



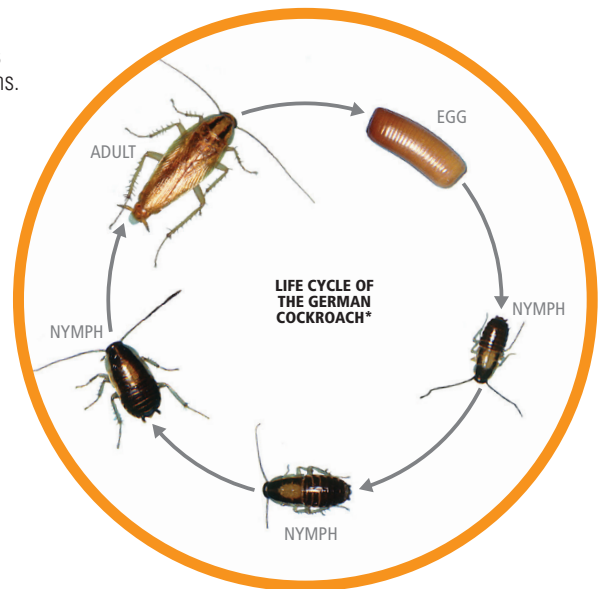
## PEST IDENTIFICATION & TREATMENT

# Commercial German Cockroach Control Protocol




## Understanding German Cockroach Habits and Life Cycle

- Gradual metamorphosis, passing through three life stages – egg, nymph and adult.
- Nymphs are similar in appearance to adults, but smaller and lack wings.
- As the nymph matures, it sheds its exoskeleton to grow. Freshly molted cockroaches are white, assuming their typical coloration within a few hours as their cuticle hardens.
- Each nymphal stage is larger than the previous one and the adult emerges after the last nymphal stage.
- Several nymphal stages (6-7 molts) before becoming adults.
- In general, cockroaches need four things to successfully live in an environment: water, food, shelter and warmth.



## Identifying German Cockroaches

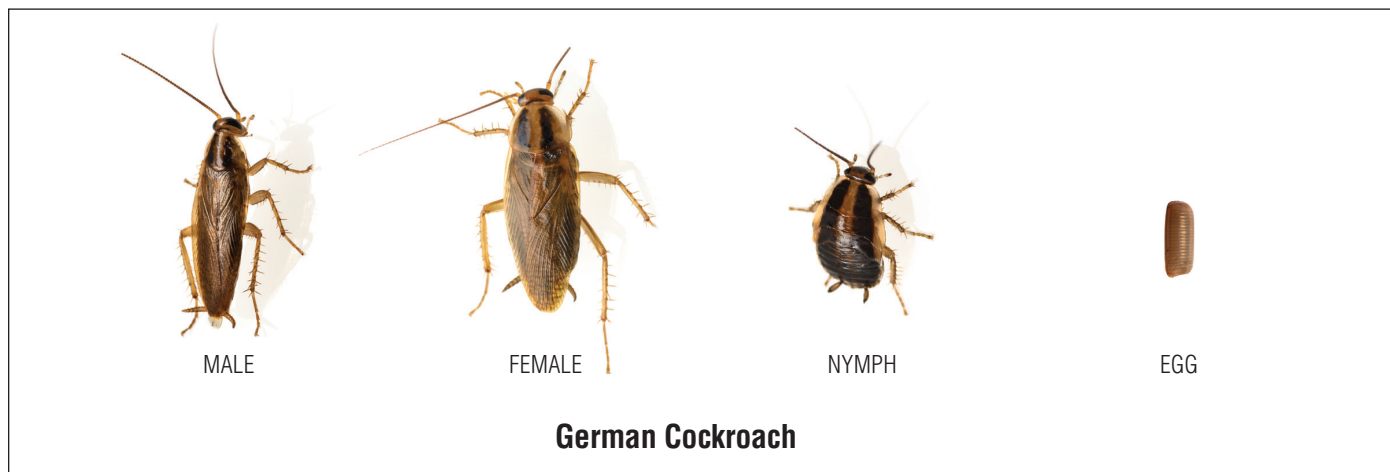
- Adults are light brown to tan in color with two longitudinal black stripes on the pronotum.
  - Nymphs are dark brown and about 1/8 inches long and the Ootheca is light brown.
- Can be confused with Asian or brownbanded roaches

COCKROACH SPECIES	LENGTH (INCHES)	COLOR AND MARKINGS	EGGS PER CASE	EGG TO ADULT (DAYS)	NUMBER OF MOLTS	AVERAGE LIFE SPAN OF ADULT (DAYS)	REPRODUCTIVE CHARACTERISTICS
<b>GERMAN</b> ( <i>Blattella germanica</i> ) 	1/2 – 5/8	Light brown with two dark stripes on the pronotum	30 – 40	54 – 215	6 – 7	100 – 200	Females carry egg cases about 24 hours before hatching, then drops it in a secure place



# Commercial German Cockroach Control Protocol

## Cockroach Life Stages



## Assessment

- Determine the infestation level: high, medium, or low
  - High – Large number of roaches can be found inside and outside common harborage areas
  - Medium – Moderate number of roaches found in common harborage areas
  - Low – very few roaches are found in common harborage areas
- Glue traps can also be used to assess the level of infestation



HIGH INFESTATION

## Inspection

- Focus on areas where the following conditions exist: high humidity/ water, darkness and limited air movement. Look under sinks, refrigerators, dishwashers and stoves, near trash containers and storage areas. See common harborage areas on page 3.
- Check behind objects attached to walls such as stainless-steel panels, shelves, and exhaust hoods.
- In high level infestations do not restrict inspection to the kitchen area.
- Other signs of German roach activity are: dead roaches, egg casings and fecal material



MEDIUM INFESTATION

## Pre-Treatment

- Stress the importance of sanitation to your customers. Encourage them to remove water sources and eliminate harborage areas with exclusion methods to increase the likelihood of success.
- When using baits be careful not to contaminate bait placement areas with insecticidal dusts, aerosols, or liquid sprays. These products will likely reduce the palatability of the bait leading to reduced bait consumption.
- Bait placed on folded wax paper strips can be used in areas where contamination is a concern or in high clutter areas.

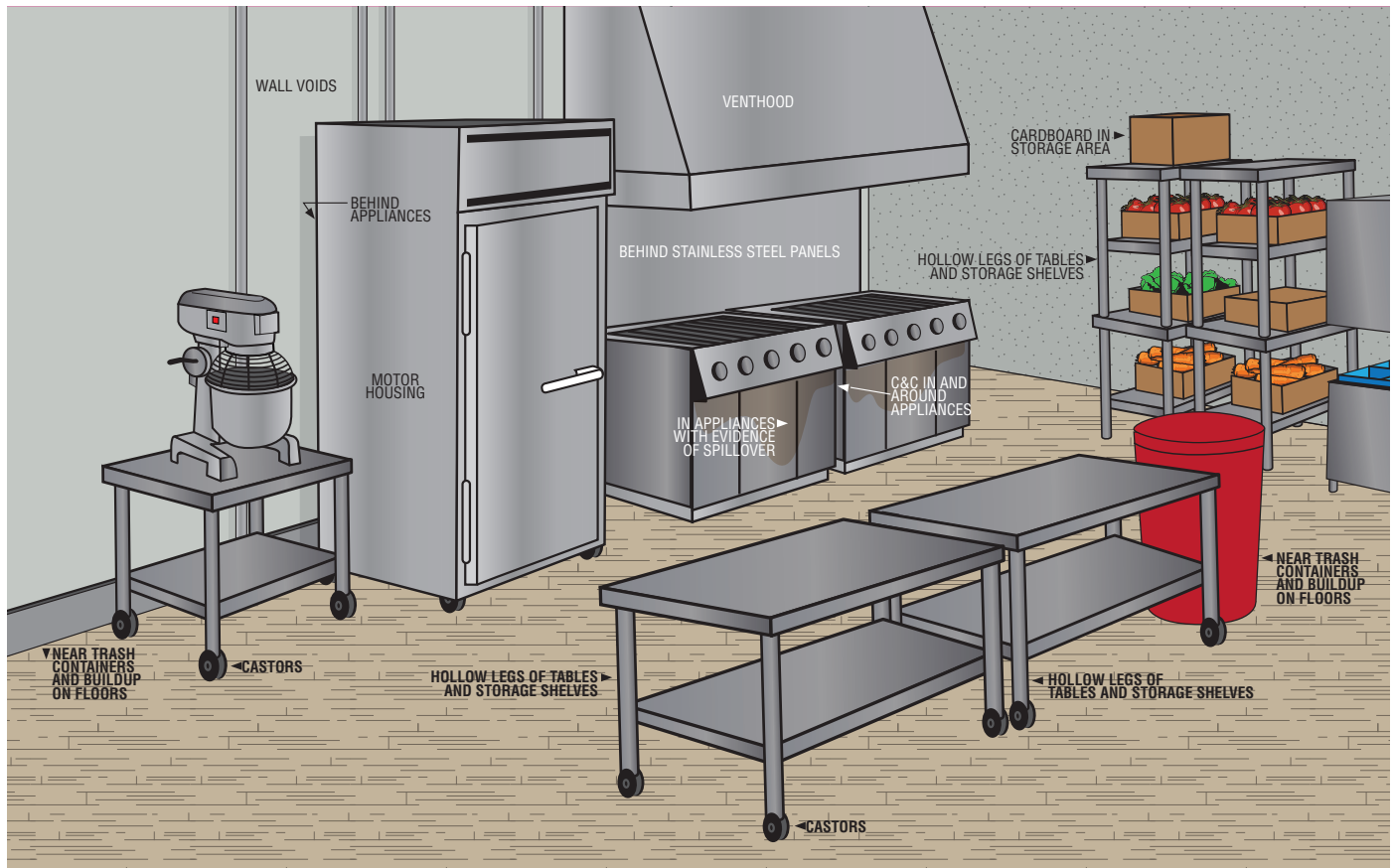


LOW INFESTATION

# Commercial German Cockroach Control Protocol



## Common German Cockroach Harborage Areas



- Wall voids
- Behind appliances
- Near trash containers and buildup on floors
- Castors
- Motor housing
- Behind stainless steel panels
- In appliances with evidence of spillover
- C&C in and around appliances
- Cardboard in storage area
- Hollow legs of tables and storage shelves

### Treatment for High Level Infestations



- To reduce labor and chemical cost decreasing the roach population is the goal. The use of a bait product at this stage is not recommended due to disturbance causing bait avoidance.
- Make direct harborage treatments.
  - Determine if the client's business is appropriate for fogging in hard-to-reach areas (i.e. drop ceilings) using Shockwave® Fogging Concentrate.
  - Use an aerosolization machine (such as Actisol, PAS, etc.) to apply Shockwave concentrate to harborage areas or use Shockwave® 1 Flushing, Killing & Residual Aerosol.
  - Dust products are also an option.
- Communicate with the client what to expect after the treatment.
  - Stress the importance of next day cleanup.
  - Dead or dying roaches will be in the kitchen, and possibly dining and bar areas.
  - Roaches will need to be removed before the facility opens to customers.
- Follow up approximately two weeks later.
  - Vacuum dead and dying roaches to reduce callbacks and help with reevaluation.
  - Make an assessment and treat according to the level of infestation.

### Treatment for Medium Level Infestations



- MGK studies show that the use of Shockwave in a harborage area does not cause palatability issues when using Vendetta bait two weeks later.
- Apply Vendetta Nitro®
  - Place 1-4 mm beads (1/32-1/8 inch sized bait points) close to harborage areas. See common harborage sites on page 3.
  - Place sufficient bait for the level of infestation.
- Apply a non-repellent insecticide as a spot or crack and crevice treatment under and behind all harborage areas.
- Follow up approximately one month later.
  - Vacuum dead and dying roaches to reduce callbacks and help with reevaluation.
  - Make an assessment and treat according to the level of infestation.
- To help reduce the chance of bait aversion developing in roaches, baits should be rotated on a routine basis.
  - Use Vendetta 360 as a rotational bait



## Treatment for Low Level Infestations



- Use glue traps to pinpoint harborage areas and make targeted applications.
  - Monitors containing predominantly adult cockroaches indicate they are not placed close to a harborage area and should be moved in the direction the roaches are entering the glue trap.
  - Large numbers of small instars captured on a glue trap is an indication you are close to the harborage area.



- Apply Vendetta Plus
  - Place 1/8 inch to 1/4 inch in diameter sized bait points close to harborage areas. See common harborage sites on page 3.
  - Place sufficient bait for the level of infestation.
- Apply NyGuard® IGR at a rate of 8 ml. per 1000 sq. ft. as a broadcast, spot or crack and crevice treatment to reduce the reproductive potential of cockroaches.
- To help reduce the chance of bait aversion developing in roaches, baits should be rotated on a routine basis.
  - Use Vendetta 360 as a rotational bait.

## Maintenance Treatments

- Conduct visual/glue trap inspections in areas frequently reinfested.
- Apply Vendetta in areas where roaches are found.
- Apply NyGuard IGR at a rate of 8 ml. per 1000 sq. ft. as a broadcast, spot or crack and crevice treatment to reduce the reproductive potential of cockroaches.



# Commercial German Cockroach Control Protocol

## Portfolio of Products



### BREAK THE REPRODUCTIVE CYCLE

#### NyGuard® IGR Insect Growth Regulator

- The only IGR with EPA Reduced Risk status in food handling areas
- May be used in food and non-food areas
- Photostable so it can be used both indoors and outdoors
- Up to six months of residual cockroach control



### FLUSH & KILL

#### Shockwave® 1 Flushing, Killing & Residual Aerosol

- All-in-one flushing and residual aerosol
- Provides flushing, killing, residual and long-lasting control with an IGR
- May be used in food and non-food areas
- Offers convenience and improved cockroach control performance
- Doesn't drip or leak, even when sprayed upside down



### FOGGING

#### Shockwave® Fogging Concentrate

- Combines five active ingredients to provide flushing, fast knockdown, and residual control (six months for cockroaches)
- Dual synergized and contains NyGuard® IGR for enhanced control
- Ideal for cleanouts and heavy pest populations
- For use in food and non-food areas, including food processing and food storage areas



### ALL-IN-ONE SOLUTION

#### Sumari® Concentrate

- 90-day residual
- Kills a wide variety of labeled pests
- Contains NyGuard® IGR for dual modes of action
- Labeled for use in food handling facilities
- No signal word



# Commercial German Cockroach Control Protocol

## Vendetta® Portfolio of Products

### Innovative Bait Matrix Technology



#### ROTATE

### Vendetta® 360 Cockroach Gel Bait

- Ideal rotational product
- Advanced roach defense system
- Contains NyGuard® IGR
- Ideal for use in sensitive accounts
- Use as a rotational bait with Vendetta®, Vendetta® Plus, Vendetta Nitro® or other products that control the same pests



#### CLEAN OUT

### Vendetta Nitro® Cockroach Gel Bait

- Use for heavy infestations
- No signal word
- Highly palatable to bait averse and non-averse cockroaches
- Contains NyGuard® IGR
- Stable in high heat



#### GAIN CONTROL

### Vendetta® Plus Cockroach Gel Bait

- Attractive
- Contains NyGuard® IGR
- Breaks the life cycle of German cockroaches
- Stable in high heat



#### MAINTAIN CONTROL

### Vendetta® Cockroach Gel Bait

- Attractive to bait averse and non-averse German cockroaches
- Stable in high heat
- Works around the clock
- Kills roaches where they hide



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