STEWARD® 150 EC

SOUTH AFRICA
Registration number L8435 Act No. 36 of 1947
MALAWI
Registration number MW/PCB/2015R/0272
NAMIBIA
Registration number N-AR 1121
BOTSWANA
Registration number W130934

An emulsifiable concentrate stomach and contact insecticide for the control of various insect pests in several crops as indicated.

SUID AFRIKA
Registrasie nommer L8435 Wet Nr. 36 van 1947
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BOTSWANA
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'n Emulgeerbare konsentraat maag en kontak insekdoder vir die beheer van verskeie plae in verskeie gewasse soos aangedui.

INSECTICIDE GROUP CODE	**22 A**	**INSEKDODER GROEP KODE**

ACTIVE INGREDIENT		**AKTIEWE BESTANDDEEL**
Indoxacarb (Oxadiazine)	150 g/litre	Indoksakarb (Oksadiasien)

Net Volume	**250 mℓ, 1 ℓ**	**Netto Volume**

REGISTERED BY / GEREGISTREER DEUR:
FMC Chemicals (Pty) Ltd
Co. Reg. No.: 1988/001451/07
P O Box / Posbus 44
Postnet Menlyn
Waterkloof Glen
0181

For any emergency or poisoning contact:
Griffon Poison Information Centre (24 hrs)
+27-(0)-82-446-8946

BATCH NUMBER		LOTNOMMER
DATE MANUFACTURED		DATUM VERVAARDIG

UN No. / VN Nr. 3082

HARMFUL/SKADELIK

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Active ingredient: **Indoxacarb 150 g/ℓ**

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HARMFUL / SKADELIK

WARNINGS

WITHHOLDING PERIOD:

THE FOLLOWING MINIMUM NUMBER OF DAYS BETWEEN LAST APPLICATION AND HARVEST MUST BE ADHERED TO:

Apples	28 days
Barley	42 days
Canola	56 days
Cotton	14 days
Cruciferous (cabbage, broccoli, cauliflower, Brussels sprouts)	3 days
Cucurbits (pumpkins, squash, watermelons, muskmelons, baby marrows, patty pans and cucumbers)	3 days
Dry beans (grazing)	42 days
Eggplant	1 day
Grapes (Table)	14 days
Grapes (Wine)	28 days
Green beans	3 days
Hops	7 days
Lettuce	1 day
Maize and sweetcorn (grazing)	42 days
Maize and sweetcorn	3 days
Oats	42 days
Peaches (including Nectarines)	28 days
Pears	28 days
Peas	7 days
Peppers	1 day
Plums	28 days
Potatoes	0 days
Potatoes (in a tank mixture with abamectin)	14 days
Sorghum	30 days
Soybeans	14 days
Soybeans (grazing)	42 days
Sugarcane	28 days
Tobacco	28 days
Tomatoes	1 day
Tree nuts	14 days
Wheat	42 days

- Do not graze treated cotton.
- Handle with care.
- A skin and eye irritant.
- May cause sensitisation by skin contact.
- Harmful by inhalation, contact and if swallowed.
- This product is toxic to animals, bees, fish and other aquatic organisms (refer General Information – BEES on this label).
- Keep out of the reach of children, uninformed persons and animals.
- Store in a cool place away from food and feed.
- Use of this material in a manner or at a time other than in accordance with the directions may cause excessive residues or other undesirable results.
- **RE-ENTRY:** Do not enter treated area within 1 day after treatment unless wearing protective clothing.
- In case of poisoning a person, **CALL A DOCTOR and in the case of an animal a VETERINARIAN IMMEDIATELY AND MAKE THIS LABEL AVAILABLE TO HIM.**
- **AERIAL APPLICATION:** Notify all inhabitants in the immediate vicinity of the lands to be sprayed and issue the necessary warnings. Do not apply over water surfaces and do not 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 because the action and effect thereof may be affected by factors such as abnormal climatic and storage conditions;

quality of dilution water, compatibility with other substances not indicated on the label and 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 immediately in the event of any uncertainty.

PRECAUTIONS:

- Do not inhale spray mist.
- **All persons in contact with the insecticide must wear protective clothing (overalls, face shield, rubber boots and gloves).**
- Wash contaminated clothing daily.
- Do not get in eyes or on skin and clothing.
- Wash with plenty of soap and water immediately after accidental skin contact.
- In case of eye contact wash immediately with plenty of water.
- Remove clothing and shoes immediately should they become contaminated.
- Do not eat, drink or smoke whilst applying or mixing, or before washing hands and face.
- Prevent contamination of feed, food, eating utensils and drinking water.
- **DO NOT APPLY DIRECTLY TO AND PREVENT DRIFT OF SPRAY MIST ONTO OTHER EDIBLE CROPS, GRAZING, RIVERS, DAMS AND AREAS NOT UNDER TREATMENT.**
- Clean application equipment after use. Dispose of wash water where it will not contaminate crops, grazing, rivers and dams.
- Triple rinse the empty container in the following manner: Invert the empty container over the spray or mixing tank and allow to drain for 30 seconds after the flow has slowed down to a drip. Thereafter rinse the empty container three times with a volume of water equal to minimum of
  10 % of the container. Add the rinsing water to the contents of the spray tank before destroying the container in the prescribed manner.
- Destroy empty container by perforation and flattening and never re-use for any other purpose.

RESISTANCE STATEMENT:

STEWARD® 150 EC contains Indoxacarb, a Group 22A insecticide, based on the international IRAC* Mode of Action classification. Repeated and exclusive use of **STEWARD® 150 EC** or other Group 22 Insecticides may create resistant insect populations. Follow these recommendations to prevent or delay the development of insecticide resistance to **STEWARD® 150 EC**:

- As a guideline do not apply more than the specified number of 2 applications of **STEWARD® 150 EC** per season for any crop. For more specific information please refer to the particular crop and pest under “directions for use”.
- Apply **STEWARD® 150 EC** or other Group 22 insecticides using a “window” approach to avoid exposure of multiple successive pest generations to the same mode of action. A window is defined as the period of residual activity with insecticides of the same mode of action within an approximate 30 day period.
- Two successive applications of **STEWARD® 150 EC** may be made within a treatment window to protect new growth or control high pest populations.
- Following a window of use with **STEWARD® 150 EC** or other Group 22 insecticides, rotate to a window using effective insecticides with a different mode of action.
- The period between group 22 “treatment windows” should be at least 60 days starting from the last application of group 22 insecticides.
- Incorporate IPM practices (cultural and biological control) into the pest management program.
- Monitor insect populations for loss of field efficacy.
- Target the most sensitive life stage of the pest, typically small larvae.
- If you experience difficulty with control, and resistance is a reasonable cause, immediately consult your local company representative or agricultural advisor for the best alternate method of control for your area.

*IRAC - Insecticide Resistance Action Committee. For additional information on insect resistance visit the web at http://www.irac-online.org.

SYMPTOMS OF POISONING:

Can cause eye damage.
Can cause skin irritation.

FIRST AID TREATMENT:

In case of eye contact wash with plenty of water and seek medical advice
In case of skin contact wash with soap and water for 15 minutes

In case of ingestion do not induce vomiting. Administer 1 – 2 glasses of water, and if possible 30 – 50g activated charcoal.

NOTE TO PHYSICIAN:

Antidotal treatment is not applicable. Consider gastric lavage avoiding aspiration. Do not give ephedrine or related drugs.

GENERAL INFORMATION:

STEWARD® 150 EC has a novel mode of action. The product acts by inhibiting sodium ion entry into nerve cells, resulting in paralysis and death of the pest species. Death of the pest occurs within 1 - 2 days, but inhibition of insect feeding occurs very rapidly (within 2 - 8 hours).

STEWARD® 150 EC is active as a larvicide through ingestion (stomach action) and through cuticular absorption (contact action). **STEWARD® 150 EC** is equally active on larvae of all development stages except in the case of fall armyworm (*Spodoptera frugiperda*) where application is not recommended for the control of worms larger than 1 cm.

STEWARD® 150 EC is safe to most beneficial insects, including predatory mites.

STEWARD® 150 EC is also effective in hot climatic conditions.

BENEFICIAL ARTHROPODS:

STEWARD® 150 EC helps conserve certain beneficial arthropods (parasites and predators). While these beneficial arthropods cannot be relied upon to control pests, they are of potential value and can be monitored along with pests in pest management programs on these crops.

STEWARD® 150 EC can be dangerous to bees. To protect bees and other pollinators, and according to the standards of Good Agricultural Practices, **STEWARD® 150 EC** should not be applied when honeybees are actively foraging.

RAINFAST PROPERTIES: Once the spray mixture has dried on the target area, **STEWARD® 150 EC** will not wash off through rainfall or irrigation and these conditions will therefore not influence the normal residual activity of the product.

AERIAL APPLICATION

Aerial application of **STEWARD® 150 EC** may only be done by a registered Aerial Application Operator using a correctly calibrated, registered aircraft according to the instructions of SANS 10118:2009 (Aerial Application of 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 at least 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 aerially at a lower volume rate than recommended above.
- Droplet coverage: 30 to 40 droplets per cm^2 must be recovered at the target area.

- Droplet size: A droplet spectrum with a VMD of 250 to 280 microns is recommended. Limit the production of fine droplets less than 150 microns (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/h.
- 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:
    - reduced efficacy due to suspension and evaporation of small droplets in the air (inadequate coverage).
    - 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.

DIRECTIONS FOR USE: **USE ONLY AS DIRECTED**

COMPATIBILITY:

The compatibility of **STEWARD® 150 EC** has not been fully investigated. **STEWARD® 150 EC** is compatible with:
Tanos® (**SOUTH AFRICA** Reg. No. L6564 Act No. 36 of 1947) in potatoes and tomatoes only, Curzate® Pro (**SOUTH AFRICA** Reg. No. L5698 Act No. 36 of 1947, **NAMIBIA** Reg. No. N-AR1129 Act No. 36 of 1947) in potatoes and tomatoes only,
Dichlorvos 1000 EC (**SOUTH AFRICA** Reg. No. L4640 Act No. 36 of 1947, **NAMIBIA** Reg. No. N-AR0990 Act No. 36 of 1947) in beans, cruciferae and tomatoes only,
Nogos® 1000 EC (**SOUTH AFRICA** Reg. No. L5408 Act No. 36 of 1947) in beans, cruciferae and tomatoes only,
Cypermethrin 200 EC (**SOUTH AFRICA** Reg. No. L4069 Act No. 36 of 1947, **NAMIBIA** Reg. No. N-AR0945 Act No. 36 of 1947) maize only,
Polytrin® 200 EC (**SOUTH AFRICA** Reg. No. L5409 Act No. 36 of 1947) in maize only,
Agrimec® 018 EC (**SOUTH AFRICA** Reg. No. L3209 Act No. 36 of 1947) in potatoes only,
Vilmectin 18 EC (**SOUTH AFRICA** Reg. No. L7979 Act No. 36 of 1947) in potatoes only,
Unimectin 18 EC (**SOUTH AFRICA** Reg. No. L7978 Act No. 36 of 1947) in potatoes only and the adjuvants/wetters
H&R Crop Oil (**SOUTH AFRICA** Reg. No. L6802 Act No. 36 of 1947),
Break-Thru® (**SOUTH AFRICA** Reg. No. L6764 Act No. 36 of 1947, **NAMIBIA** Reg. No. N-AR1146 Act No. 36 of 1947),
Villa 51 (**SOUTH AFRICA** Reg. No. L8050 Act No. 36 of 1947, **NAMIBIA** Reg. No. N-AR1090 Act No. 36 of 1947) and
Trend® 90 (**SOUTH AFRICA** Reg. No. L8207 Act No. 36 of 1947) as indicated on this label only. For more information on compatibility or in the event of uncertainty, contact your nearest FMC representative.

TANK MIXING:

Spray equipment must be clean and free of previous pesticide deposits before applying **STEWARD®150 EC**. Fill spray tank ¼ to ½ full with clean water. Add the required amount of **STEWARD®150 EC** directly into the tank and fill with water whilst stirring constantly.

TANK MIXING SEQUENCE:

Add different formulation types in the sequence indicated below*. Allow time for complete mixing and dispersion after addition of each product.

1. Water soluble bag.
2. Water dispersible granules for example Tanos®
3. Wettable powders.
4. Water based suspension concentrates.
5. Water-soluble concentrates.
6. Oil based suspension concentrates.
7. Emulsifiable concentrates like **STEWARD®150 EC**.
8. Adjuvants, surfactants, oils.
9. Soluble fertilizers.
10. Drift retardants.

* *Unless otherwise specified by manufacturer directions for use or by local experience.*

MAXIMUM RESIDUE LEVELS

Maximum Residue Levels (MRL) and Import tolerances for crops treated with **STEWARD® 150 EC** may be pending in some countries. Consult with your exporter or local distributor before applying **STEWARD® 150 EC** to export crops.

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
APPLES & PEARS: African bollworm (larvae) *(Helicoverpa armigera)*	30 mℓ/100 ℓ water	**Foliar application:** Apply when eggs or young larvae are present, but before larvae enter the fruit. A follow-up application may be necessary 10 to 14 days later depending on re-infestation of the pest. Refer to notes below.
APPLES & PEARS: (continued) Codling moth (larvae) *(Cydia pomonella)*	50 mℓ/100 ℓ water	**Foliar application:** Apply against the first generation of the pest. Commence application at 75% petal fall at the onset of the first moth generation of the pest. Apply in a programme, not exceeding 14-day intervals. Refer to notes below.
APPLES & PEARS: (continued) Banded Fruit Weevil (Snoutbeetle) Fruit damage *(Phlyctinus callosus)*	50 mℓ/100 ℓ water	**Foliar application:** Commence application from 75% petal fall onwards, or when weevils are observed in cardboard traps, or when feeding damage is observed on lower shoots. A second application may be necessary 14 to 21 days later if infestation persists. Refer to notes below.

IMPORTANT NOTES WITH REGARDS TO FOLIAR APPLICATION ON APPLES AND PEARS:

- Apply as a full cover spray in 500 to 2000 L water per hectare.
- Ensure thorough coverage.
- Do not exceed 2 **STEWARD® 150 EC** applications per season, including applications made with this product against other pests.
- To avoid the development of resistance, apply registered products with a different mode of action against further generations or other pests.
- The addition of an adjuvant / wetter e.g. Trend® 90 at 10mℓ/100ℓ of spray mixture can be added in apples to improve coverage.
- **Allow 28 days between last application and harvest.**
- The withholding period, i.e. the number of days between last application and harvest meets local maximum residue limits (MRL's), but may not necessarily meet all those for export.

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
CANOLA: African bollworm (larvae) *Helicoverpa armigera*	250 ml/ha	Apply **STEWARD® 150 EC** at the beginning of infestation, when the first bollworm eggs, or small larvae are observed. Do not exceed 1 application per season in total of **STEWARD® 150 EC**. The alternation of **STEWARD® 150 EC** with products having a different mode of action (e.g. **ALTACOR®, CORAGEN®** or **PREVATHON® 5 SC)** is recommended. Allow 56 days between last **STEWARD® 150 EC** application and harvest. The emergency registration on Canola for control of African Bollworm is based on limited and/or restricted data and experience on efficacy and crop safety. Therefore, use is at the sole risk and responsibility of the applicator. Applicators are strongly advised to test spray a small area before using it in a large scale and/or large area.
BARLEY & OATS: African bollworm (larvae) *Helicoverpa armigera*	250 ml/ha	Apply **STEWARD® 150 EC** at the beginning of infestation, when the first bollworm eggs, or small larvae are observed. Do not exceed 1 application per season in total of **STEWARD® 150 EC**. The alternation of **STEWARD® 150 EC** with products having a different mode of action (e.g. **ALTACOR®, CORAGEN®** or **PREVATHON® 5 SC)** is recommended. Allow 42 days between last **STEWARD® 150 EC** application and harvest. The emergency registration on Barley & Oats for control of African Bollworm is based on limited and/or restricted data and experience on efficacy and crop safety. Therefore, use is at the sole risk and responsibility of the applicator. Applicators are strongly advised to test spray a small area before using it in a large scale and/or large area.
COTTON: African bollworm (larvae) (*Helicoverpa armigera*) Red bollworm (larvae) *(Diparopsis custanea)* Spiny bollworm (larvae) *(Earias* spp.) Leafhopper (Jassid) (*Jacobiella fascialis*)	**GROUND APPLICATION:** 200–250 mℓ/ha	Use the lower rate when economic threshold values are **reached**. Use the higher application rate for corrective application when the economic threshold value is **exceeded.** Refer to **'NOTES'** below for economic threshold levels.
COTTON: **(continued)** Fall armyworm (larvae) (*Spodoptera frugiperda*)	**GROUND APPLICATION:** 250 ml/ha	Start applications when worms (larvae) up to 1 cm are found in 5% of the plants. **Application is NOT recommended for control of worms (larvae) larger than 1 cm.** Interval between applications: 7 days. **Refer to 'NOTES' below for economic threshold levels.**

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
COTTON: (continued) African bollworm (larvae) (*Helicoverpa armigera*) Red bollworm (larvae) *(Diparopsis custanea)* Spiny bollworm (larvae) *(Earias* spp.) Leafhopper (Jassid) (*Jacobiella fascialis*) Fall armyworm (larvae) (*Spodoptera frugiperda*)	**AERIAL APPLICATION:** 250 mℓ/ha + 1 ℓ/100 ℓ water (minimum 350 mℓ/ha) H&R Crop Oil	Apply **STEWARD® 150 EC** when economical thresholds are reached. Under conditions of continuous re-infestation use **STEWARD® 150 EC** in a spray programme, at 7–14 day intervals. Use the shorter interval when plants are growing actively or when leafhoppers are present. Use a 7 day interval for fall armyworm. **Refer to 'NOTES' below for economic threshold levels.**

IMPORTANT NOTES WITH REGARDS TO GROUND AND AERIAL APPLICATIONS OF COTTON:

GROUND APPLICATION:
Apply as a foliar application in 200–400 ℓ water per hectare and ensure thorough coverage of the foliage. Spray volumes are based on plants taller than 0.6 m. Make use of hollow or full cone nozzles.

AERIAL APPLICATION:
Apply in minimum of 35 ℓ water per hectare, ensure thorough coverage of the foliage.

Do not exceed 2 applications per season with **STEWARD® 150 EC**.
Two applications can be made consecutively after which insecticide with other mode of action must be used.
The addition of an adjuvant / wetter e.g. Trend® 90 at 100 mℓ/100 ℓ of spray mixture is recommended to improve coverage.

ECONOMIC THRESHOLD LEVELS

BOLLWORM SPECIES IN COTTON:
All sprays should be based on scouting, with weekly (8–20 weeks after emergence) inspection of 24 plants per 15 hectare.

African bollworm (*Helicoverpa armigera*):
Egg threshold: 12 per 24 plants
Larval threshold: 5 per 24 plants

Red bollworm (*Diparopsis custanea*):
Egg threshold: 6 per 24 plants
Larval threshold: 2 per 24 plants

Spiny bollworm *(Earias* spp.):
Larval threshold: 2 per 24 plants

FALL ARMYWORM IN COTTON:

***Spodoptera frugiperda*:**
Start applications when worms (larvae) up to 1 cm are found in 5% of the plants. **Application is not recommended for control of worms (larvae) larger than 1 cm.**

LEAFHOPPERS (JASSIDS) IN COTTON:
Commence applications when two leafhoppers (adults and/or juveniles) occur per leaf.

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
CRUCIFERAE: **(Cabbage, Broccoli, Cauliflower and Brussels Sprouts)** Diamondback moth (larvae) *(Plutella xylostella),* Cabbage webworm (larvae) *(Hellula undalis),* African bollworm (larvae) *(Helicoverpa armigera)* Cabbage white butterfly (larvae) *(Pieris brassicae)*	**GROUND APPLICATION:** 250-300 mℓ/ha	**Early Corrective Foliar Application:** Apply in 300-600 ℓ of water per hectare and ensure thorough coverage of the heads, where the larvae feed. Make use of hollow or full cone nozzles. Use the higher application rate when applied correctively. Use the lower rate for subsequent applications when applied in a regular spray programme. **DIAMONDBACK MOTH AND WEBWORM:** It is important to commence application shortly after transplant before or when the first eggs or very first larvae appear. Diamondback moth and cabbage webworm are most damaging at the early crop stage. Under conditions of continuous re-infestation, use in a spray programme at 7–10 day intervals, but do not exceed 3 applications per season with **STEWARD® 150 EC**. Use the shorter interval early in the growing season when plants are growing actively. **BOLLWORM AND CABBAGE WHITE BUTTERFLY:** Apply correctively when needed. The alternation of **STEWARD® 150 EC** with products that have a different mode of action is recommended. Apply 2 **STEWARD® 150 EC** applications consecutively (= block application) before switching to insecticides with other modes of action. It is important not to apply more than 3 sprays of **STEWARD® 150 EC** per season. **STEWARD® 150 EC** will control larvae of all stages of development. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC.** **The addition of an adjuvant / wetter e.g. Trend® 90 at 100mℓ/100ℓ of spray mixture is essential to improve coverage.** ***The Cruciferae crop may be harvested 3 days after application.***

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
CUCURBITS: **(Pumpkins, Squash, Watermelons, Muskmelons, Baby Marrows, Patty Pans and Cucumbers)** African bollworm (larvae) *(Helicoverpa armigera)*	**GROUND APPLICATION:** 250 mℓ/ha	**Early Corrective Foliar Application:** Apply in 250–750 ℓ water per hectare depending on the specific cucurbit species and crop stage. Ensure thorough, even coverage of the foliage. Apply when the first bollworm eggs or small larvae are observed following regular scouting during flowering and fruit-set stages. It is important to take into consideration that even slight bollworm feeding damage on the flowers of cucurbit crops may result in significant yield losses. A follow-up application 7–10 days later will normally be necessary if the first application is made at the early flowering stage or under conditions of continuous re-infestation. Although **STEWARD® 150 EC** will control larvae of all stages of development, including large 5th instar larvae, larvae that have penetrated the fruits or are obscured by dense foliage during application may not be adequately controlled. It is therefore essential to ensure thorough coverage of the foliage. Do not exceed 2 applications of **STEWARD® 150 EC** per season. Should a third application be needed, use an insecticide with a different mode of action. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC.** **The addition of an adjuvant / wetter e.g. Trend® 90 at 75 mℓ/100 ℓ of spray mixture, or similar adjuvant, is recommended to improve coverage.** ***Cucurbits may be harvested 3 days after application.***
DRY BEANS: African bollworm (larvae) *(Helicoverpa armigera)*	**GROUND APPLICATION:** 250 mℓ/ha	**Corrective Foliar Application:** Apply in 330–500 ℓ water per hectare and ensure thorough, even coverage of the foliage. Apply at flowering or when the first bollworm eggs or small larvae are observed following regular scouting during flowering and pod-set stages. A second application with an insecticide with a different mode of action could be necessary if the **STEWARD® 150 EC** application is made at the early flowering stage or under conditions of continuous re-infestation. **STEWARD® 150 EC** will control larvae of all stages of development, including large 5th instar larvae. Larvae that have penetrated the pods or are obscured by dense foliage during application may not be adequately controlled. It is therefore essential to ensure thorough coverage of the foliage. Do not exceed 1 application of **STEWARD® 150 EC** per season in dry beans. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC**. **The addition of an adjuvant / wetter e.g. Trend 90 at 75 mℓ/100 ℓ of spray mixture is recommended to improve coverage.** ***Dry beans may be harvested as soon as they are ready for harvest.***

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
EGGPLANT: Tomato leaf miner moth (larvae) (*Tuta absoluta*)	**GROUND APPLICATION:** 300 mℓ/ha **(when applying >1000 ℓ spray mixture per ha, use 30 mℓ/100 ℓ water)**	**Early corrective foliar application:** Apply at 500–1500 ℓ of spray mixture per hectare. Good coverage of all foliage is essential. Monitor the adult moth flights. Start application at egg-hatching or when the very first erosions by the newly hatched larvae are visible. Should additional applications be needed, reapply at 7 day intervals. Steward®150 EC has an efficacy of around 85% against *Tuta absoluta* larvae. The addition of a suitable registered adjuvant can increase the efficacy to about 95% due to improved penetration of the active ingredient into the leaves. **Please see important notes below.**

IMPORTANT NOTES APPLICABLE TO TOMATO LEAF MINER MOTH LARVAE ON EGGPLANT:

- Regular scouting of eggplant fields is essential to determine the timing of the first and subsequent applications if necessary.
- **STEWARD® 150 EC** can be applied in a 7 day interval spray programme under conditions of continuous re-infestation. Do not exceed 2 applications per season with **STEWARD® 150 EC**. The alternation of **STEWARD® 150 EC** with insecticides having a different mode of action is recommended. Apply 2 **STEWARD® 150 EC** applications consecutively (= block application) before going over to products with other modes of action.
- Most beneficial insects are unaffected by applications of **STEWARD® 150 EC.**
- **The addition of an adjuvant / wetter e.g. Trend® 90 at 75 mℓ/100 ℓ, Villa 51 at 50 mℓ/100 ℓ of spray mixture is recommended to improve coverage.**
- ***Eggplant may be harvested 1 day after application.***

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
TABLE AND WINE GRAPES: African bollworm (larvae) *Helicoverpa armigera*	30ml/100ℓ water	**Foliar application:** Apply preventively or as soon as eggs or larvae are present, but before larvae enter the fruit. A follow-up application may be necessary 10 to 14 days later depending on re-infestation of the pest. **Please see IMPORTANT NOTES below.**
TABLE AND WINE GRAPES: (continued) Banded Fruit Weevil (Snoutbeetle) Berry damage *Phlyctinus callosus*	40ml/100ℓ water	**Foliar application:** Commence application from 25cm shoot length onwards or when weevils are first observed in cardboard traps or when first feeding damage is observed on lower shoots. The first occurrence of weevils (snoutbeetles) varies from area to area but can normally be expected from mid October to mid November. A second application may be necessary 14 days later if infestation persists. **Please see IMPORTANT NOTES below.**

TABLE AND WINE GRAPES: (continued) Leafhoppers *Acia & Mgenia spp*.	40ml/100ℓ water	**Foliar application:** Apply preventively as soon as leafhoppers are present and their numbers start increasing, usually at the beginning of January. A follow-up application may be necessary 10 to 14 days later depending on re-infestation of the pest. A third application is recommended after harvest to decrease leafhopper numbers and transfer of the disease, Aster-Yellows. If 2 STEWARD® 150 EC applications were applied before harvest, apply a registered pesticide unrelated to STEWARD® 150 EC as the post harvest application. **Please see IMPORTANT NOTES below.**
TABLE AND WINE GRAPES: (continued) False Codling Moth *Thaumatotibia leucotreta*	40 ml/100ℓ water	**Foliar application:** Apply **STEWARD® 150 EC** when moth catches in pheromone traps indicate an infestation of False Codling moth. Further applications should be made at 10 day intervals if necessary. Always apply **STEWARD® 150 EC** as part of an integrated pest management program (IPM). For optimum results **STEWARD® 150 EC** applications should be combined with, or preceded by, other methods of false codling moth control for example false codling moth mating disruption, biological control programs, good sanitation programs and effective insecticides. The emergency registration for grapes for control of False codling moth is based on limited and/or restricted data and experience on efficacy and crop safety. Therefore, use is at the sole risk and responsibility of the applicator. Applicators are strongly advised to test spray a small area before using it in a large scale and/or large area. **Please see IMPORTANT NOTES below.**

IMPORTANT NOTES WITH REGARDS TO TABLE AND WINE GRAPES:

- Apply as a full cover spray depending on vine size at 1000-1500ℓ spray mixture per ha.
- Thorough coverage is essential.
- Do not exceed 2 **STEWARD® 150 EC** applications in total per season on crop. Should any further control of the pest be required use a product with a different mode of action.

- **STEWARD® 150 EC** can be dangerous to bees. To protect bees and other pollinators, and according to the standards of Good Agricultural Practices, **STEWARD® 150 EC** should not be applied when honeybees are actively foraging.

- **Allow 14 and 28 days between last application and harvest of table and wine grapes respectively.**
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- Note: The withholding period, i.e. the number of days between last application and harvest meets local maximum residue limits (MRL's), but may not necessarily meet all those for export.

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
GREEN BEANS: African bollworm (larvae) *(Helicoverpa armigera)*	**GROUND APPLICATION:** 250 mℓ/ha	**Corrective Foliar Application:** Apply in 250–350 ℓ water per hectare in green beans. Ensure thorough, even coverage of the foliage. Apply at flowering or when the first bollworm eggs or small larvae are observed following regular scouting during flowering and pod-set stages. A follow-up application 7–10 days later will normally be necessary if the first application is made at the early flowering stage or under conditions of continuous re-infestation. **STEWARD® 150 EC** will control larvae of all stages of development, including large 5th instar larvae. Larvae that have penetrated the pods or are obscured by dense foliage during application may not be adequately controlled. It is therefore essential to ensure thorough coverage of the foliage. The *Spodoptera* leaf worm (*Spodoptera littoralis*) and the semi- (Plusia) looper (*Chrysodeixis acuta*) will also be controlled in soybeans if present during application. Do not exceed 2 applications of **STEWARD® 150 EC** per season. Should a third application be needed, use an insecticide with a different mode of action. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC**. **The addition of an adjuvant / wetter e.g. Trend 90 at 75 mℓ/100 ℓ of spray mixture is recommended to improve coverage in green beans.** ***Green beans may be harvested 3 days after application.***
HOPS: African bollworm (larvae) *(Helicoverpa armigera)*	**GROUND APPLICATION:** 30 mℓ/100 ℓ water	**Only for use by authorized members of the SA Hop Growers Association and for production of hops for use in South Africa only.** **Early Corrective Foliar Application:** Apply in 500–1000ℓ of water per hectare depending on plant height and density. Good coverage of all foliage is essential. Apply when the first larvae are observed usually early in the season on young shoots, during flowering and after flowering when cones are formed. **STEWARD® 150 EC** will control larvae of all stages of development. Regular scouting of hop fields is essential to determine the timing of the first and subsequent applications if necessary. Apply **STEWARD® 150 EC** at a spray interval of 10–14 days. Use the shorter interval early in the growth season when plants are growing actively or under high pest pressure. Do not exceed 2 applications per season with **STEWARD® 150 EC**. The alternation of **STEWARD® 150 EC** with insecticides that have a different mode of action is recommended. Apply the 2 **STEWARD® 150 EC** applications consecutively (= block application) before switching to insecticides with other modes of action. Most beneficial insects are unaffected by applications **STEWARD® 150 EC.** **The addition of an adjuvant / wetter e.g. Trend® 90 at 50 mℓ/100 ℓ of spray mixture is recommended to improve coverage.** ***Hops may be harvested 7 day after application.***

LETTUCE: Fall armyworm (larvae) (*Spodoptera frugiperda*)	**GROUND APPLICATION:** 250 ml/ha	Start applications in the initial phase of the crop (before the formation of the head), when the first larvae smaller than 1cm are found in the crop. Apply in 500–600 ℓ of water per hectare depending on plant size. Interval between applications: 7 days. Do not exceed 2 applications per season with **STEWARD® 150 EC**. The alternation of **STEWARD® 150 EC** with insecticides that have a different mode of action is recommended. The addition of a suitable registered adjuvant at the registered rate, may enhance efficacy. Allow 1 day between last **STEWARD 150 EC®** application and harvest.
CROP / PEST	**APPLICATION RATE**	**RECOMMENDATIONS / REMARKS**
MAIZE (**including sweetcorn):** Stalk borer (larvae) (*Busseola fusca*) Sorghum stem borer (larvae) (*Chilo partellus*) African bollworm (larvae) (*Helicoverpa armigera*)	**GENERAL GROUND APPLICATION:** 300 mℓ/ha **STEWARD® 150 EC** + 0,5 ℓ/ha H&R Crop Oil or 225 mℓ/ha Trend® 90 **OR** 250 mℓ/ha **STEWARD® 150 EC** + 250 mℓ/ha cypermethrin + 0,5 ℓ/ha H&R Crop Oil or 225 mℓ/ha Trend® 90	**APPLY STEWARD® 150 EC OR STEWARD® 150 EC PLUS CYPERMETHRIN TANK MIXTURES AS AN EARLY CORRECTIVE FOLIAR TREATMENT** Apply in a minimum of 450 ℓ water per hectare. Apply over the funnel of the plants and ensure thorough coverage of the foliage. To ensure optimum results, application must take place early in the morning when dew is present. The absence of rain or irrigation within 3 days after application can lead to a decrease in control with **STEWARD® 150 EC** spray mixtures. Water after application is essential to wash the spray mixture into the funnel. Use the **STEWARD® 150 EC** plus cypermethrin mixture when hot, dry environmental conditions are prevalent.
MAIZE (**including sweetcorn):** **(Continued)** Stalk borer (larvae) (*Busseola fusca*) Sorghum stem borer (larvae) (*Chilo partellus*) African bollworm (larvae) (*Helicoverpa armigera*)	**GROUND APPLICATION OVER THE PLANT ROW:** 3,0 mℓ/100 m plant row **STEWARD® 150 EC** + 3,3 mℓ/100 m plant row H&R Crop Oil or 1,5 mℓ/100 m plant row Trend 90 **OR** 2,5 mℓ/100 m plant row **STEWARD® 150 EC** + 2,5 mℓ/100 m plant row cypermethrin + 3,3 mℓ/100 m plant row H&R Crop Oil or 1,5 mℓ/100 m plant row Trend® 90	Apply in 3 ℓ water per 100 m plant row over the funnel of the plants and ensure thorough coverage of the foliage. To ensure optimum results, application must take place early in the morning when dew is present. The absence of rain or irrigation after application can lead to a decrease in control with the **STEWARD® 150 EC** spray mixtures. Water after application is essential to wash the spray mixture into the funnel. Use the **STEWARD® 150 EC** plus cypermethrin mixture when hot, dry environmental conditions are prevalent. **NB: For instructions for the control of stalk borer, stem borer and African bollworm with STEWARD® 150 EC plus cypermethrin spray mixtures on maize, see 'IMPORTANT NOTES' below.** Under conditions of repeated infestation, apply **STEWARD® 150 EC** in a 10–14 day spray programme. Use the shorter spray interval when the pest infestation pressure is high or when maize is growing rapidly. Do not exceed the maximum of 2 **STEWARD® 150 EC** applications per season. **NB: Do not apply STEWARD® 150 EC on maize that is under drought stress. Larvae that have already tunnelled into the funnels will not be controlled by STEWARD® 150 EC spray mixtures.**

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
MAIZE (including sweetcorn): (continued) Stalk borer (larvae) (*Busseola fusca*) Sorghum stem borer (larvae) (*Chilo partellus*) African bollworm (larvae) (*Helicoverpa armigera*)	**APPLICATION WITH PIVOT IRRIGATION SYSTEM:** 300 mℓ/ha **STEWARD® 150 EC** or 250 mℓ/ha **STEWARD® 150 EC** + 250 mℓ/ha cypermethrin	**APPLY STEWARD® 150 EC OR STEWARD® 150 EC PLUS CYPERMETHRIN TANK MIXTURES AS AN EARLY CORRECTIVE TREATMENT.** **Ensure that the pivot irrigation system complies with the following specifications before application starts:** The distribution coefficient of the pivot irrigation system must be >90%, and the pivot should not apply more than 5mm (50 000 ℓ) per hectare at maximum speed. Clean all the sieves of the pivot irrigation system before starting application. Calibrate the injection pump of the pivot irrigation system according to the time it takes for the pivot irrigation system to complete one full circle. Set the pivot irrigation system to maximum speed so that as little water as possible (not more than 5 mm) is applied per hectare. Mix the **STEWARD® 150 EC** (and cypermethrin if applicable) with water in the application tank. Stir the spray mixture continuously before and during application. Inject the **STEWARD® 150 EC** spray mixture into the main application line of the pivot irrigation system as soon as the irrigation system reaches maximum speed. Mark the position on the land when the spray mixture reaches the furthest end of the pivot irrigation system. Allow the pivot irrigation system to complete one full circle from the aforementioned point. Do not irrigate within 6 hours after a **STEWARD® 150 EC** application. **NB: For instructions on the control of stalk borer, stem borer and African bollworm with STEWARD® 150 EC plus cypermethrin spray mixtures on maize, see 'IMPORTANT NOTES' below.** Under conditions of repeated infestation, apply **STEWARD® 150 EC** in a 10–14 day spray programme. Use the shorter spray interval when the pest infestation pressure is high or when maize is growing rapidly. Do not exceed the maximum of 2 **STEWARD® 150 EC** applications per season. **NB: Do not apply STEWARD® 150 EC on maize that are under drought stress. Larvae that have already tunnelled into the funnels will not be controlled by STEWARD® 150 EC spray mixtures.** **When STEWARD® 150 EC** is applied through a centre pivot irrigation system the addition of an adjuvant is **not necessary. If however, an adjuvant is to be added, a mineral oil type adjuvant e.g. H&R Crop Oil at 5 ℓ per hectare is recommended.**

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
MAIZE (including sweetcorn): (continued) Fall armyworm (larvae) (*Spodoptera frugiperda*)	**GENERAL GROUND APPLICATION:** 300 mℓ/ha	Apply at the beginning of infestation and at the first signs of damage, no more than when 5% of the plants are found scraped. **Application is not recommended for control of worms (larvae) larger than 1 cm.** Apply in a minimum of 450 ℓ water per hectare. Apply over the funnel of the plants and ensure thorough coverage of the foliage. To ensure optimum results, application must take place early in the morning when dew is present. The absence of rain or irrigation within 3 days after application can lead to a decrease in control with **STEWARD® 150 EC** spray mixtures. Water after application is essential to wash the spray mixture into the funnel. Interval between applications: 7 days. The addition of a suitable adjuvant, such as H&R Crop oil or Trend® 90 at the registered rates, may enhance efficacy. Allow 3 days between last **STEWARD 150 EC®** application and harvest. Refer to '**IMPORTANT NOTES'** below for economic threshold levels.
MAIZE (including sweetcorn): (continued) Fall armyworm (larvae) (*Spodoptera frugiperda*)	**AERIAL APPLICATION:** 300 mℓ/ha	Apply at the beginning of infestation and at the first signs of damage, no more than when 5% of the plants are found scraped. **Application is not recommended for control of worms (larvae) larger than 1 cm.** Apply in minimum of 30 ℓ water per hectare. Apply **STEWARD® 150 EC** in a preventive program or when economical thresholds are reached. Under conditions of continuous re-infestation use **STEWARD® 150 EC** in a 7 day interval spray programme. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC**. This benefit is maximised when **STEWARD® 150 EC** applications are commenced early in the growing season of the crop. Refer to '**IMPORTANT NOTES'** below for economic threshold levels.

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
MAIZE (including sweetcorn): (continued) Fall armyworm (larvae) (*Spodoptera frugiperda*)	**APPLICATION WITH PIVOT IRRIGATION SYSTEM:** 300 ml/ha	**APPLY STEWARD® 150 EC AS AN EARLY CORRECTIVE TREATMENT.** **Ensure that the pivot irrigation system complies with the following specifications before application starts:** The distribution coefficient of the pivot irrigation system must be >90%, and the pivot should not apply more than 5mm (50 000 ℓ) per hectare at maximum speed. Clean all the sieves of the pivot irrigation system before starting application. Calibrate the injection pump of the pivot irrigation system according to the time it takes for the pivot irrigation system to complete one full circle. Set the pivot irrigation system to maximum speed so that as little water as possible (not more than 5 mm) is applied per hectare. Mix the **STEWARD® 150 EC** with water in the application tank. Stir the spray mixture continuously before and during application. Inject the **STEWARD® 150 EC** spray mixture into the main application line of the pivot irrigation system as soon as the irrigation system reaches maximum speed. Mark the position on the land when the spray mixture reaches the furthest end of the pivot irrigation system. Allow the pivot irrigation system to complete one full circle from the aforementioned point. Do not irrigate within 6 hours after a **STEWARD® 150 EC** application. **NB: For instructions on the control of fall armyworm with STEWARD® 150 EC on maize, see 'IMPORTANT NOTES' below.** Under conditions of repeated infestation, apply **STEWARD® 150 EC** in a 7 day spray programme. Do not exceed the maximum of 2 **STEWARD® 150 EC** applications per season. **When STEWARD® 150 EC** is applied through a centre pivot irrigation system the addition of an adjuvant is **not necessary. If however, an adjuvant is to be added, a mineral oil type adjuvant e.g. H&R Crop Oil at 5 ℓ per hectare is recommended.**

IMPORTANT NOTES APPLICABLE TO STALK BORER, STEM BORER, AFRICAN BOLLWORM AND FALL ARMYWORM CONTROL WITH STEWARD® 150 EC OR STEWARD® 150 EC PLUS CYPERMETHRIN TANK MIXTURES IN MAIZE:

NB: Do not apply **STEWARD® 150 EC** on maize that are under drought stress.
Larvae that have already tunnelled into the funnels will not be controlled by STEWARD® 150 EC.
Do not exceed 2 applications per season with **STEWARD® 150 EC**. Two applications can be made consecutively after which other mode of action insecticide must be used.

Stalk borer (*Busseola fusca*) larvae:
Commercial maize:
Apply when eggs are found on 5% of the plants, or when 10% of the plants are showing shot hole damage symptoms in the maize funnels, which are caused by small feeding larvae.
Sweetcorn:
Apply when egg laying starts, or with the first signs of shot hole damage symptoms on the maize funnels.
NB: Application must be done before larvae migrate to the stems of the maize plants and when larvae are smaller than the 2nd larval instar. Do not apply STEWARD® 150 EC on maize against stalk borer while the tassel is encircled by the flag leaf.

Sorghum stem borer (*Chilo partellus*) larvae:
Commercial maize:
Apply when eggs are found on 2,5% of the plants, or when 5% of the plants are showing shot hole damage symptoms on the maize funnels, which are caused by small feeding larvae.
Sweetcorn:
Apply when egg laying starts or with the first signs of shot hole damage symptoms on the maize funnels.

NB: Application must be done before larvae migrate to the stems of the maize plants and when larvae are smaller than the 2nd larval instar. Do not apply STEWARD® 150 EC on maize against stalk borer whilst the tassel is encircled by the flag leaf.

African bollworm (*Helicoverpa armigera*) larvae:
Funnel infestation:
Apply as for stalk borer (see notes above).
Cob infestation:
Apply when first larvae are observed on the beard (silk) during cob formation. Larvae that are already deep within the beard or have migrated into the cobs will not be controlled.

Fall armyworm (*Spodoptera frugiperda*) larvae:
Apply at the beginning of infestation and at the first signs of damage, no more than when 5% of the plants are found scraped.
Application is NOT recommended for control of worms (larvae) larger than 1 cm.
NB: Application must be done before larvae migrate into the cobs of the maize plants.
Larvae that are already deep within the beard or have migrated into the cobs will not be controlled.

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
PEAS: **(Green peas, including "Mange Tout")** African bollworm (larvae) *(Helicoverpa armigera)*	**GROUND APPLICATION:** 250 mℓ/ha **AERIAL APPLICATION:** 300 mℓ/ha	**Early Corrective Foliar Application:** **Ground application**: Apply in 250–350 ℓ water per hectare and ensure thorough, even coverage of the foliage. **Aerial application**: Apply in minimum of 30 ℓ water per hectare. Apply at flowering or when the first bollworm eggs or small larvae are observed following regular scouting during flowering / fruit set stages. A follow up application 7–10 days later will normally be necessary if the first application is made at the early flowering stage or under conditions of continuous re-infestation. Although **STEWARD® 150 EC** will control larvae of all stages of development, including large 5th instar larvae, larvae that have penetrated the pods or are obscured by dense foliage during application may not be adequately controlled. It is therefore essential to ensure thorough coverage of the foliage. Do not exceed 2 applications of **STEWARD® 150 EC** per season. Should a third application be needed, use an insecticide with a different mode of action. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC** **The addition of an adjuvant / wetter e.g. Trend® 90 at 75 mℓ/100 ℓ or Villa 51 at 50 mℓ/100 ℓ is recommended to improve coverage.** ***Peas can be harvested 7 days after application.***
PEPPERS: Tomato leaf miner moth (larvae) (*Tuta absoluta*) Fall armyworm (larvae) (*Spodoptera frugiperda*)	**GROUND APPLICATION:** 300 mℓ/ha **(when applying >1000 ℓ spray mixture per ha, use 30 mℓ/100 ℓ water)**	**Early corrective foliar application:** Apply at 500–1500 ℓ of spray mixture per hectare. Good coverage of all foliage is essential. **STEWARD® 150 EC** has an efficacy of around 85% against *Tuta absoluta* larvae. The addition of a suitable registered adjuvant can increase the efficacy to about 95% due to improved penetration of the active ingredient into the leaves. **The addition of an adjuvant / wetter e.g. Trend® 90 at 75 mℓ/100 ℓ, Villa 51 at 50 mℓ/100 ℓ of spray mixture is recommended to improve coverage.** ***Peppers may be harvested 1 day after application.*** **Please see important notes below.**

IMPORTANT NOTES APPLICABLE TO TOMATO LEAF MINER MOTH AND FALL ARMYWORM LARVAE ON PEPPERS:

- Regular scouting of pepper fields is essential to determine the timing of the first and subsequent applications if necessary.
- In the case of trellised peppers both sides of the pepper row must be sprayed.
- **STEWARD® 150 EC** can be applied in a 7 day interval spray programme under conditions of continuous re-infestation.
- Do not exceed 4 applications per season with **STEWARD® 150 EC**. Apply 2 **STEWARD® 150 EC** applications consecutively (= block application) before going over to products with other modes of action.
- Most beneficial insects are unaffected by applications of **STEWARD® 150 EC.**

Tomato leaf miner moth *(Tuta absoluta):*
- Monitor the adult moth flights.
- Start application at egg-hatching or when the very first erosions by the newly hatched larvae are visible.

Fall Armyworm (*Spodoptera frugiperda*):
- Apply at the beginning of infestation and at the first signs of damage, no more than when 5% of the plants are found scraped. **Application is not recommended for control of worms (larvae) larger than 1 cm.**

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
POTATOES: Potato tuber moth (larvae) *(Phthorimaea operculella)* Tomato leaf miner moth (larvae) *(Tuta absoluta)* Fall armyworm *(Spodoptera frugiperda)*	**GROUND APPLICATION:** 250 mℓ/ha **AERIAL APPLICATION:** 300 mℓ/ha	**Early Corrective Foliar Application:** **Ground application:** Apply in 500–1000 ℓ of water per hectare. Good coverage of all foliage is essential. **Aerial application:** Apply in minimum of 30 ℓ water per hectare. Apply as soon as the first symptoms of infestation (mines) appear on the leaves or when the presence of moths is observed. The presence of these moths in and around the foliage is normally a good indication that an infestation will take place. Timing of subsequent applications should be based on regular scouting of potato fields. **ARMYWORM:** Apply at the beginning of infestation and at the first signs of damage when no more than when 5% of the plants are found scraped. **Application is not recommended for control of worms (larvae) larger than 1 cm. Worms that have tunnelled into the stem and spuds will not be controlled.** **STEWARD® 150 EC** may be applied in an 8–14 day interval spray programme under conditions of continuous re-infestation. Use the shorter interval early in the growth season when plants are growing actively. Do not exceed 2 applications per season with **STEWARD® 150 EC**. Apply 2 **STEWARD® 150 EC** applications consecutively (= block application) before switching to insecticides with other modes of action. **STEWARD® 150 EC** will also control African bollworm (*Helicoverpa armigera*) larvae if present. For details on the corrective application of **STEWARD® 150 EC** against this pest, refer to **'TOMATOES'** below. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC.** Ridge plant rows at least twice during growing season. Late applications of **STEWARD® 150 EC**, once the potato plant's foliage is dying down, will not lead to proper control of potato tuber moth larvae. **The addition of an adjuvant / wetter e.g. Trend® 90 at 75 mℓ/100 ℓ of spray mixture, H&R Crop Oil at 500 mℓ/ha during ground and aerial application or Break- Thru at 250 mℓ/ha for ground but not for aerial application is recommended to improve coverage.** ***The potato crop may be harvested at any time following STEWARD® 150 EC application.***

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
POTATOES (continued): Potato leaf miner *(Liriomyza huidobrensis)*	**GROUND APPLICATION:** 250 mℓ **STEWARD® 150 EC** + 500 mℓ abamectin 18 g/ℓ EC + 500 mℓ H&R Crop Oil/ha	**Early Corrective Foliar Application:** Premix **STEWARD® 150 EC** in an appropriate amount of water and add to the spray tank half filled with water. Premix the abamectin 18 g/ℓ EC and H&R Crop Oil in at least 10 ℓ of water separately before it is added to the rest of the spray mixture in the spray tank (Refer to abamectin 18 g/ℓ EC label for complete mixing instructions). Apply in 400–600 ℓ water per hectare and ensure good coverage of the foliage. Apply in a spray programme that commences as soon as the first symptoms of infestation appear on the leaves and repeat at 7 day spray intervals. Use the shorter interval under conditions of repeated high infestations. Do not exceed 2 applications per season with **STEWARD® 150 EC**. The alternation of **STEWARD® 150 EC** with insecticides that have a different mode of action is recommended. Apply 2 **STEWARD® 150 EC** applications consecutively (= block application) before switching to products with other modes of action. **STEWARD® 150 EC** will also control potato tuber moth (*P. operculella)* and African bollworm (*H. armigera*) larvae if present. For details on the corrective application of **STEWARD® 150 EC** against this pest, refer to **'TOMATOES'** below. ***Potatoes may be harvested 14 days after the application of STEWARD® 150 EC PLUS abamectin 18g/ℓ EC tank mixture***.
SORGHUM: Fall armyworm (larvae) (*Spodoptera frugiperda*)	**GROUND APPLICATION:** 300-400 ml/ha	Apply at the beginning of infestation and at the first signs of damage, no more than when 5% of the plants are found scraped. **Application is NOT recommended for control of worms (larvae) larger than 1 cm.** Apply in 250-400 ℓ water per hectare. Interval between applications: 7 days. Do not exceed 2 applications per season with **STEWARD® 150 EC**. The alternation of **STEWARD® 150 EC** with insecticides that have a different mode of action is recommended. The addition of a suitable adjuvant at the registered rates, may enhance efficacy. Allow 30 days between last **STEWARD 150 EC®** application and harvest.

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
SOYBEANS: African bollworm (larvae) *(Helicoverpa armigera)* Fall armyworm (larvae) (*Spodoptera frugiperda*)	**GROUND APPLICATION:** 250 mℓ/ha	**Corrective Foliar Application:** Apply in 300–700 ℓ water per hectare in soybeans. Ensure thorough, even coverage of the foliage. **FOR BOLLWORM:** Apply at flowering or when the first bollworm eggs or small larvae are observed following regular scouting during flowering and pod-set stages. **FOR FALL ARMYWORM:** Apply at the beginning of the infestation and at the first sign of damage. **Application is not recommended for control of worms larger than 1 cm.** A follow-up application 7–10 days later will normally be necessary if the first application is made at the early flowering stage or under conditions of continuous re-infestation. **STEWARD® 150 EC** will control larvae of all stages of development, including large 5th instar larvae. Larvae that have penetrated the pods or are obscured by dense foliage during application may not be adequately controlled. It is therefore essential to ensure thorough coverage of the foliage. The *Spodoptera* leaf worm (*Spodoptera littoralis*) and the semi-(Plusia) looper (*Chrysodeixis acuta*) will also be controlled in soybeans if present during application. Do not exceed 2 applications of **STEWARD® 150 EC** per season. Should a third application be needed, use an insecticide with a different mode of action. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC**. The addition of a suitable registered adjuvant at the registered rate, may enhance efficacy. Allow 14 days between last **STEWARD 150 EC®** application and harvest.
SUGARCANE: Sugarcane Borer (*Eldana saccharina*) (larvae)	**FOLIAR APPLICATION:** 300 mℓ/ha	**EARLY CORRECTIVE APPLICATION:** Start applications in August. Four applications to be made at a monthly interval period. Please see important notes below.
SUGARCANE: Fall armyworm (larvae) *Spodoptera frugiperda*	**FOLIAR APPLICATION:** 300 mℓ/ha	**EARLY CORRECTIVE APPLICATION:** Apply at the beginning of infestation and at the first signs of damage, when no more than 5% of the plants are found damaged. **Application is not recommended for control of worms (larvae) larger than 1 cm.** Make 2 consecutive applications at a 7 day interval in a particular treatment window. Another 2 **STEWARD® 150 EC** applications at a 7 day interval can be made after a window of 60 days following the last **STEWARD® 150 EC** application. Please see important notes below.
SUGARCANE: (Continued) Sugarcane Borer (*Eldana saccharina*) (larvae)	**AERIAL APPLICATION:** 300 mℓ/ha	Please see important notes below.

SUGARCANE: (Continued) Fall armyworm (larvae) *Spodoptera frugiperda*	**AERIAL APPLICATION:** 300 mℓ/ha	Apply at the beginning of infestation and at the first signs of damage, when no more 5% of the plants are found damaged. **Application is not recommended for control of worms (larvae) larger than 1 cm.** Make 2 consecutive applications at a 7 day interval in a particular treatment window. Another 2 **STEWARD® 150 EC** applications at a 7 day interval can be made after a window of 60 days following the last **STEWARD® 150 EC** application. Please see important notes below.

IMPORTANT NOTES ON THE CONTROL OF SUGARCANE BORER AND FALL ARMYWORM LARVAE ON SUGARCANE:

- Scouting operations in the field are critical to intervention.
- The use of **STEWARD® 150 EC** is only recommended when plants are growing actively.
- Do not apply **STEWARD® 150 EC** on sugarcane that is under drought stress. Larvae that have already tunnelled into the stalks will not be controlled by **STEWARD® 150 EC** spray mixtures.
- **GROUND APPLICATION:** Apply as a full cover spray with a mist blower at 350 – 500 ℓ of water per hectare.
- **AERIAL APLICATION:** Apply in minimum of 30 ℓ water per hectare.
- Optimal activity of **STEWARD® 150 EC** depends on full cover application of the foliage of the treated plant. Larvae need to feed on the treated foliage to be controlled. Therefore foliage without any spray deposits will not control the larvae.
- Do not irrigate within 6 hours after a **STEWARD® 150 EC** applications.
- The addition of an adjuvant / wetter e.g. Trend® 90 or Villa 51 at rates indicated on the label is recommended to improve coverage.
- Do not exceed 4 applications of **STEWARD® 150 EC** per season.
- The alternation of **STEWARD® 150 EC** with products having a different mode of action (e.g. **CORAGEN®**) is recommended.

IMPORTANT NOTES ON THE CONTROL OF SUGARCANE BORER (*Eldana saccharina*) LARVAE ON SUGARCANE:

- **Cultural Control practices :**
- Plant non-infested seed cane to improve crop stands.
- Early harvesting can reduce the impact of sugarcane borer numbers as borer numbers and damage accumulate as the crop ages, especially after about 12 months.
- Stressed crops are more liable to attack, and under extreme conditions such as drought, damage can increase significantly.
- The practice of burning heavily infested crops and good subsequent field hygiene can reduce initial infestation.
- When harvesting, it is important to ensure that stalks are cut at ground level, as above – ground stalk material can harbour larvae.
- The “push-pull” sugarcane habitat management is an option for biological control.
- Differences between cultivars resistance to sugarcane borer exists, choose your cultivars according to the sugarcane borer risk in your area.

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
STONE FRUIT: **(Peaches, Nectarines & Plums)** African bollworm (larvae) *(Helicoverpa armigera)*	30 mℓ/100 ℓ water	**FOLIAR APPLICATION:** Apply early when eggs or larvae are present, but before larvae enter the fruit. A follow-up application may be necessary 10 to 14 days later depending on re-infestation of the pest. **Please see IMPORTANT NOTES below.**
STONE FRUIT: **(Peaches, Nectarines & Plums)** **(continue):** Banded Fruit Weevil (Snout beetle) Fruit damage *(Phlyctinus callosus)*	40 mℓ/100 ℓ water	**FOLIAR APPLICATION:** Commence application from 75% petal fall onwards, or when weevils are observed in cardboard traps, or when feeding damage is observed on lower shoots. A second application may be necessary 14 to 21 days later if infestation persists. **Please see IMPORTANT NOTES below.**
STONE FRUIT: **(Peaches, Nectarines & Plums)** **(continue)** Oriental Fruit Moth (larvae) (*Grapholita (Cydia) molesta*)	40 mℓ/100 ℓ water	**FOLIAR APPLICATION:** Monitor pheromone trap catches and apply according to the day-degree model. Apply **STEWARD® 150 EC** between 278 and 333 degree days after each biofix (Biofix is a term used to describe the start of each moth generation). Applications must be carefully timed and applied before newly hatched larvae tunnel into shoots or fruit. **Please see IMPORTANT NOTES below.**
STONE FRUIT: **(Peaches, Nectarines & Plums)** **(Continue)** False Codling Moth *Thaumatotibia leucotreta*	**FOLIAR APPLICATION:** 40 ml/100 ℓ water	**FOLIAR APPLICATION:** Apply **STEWARD® 150 EC** when moth catches in pheromone traps indicate an infestation of False Codling moth. Further applications should be made at 10 day intervals if necessary. Always apply **STEWARD® 150 EC** as part of an integrated pest management program (IPM). For optimum results **STEWARD® 150 EC** applications should be combined with, or preceded by, other methods of false codling moth control for example false codling moth mating disruption, biological control programs, good sanitation programs and effective insecticides. The emergency registration for stone fruit for control of False codling moth is based on limited and/or restricted data and experience on efficacy and crop safety. Therefore, use is at the sole risk and responsibility of the applicator. Applicators are strongly advised to test spray a small area before using it in a large scale and/or large area. **Please see IMPORTANT NOTES below.**

IMPORTANT NOTES ON STONE FRUIT (PEACHES, NECTARINES & PLUMS):

- Apply as a full cover spray at 500-2000 ℓ spray mixture per ha.
- Thorough coverage is essential.
- Do not exceed 2 applications in total per season on the crop including applications made against all pests.
- Should a third application be needed, make use of a registered insecticide with a different mode of action.
- The addition of an adjuvant / wetter e.g. Trend® 90 at 10mℓ/100ℓ of spray mixture can be added in nectarines to improve coverage.
- **Allow 28 days between last application and harvest of peaches, nectarines & plums.**
- The withholding period, i.e. the number of days between last application and harvest meets local maximum residue limits (MRL's), but may not necessarily meet all those for export.

CROP/PEST	APPLICATION RATE	RECOMMENDATIONS/REMARKS
TOBACCO: Potato tuber moth (tobacco leaf miner) *(Phthorimaea operculella)*	**GROUND APPLICATION:** 70 mℓ/100 ℓ water (175–210 mℓ/ha)	**FIELD TREATMENT:** After transplanting into the field during the establishment phase of tobacco. Apply **STEWARD® 150 EC** as a foliar application at 250–300 ℓ spray mixture per hectare. Spray programs must focus on very early developing pest populations. Apply **STEWARD® 150 EC** at 7–10 day intervals. The first **STEWARD® 150 EC** applications must be done 2–3 days after transplanting. Use the shorter interval under conditions of heavy infestation pressure. Apply the first and second applications, directed as band applications, over the top of the plants making sure that all the foliage is thoroughly covered, especially the lower third of the plants, as this is where tobacco leaf miner infestation is most severe. For the third and fourth application it is advised that the plants be treated from both sides. A boom fitted with drop arms with nozzles spraying towards each other is recommended in order to improve coverage. Increase the spray volume as the plants grow. Do not exceed 4 **STEWARD® 150 EC** applications against tobacco leaf miner or 2 applications per season with **STEWARD® 150 EC** against bollworm (budworm) (for details refer to the bollworm recommendations on this label), or a maximum of 840 mℓ/ha of **STEWARD® 150 EC** in total per growing season of the tobacco crop. The alternation of **STEWARD® 150 EC** with insecticides that have a different mode of action is recommended. Apply 2 **STEWARD® 150 EC** applications consecutively (= block application) before switching to insecticides with other modes of action. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC**. **The addition of an adjuvant wetter e.g. Trend 90 at 75 mℓ/100 ℓ of spray mixture is recommended to improve coverage.** ***Allow 28 days between last application and harvest of the crop.***

CROP/PEST	APPLICATION RATE	RECOMMENDATIONS/REMARKS
TOBACCO: (continued): African bollworm (budworm) (larvae) (*Helicoverpa armigera*) Tomato Leafminer Moth (larvae) *Tuta absoluta*	**GROUND APPLICATION:** 250 mℓ/ha + 75 mℓ Trend® 90/ 100 ℓ water	**FIELD TREATMENT:** After transplanting into the field during the establishment and growing phases of tobacco. Apply **STEWARD® 150 EC** as a foliar application in 300–400ℓ water per hectare. Increase the spray volume as plant size and density increases. Apply **STEWARD® 150 EC** early when bollworm eggs or small larvae are observed during regular scouting. Follow-up with a second **STEWARD® 150 EC** application at a spray interval of 10–14 days if necessary under conditions of continuous re-infestation. Use the shorter interval under conditions of heavy infestation pressure. Do not exceed 2 applications per season with **STEWARD® 150 EC** against bollworm or 4 **STEWARD® 150 EC** applications against tobacco leaf miner (for details refer to the tobacco leaf miner recommendations on this label) or a maximum of 840 mℓ/ha of **STEWARD® 150 EC** in total per growing season of the tobacco crop. The alternation of **STEWARD® 150 EC** with insecticides that have a different mode of action is recommended. Apply the 2 **STEWARD® 150 EC** applications consecutively (= block application) before going over to insecticides with other modes of action. Most beneficial insects and predatory mites are unaffected by applications of **STEWARD® 150 EC**. **The addition of an adjuvant wetter e.g. Trend® 90 at 75 mℓ/100 ℓ of spray mixture is recommended to improve coverage.** **Allow 28 days between last application and harvest of the crop.**
TOMATOES: African bollworm (larvae) *(Helicoverpa armigera)* Tomato semi-looper (larvae) *(Chrysodeixis acuta)*	**GROUND APPLICATION:** 300 mℓ/ha **(when applying >1000 ℓ spray mixture per ha, use 30 mℓ/100 ℓ water)**	**Corrective Foliar Application:** Apply at 500–1500 ℓ of spray mixture per hectare. Good coverage of all foliage is essential. In the case of trellised tomatoes both sides of the tomato row must be sprayed. Apply when the first larvae are observed – normally around the fruit-set stage of the crop. **STEWARD® 150 EC** will control larvae of all stages of development. **Please see important notes below.**
TOMATOES: (continued) Potato tuber moth (leaf miner larvae) *(Phthorimaea operculella)*	**GROUND APPLICATION:** 300 mℓ/ha **(when applying >1000 ℓ spray mixture per ha, use 30 mℓ/100 ℓ water)**	**Early corrective foliar application:** Apply at 500–1500 ℓ of spray mixture per hectare. Good coverage of all foliage is essential. In the case of trellised tomatoes both sides of the tomato row must be sprayed. Apply as soon as the first symptoms of infestation (mines) appear on the leaves or when the presence of moths is observed. The presence of these moths in and around the foliage is normally a good indication that an infestation will take place. **Please see important notes below.**

TOMATOES: (continued) Tomato leaf miner moth (larvae) (*Tuta absoluta*)	**GROUND APPLICATION:** 300mℓ/ha **(when applying >1000ℓ spray mixture per ha, use 30mℓ/100ℓ water)**	**Early corrective foliar application:** Apply at 500–1500 ℓ of spray mixture per hectare. Good coverage of all foliage is essential. In the case of trellised tomatoes both sides of the tomato row must be sprayed. Monitor the adult moth flights. Start application at egg-hatching or when the very first erosions by the newly hatched larvae are visible. Should additional applications be needed, reapply at 7 day intervals. Steward®150 EC has an efficacy of around 85% against *Tuta absoluta* larvae. The addition of a suitable registered adjuvant can increase the efficacy to about 95% due to improved penetration of the active ingredient into the leaves. **Please see important notes below.**

IMPORTANT NOTES APPLICABLE TO AFRICA BOLLWORM, TOMATO SEMI-LOOPER, POTATO TUBER MOTH AND TOMATO LEAF MINER MOTH LARVAE ON TOMATOES:

- Regular scouting of tomato fields is essential to determine the timing of the first and subsequent applications if necessary.
- **STEWARD® 150 EC** can be applied in an 8–14 day interval spray programme under conditions of continuous re-infestation of African Bolworm, tomato semi-looper or potato tuber moth. Use the shorter interval early in the growth season when plants are growing actively. Use a 7 day spray interval for *Tuta absoluta*.
- Do not exceed 4 applications per season with **STEWARD® 150 EC**. The alternation of **STEWARD® 150 EC** with insecticides that have a different mode of action is recommended. Apply 2 **STEWARD® 150 EC** applications consecutively (= block application) before switching to products with other modes of action.
- Most beneficial insects are unaffected by applications of **STEWARD® 150 EC.**
- **The addition of an adjuvant / wetter e.g. Trend® 90 at 75 mℓ/100 ℓ, Villa 51 at 50 mℓ/100 ℓ of spray mixture is recommended to improve coverage.**
- ***Tomatoes may be harvested 1 day after application.***

CROP / PEST	APPLICATION RATE	RECOMMENDATIONS / REMARKS
TREE NUTS (including almonds, cashew, chestnut, hazelnut, macadamia, pecan, pistachio, walnut): False Codling moth (larvae) *Thaumatotibia leucotreta*	50 ml/100 ℓ spray mixture	Apply **STEWARD® 150 EC** as a full cover foliar application at spray volumes from 2000 up to 4000 litres spray mixture per hectare depending on the stage of the crop. The addition of a registered non-ionic wetter, such as **TREND® 90**, may enhance the insect control potential of **STEWARD® 150 EC**. Ensure thorough coverage of the foliage and developing fruit. Apply **STEWARD® 150 EC** when moth catches in pheromone traps indicate an infestation of False Codling moth or at the onset of ripening. Further applications should be made at 10 day intervals if necessary. Do not apply more than 2 consecutive applications of **STEWARD® 150 EC** at a time. Follow this with a "window" of 60 days with applications of an effective registered product with a different mode of action, after which a 3rd application of **STEWARD® 150 EC** can be applied. Do not exceed 3 **STEWARD® 150 EC** applications in total per season on the crop. Should any further control of the pest be required apply an insecticide that is not from chemical group code 28. **Allow 14 days between last STEWARD® 150 EC application and harvest.** **<u>IMPORTANT NOTE</u>: The withholding period or pre-harvest interval (PHI), i.e. number of days between last application and harvest, meets local maximum residue limits (MRL's), but may not necessarily meet all those for export crops. Also refer to MAXIMUM RESIDUE LEVELS - IMPORTANT NOTE under "WARNINGS"** The emergency registration for Tree nuts for control of False codling moth is based on limited and/or restricted data and experience on efficacy and crop safety. Therefore, use is at the sole risk and responsibility of the applicator. Applicators are strongly advised to test spray a small area before using it in a large scale and/or large area.
WHEAT: African bollworm (larvae) *Helicoverpa armigera*	250 ml/ha	Apply **STEWARD® 150 EC** at the beginning of infestation, when the first bollworm eggs, or small larvae are observed. Do not exceed 1 application per season in total of **STEWARD® 150 EC**. The alternation of **STEWARD® 150 EC** with products having a different mode of action (e.g. **ALTACOR®, CORAGEN®** or **PREVATHON® 5 SC)** is recommended. Allow 42 days between last **STEWARD® 150 EC** application and harvest. The emergency registration on Wheat for control of African Bollworm is based on limited and/or restricted data and experience on efficacy and crop safety. Therefore, use is at the sole risk and responsibility of the applicator. Applicators are strongly advised to test spray a small area before using it in a large scale and/or large area.

ACKNOWLEDGEMENT OF REGISTERED PRODUCTS:

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Villa 51 (**SOUTH AFRICA** Reg. No. L8050 Act No. 36 of 1947, **NAMIBIA** Reg. No. N-AR1090 Act No. 36 of 1947), Polytrin® 200 EC (**SOUTH AFRICA** Reg. No. L5409 Act No. 36 of 1947), Vilmectin 18 EC (**SOUTH AFRICA** Reg. No. L7979 Act No. 36 of 1947) and Nogos® 1000 EC (**SOUTH AFRICA** Reg. No. L5408 Act No. 36 of 1947 are the registered products of Villa Crop Protection (Pty) Ltd

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