Evaluation of 2 Bait Formulations by Innovative Pest Products when exposed to a Mixed Population of German Cockroaches (*Blattella germanica*)

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GOOD LABORATORY PRACTICES STATEMENT

This study was NOT conducted in compliance with Good Laboratory Practice Standards as described by EPA (40 CFR Parts 160 and 792), and was never intended for that purpose. Nevertheless the information and data obtained are useful in judging the usefulness of the products evaluated.

Submitter: Compliance Services International
c/o Innovative Pest Control Products

Consultant

Date

Sponsor: Innovative Pest Control Products

President

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Date /9/11/06/
Objectives:

1. To determine the efficacy of 2 formulations of Innovative Pest Products Gourmet Bait products when exposed to a mixed population of German Cockroaches (*Blattella germanica*).

Treatments:

1. Control-Water
2. Innovative Pest Products Gourmet Bait Gel
3. Innovative Pest Products Gourmet Bait Liquid

Materials and Methods:

The following is the Snell Scientiﬁcs Standardized Testing Method for evaluating the efficacy of insect baits when placed in arenas with various arthropod species. Select action items and illustrations have been removed from this standardized test method in an effort to make the report more precise and accurate to the test conducted. Any details removed from this test method were deemed irrelevant to the test conducted in this report.

319.1 **Materials:**

319.1.1 Insect Arenas – can be Petri dishes, containers (ex. 800 ml), large tupperware-type containers, various size cages/tents, etc…

319.1.2 Digital Scales – appropriate range for measuring solid formulations

319.1.3 CO2 and regulator – standard 20 pound cylinders and gas regulator is used for anesthetizing insects (as necessary, depending on species)

319.1.4 Chill Table – used for some insects to keep them asleep while sorting.

319.1.5 Intermediate transfer/holding chambers – used for housing insects after they have been removed from their primary breeding housing. Intermediate chambers are used to anesthetize insects and sort them to the treatment panels

319.1.6 For some tests, a choice of non-toxic food/water may be required. If food/water is required for the test, a means of housing the food/water may be necessary such as small weight trays, cotton balls for sugar water, gel water in a tray, etc…

319.1.7 Poster putty (or similar) to hold harborages, water vials, and other items in place

319.2 **Methods:**

319.2.1 Arena containers are positioned on a cleaned counter into sets of 2-4 replicates. Each container is labeled with a treatment code and a replicate number. Each set of 2-4 replicates are positioned in a group and the counter or trays are clearly labeled with quadrants for each treatment type (as a duplicate means of ensuring accurate data collection)
Pesticides are mixed or weighed per label directions using pipettors to measure liquid concentrates and using balances to measure solid formulations.

Each arena is clearly labeled with the chemical, rate, and date mixed.

The label rate for each chemical is calculated to determine the amount needed for the size of the arena to be treated (if applicable).

The proper Pipettor is selected based on the amount of liquid needed per arena.

Disposable pipette tips are used for each new chemical and rate.

For liquids, the amount of chemical needed per arena is applied using the appropriate pipettor with a tapping process to ensure a uniform coverage, or can be applied with various sprayers as required.

Solid materials such as granular baits, dusts, or powders are weighed and applied into appropriate containers such as 100 mm Petri dishes, weighing trays/canoes, 800 containers, or other holders.

The prepared treatment/chemicals are placed inside the test arena such as a large tuperware-type container, an 800 ml container, or smaller arenas such as a Petri dish (see illustration).

For ants, mosquitoes, flies and other species, it may be necessary to provide sugar water by adding floral foam soaked in sucrose solution into the side of the center spacer panel or sucrose solution soaked into cotton balls and inserted into the side of a container, or other species may require trays with non-toxic food, water, or gel water.

Control replicate arenas will contain no toxic materials but will include equal food/water sources (if applicable)

Insects are immobilized by the appropriate means and all insects are confirmed alive and mobile to ensure no dead insects are placed into treatment arenas.

Insects are transferred to each treatment arena (the number per arena may be 5-100, depending on the test needs)

The insects are then covered in their respective arenas.

The process is repeated for 2-4 arenas per chemical rate

The number of Dead, Knocked Down (KD) and Alive per arena are recorded at time intervals pre-selected for the test.

For long-term affects on development, such as cockroach baits, or insect growth regulators, data will be recorded on the individual stage groups, development, death of each stage group, egg development and other population factors.

For ant tests the original harborage system may be supplemented with a clear panel attached with poster putty (to secure and to create a void) covered on the top with a piece of paper. This provides a secondary harborage as the stressed colony will move from their original harborage. The paper can be lifted to quantify the colony underneath.
319.2.19 Additional Testing Details Not Fully Described in Standard Protocols:

**Test Set-Up:** The evaluations in this test followed Illustration(s): 319.3.1 and 319.3.2

**Replicates:** Insect Stage Tested: Adult male and female, late, middle and early instars

# of Reps: 4
# of Insects/Rep: 10 of each stage (Total of 50 per replicate).

**Conditions in Test Room:**
- Temperature: 77deg F.
- Humidity: 48%

**Application Rate Calc:**
- Labeled Rate Required: 7.0g
- Amt Needed per arena: 7.0g

Exposure time: Insects were exposed to products for duration of test

**Application Type:**
- Gel: Products dispensed from supplied applicator into bait tray
- Liquid: Calibrated pipettor with disposable tip used to dispense product into trays

**Additional application(s):**
- Gel bait: Replacement made with 7.0g fresh bait at 4 DAT and 8 DAT
- Liquid bait: Replacement made with 7.0g fresh bait at 2 DAT, 5 DAT, and 8 DAT
(Replaced when bait was ‘skinned over’ and no longer palatable.

**Confirming Pest Condition:**
All German Cockroaches were confirmed ‘alive’ 2 times prior to treatment:
1) the insects were removed from the breeding container by transferring only live specimens to transfer container,
2) after all insects were transferred to the arenas, they were confirmed to be moving before any exposures were made.

**Definition of Alive/Dead/Knockdown:**
- Alive: Insect exhibits forward motion or ability to fly
- KD: Insect exhibits some movement but cannot fly or crawl
- Dead: Insect exhibits no movement even when stimulated

Method Used to Evaluate Condition: Arena is opened and insects observed *in situ.*
319.3  Illustrations:

319.3.1  Large Container ('tuperware-type) with snap-on lid with center removed to snap over mesh (ex hair net)

319.3.2  Arena Set-up #1– Including food tray, water tray, toxicant tray, and harborage
Results / Discussion:

The data for both bait products are presented in Table 1 and Graph 1. After 5 days, only 9% of the untreated control cockroaches died and 32% were dead after 11 days. Within 9 days, the Gourmet Liquid Bait resulted in an average mortality of 93% and 95% within 11 days. The Gourmet Gel Bait provided 78% mortality in 9 days and 88% in just 11 days.

All tests were conducted using a two-tailed distribution and probability value of p<.05. Statistically, all treatments were significantly different from the controls. Clearly, both Gourmet Gel Bait and Gourmet Liquid Bait provide excellent kill rates with German cockroaches.
Tables:

Table 1.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1 DAT</th>
<th>3 DAT</th>
<th>5 DAT</th>
<th>7 DAT</th>
<th>9 DAT</th>
<th>11 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>3%</td>
<td>6%</td>
<td>9%</td>
<td>10%</td>
<td>18%</td>
<td>32%</td>
</tr>
<tr>
<td>Gourmet Gel Bait 7.0g</td>
<td>2%</td>
<td>13%</td>
<td>20%</td>
<td>40%</td>
<td>78%</td>
<td>88%</td>
</tr>
<tr>
<td>Gourmet Liquid Bait 7.0g</td>
<td>2%</td>
<td>15%</td>
<td>34%</td>
<td>57%</td>
<td>93%</td>
<td>95%</td>
</tr>
</tbody>
</table>

Graphs:

Graph 1.
Photographs:

Photograph 1.
Photograph 2.
Photograph 3.
Photograph 4.
Photograph 5.
Photograph 6.