



SYN^oITA
Our Science ...Your Pest Solution

COCKROACH CONTROL PROGRAMME

CONTENTS

INTEGRATED PEST MANAGEMENT (IPM)	1
COCKROACH MONITORING	3
KNOW YOUR PEST	4
GOOD FOOD PRACTICE & SANITATION	6
ACCESS CONTROL	7
PEST RESISTANCE MANAGEMENT	8
PRODUCTS	9
APPLICATION EQUIPMENT	12
INFORMATION TABLE	14

INTEGRATED PEST MANAGEMENT (IPM)

What is IPM?

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programmes use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, animals, property, and the environment.

As with most pest control solutions, an Integrated Pest Management (IPM) approach is advised to achieve the best results. In order to understand the cockroach challenge, it is important to conduct a survey of the premises to determine the cockroach species, the extent of the infestation and the best locations to apply the bait. The use of an appropriate monitoring tool and spot flushing treatment using the **SUPERFAST®** or **LONGLAST®** aerosols will greatly assist in determining the baiting sites to obtain the best results.



COCKROACH MONITORING

Keep a record of the number and location of the monitoring units so you can keep accurate records. Initially, check the monitoring units daily for a few days until it is apparent where the greatest numbers of cockroaches are caught. Keep records of cockroaches caught in different locations before and after you initiate a IPM programme to evaluate its success.

Female cockroaches and their nymphs are known to spend 75% of their lives in such harborages and identification of these is critical when identifying bait sites. Cockroaches have a behavior phenomenon known as thigmotaxis that requires them to be in contact with two surfaces at any given time hence the desire to harbor in crack and crevices as well as their preference to be in close quarters and aggregate with each other. This can make control difficult using residual surface sprays alone so an integrated approach is required.

You can also track a cockroach infestation by using a flashlight to inspect cracks, underneath counters, around water heaters, and in other dark locations. A small mirror on a long handle can be useful in hard-to-see areas. Look for live and dead cockroaches, cast skins, egg capsules, and droppings, all of which aid in identification and are evidence of an infestation.



KNOW YOUR PEST

Cockroaches are insects of the order Blattodea, sometimes called Blattaria, of which about 30 species out of a total of 4,600 are associated with human habitation. At least six species in southern Africa are known to be public health pests. Among the best-known pest species are the American cockroach, *Periplaneta americana*, the German cockroach, *Blattella germanica* and the Oriental cockroach, *Blatta orientalis*.



ORIENTAL COCKROACH:

Size: 18-29mm.

Habitat: Commonly found in outdoor locations that support leaf mulch litter, outside rubbish bins and storm water drains etc. Prefers temperatures of between 20-30 °C.

Nymphal Development: 164-542 days.

Life Span: 35-90 days.

Flying Ability: None.



AMERICAN COCKROACH:

Size: 29-53mm.

Habitat: Found in dark, warm, moist places in close proximity to food. Drains and other crack and crevice harborages are common locations. Can be found both indoor and outdoor areas when warmer temperatures allow. Prefers temperatures of between 20-29 °C.

Nymphal Development: 150-360 days.

Life Span: 90-706 days.

Flying Ability: Good.



GERMAN COCKROACH:

Size: 13-16mm.

Habitat: Most commonly found around indoor locations, in and around food preparation facilities, kitchens, bathrooms and similar locations that offer dark, warm, moist places such as cracks and crevices in close proximity to food. Prefers temperatures of between 15-35 °C.

Nymphal Development: 54 -215 day

Life Span: 200 days.

Flying Ability: Poor.



GOOD FOOD HYGIENE PRACTICE AND SANITATION

There is generally a direct correlation between areas of poor hygiene and sanitation and cockroach infestations.

Cockroaches thrive where food, water and heat are available to them. Even small amounts of food debris or liquids caught between cracks provide a food source.

Important sanitation measures should include the following:

- Store food in insect-proof containers such as glass jars or re-sealable plastic containers.
- Keep kitchens clean and regularly remove refuse and food waste in tight fitting containers and position them away from doorways. Be sure surfaces where food or beverages have been spilled are cleaned up immediately.

- Remove newspapers, magazines, piles of paper bags, boxes, and other items that may provide hiding places and harborage.
- Eliminate plumbing leaks and correct other sources of free moisture. Increase ventilation where condensation is a problem.
- Vacuum cracks and crevices to remove food and debris. Vacuuming also removes cockroaches, shed skins, and egg capsules. Removing cockroaches reduces their numbers and slows development. Vacuumed cockroaches and debris should be destroyed. Add **PERMADUST®** insect dusting powder to the vacuum bag to kill cockroaches caught in the unit.

ACCESS CONTROL

If observation or monitoring shows cockroaches are migrating into a building from outdoors or other areas of the building implement the following steps:

- Locate and seal cracks and crevices and other openings both inside and outside the structure where cockroaches can enter and hide.
- Use weather stripping on doors and windows.
- Look for other methods of entry, such as from items being brought into the building, especially appliances, furniture, and items that were recently in storage.
- Inspect food deliveries before putting them in kitchens.
- Look for egg cases (oothecae) glued to undersides of furniture, in refrigerator and other appliance motors, boxes, and other items. Remove and destroy any that you find.
- Remove rubbish and stored items from around the outside of buildings that provide hiding places for cockroaches.

Due to the typical behavior of common cockroach species, bait placement is critical and should be applied to areas that are in close proximity to crack and crevice harborages. These are normally sited in natural dark, warm and damp areas. The application of gel baits close to these cracks and crevices allows them to investigate close to their harbourage and feed on the bait. Baits can be quite effective for long-term control of cockroaches, unless the cockroaches have other food sources available to them.

PESTICIDE RESISTANCE MANAGEMENT

Synvita® has developed the most comprehensive range of cockroach control products using proven pesticide active ingredients that have been used successfully in integrated cockroach control programmes globally.

To preserve the life of the insecticides currently available to the industry it is not recommended that the same pesticide active ingredient be used in the control of both the larva and adult insect as this practice promotes the rapid development of resistance, especially when insect life cycles are short. The utilization of different classes of insecticides, used correctly, plays an important roll in insect resistance management. The Synvita® range has taken this into consideration and offers products whose active ingredients are derived from four different classes of pesticides; phenyl pyrazoles, biologicals, pyrethroids both photolabiles and residual and benzoyl ureas, commonly referred to as Insect Growth Regulators (IGR's).

Measures should be put in place to monitor incoming stock and other receivables to ensure they are free from cockroaches. Good hygiene practices also include the exclusion of foodstuffs that may attract the cockroaches and offer the pest alternative feed options. This may negatively impact the effectiveness of gel bait treatment. In order to implement a successful approach good hygiene practices are a critical element that should be managed together with the use of monitoring devices, gel baits, residual sprays, flushing treatments and insect growth regulators.

Implementation of an IPM approach

Incorporating an IPM approach is critical in order to successfully manage a cockroach infestation. Cockroaches' effective and efficient life cycles demand an extremely high level of control throughout the entire lifecycle. With female cockroaches capable of producing up to 40 eggs every 2 weeks, populations can easily boom out of control even when majority of the adult cockroaches are controlled. This enforces the use of an IPM approach, whereby the use of multiple interventions, both chemical and physical, are used to effectively manage the cockroaches' lifecycle.

PRODUCTS

Bait

DOMINO® Cockroach Gel is highly palatable and an efficient ready-to-use gel bait for the control of German, American, Oriental and other common cockroach species and their nymphs.

DOMINO® is particularly valuable in sensitive areas where the use of conventional insecticides may not be practical and forms part of an integrated insecticide control programme.

Due to the very small amount of bait required per bait site and the cascade effect of the treatment ensures the toxicant gets to the source of the colony. After consuming **DOMINO®** bait containing Fipronil, a toxicant known to have delayed insecticidal activity, cockroaches return to their harborage where they excrete faeces, urinate and die.



Toxicant transmission can then occur through direct contact with, or ingestion of, traces of bait dispersed by contaminated cockroaches. The insecticide-contaminated faeces, fluids and eventual insect carcass, can contain sufficient pesticide to kill others in the same nesting site by toxicant transfer.

DOMINO® Cockroach Gel is packed in specially designed UV protected syringe barrels to ensure the integrity of the bait is not compromised.

Residual Spray

DELTA® 7 WP is a unique surface spray formulation developed to control a wide range of stored product and public health insect pests including those exhibiting potential resistance. The formulation is a wettable powder, which includes the very active residual pyrethroid Deltamethrin, combined with the resistance breaking synergist Piperonyl Butoxide. This combination in a particulate formulation offers a powerful tool in the search for better insect control especially where no resistance management programmes have been adopted in the past. The product has shown excellent residuality and knockdown action on many surfaces, against a wide range of insect species tested.



Specially suited for both band, crack and crevice spray treatments.

Flushing/Space Spray and Spot Treatment Tools

NIMBUS® (Pyrethrum & Piperonyl Butoxide) is a ready-to-use space spray treatment that acts as both a flushing and contact kill for all cockroach species. The product is applied using ultra low volume or thermal fogging application equipment that produce aerosol droplets in the range of 10 - 30 microns. These droplets float and drift throughout the target space and creep into cracks and crevices to flush out cockroaches from their harbourages. **NIMBUS®** contains natural Pyrethrum and the synergist Piperonyl Butoxide. Combined, these biological active ingredients are very effective flushing, knock down and kill agents.



SUPERFAST® Aerosols contains three photolabile pyrethroids that have extremely good flushing, knockdown and kill properties against a wide range of insect pests including cockroaches. The fourth active ingredient is the synergist Piperonyl Butoxide that increases the activity of the pyrethroids, improving both flushing and knockdown characteristics and plays a vital role in insecticide resistance management. Due to the nature of the droplet small size and the active ingredient composition the **SUPERFAST®** is better suited as a professional flushing tool with no residual effect after treatment. The active ingredients inclusion rates are higher than those found in household aerosols resulting in improved performance.



LONGLAST® Aerosols contains one photolabile pyrethroid and one residual pyrethroid that have extremely good flushing, knockdown and kill properties against a wide range of insect pests including cockroaches. The third active ingredient is the synergist Piperonyl Butoxide that increases the activity of the pyrethroids, improving both flushing and knockdown characteristics and plays a vital role in insecticide resistance management. Due to the nature of the droplets larger size and the active ingredient composition the **LONGLAST®** is better suited as a professional flushing tool with some residual effect on surfaces after treatment. The active ingredients inclusion rates are higher than those found in household aerosols resulting in improved performance.



Within households and human habitation the nuisance element as well as communicable disease transmission associated with cockroaches will also be greatly reduced allowing both adults and children to have more productive and healthy lives.

PERMADUST® is a dusting powder based on Permethrin and Piperonyl Butoxide and has an excellent safety profile. Due to this being a particulate formulation, it has physical properties



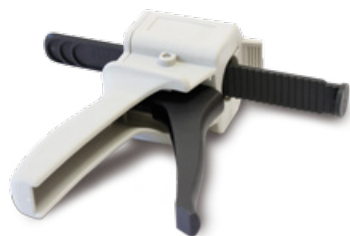
associated with excellent residual capabilities for long lasting, cost effective control. Ideally suited for treating under stoves and fridges, cracks, crevices, and other known cockroach harborages.

APPLICATION EQUIPMENT

D50 Gel Gun is an accurate gel applicator gun that is user friendly and designed to economically dispense gel from plastic syringes to ensure cost effect treatments for cockroaches.

The **Hudson X-Pert®** Sprayer is a high quality compression sprayer manufactured from chromium-nickel stainless steel for use in residual pesticide application. **Hudson X-Pert®** Sprayers are specially engineered and built to meet the precise and standardized application procedure used in residual pesticide applications for malaria control. They conform to the World Health Organization (WHO) specifications and are associated with years of proven durability, uniformity and performance in vector and general pest control.

The **Hudson Pro ULV** Sprayer is an electrically operated Ultra Low Volume (ULV) machine capable of producing 7-46 micron droplets with an average discharge particle size of 8.5 micron. The effective discharge carry in still air is 30m. The **Hudson Pro ULV** sprayer performs the same function as a space spray aerosol but on a much larger scale allowing effective coverage of the target area in the minimal amount of time. This



forms a critical part of the integrated control programme for cockroaches therefore offering the ultimate flushing tool for large scale areas when combined with the **NIMBUS®** space spray treatment. The **Hudson Pro ULV** sprayer comes standard with a commercial coil hose for directing chemical accurately into or at the target area. The flow rate of product can be adjusted from 5.5 litres - 53 litres per hour.



Product Name	Active Ingredient	Formulation Type	Areas of Use	Dosage Rate	Maintenance Application
DELTA 7 WP Wettable Powder Reg No: L8605 of Act 36 of 1947 Namibia Reg No.: NAR1219 Zimbabwe Reg No.: 15-D-110-58	70g/Kg Deltamethrin (Pyrethroid) 350g/Kg Piperonyl Butoxide (Synergist)	Wettable Powder (WP)	Apply a band spray on wall floor junctions, cracks and crevices. Please note that surfaces exposed to cleaning will require re-treatment.	Initial Application (for heavily infested areas): Mix 35g to 5 liters of water to spray 100m ² of surface area where cockroaches are known to harborage and frequent. Retreat every 4 weeks.	Mix 35g to 5 liters of water to spray 125m ² of surface area where cockroaches are known to harborage and frequent. Retreat every 4 weeks.
DOMINO Gel Bait Reg No: L9782 of Act 36 of 1947	0,6g/Kg Fipronil (Phenyl Pyrazole)	Gel Bait	For crack, crevice and spot treatments in domestic, commercial and industrial premises. It can be safely used in food handling, storage and preparation areas.	Apply 1-3 spots per m ² . Recommended spot size is 0,03g-0,06g. One spot = 2-4 mm in diameter. Depending on the severity of the infestation and species present it may be necessary to increase the number of spots to three and increase the spot size. A thin ribbon strip equating to one spot can alternatively be applied.	
NIMBUS Space Spray Reg No: L8012 of Act 36 of 1947 Namibia Reg No.: NAR1215 Zimbabwe Reg No.: 15-D-57-92	5g/Kg Pyrethrum (Natural Pyrethrum) 40g/Kg Piperonyl Butoxide (Synergist)	Space Spray Treatment	Registered for use in sensitive areas such as food preparation areas and kitchens. Ideally suited for large scale flushing treatments as part of an integrated approach for cockroach treatment.	To be applied through an Ultra Low Volume (ULV), thermal or misting machine at a dosage rate of 400ml per 1000m ³ .	
SUPERFAST Aerosol Reg No: L7838 of Act 36 of 1947 Namibia Reg No.: NAR1218 Zimbabwe Reg No.: 15-D-122-16-D-109-24-D-93-21	1,6g/Kg D-Phenothrin (Pyrethroid) 0,9g/Kg D-Trans Allethrin (Pyrethroid) 0,9g/Kg D-Tetramethrin (Pyrethroid) 8g/Kg Piperonyl Butoxide (Synergist)	Space Spray Aerosol	Complete with a 360° nozzle allows all angle spraying in hard to reach places such as in cracks and crevices, behind and under; stoves, sinks, cupboards and in other known harborages to flush out cockroaches.	<i>For use as a contact spray:</i> Spray a 1-2 second burst at the insect. <i>For use as a flushing tool:</i> Spray a 1-2 second burst into cracks and crevices and in other known cockroach harborages. <i>For use as a space spray:</i> For an average sized room. Close all windows and doors. Commence spraying from furthest point of the room from the exit. Spray in a sweeping motion for 5 -8 seconds while moving towards the exit. Vacate room for 15 minutes followed by ventilating room for 15 minutes.	
LONGLAST Aerosol Reg No: L7837 of Act 36 of 1947 Namibia Reg No.: NAR1220 Zimbabwe Reg No.: 15-D-111-31-D-190-4	2,2g/Kg Cypermethrin (Pyrethroid) 1,1g/Kg Prallethrin (Pyrethroid) 8g/Kg Piperonyl Butoxide (Synergist)	Contact Spray Aerosol	Complete with a 360° nozzle allows all angle spraying in hard to reach places such as in cracks and crevices, behind and under; stoves, sinks cupboards and in other known harborages to flush out cockroaches.	For use as a contact spray: Spray a 1-2 second burst at the insect. For use as a flushing tool: Spray a 1-2 second burst into cracks and crevices and in other known cockroach harborages.	
Dimilin WP 25 Wettable Powder Reg No: L5483 of Act 36 of 1947	250g/Kg Diflubenzuron (Chitin Inhibitor)	Wettable Powder (WP)	In and around cockroach harborages where cockroaches are known to breed. Dimilin® WP 25 can be added to an insecticide spray mix in order to achieve control of both the adult and nymph stage with a single application.	Mix 40g to 5 litres of water and apply the solution to 100m ² of surface area.	Mix 20g to 5 litres of water and apply the solution to 100m ² of surface area.





FOR MORE INFORMATION
PLEASE CONTACT

Tel: +27 33 346 1920 • Fax: +27 33 346 0512
e-mail: info@synvita.co.za • www.synvita.co.za