



NUVAN[®] Directed Spray[™] Aerosol

Bed Bug Control





Program Overview

- Welcome
- NUVAN® Product Line Overview
- Evolution of Bed Bug Control
- NUVAN® Technical Overview
- NUVAN® Directed Spray™ Aerosol in Action
- What's Next for NUVAN®
- Q&A





Jeff Alvis, AMVAC

NUVAN® PRODUCT LINE OVERVIEW





NUVAN[®] Family of Products

- NUVAN[®] Prostrips[®] and NUVAN[®] Prostrips[®]+
 - Provide control through vapor action that lasts up to four months
 - Two sizes
 - NUVAN Prostrips = 16g
 - NUVAN Prostrips + = 65g
 - Features DDVP
 - Powerful tool for controlling bed bugs and other structural pests
 - Controls bed bug nymphs and adults in 48 to 72 hours
 - Controls bed bug eggs in a minimum of one week





NUVAN[®] Family of Products

- NUVAN[®] Directed Spray[™] Aerosol
 - Introduced in September.
 - New spray product that is highly effective against bedbugs, cockroaches and other structural pests.
 - Contains DDVP, one of the most effective active ingredients to use against bed bugs, including pyrethroid-resistant strains.
 - Provides immediate kill for bed bugs, with 100% kill within 20 minutes.





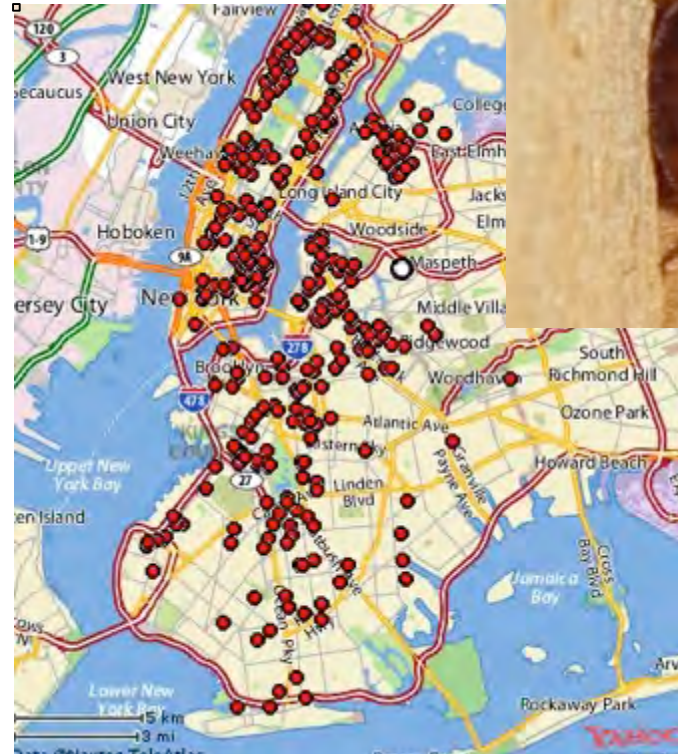
Paul Bello, Industrial Entomologist, PJB Pest Management Consulting

EVOLUTION OF BED BUG CONTROL



Bed Bugs and You

- As we all know, bed bugs have continued to increase in prevalence since the mid 1990s.
 - The exact cause of the resurgence of bed bugs is unclear.
- What is clear is that they are a problem that cannot be managed without a thorough and comprehensive approach best implemented by competent pest management professionals.



Bed Bug Health Risks

- Bed bugs can cause a number of health effects including
 - Skin rashes,
 - Psychological effects, and
 - Allergic symptoms.
- Bites may lead to a range of skin manifestations.
- Additional research is needed to determine the potential for bed bugs to transmit disease and their impact on public health.



Bed Bug Identification

- The first step to controlling bed bugs is knowing that the client truly has a bed bug infestation.
- Many people may think they have bed bugs but may not.
- Telltale signs of bed bugs include:
 - Fecal stains,
 - Shed skins,
 - Eggs,
 - Carcasses, and
 - Live bed bugs.
- We cannot confirm bed bug infestation based upon bite evidence alone!

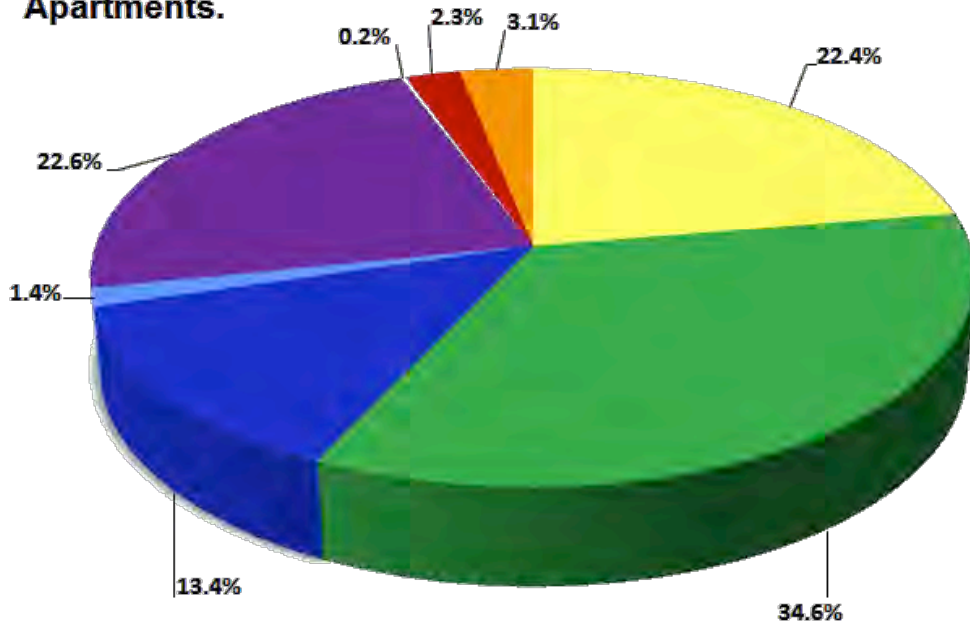




Bed Bug Hiding Spots

BED BUG HIDING SPOTS

Distribution of Bed Bugs Found In 13 Infested Apartments.



Source: University of Kentucky

- Mattress
- Boxspring
- Frame / Headboard
- Baseboard Areas
- Couch / Chair
- Nightstand / Dresser
- Walls / Ceiling
- Other



Controlling Bed Bugs

- Bed bug control is most effective when an Integrated Pest Management (IPM) approach is taken.
- IPM takes advantage of all appropriate bed bug management options including
 - Thorough inspection,



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Controlling Bed Bugs

- Bed bug control is most effective when an Integrated Pest Management (IPM) approach is taken.
- IPM takes advantage of all appropriate bed bug management options including
 - Thorough inspection,
 - Vacuuming,
 - Steam application,
 - Heat Treatments,
 - Pesticides,
 - Installation of encasements & blocker devices, and
 - Suitable follow up.



Bed Bug Pesticides

- Judicious use of pesticides has been critical in the success of bed bug control and will continue to play an important role in successful management programs.
- Pesticide resistance by bed bugs has continued to increase with time.
 - U.S. bed bug populations show a tolerance for pyrethroids many times that of susceptible lab strains.
 - Bed bugs collected from NYC have been found to be many times more resistant to pyrethroids than those collected in Florida.





Pesticide Evolution

- NUVAN[®] Prostrips[®] have been used successfully for bed bug control by pest pros across the country.
- NUVAN[®] Directed Spray[™] Aerosol will provide even more opportunities for success for today's bed bug professional.





Charles Silcox, Ph.D., Product Development Manager, AMVAC

NUVAN® TECHNICAL OVERVIEW





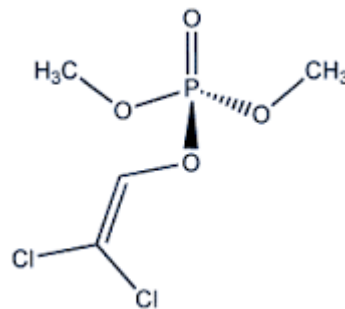
Technical Overview

- Active Ingredient Information
 - Basic information on dichlorvos
 - Unique attributes of dichlorvos
 - Applicator and occupant exposure study
- NUVAN® Products
 - NUVAN® Prostrips®
 - NUVAN® Prostrips® +
 - NUVAN® Directed Spray™ Aerosol
- NUVAN® Directed Spray™ Aerosol
 - Brief label review
 - Bed bug efficacy data



Active Ingredient Information

- **Common Name:** dichlorvos
- **Chemical Name:** 2,2-Dichlorovinyl dimethyl phosphate
- **ISO* Name:** Dimethyl-2,2-dichlorovinyl phosphate
- **Chemical Class:** Organophosphate
- **Target System:** Nervous System - Synapse
- **Mode of Action:** Acetylcholinesterase Inhibitor
- **IRAC Code:** Group 1-B Insecticide

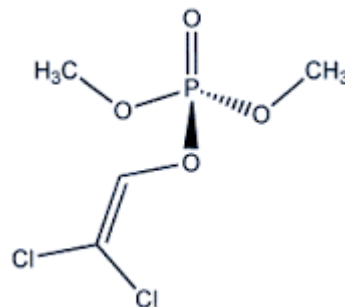


Dichlorvos
(DDVP)



Unique Dichlorvos Attributes

- Contact and vapor action
 - Insects directly contacted with spray are quickly killed.
 - Bed bugs appear to be particularly susceptible to dichlorvos
 - Moves in the vapor phase to deep harborages and other hidden areas.
- Selective toxicity via enzymatic degradation
 - Dichlorvos-ACHE complex rapidly hydrolyzed by mammals
 - Dichlorvos-ACHE complex is stable in target insects

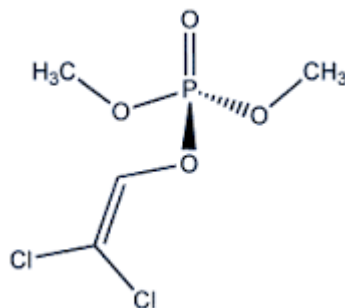


Dichlorvos
(DDVP)



Unique Dichlorvos Attributes

- Rapid degradation
 - When applied, it quickly kills insects and then rapidly dissipates.
 - Its greatest strength may be its molecular weakness.
 - Non-residual – should be used with a complementary residual product.
- Mode of Action
 - The only Group 1 insecticide registered for indoor residential use.
 - Important component of a resistance management program.



Dichlorvos
(DDVP)





Researcher Quotation

- “Recent cancellation of most indoor organophosphate and carbamate insecticide usage has depleted the arsenal of effective bed bug products; and of those remaining products (principally pyrethroids), the prospect of resistance is worrisome.”

*Dr. Michael F. Potter
University of Kentucky
American Entomologist – Summer 2006*



Applicator and Occupant Study

Dermal and Respiratory Exposure to Applicators and Occupants of Residences Treated with Dichlorvos (DDVP)

R. E. GOLD, T. HOLCISLAW, D. TUPEY, AND J. B. BALLARD*

Department of Entomology, University of Nebraska,
Lincoln, Nebraska 68583-0818

J. Econ. Entomol. 77: 430-436 (1984)

ABSTRACT. Single-family residences were treated with a 0.5% (AI) solution of dichlorvos (DDVP) to control *Aedes triseriatus* (L.). Pesticide applicators and members of several households were monitored for residues of DDVP exposure with exposure pads, urinary (AET5, AET6) and erythrocyte acetylcholinesterase tests, and urinalysis. Time spent was 0.0282/3 h for applicators and 0.0288/3 h for residents who were present during application and re-treated in one treated structure for 24 h after treatment. There was no evidence of DDVP in the diethylacrylate and methacrylate in the urine of the applicators or residents. There was slight but statistically significant differences in erythrocyte acetylcholinesterase activity of test subjects at various locations, but erythrocyte acetylcholinesterase was unchanged. We concluded that there was not a significant risk, in terms of acute toxicity, to either the applicators or the residents of treated structures when DDVP was used for residential control.

Materials and Methods

Field Efficacy Trials. The study sites consisted of single-family houses managed by the Orinai Indian Tribal Housing Authority in Moor, Neb. The 20 residences varied in age, construction, and size, but the principal source of variation resulted from the complexity of the internal environment and sanitation.

German cockroach, *Blattella germanica*, population estimates were made with sticky traps as described by Gold et al. (1981), and Ballard and Gold (1982). After two-line cockroach population levels were determined, each unit was thoroughly treated with a 0.5% (AI) water emulsion spray of DDVP prepared from Vapona SEC (24.7% Vapona). DDVP was applied with a 3.6-liter R & G hand sprayer operated at 167.5 kPa of pressure fitted with a multiple nozzle set for fine fan spray. Insecticide was applied to positions found using the baseboards and around the doorways, windows, and wall surfaces, beneath the sink, stove, and refrigerator, as well as all shelves and cabinets and around plumbing and other utility installations. Shelves, chests, and storage areas were stripped before treatment.

Applicator Dermal Exposure, Applicator exposure to DDVP was monitored with techniques similar to those of Durham and White (1962), Gold et al. (1981, 1982) and Lewis et al. (1982). Each applicator wore a disposable polyester pump suit with an open collar and long sleeves, a hard hat, respirator, and rubber gloves. Dermal exposure pads were attached to the outer clothing and to the skin beneath the clothing. Pads were located on the hand, forearm (just above the wrist), leg (just above the knee), chest, and back. The amount of

DURHAM AND WHITE (1962) expressed the opinion that there was not a single pesticide for which there is definitive information concerning the interrelationships between occupational exposure by different routes, the fate of the compound in the human body, and its chemical effects. Although these statements were made many years ago, the premise remains valid, particularly for insecticides such as dichlorvos (DDVP) that are used both in agricultural and urban settings.

Public concern over pesticide use prompted legislation that provided for review of registered pesticides believed to cause unreasonable risks to either humans or the environment. DDVP is an insecticide that has been subject to review as a result of reported carcinogenicity, teratogenicity, organotoxicity, and reproductive and isotretic effects (Kimberling and Gaines 1968; Krone and Humala 1974; Voogd et al. 1975; Johnson-Smith et al. 1975).

There have been several studies of respiratory and dermal exposure of humans to DDVP formulated in water strips (Leary et al. 1974; Cavagna et al. 1980; Gillett et al. 1972a, and Gillett et al. 1972b); however, limited data are available on exposure of humans to other DDVP formulations used by commercial pest control applicators and homeowners. Our research was done to measure exposure of pesticide applicators and residents of treated structures who inadvertently come in contact with this insecticide.

* Dept. of Entomology and Plant Pathology, University of Nebraska-Lincoln, Lincoln, Nebraska.
* Dept. of Agronomy.
* Dept. of Environmental Engineering.

- Gold, R.E., Holcslaw, T., Tupy, D., and Ballard, J.B. 1984. Dermal and Respiratory Exposure to Applicators and Occupants of Residences Treated with Dichlorvos (DDVP). J. Econ. Entomol. 77: 430-436.





Applicator and Occupant Study

- Researcher Affiliations
 - University of Nebraska
 - Department of Entomology; Department of Agronomy; Department of Environmental Programs
 - University of Nebraska Medical Center
 - Department of Pharmacodynamics and Toxicology
- Evaluated occupational and residential exposure during liquid applications of 0.5% dichlorvos.





Applicator and Occupant Study (continued)

- Twenty single-family houses were treated in Macy, NE.
- Treated with an average of 19.5 g (AI) of dichlorvos per residence.
- Concluded:
 - “that the application of 0.5% (AI) DDVP caused no undue risk to either the applicators who mixed and applied the insecticide or to residents of the treated structures.”
 - “It was demonstrated that normal work apparel provides an effective barrier to DDVP; however hand protection is strongly recommended.”





Applicator and Occupant Study

- Provides a frame of reference for NUVAN[®] Directed Spray[™] Aerosol
 - NUVAN[®] Directed Spray[™] Aerosol is marketed in a 17 ounce unit.
 - Each unit contains approximately 2.4 g of dichlorvos.
 - This is about 1/8 of the amount of dichlorvos that was applied per residence in the study conducted by Gold et.al.
 - In most cases, one unit of NUVAN[®] Directed Spray[™] Aerosol will be used to treat more than one residence.
 - Thus, in practice, the amount of dichlorvos applied using NUVAN[®] Directed Spray[™] Aerosol will be at least an order of magnitude less than that shown by Gold et.al. to have no undue risk.





NUVAN[®] Family of Products

- NUVAN[®] Prostrips[®]
 - Resin strip containing 18.6% dichlorvos
 - “Small Strip” – 16 grams
 - Each strip treats 100 to 200 cubic feet
- NUVAN[®] Prostrips[®] +
 - Resin strip containing 18.6% dichlorvos
 - “Large Strip” – 65 grams
 - Each strip treats 900 to 1,200 cubic feet
- NUVAN[®] Directed Spray[™] Aerosol
 - Aerosol containing 0.5% dichlorvos
 - Marketed in a 17 ounce aerosol





NUVAN[®] Prostrips[®] vs NUVAN[®] Prostrips[®] + Application Sites

Nuvan[®] Prostrips[®]

- Animal Buildings
 - Attics
 - Barns
 - Boats
 - Cabins
 - Closets
- Crawl Spaces
- Cupboards
- Farm Houses
 - Garages
- Grain Bins
- Mobile Homes
- Museum Collections
 - Museums
- Outhouses
- Pantries
- Pest Traps
- Ranch Houses
- Recreational Vehicles
 - Sheds
- Storage Units
- Trash Bins
- Utility Boxes
- Vacation Homes

Nuvan[®] Prostrips[®] +

- Animal Buildings
 - Attics
 - Barns
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- Garages
- Grain Bins
- Museum Collections
 - Museums
 - Outhouses
- Pest Traps
- Sheds
- Storage Units
- Trash Bins
- Utility Boxes





NUVAN[®] Prostrips[®]

- For Control of Bed Bugs and Bed Bug Eggs
 - NUVAN PROSTRIPS may be used to control crawling bed bug nymphs and adults exposed to product vapors for **48 hours**. In difficult to treat areas, a minimum treatment time of **72 hours** will provide better results. **Strip may be used to control bed bugs that have entered various items in an infested structure** including, but not limited to: electronics, appliances, footwear, artwork, collectibles, plush toys, clocks, radios, wall hangings, telephones, computers, printers, mattresses, box springs, books, lamps, furniture and other such items.





NUVAN[®] Prostrips[®]

- For Control of Bed Bugs and Bed Bug Eggs
 - Place infested items in a suitable **plastic bag, poly sheeting, container or room** that is closed to contains strip treatment. Plastic bags or poly sheeting should be at least 2 mils thick. The closed volume for treatment should not exceed the volume to be treated for the size of the strip used. Take care to avoid direct contact of the strip with the surface of items being treated. **Seal items in the containment for a minimum of 48 hours to kill bed bug nymphs and adults. To kill any bed bug eggs, if suspected to be present, seal items in the treated space for seven days.** Seal plastic bags and poly sheeting with as much **air space** around the treated article as is practical as this will enhance the exposure to the product vapors. Proper seal can be attained by any appropriate manner such as the use of tape, twist ties or other means. Professionals should test for adequate seal by testing for the escape of air from the sealed bag.





NUVAN[®] Prostrips[®]

- For Control of Bed Bugs and Bed Bug Eggs

- Identify sealed treatment by a label indicating a pesticide treatment is in process that should not be disturbed by unauthorized persons. **The label should include the date, pest professional person or company responsible and contact telephone number.** When treatment is completed, remove treated items from the treatment in a well ventilated area and air out for a period of not less than two hours.





NUVAN[®] Prostrips[®] +

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 - NUVAN PROSTRIPS + may be used to control crawling bed bug nymphs and adults exposed to product vapors for **48 hours**. In difficult to treat areas, a minimum treatment time of **72 hours** will provide better results. **The strip may be used to control bed bugs that have entered various items in an infested structure** including, but not limited to: electronics, appliances, footwear, artwork, collectibles, plush toys, clocks, radios, wall hangings, telephones, computers, printers, mattresses, box springs, books, lamps, furniture and other such items.





NUVAN[®] Prostrips[®] +

- For Control of Bed Bugs and Bed Bug Eggs
 - Place infested items in a **container or room** that is closed to contains strip treatment. The sealed volume for treatment should not exceed the volume to be treated for the size of the strip used. Multiple strips can be used in a large space and should be distributed uniformly over the space being treated. Take care to avoid direct contact of the strip with the surface of items being treated. **Seal items in the treatment for a minimum of 48 hours to kill bed bug nymphs and adults. To kill any bed bug eggs, seal items in the treated space for seven days** if bed bug eggs are suspected to be present. The presence of **air space** or volume within the sealed treatment space is desirable to enhance the exposure to the product vapors.





NUVAN[®] Prostrips[®] +

- For Control of Bed Bugs and Bed Bug Eggs
 - Identify sealed treatment areas by label indicating a pesticide treatment is in process that should not be disturbed by unauthorized persons and **the label should include the date, pest professional person or company responsible and contact telephone number.** When treatment is completed, remove treated items from the treatment in a well ventilated area and air out for a period of not less than two hours.





NUVAN[®] Directed Spray[™] Aerosol

- Read the entire label before using NUVAN[®] Directed Spray[™] Aerosol.

NUVAN[®]
DIRECTED SPRAY AEROSOL

KILLS INSECTS WITH VAPOR ACTION

Effective Against: Ants, Bed Bug, Bed Bug Egg, Bees, Beetles, Carpet Beetles, Clothes Moth Larvae, Cockroaches, Crickets, Fleas, Flies, Flour Beetles, Gnats, Hornets, Millipedes, Mosquitoes, Moths, Silverfish, Sowbugs, Spiders, Ticks, Wasps, Waterbugs, and Weevils.

INTENDED FOR SALE TO, USE AND STORAGE BY LICENSED PEST CONTROL OPERATORS, OR PERSONS UNDER THEIR DIRECT SUPERVISION, ONLY

ACTIVE INGREDIENT:
Dichlorvos (1,2-Dichlorovinyl dimethyl phosphate)..... 0.5%

INERT INGREDIENTS:..... 99.5%

Total 100.0%

Contains petroleum distillate

KEEP OUT OF REACH OF CHILDREN
CAUTION

FIRST AID	
<small>Consult an ophthalmologist if irritation continues.</small>	
If swallowed:	<ul style="list-style-type: none"> • Immediately call a poison control center or doctor. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give any liquid to the person. • Do not give anything to eat to an unconscious person.
If in eyes:	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing:	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If inhaled:	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
EMERGENCY INFORMATION	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
FOR THE FOLLOWING EMERGENCIES, PHONE 24 HOURS A DAY:	
For Medical Emergencies phone:	1-888-681-4261
For Transportation Emergencies, including spill, leak or fire, phone CHEMTREC [®] :	1-800-424-9300
For Product Use Information phone - AMVAC [®] :	1-888-462-6822
NOTE TO PHYSICIAN	
<small>Probable mucosal damage may contraindicate the use of gastric lavage. May pose an aspiration pneumonia hazard. Contains petroleum distillate. If symptoms of cholinesterase inhibition are present, atropine by injection is antidotal.</small>	

EPA Reg. No. 5481-13

EPA Est. No. 47000-1A-1

NET CONTENTS: 17 oz.

AMVAC
4100 E. Washington Blvd.
Los Angeles, CA 90023 U.S.A.
1-888-462-6822





NUVAN[®] Directed Spray[™] Aerosol – Label Review

- KILLS INSECTS WITH VAPOR ACTION
 - **Effective against:** Ants, Bed Bugs, Bed Bug Eggs, Bees, Beetles, Carpet Beetles, Clothes Moth Larvae, Cockroaches, Crickets, Fleas, Flies, Flour Beetles, Gnats, Hornets, Millipedes, Mosquitoes, Moths, Silverfish, Sowbugs, Spiders, Ticks, Wasps, Waterbugs, and Weevils
- INTENDED FOR SALE TO, USE AND STORAGE BY LICENSED PEST CONTROL OPERATORS, OR PERSONS UNDER THEIR DIRECT SUPERVISION, ONLY





NUVAN[®] Directed Spray[™] Aerosol – Label Review

- PRECAUTIONARY STATEMENTS
 - Hazards to Humans and Domestic Animals
 - CAUTION: Harmful if swallowed. Causes moderate eye irritation. Avoid contact with eyes or clothing. Wear long sleeved shirt, long pants, shoes and socks. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum or using tobacco. Remove and wash contaminated clothing before reuse. KEEP OUT OF REACH OF CHILDREN. Do not apply to surfaces contacted frequently by children or allow them in areas where surfaces are not yet dry. Avoid contamination of food/feed and foodstuffs. Do not treat areas where food or food/feed crops are growing. Do not use on pets or animals. Do not smoke while using. Do not spray directly on the skin or on animals. Do not apply in patient rooms or rooms occupied by the elderly or infirm. Do not allow children or pets to contact treated surfaces until dry.





NUVAN[®] Directed Spray[™] Aerosol – Label Review

- PERSONAL PROTECTIVE EQUIPMENT (PPE)
 - Some materials that are chemical-resistant to this product are barrier laminates, butyl rubber, nitrile rubber, neoprene rubber, polyvinyl chloride or viton. If you want more options, follow the instructions for category C on An EPA chemical-resistance category selection chart.
 - Applicators and other handlers must wear:
 - Long-sleeved shirt
 - Long pants
 - Shoes and socks
 - Chemical-resistant gloves





NUVAN[®] Directed Spray[™] Aerosol – Label Review

- DIRECTIONS FOR USE
 - It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Use in residential sites as a crack and crevice or space spray is prohibited. Use on lawns, turf or ornamentals is prohibited. NUVAN Directed Spray Aerosol is intended for sale to and use by pest management professionals only. **This product is NOT intended for sale to or use by homeowners.**
- RESTRICTIONS
 - This product may be injurious to health; read entire label and use only as directed. Hold container upright to spray. Point valve opening away from face when spraying.
 - **Keep people and pets out of the area during applications. Only handlers wearing specified PPE may be in the area during application. Do not apply this product in a way that will contact any person or pet either directly or through drift. Do not allow people or pets to enter the treated area until sprays have dried. Do not reoccupy treated areas for at least two (2) hours.**





NUVAN[®] Directed Spray[™] Aerosol – Label Review

- RESTRICTIONS

- Do NOT use in hospitals or clinical rooms, such as patient rooms, wards, nurseries, operating or emergency areas.
- Do NOT use in any rooms where infants or the sick or aged occupy or will be present for any extended periods of confinement.
- Do NOT use to treat non-perishable packaged or bagged and/or bulk, stored raw or processed agricultural commodities.
- Do NOT use in food/feed areas of food/feed handling establishments, restaurants or other areas where food/feed is commercially prepared or processed, in serving areas while food/feed is exposed or facility is in operation.
- Do NOT use in federally inspected meat and poultry plants.
- FOR COMMERCIAL APPLICATIONS, DO NOT TREAT MORE FREQUENTLY THAN ONCE A MONTH



Read the entire label before using NUVAN[®] Directed Spray[™] Aerosol



NUVAN[®] Directed Spray[™] Aerosol – Label Review

- DIRECTIONS FOR USE (Continued)
 - In the home, cover all food contact surfaces during treatment and thoroughly clean before using for food preparation or service.
 - **Applicators:** Do NOT treat more than five (5) application sites per day and do NOT make DDVP applications more than once per week.
 - **Application Sites:** For localized surface application in homes, cabins, garages and basements. Also for use in and around apartments, commercial buildings, factories, hotels, motels, warehouses, and other commercial and industrial buildings.
 - **Application Rate:** Apply a 2 second application of product per 4-5 linear feet as a localized application with the spray being applied 12-15 inches from the surface being treated.
 - Follow instructions for specific pests as listed below, repeating treatments as necessary, but **not more frequently than once a month.**





NUVAN® Directed Spray™ Aerosol – Label Review

- BED BUGS & BED BUG EGGS
 - Nuvan Directed Spray Aerosol kills bed bugs at the time of application and controls bed bug eggs for up to 14 days by direct application and through vapor action. **For best results bed bug eggs must be directly contacted.** Thoroughly inspect and treat areas where bed bugs may hide, travel, harbor or lay eggs. Treat surfaces of baseboards, floors, molding, and other infested areas where bed bugs may hide, lay eggs or travel **not more than once a month.**
 - Remove furniture coverings including bed liners and blankets. Infested coverings, bedding and linens should be sealed in a plastic bag and then removed for laundering and run in a hot clothes dryer for a sufficient time and temperature to destroy all bed bugs that may be present. **To avoid staining or discoloration of furniture surfaces, make an application to a hidden area of items to be treated to test for potential staining or discoloration before making a complete application.**





NUVAN® Directed Spray™ Aerosol – Label Review

- BED BUGS & BED BUG EGGS (*continued*)
 - Inspect the mattress, box spring, bed frame and other furniture thoroughly for the presence of bed bugs and bed bug eggs. **Dismantle beds and other furniture as needed to inspect and treat mattress, box springs, bed frame, and headboard.**
 - **Inspect and treat furniture and other items where bed bugs and bed bug eggs may be present** such as night stands, chairs, couches, futons, tables, desks, artwork, wall hangings, luggage, books, shelving and other items where bed bugs may hide. Sensitive electronic items may be successfully treated using **NUVAN® Prostrips®** as needed, following directions on the product label.





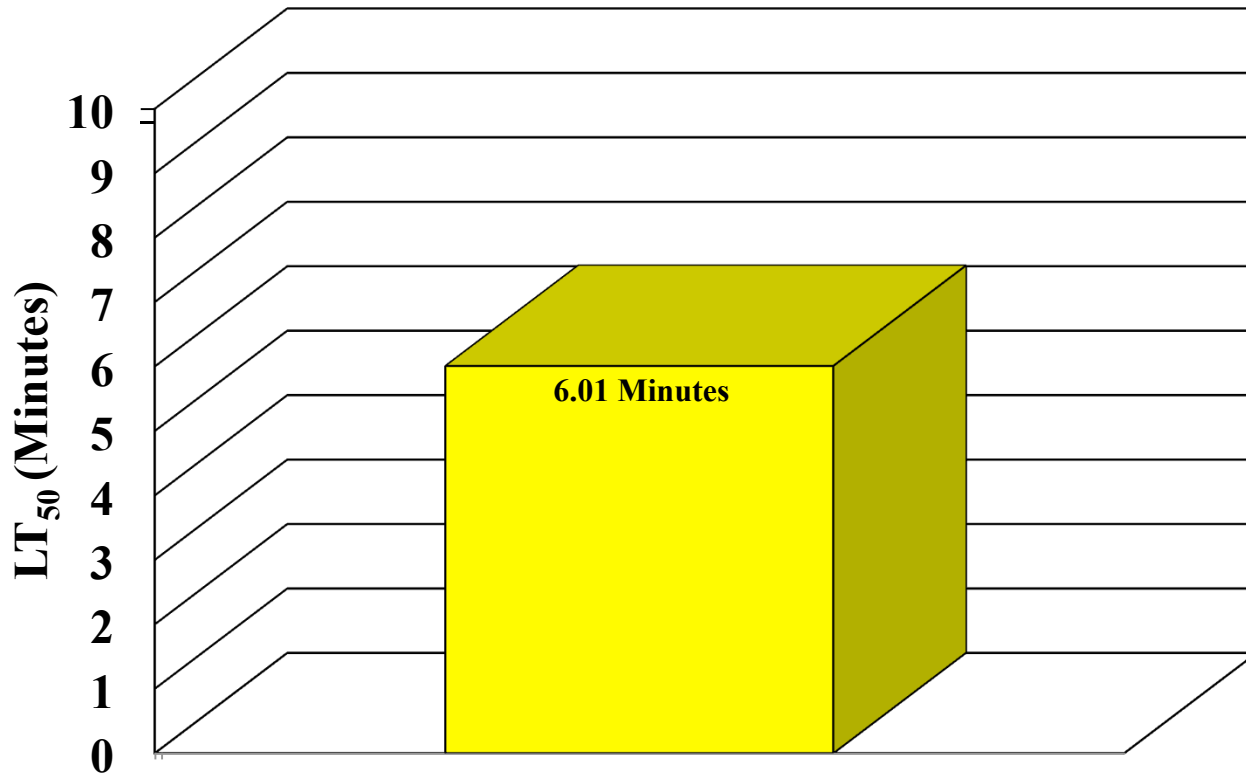
NUVAN® Directed Spray™ Aerosol Bed Bug Efficacy Data





NUVAN[®] Directed Spray[™] Aerosol Bed Bug Adults

■ Speed of Kill



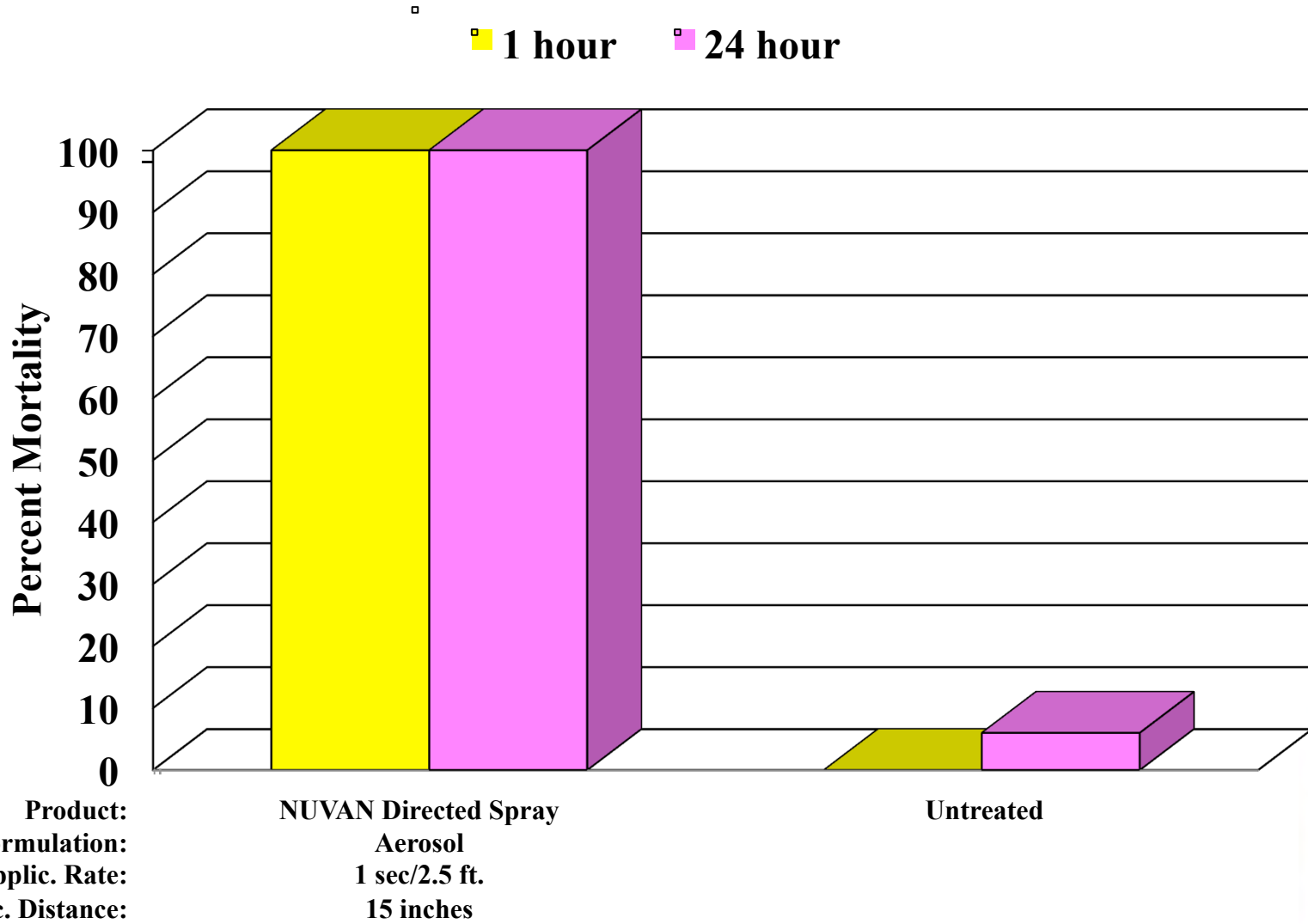
Product:
Formulation:
Applic. Rate:
Applic. Distance:

**NUVAN Directed Spray
Aerosol
1 sec/2.5 ft.
15 inches**



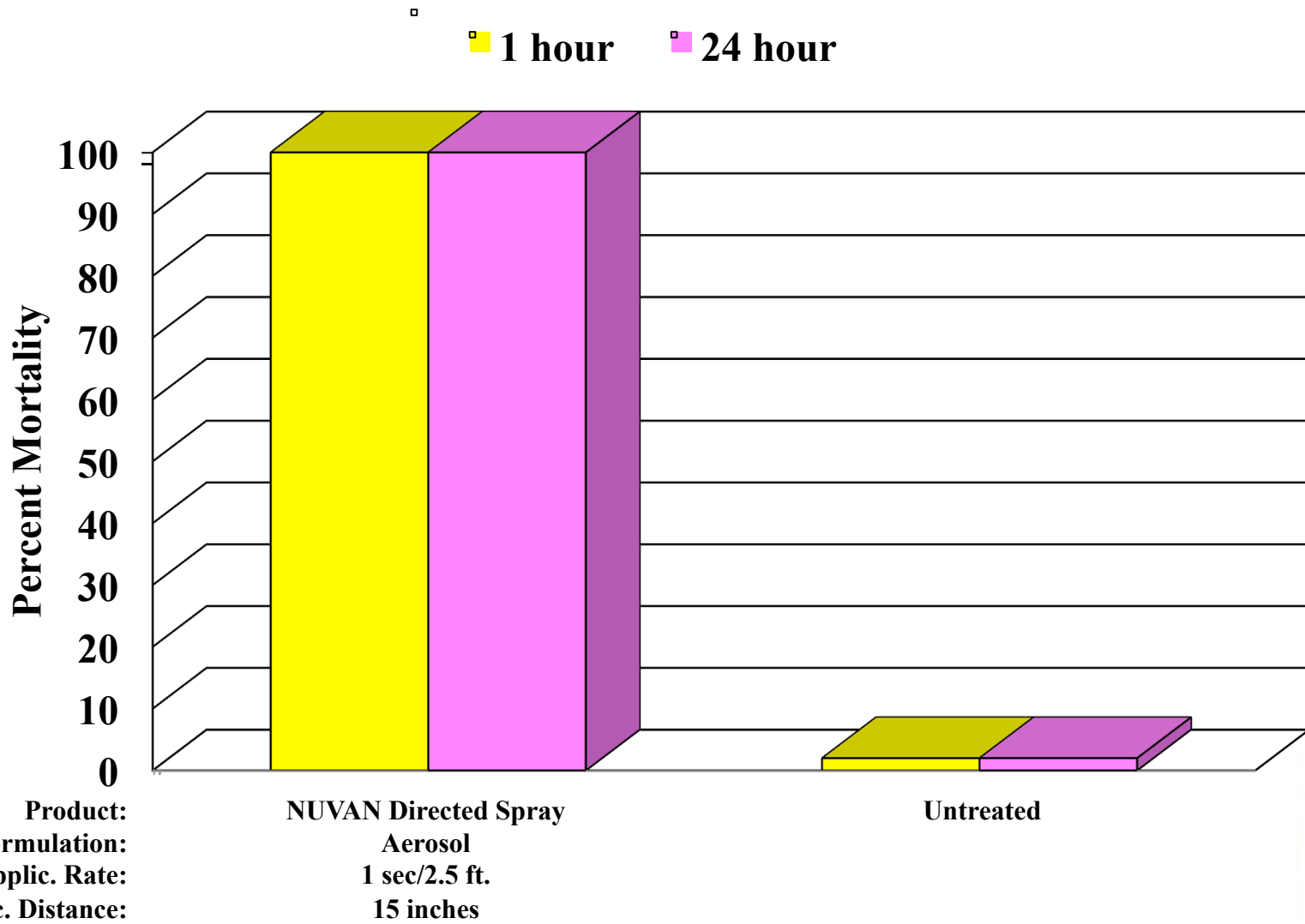


Nuvan[®] Directed Spray[™] Aerosol Bed Bug Adults (Harlan Strain)





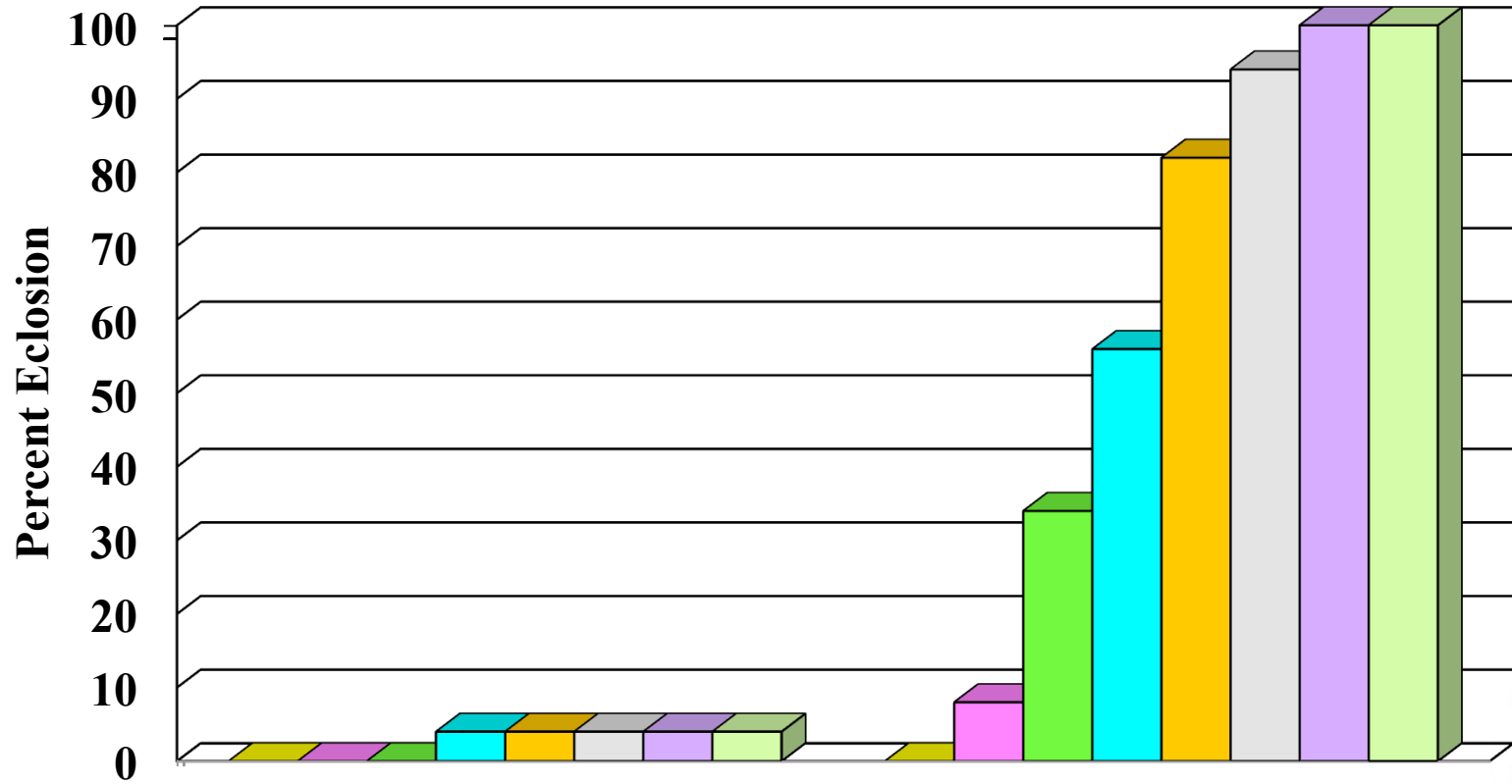
Nuvan[®] Directed Spray[™] Aerosol Bed Bug Adults (Cooper 2 Strain)





Nuvan[®] Directed Spray[™] Aerosol Bed Bug Eggs (Cooper 2 - 1 to 3 days old)

6 DAT 7 DAT 8 DAT 9 DAT 10 DAT 11 DAT 12 DAT 13 DAT

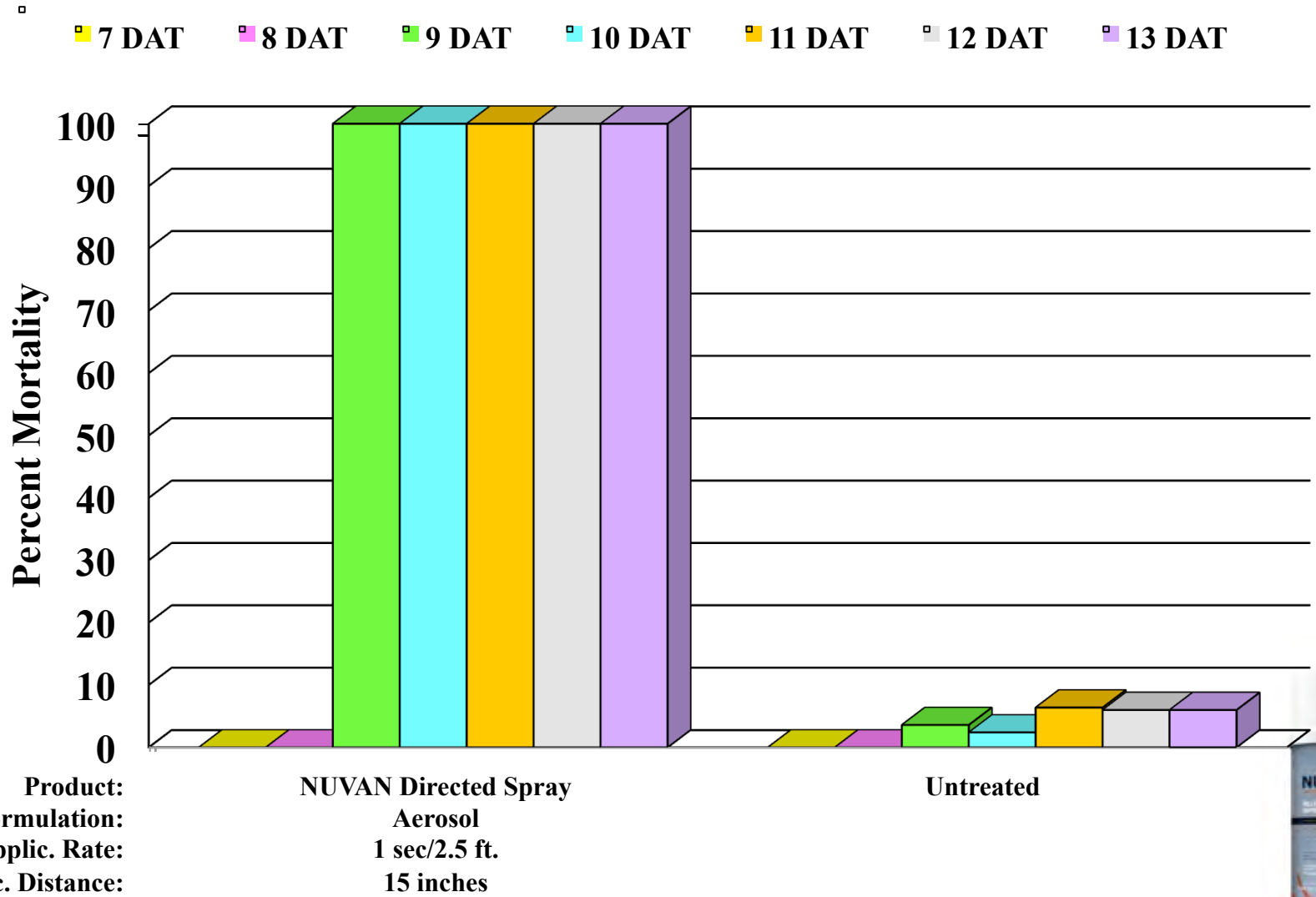


Product: NUVAN Directed Spray
Formulation: Aerosol
Applic. Rate: 1 sec/2.5 ft.
Applic. Distance: 15 inches





Nuvan[®] Directed Spray[™] Aerosol Bed Bug Eggs (Cooper 2 - 1 to 3 days old)





NUVAN® DIRECTED SPRAY™ AEROSOL IN ACTION





NUVAN[®] Directed Spray[™] Aerosol in Action

- In my view NUVAN[®] Directed Spray[™] Aerosol is like duct tape for bed bugs.
- This is so because it gives the applicator a broader window of opportunity for success than they had before due to the vapor action.





NUVAN[®] Directed Spray[™] Aerosol in Action

- Plus, if we're looking to take full advantage of the vapor action, we can eliminate bed bugs on a sofa, lounge chair, box spring or other furniture item more easily than before.





NUVAN[®] Directed Spray[™] Aerosol in Action

- As with any pesticide product, we want to use NUVAN[®] Directed Spray[™] Aerosol in it's "sweet spot".
- This is not a residual product so we shouldn't expect it to be. And, it's a good thing that it's not a residual.
- NUVAN[®] Directed Spray[™] Aerosol is able to kill bed bugs in areas that are tough to see due to the vapor action.
- I recommend that we use NUVAN[®] Directed Spray[™] Aerosol in combination with other methodologies.



Beyond Bed Bugs

- NUVAN[®] Directed Spray™ Aerosol is registered, and effective against more than 20 other pests including:





Jeff Alvis, AMVAC

WHAT'S NEW FOR NUVAN®





What's New

- Happy to announce the newest addition to the NUVAN[®] family of products
 - NUVAN[®] FOG5%[™]
 - Currently pending state registrations
 - Fogging product for use in commercial situations





What's New

- AMVAC is committed to continuing to bring new solutions to pest management professionals
 - Highest level of control and safety for applicators and customers





QUESTIONS?

