seedbed free of clods and excessive trash. c) It is important that the soil to the surface is moist with application, to ensure satisfactory control. d) When applying to dry soil, rain or irrigation within seven (7) days after application is required, to wet the soil to at least 5 cm deep.	

Crop / Pest	Dosage Rate	Remarks
All Row Crops (continue) Cutworms (<i>Agrotis</i> spp.)	B. CORRECTIVE (post-emergence): a) When crop has already emerged. b) Apply spray when damage is noticed on 5 % or more seedlings.	
	0.4 to 0.5 ml / 100 m row	Ground application: i) Row treatment: Apply in 3 litres water per 100-metre row length and in a 30 cm wide band over the width of the row. If applying in a wider band, increase the dosage rate accordingly.
	125 to 165 ml / ha (4 to 5.5 ml / 10 ℓ water)	ii) Overall ground treatment: Apply in a minimum of 300 litres water per hectare. Apply the lower dosage rate when minimum tillage practices are not applied.
	165 ml / ha	Aerial application: Apply in 30 litres water per hectare.
Reduced tillage practices: In the case of such tillage practices, the Cutworm populations must, after the initial application, be carefully monitored. As fields under these conditions usually have high Cutworm populations, a follow-up application may be necessary. Apply the follow-up application as an overall ground treatment. Also refer to “ USE RESTRICTIONS ” for conditions during which poor control of Cutworms can be expected.		
Beans, Peas & Groundnuts African bollworm (<i>Helicoverpa armigera</i>)	Warning Against Resistance: Refer to “ RESISTANCE MANAGEMENT ” above. LARVAL INSPECTION TECHNIQUE: a) Scout 25 randomly chosen plants in field up to 15 hectares. b) Scout the fields weekly from flowering stage. c) Apply the first spray when 10 % of the plants have an average of 1 to 2 larvae (smaller than 10 mm in length). d) Repeat application as determined by the scouting of the crop.	
	250 ml / ha (5 to 12.5 ml / 10 ℓ water)	Ground application: Apply in at least 200 to 500 litres water per hectare.
	250 ml / ha	Aerial application: Apply in 30 litres water per hectare.
Cutworms (<i>Agrotis</i> spp.)	Refer to instructions for All Row Crops .	
Cactus pear (including Spineless pear) <i>Cactoblastis</i> larvae	15 ml / 100 ℓ water (1.5 ml / 10 ℓ water)	Ground application: High volume application: Apply a full cover spray as soon as eggs are deposited or when larvae are noticed. Apply a follow-up application when necessary, with 14- to 21-day intervals. Ensure thorough wetting.

Crop / Pest	Dosage Rate	Remarks
Cotton		<p>Warning Against Resistance: Refer to “RESISTANCE MANAGEMENT” above. DELTA-THRIN 25 EC is primarily a preventative control measure against all bollworm larvae. Applications are recommended for the period from 1 January to 1 March, due to the importance of integrated control and pest management principles. Applications are based on regular weekly scouting, or a regular 7-day spray programme.</p> <p>A bollworm control programme will usually commence approximately 12 weeks after plant emergence.</p> <p>Do not use DELTA-THRIN 25 EC from start of flowering until peak flowering. During this period use non-pyrethroid insecticides for the control of the African bollworm, Red bollworm, Spiny bollworm and Stainers. Apply the sprays as determined by scouting.</p> <p>Cotton older than 12 weeks after plant emergence is considered mature, and usually taller than 600 mm.</p> <p>Thorough wetting and penetration of the plants are important. (Refer to “Instructions for application” above).</p>
All bollworms, i.e., African (<i>Helicoverpa</i>), Red and Spiny bollworm larvae & Stainers	<p>Apply treatments, based on scouting as follows:</p> <p>a) Scout 24 randomly chosen plants in field up to 15 hectares.</p> <p>b) Scout the fields weekly from flowering stage until boll-split.</p> <p>c) Apply treatments when the following threshold is exceeded: <u>African bollworm:</u> average 1 egg per 2 plants or 5 small larvae per 24 plants. <u>Red bollworm:</u> 6 eggs per 24 plants. <u>Spiny bollworm:</u> 4 larvae per 24 plants. <u>Stainers:</u> as soon as pest is noticed.</p> <p>d) Up to week 7, apply follow-up sprays at 7-day intervals if threshold values require spraying.</p> <p>e) From week 17, if plant growth tempo has slowed down, intervals can be extended to 14 days, taking into account the threshold values.</p>	<p>Ground application: With mist blowers and boom sprayers. Apply in sufficient volume of water, to ensure thorough coverage of the plants.</p> <p>“Tramline” treatment: Apply sufficient spray mixture per hectare, to ensure thorough wetting. Use minimum of 5 suitable hollow cone nozzles over the “tramlines”, so that one nozzle sprays directly onto each row, one in the middle of the two rows and one on each of the outsides of the rows. Mount the two outside nozzles on drop-arms at a 45° upwards angle. 1/3 metre tramline spacing = 5000 running metre per hectare.</p> <p>Aerial application: Apply in 30 litres water per hectare.</p>
Cutworms (<i>Agrotis</i> spp.)		Refer to instruction for All Row Crops .

Crop/Pest	Dosage Rate	Remarks
Cruciferae Diamond back moth larvae (<i>Plutella xylostella</i>)	If destined for fresh produce market: LARVAL INSPECTION TECHNIQUE: a) Scout 20 randomly chosen plants per hectare. b) Scout the fields weekly from 7 days after transplant. c) Apply the first spray when: i) average of 0.3 larvae per plant occur on small plants and ii) average of 0.2 larvae per plant occur on big plants. d) If necessary, repeat the spray 14 days later. If destined for freezing: SPRAY PROGRAMME: Follow a 14-day spray programme.	
	20 ml / 100 l water (2 ml / 10 l water)	Apply up to 500 litres spray mixture per hectare, depending on the plant size. Use a boom with D3-25 hollow cone nozzles. Apply directly onto the rows. Add a wetting agent, as thorough wetting of the plants is important. Brussel sprouts: More than 500 litres spray mixture per hectare may be necessary, but do not exceed the recommended concentration. Use drop-arms.
Cutworms (<i>Agrotis</i> spp.)	Refer to instructions for All Row Crops .	
Grazing Army worm (<i>Spodoptera exempta</i>)	250 ml / ha (8 ml / 10 l water)	Only for maize, grass, sorghum, and wheat pastures. Apply as soon as the pest is noticed and no further larvae hatch. Ground application: Apply in minimum 300 litres water per hectare. Ensure thorough coverage.
Grape Vines Weevils (Snout beetles) (<i>Phlyctinus callosus</i> & <i>Eremnus setulosus</i>)	Apply the first treatment when movement or feeding of Weevils is noticed (usually from middle October to middle November). If necessary, apply a follow-up treatment after 21 days.	
	25 ml / 100 l water (2.5 ml / 10 l water)	High volume application: Apply as a full cover application and ensure thorough wetting of the total plant.
African bollworm (<i>Helicoverpa armigera</i>)	Warning Against Resistance: Refer to “ RESISTANCE MANAGEMENT ” above.	
	12 ml / 100 l water (1.2 ml / 10 l water)	High volume application: Apply as a medium cover spray as soon as the pest is noticed. Repeat the application when necessary. Ensure thorough wetting of the leaves and bunches.
Lupins African bollworm (<i>Helicoverpa armigera</i>)	Warning Against Resistance. Refer to “ RESISTANCE MANAGEMENT ” above.	
	200 ml / 100 l water	LARVAL INSPECTION TECHNIQUE: a) Scout 25 randomly chosen plants per 15 hectares. b) Scout the fields weekly from bud stage. c) Apply the first spray when 10 % of the plants have an average of 1 to 2 larvae (smaller than 10 mm in length). Aerial application: Apply in 30 litres water per hectare.
Lucerne Lucerne caterpillar (<i>Colias electo</i>)	25 ml / 100 l water (2.5 ml / 10 l water)	Apply as soon as the pest is noticed. Repeat if necessary. Ground application: Apply in 300 litres water per hectare.
Lettuce Caterpillars	250 ml / ha (8 ml / 10 l water)	Ground application: Apply the first application as soon as the pest is noticed. Apply follow-up sprays, every 14 days as necessary.

Crop/Pest	Dosage Rate	Remarks
Grain Sorghum African bollworm (<i>Helicoverpa armigera</i>)	Warning Against Resistance: Refer to “RESISTANCE MANAGEMENT” above. LARVAL INSPECTION TECHNIQUE: a) Scout 25 randomly chosen panicles per 15 hectares. b) Scout the fields weekly from panicle emergence until grain is hard. c) Apply the first spray when: i) 25 larvae per 25 panicles occur in fields with projected yield of approximately 2 ton per hectare and ii) 12 larvae per 25 panicles occur in fields with projected yield of approximately 4 ton per hectare. d) Unsatisfactory control is achieved if the crop is in more advanced stage than the hard dough stage. e) Apply the spray before the panicles close up, in the case of cultivars, which form tight ears (before grains filled out).	
	2.5 ml / 100 m row (8 ml / 10 l water)	Ground application: Apply in minimum 3 litres water per 100 metre row and 50 cm wide band over row. Direct application onto ears.
	250 ml / ha	Aerial application: Apply in 30 litres water per hectare.
Cutworms (<i>Agrotis</i> spp.)	Refer to instructions for All Row Crops .	
Mangoes Mango weevil	40 ml / 100 l water (4 ml / 10 l water)	High volume application: Apply as medium cover spray. Apply the first application at fruit size of 10 mm in diameter, and the second 4 to 5 weeks later at fruit size of 30 to 40 mm in diameter. NOTE Scale numbers may increase due to these sprays.
Maize & Sweetcorn African bollworm (<i>Helicoverpa armigera</i>)	Warning Against Resistance: Refer to “RESISTANCE MANAGEMENT” above. As soon as beards emerge, commence scouting for eggs on a weekly basis. Apply as soon as the eggs are noticed. Maintain weekly scouting and repeat the spray when necessary. Cobs, which are hardened off, are not significantly affected. It is important to control infestation as early as possible, as damage to the young beards adversely affects fertilization. Thorough wetting and penetration of upper third of the plants are important.	
	250 ml / ha	Aerial application: Apply in 30 litres water per hectare.
Cutworms (<i>Agrotis</i> spp.)	Refer to instructions for All Row Crops .	
Maize Chafer beetle	600 ml / ha	Aerial application: Apply a spray as soon as damage to the leaves is visible. If beetles are still hatching, repeat the spray after 14 days.
Chilo stalk borer (<i>Chilo partellus</i>)	Red spider mite: If infestation is expected, and maize and cotton is planted next to each other, do not spray more than two DELTA-THRIN 25 EC sprays. Apply these two last applications just before tasseling.	

Crop / Pest	Dosage Rate	Remarks
Maize (continued) Chilo stalk borer (<i>Chilo partellus</i>)	2.5 ml / 100 m row (10 ml / 10 l water)	Ground application: Apply the first spray 10 to 14 days after crop emergence. For plantings during cooler times of the year, apply from 2- to 4-leaf stage. Apply follow-up sprays every two weeks as necessary until the crop is 8 to 9 weeks old (coincide with tasseling). Apply directly into the funnels by using a tandem fitting. Mount two solid cone nozzles (D4-35 or D5-35) on the boom, above each row with one nozzle angled down and the second slightly ahead.
	250 ml / ha	Chemigation: Apply the first spray at 6-leaf stage. For earlier growth stage, sprays must be applied according to the “ Ground application ” method. Apply follow-up applications every 7 to 10 days until the crop is 8 to 9 weeks old (tasseling). Set the centre pivot speed at 100 %. For dragline sprinkler irrigation systems, the product must be applied during the last 10 to 15 minutes of the cycle, before moving the pipes. IMPORTANT Take necessary precautions to prevent contamination of water sources.
Stalk borer (<i>Busseola fusca</i>)		BASED ON SCOUTING: Apply applications on the basis of scouting, as follows: a) Scout 100 plants randomly per field for eggs. b) Scout the fields weekly from 2 weeks post-emergence of the crop until tasseling. c) Apply the application 7 days after 5 % plants are infested with eggs. d) If eggs have already hatched and 10 % of the plants show first signs of damage, spray immediately. Unsatisfactory control is obtained when larvae are larger than 5 mm and have already tunnelled into the stalk. e) Maintain scouting and repeat application 12 to 14 days later if re-infestation occurs. Thorough wetting and penetration of the plants are important.
		2 ml / 100 m row (7 ml / 10 l water)
	1 ml / 100 m plant row	BASED ON BIOTRAP: Use BIOTRAP (L 2982) directions to determine the 4 th week of moth flights. Refer to the Biotrap instructions for further details.
		Ground application: Refer to the instructions for ground application under “ BASED ON SCOUTING ”.
	200 ml / ha	Aerial application: Apply in 30 litres water per hectare according to Biotrap instructions.
	250 ml / ha	Control of cob damage during January to February generation: Determine week 3 of the moth flight, using Biotrap . If the crop is not yet showing full tassel, apply spray in week 4. As soon as the crop reached full tassel stage, damage is not significant. If the crop is in the funnel stage, follow instructions as described for “ BASED ON SCOUTING ”.
		Aerial application: Apply in 30 litres water per hectare. Ensure recovery of minimum 20 droplets per cm ² at cob level.

Crop / Pest	Dosage Rate	Remarks
Onions Thrips	Not for use on spring onions. Apply the first application as soon as the pest is noticed. Apply follow-up sprays, when necessary, with 10- to 14-day intervals. Add wetting agent, to ensure thorough wetting.	
	40 ml / 100 l water (4 ml / 10 l water)	Ground application: High volume application: Apply 250 to 500 litres spray mixture per hectare, depending on the plant size.
	100 to 200 ml / ha	Low volume application: Apply the low dosage rate to small plants and the high rate to big plants.
Ornamentals African bollworm (<i>Helicoverpa armigera</i>)	12.5 ml / 100 l water (1.3 ml / 10 l water)	Warning Against Resistance: Refer to “ RESISTANCE MANAGEMENT ” above. High volume application: Apply as soon as the pest is noticed. Repeat when necessary. Ensure good wetting of the plants.
Paprika African bollworm (<i>Helicoverpa armigera</i>)	250 ml / ha (8 ml / 10 l water)	Warning Against Resistance: Refer to “ RESISTANCE MANAGEMENT ” above. Apply as soon as the pest is noticed. Ensure thorough wetting of the flowers and fruits by using sufficient volume of water.
Peaches (Nectarines) & Plums African bollworm (<i>Helicoverpa armigera</i>)	Warning Against Resistance. Refer to “ RESISTANCE MANAGEMENT ” as described above. CORRECTIVE after 75 % petal drop: When necessary, apply as a full cover spray. Do not apply before 75 % petal drop. When necessary, repeat the spray 18 to 21 days later.	
	12 ml / 100 l water (1.2 ml / 10 l water)	High volume application: Apply 300 to 420 ml per hectare at 2500 to 3500 litres spray mixture per hectare.
	300 to 420 ml / ha	Low volume application: Apply in a quarter to an eighth of the volume for high volume application.
Banded fruit weevil (Snout beetle) (<i>Phlyctinus callosus</i>)	Apply as full cover spray as soon as feeding damage is noticed. If necessary, apply a second application 3 to 4 weeks later. A third spray may be necessary by middle January.	
	25 ml / 100 l water (2.5 ml / 10 l water)	High volume application: Apply 625 to 875 ml per hectare at 2500 to 3500 litres spray mixture per hectare. Ensure thorough wetting of trunk and scaffold.
Pineapples Pink Bud Moth (<i>Anatrachyntis rileyi</i>)	250 ml / ha (1.5 ml / 10 l water) PLUS 100 ml/ha Charge	Apply at pre-blue flower stage and repeat 14, 28 and 42 days later. Apply a total spray volume between 1500 to 2000 litres per hectare.

Crop / Pest	Dosage Rate	Remarks
<p>Potatoes Potato tuber moth (<i>Phthorimaea operculella</i>)</p>	<p>PREVENTATIVE TREATMENT: Apply a full cover spray before or as soon as the pest is noticed. Apply follow-up applications every 8 to 14 days, to ensure control. Ensure thorough penetration and wetting. The crop must be ridged at least twice during the growing season, to ensure that tubers are covered by soil. If the crop is to be left in the ground for a period of time before it is harvested, precaution must be taken that no cracks appear in the soil covering the rows. The cracks offer direct access for the moths to the tubers.</p>	<p>Ground application: Apply as a high-volume application. Use 180 ml per hectare to control insects between day 0 and day 40, 240 ml per hectare for day 41 to 70 and 300 ml per hectare from day 71.</p>
<p>Sweet potatoes Leaf miners, Weevil & Hawk moth larvae</p>	<p>180 to 300 ml / ha (1.8 to 3 ml / 100 m² area)</p>	<p>Low volume application: Apply in half to an eighth of the volume as for high volume application per hectare. Use 180 ml per hectare to control insects between day 0 and day 40, 240 ml per hectare for day 41 to 70 and 300 ml per hectare from day 71.</p>
<p>Tomatoes Cutworms (<i>Agrotis</i> spp.)</p>	<p>50 ml / 100 l water (5 ml / 10 l water)</p>	<p>Ground application: Apply the first application as soon as the first signs of damage are noticed. Apply follow-up sprays, every 14 days when necessary. Plant with clean material and ridge regularly to prevent cracks in the soil.</p>
<p>African bollworm (<i>Helicoverpa armigera</i>)</p>	<p>12.5 ml / 100 l water (1.3 ml / 10 l water)</p> <p>Dosage rate / ha based on total row length</p>	<p>Refer to instructions for All Row Crops.</p> <p>Warning Against Resistance: Refer to “RESISTANCE MANAGEMENT” above.</p> <p>Ground application: Apply as a full cover spray. Commence applications at flowering or when infestation is expected. Repeat the application every 7 to 10 days or as determined by inspection of the crop. Thorough wetting and penetration of the plants are important.</p> <p>High volume application: Apply 2 litres spray mixture per 100-metre plant row to plants 10 cm high.</p> <p>Low volume application: Ensure thorough wetting by using sufficient volume of water per hectare.</p> <p><u>Formula to calculate dosage rate per hectare:</u> (Total length of rows / hectare) / 100 x (height of tomatoes in cm x 2) / 10 = volume of mixture / hectare, and (Volume of mixture / hectare) / 100 x 12.5 = ml product / hectare.</p>

Crop / Pest	Dosage Rate	Remarks
Wheat African bollworm (<i>Helicoverpa armigera</i>)	Warning Against Resistance: Refer to “RESISTANCE MANAGEMENT” as described above. LARVAL INSPECTION TECHNIQUE: <ol style="list-style-type: none"> Scout 25 randomly chosen panicles per 15 hectares. Scout fields weekly from panicle emergence until grain is hard. Apply the first spray when 10 % of the panicles are infested. Unsatisfactory control is obtained when the crop is in a more advanced stage than the hard dough stage. Apply the spray before the panicles close in the case of cultivars, which form tight ears (before grains filled out). 	Ground application: Apply in at least 200 litres water per hectare. Aerial application: Apply in 30 litres water per hectare.
	250 ml / ha (1.3 ml / 10 l water)	

The following products mentioned in this label may be replaced with equivalent products:

- **COMMODOBUFF** (L 5390 / N-AR 1107) = **AQUABUFF** (L 5451 / W 130060) and
- **CHARGE** (L 9100 / W 130953 / N-AR 2241) = **TECHNIWET SUPER** (L 9239).

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BIOTRAP is a registered product of **WEFCO MARKETING C.C.**