



SECURECHOICE COCKROACH INTEGRATED PEST MANAGEMENT GUIDE



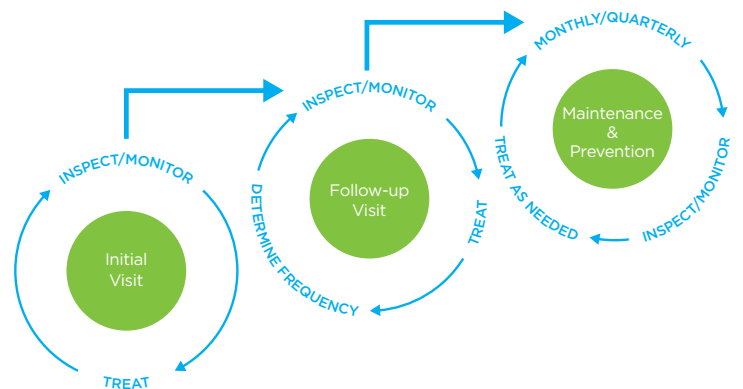


Cockroaches are adaptable and difficult to control, placing them high on the list of pests customers want managed. A variety of tools and strategies are needed to effectively control cockroaches, including inspection, monitoring, chemical solutions, non-chemical approaches and sound insecticide resistance management practices.

The [SecureChoiceSM Cockroach Assurance Program](#) uses these tactics within a proven protocol to ensure successful cockroach control. It features multiple active ingredients and formulations to help manage insecticide resistance, along with best practices for each step of the treatment process. It can also be adapted into weekly, bi-weekly, monthly, bi-monthly and quarterly services as necessary. While this guide is designed primarily for German cockroaches, it is effective on other prevailing cockroach species such as American, brown-banded, Oriental and more.

By correctly following this guide, Syngenta guarantees a reduction of at least 90% of the cockroach infestation during the first four visits over a 60-day period. If you do not see a reduction of at least 90% during the first four visits over 60 days, Syngenta will provide products

to cover the retreatment(s) of the account as needed, as described in this Assurance Program. Contact your Syngenta territory manager or Syngenta authorized distributor/retailer with questions.



PRODUCT ROTATIONS FOR EFFECTIVE COCKROACH CONTROL

Insecticides can be ineffective when the wrong product, formulation or application method is used. The foundation of an effective cockroach treatment program is a combination of non-repellent liquid sprays and gel baits, which complement each other.

For guaranteed cockroach control, use one of the following product rotations for each 90-day period. These products should be used in combination with appropriate monitoring and follow-up visits, all of which are explained in more detail on the following pages.



Note: Demand® CS insecticide, Demon® Max insecticide, Demon WP insecticide and/or Archer® insect growth regulator can be added into these rotations as needed to further suppress heavy cockroach infestations.

To supplement the products recommended as part of the SecureChoice Cockroach Assurance Program, we recommend implementing the following best practices.

INITIAL VISIT

Before making any initial insecticide applications, begin by conducting a thorough inspection, including a visual assessment or by placing monitors.

Proper equipment is essential for conducting an inspection.

Regardless of the area, the following items are recommended:

1. Flashlight: to illuminate dark areas where cockroaches hide
2. Mirror with an extension arm: to see hidden areas, such as behind sinks, under refrigerators and around appliances
3. Monitoring traps, such as sticky traps: to assess cockroach populations

Inspection

A thorough inspection will help you identify the cockroach species, where the infestation is located, the size of the infestation and the conditions favoring cockroach survival. Search for these things:

- Live and dead cockroaches
- Population size
- Cast skins
- Cockroach parts
- Empty or intact egg cases
- Cockroach specks or fecal smears
- Cockroach odors

Likely areas of cockroach activity may include:

- Around sinks
- Sources of moisture
- Equipment with compressors
- Heat-generating motors

Monitoring

Monitors can provide more information about the size and location of the infestation. To get the most out of monitoring:

- Place monitors in or as close to known harborage areas as possible
- Note the number and location of monitors
- Use the appropriate number required for the extent of the infestation and area
- Consider all possible areas for placing monitors from floor to ceiling, including voids in drop ceilings

Note that:

- Monitors will only catch cockroaches when placed within 5-6 ft. of infested areas
- The closer the monitor is to the infested area, the more cockroaches it will catch
- If monitors don't catch any cockroaches, remove or relocate them

Table 1 – Visually Estimate a Cockroach Infestation

|  | Infestation Level | Number of German Cockroaches per 10 x 10 ft. Area or 100 sq. ft. ¹ |
|---|-------------------|---|
| | Low | Fewer than 30 |
| | High | 30 or more |

Table 2 – Number of Cockroaches per Trap per Night

| Infestation Level | German | Brown-Banded | Oriental | American |
|-------------------|---------------|---------------|---------------|---------------|
| Low | Fewer than 20 | Fewer than 10 | Fewer than 10 | Fewer than 10 |
| High | 20 or more | 10 or more | 10 or more | 10 or more |

Modified from: <https://lancaster.unl.edu/pest/roach/cockroach%20manual.pdf>

¹ If time allows, conduct a ≥ 24-hour trap catch prior to first treatment.

Treatment

If an account is large and there are many cockroach harborages, consider breaking the treatments into manageable zones. Each zone may require specific treatments unique to the sensitivity and use of the zone. During every inspection (initial, follow-up and maintenance), note which formulation and active ingredient are the best fit for each zone.

1. Spray First

Advion WDG and Optigard Flex are non-repellent sprays that quickly control infestations. High rates of these non-repellent products can be used to clean out cockroach infestations, while low rates are effective during maintenance and prevention. Advion WDG may also be used in food-handling facilities, in accordance with the label, while they are open for operation.

Additional Tips

- Foaming with non-repellent products can also enhance your application by treating critical voids. Follow label instructions to apply Advion WDG or Optigard Flex as a foam.
- Adding an insect growth regulator, such as Archer, at a rate of 2.0 fl. oz. per gal. of water can help break the reproductive cycle and can be tank mixed with Advion WDG or Optigard Flex.

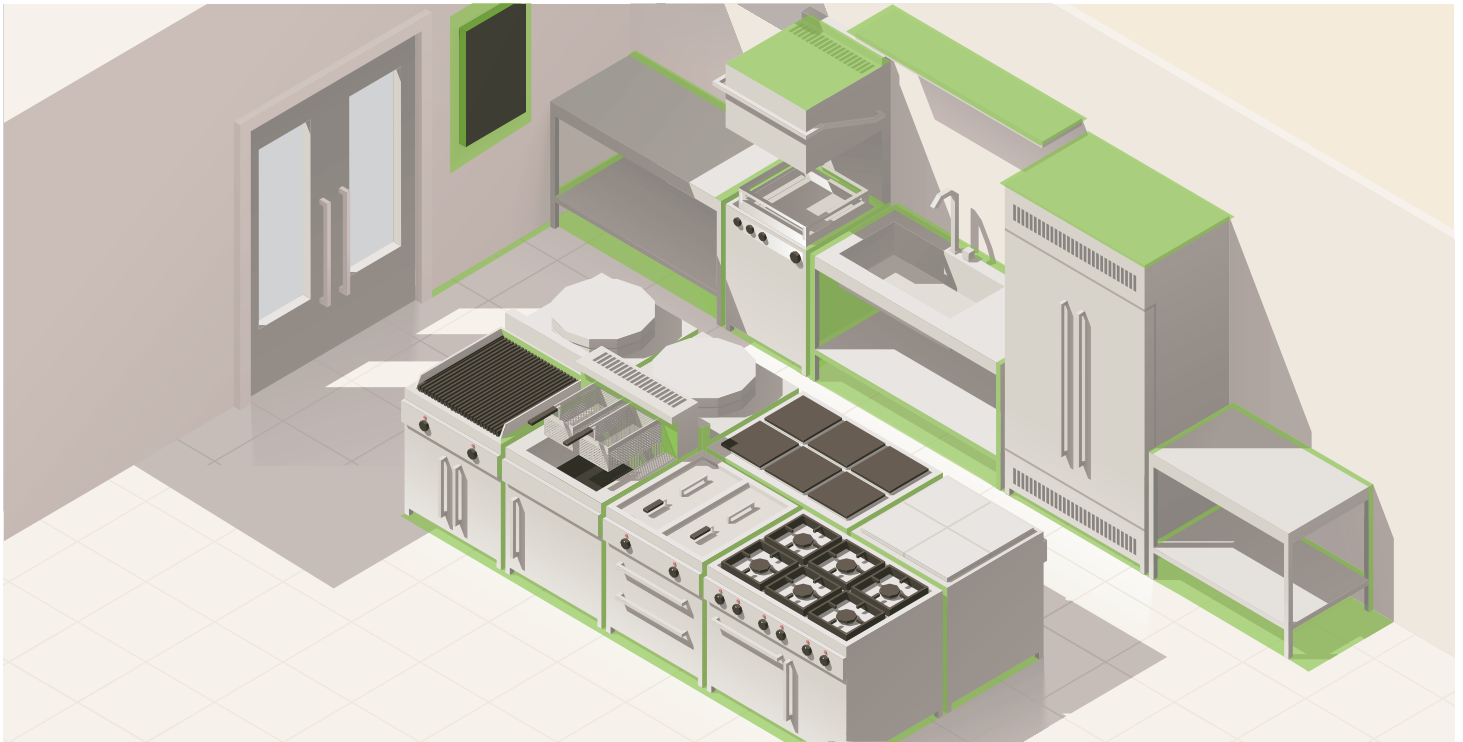
Table 3 - Spray Product Rates

| Infestation Level | Rate per Gal. of Water | |
|-------------------|------------------------|---------------|
| | Advion WDG | Optigard Flex |
| Low | 0.33 oz. | 0.27 fl. oz. |
| High | 0.66 oz. | 0.54 fl. oz. |



Common Cockroach Harborage Areas

Areas in green designate common cockroach harborage sites in food-handling establishments, including areas out of sight or reach like the tops of shelves, between equipment and behind wall coverings.



2. Bait After

Apply a cockroach gel bait, like Advion Evolution or Optigard Cockroach Gel Bait, after spraying is complete. Use a bait gun to ensure the correct amount of product is applied, and to better access cracks and crevices. Don't contaminate gel baits with sprays, aerosols, dusts or other products, which can lead to reduced bait consumption and performance.

Apply gel bait to harborage areas per chart recommendations in Table 4.

In some cases, a small, thin bead (less than 1/8 in. wide and 2 in. long) may be appropriate between construction elements or in other cracks and crevices.

Table 4 - Population Assessment

| Infestation Level | Advion Evolution | | Optigard Cockroach | |
|-------------------|--|---|--|---|
| | Approximate Gel Bait Amount (1 g) ² | Number of Gel Bait Spots (0.5 g) ² | Approximate Gel Bait Amount (1 g) ² | Number of Gel Bait Spots (0.5 g spots) ^{2,3} |
| Low | 2-6 | 4-12 | 5.5-11 | 11-22 |
| High | 6-10 | 12-20 | 11-22 | 22-44 |

Note: There may be many 10 x 10 ft. areas to treat within a single space, including but not limited to ceilings, walls, floors, behind equipment, within voids and cracks and crevices. Assess the population and treatment areas to determine the appropriate amount of gel bait needed.

² Bait placements per 100 sq. ft.

³ Optigard Cockroach allows for 0.25-0.5 g spots. Approximate bait amounts and number of bait spots can be adjusted to use the 0.25 g rate.

FOLLOW-UP VISITS

Initial follow-up to be conducted seven to 10 days after first treatment⁴

- Conduct inspection and note any new areas or conditions that may impact cockroach control
- Document areas that may need an insecticide reapplication
- Evaluate monitors and determine if an additional treatment is required based on trap counts
- Remove any aged and/or uneaten gel bait from previous application with a putty knife
- Apply gel bait near active harborages and foraging areas
 - a. The amount of gel bait should be determined by population assessment outlined in Table 4
- Replace monitors before leaving

Additional follow-up inspections should be conducted weekly, bi-weekly or as needed until cockroaches are no longer found. Multiple follow-ups may be required. Repeat first three follow-up visit instructions.

- If there is no cockroach activity, replace monitors as needed and switch to a monthly or quarterly maintenance and prevention schedule (see details below)
- If a cockroach infestation is still active, evaluate the infestation level and bait accordingly (Table 4)
- During treatment, ensure gel bait applications and non-repellent sprays are rotated at least every 90 days
- Replace monitors before leaving
- Follow these steps every one to two weeks until cockroaches are no longer detected

Table 5 - Visit Frequency

| Infestation Level | Frequency of Visit |
|-------------------|--------------------------------|
| None | Move to prevention/maintenance |
| Low | Service every 2 weeks |
| High | Service weekly |



MAINTENANCE AND PREVENTION

Once cockroaches are no longer found, move to a monthly or quarterly maintenance and prevention phase⁵

- Critical areas where cockroaches may be reintroduced should be baited and/or sprayed following the maintenance rate recommendations
- Old gel bait should be removed with a putty knife and vacuum
- A spray application should be conducted prior to baiting
- Continue to evaluate and replace monitors
- If cockroaches are found, return to a follow-up visit schedule

⁴ Seven to 10 days are recommended for a follow-up visit, but can be conducted less frequently as needed.

⁵ Complete cockroach elimination may not be feasible for certain accounts based on many factors. Thus, maintenance and prevention can begin if the infestation level reaches a critical threshold related to the specific account.

ADDITIONAL RECOMMENDATIONS

The following methods may be used to supplement the SecureChoice Cockroach Assurance Program

Dust

Inaccessible voids may be critical cockroach sites, especially when located near plumbing areas or other water sources.

A thin dust (not more than one particle thick) should be applied to areas such as:

- False cabinet bottoms
- Wall voids
- Around or on pipes
- Insulation
- Fiberglass
- Electrical outlets
- Motors
- Compressors (especially in areas where a liquid or gel bait is not feasible)

Do not contaminate any gel bait with dust.

Dry, Flowable Baits

To treat voids and cracks, dry, flowable baits can also be incorporated into a cockroach treatment plan.

Additional Tips and Methods

- Stress the importance of sanitation to your customers and encourage them to remove competing food sources, reduce water supplies and remove clutter to eliminate hiding places

- HEPA-filter vacuums are useful for removing large masses of cockroaches prior to a chemical treatment
- Aerosols are great tools to flush cockroaches from behind large equipment or other items that are hard to see behind
- Other fast-acting, residual pyrethroids, such as Demand CS, Demon Max and Demon WP insecticides, can also be used in areas where fast knockdown of cockroaches is required, or to prevent populations from moving into critical areas
- Insect granules, like Advion insect granule, can be effective for peridomestic cockroach species that harbor indoors and outdoors like American, Oriental, smokybrown and Australian cockroaches
- Arenas, like Advion cockroach bait arena, can be effective for large cockroach species that need to consume a high volume of bait, and should be placed in:
 - Areas where bait may be washed away
 - Areas where too much dust gathers
 - Areas where temperatures are very warm

We have confidence in our products and the research behind them. By following the steps laid out in this [SecureChoice Cockroach IPM Guide](#), you can ensure cockroach success across your customer accounts.

To learn more, please visit SyngentaPMP.com/Cockroach



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