



US Environmental Protection Agency Office of Pesticide Programs

BIOPESTICIDES REGISTRATION ACTION DOCUMENT

(Z)-11-Hexadecenyl Acetate Technical Pheromone (PC Code 129071)

BIOPESTICIDE REGISTRATION ACTION DOCUMENT

**(Z)-11-Hexadecenyl Acetate Technical Pheromone
(PC Code 129071)**

**U.S. Environmental Protection Agency
Office of Pesticide Programs
Biopesticides and Pollution Prevention Division
(Z)-11-Hexadecenyl Acetate
(PC Code 129071)**

Table of Contents

I. Executive Summary

- A. IDENTITY
- B. USE/USAGE
- C. RISK ASSESSMENT
- D. DATA GAPS / LABELING RESTRICTIONS

II. Overview

- A. ACTIVE INGREDIENT OVERVIEW
- B. USE PROFILE
- C. ESTIMATED USAGE
- D. DATA REQUIREMENTS
- E. REGULATORY HISTORY
- F. CLASSIFICATION
- G. FOOD CLEARANCES/TOLERANCES

III. Science Assessment

A. PHYSICAL/CHEMICAL PROPERTIES ASSESSMENT

- 1. Product Identity and Mode of Action
- 2. Food Clearances/Tolerances
- 3. Physical and Chemical Properties Assessment

B. HUMAN HEALTH ASSESSMENT

- 1. Toxicology Assessment
- 2. Dose Response Assessment
- 3. Dietary Exposure and Risk Characterization
- 4. Occupational, Residential, School and Day Care Exposure and Risk Characterization
 - a. Occupational Exposure and Risk Characterization
 - b. Residential, School and Day Care Exposure and Risk Characterization
- 5. Drinking Water Exposure and Risk Characterization
- 6. Acute and Chronic Dietary Risks for Sensitive Subpopulations Particularly Infants and Children
- 7. Aggregate Exposure from Multiple Routes Including Dermal, Oral, and Inhalation

C. ENVIRONMENTAL ASSESSMENT

- 1. Ecological Effects Hazard Assessment
- 2. Environmental Fate and Ground Water Data
- 3. Ecological Exposure and Risk Characterization

D. EFFICACY DATA

IV. Risk Management Decision

A. DETERMINATION OF ELIGIBILITY FOR REGISTRATION

B. REGULATORY POSITION

1. Conditional/Unconditional Registration
2. Tolerance Reassessment
3. CODEX Harmonization
4. Nonfood Re/Registrations
5. Risk Mitigation
6. Endangered Species Statement

C. LABELING RATIONALE

1. Human Health Hazard
 - a. Worker Protection Standard
 - b. Non-Worker Protection Standard
 - c. Precautionary Labeling
 - d. Spray Drift Advisory
2. Environmental Hazards Labeling
End-Use Product Environmental Hazards Labeling
3. Application Rate

D. LABELING

V. Actions Required by Registrants

VI. Appendix A

I. EXECUTIVE SUMMARY

A. IDENTITY

The new active ingredient (Z)-11-hexadecenyl acetate is a technical grade synthetic pheromone, to be used in the manufacturing of end-use pheromone products. The Technical Grade Active Ingredient (TGAI) contains 95 % of Z-11-hexadecenyl acetate. The product chemistry data submitted by the registrant satisfies the requirement for product identity.

B. USE/USAGE

The TGAI will be used for incorporation into end-use products intended for agricultural application for the control of the Diamondback Moth and other insect pests.

C. RISK ASSESSMENT

Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone is a lepidopteran pheromone. Toxicology and environmental data requirements for this pheromone product were waived or deemed not necessary for registration per the Agency publication entitled “Generic Fact Sheet for Lepidopteran Pheromones (12/99).” This document reports that no risks to human health are expected from the use of lepidopteran pheromones based on the low toxicity in animal testing, and expected low exposure to humans. Further, adverse effects on nontarget organisms are not expected because these pheromones are released in very small quantities in the environment and act on a select group of insects. However, appropriate precautionary labeling of end use products will minimize exposure and mitigate risk to nontarget organisms.

Therefore, the Agency is making the risk management decision regarding the registration of the Z-11-Hexadecenyl Acetate Technical Pheromone product based on the following criteria: 1) known low toxicity of lepidopteran pheromones, 2) the low application rate for end-use products; and 3) precautionary labeling which minimizes exposure and mitigates risks and further concludes that Z-11-hexadecenyl acetate pheromone products can be used without causing unreasonable adverse effects to humans or the environment.

Based on the negligible risk concerns and a history of safe use of lepidopteran pheromones in general, (Z)-11-Hexadecenyl Acetate Technical Pheromone meet the criteria as specified in §3(c)(5) of FIFRA as amended, and are thus eligible for unconditional registration. No additional data are needed.

This document presents the Agency's decision regarding the registration of new active ingredient (Z)-11-hexadecenyl acetate.

D. DATA GAPS / LABELING RESTRICTIONS

There are no data gaps.

I. OVERVIEW

A. ACTIVE INGREDIENT OVERVIEW

Common Name:	Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone
Chemical Name:	(Z)-11-hexadecenyl acetate
Chemical Formula:	C ₁₈ H ₃₄ O ₂
Chemical Family:	Lepidopteran Pheromones
Trade and Other Names:	Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone
CAS Registry Number:	34010-21-4
OPP Chemical Code:	129071
Basic Manufacturer:	Bedoukian Research, Inc. 21 Finance Dr. Danbury, CT 06810

B. USE PROFILE

The following is information on the proposed uses with an overview of use sites and application methods.

Type of Pesticide: Lepidopteran Pheromone (insect attractant; mating disrupter)

Use Sites: Manufacturing use only. This product is for formulation into pheromone end-use products for use to control insects in/on agricultural commodities.

Target: Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone, in combination with other pheromones, will be used for the control of Diamondback Moth and other insects.

Formulation Types: Liquid.

Method and Rates of Application: Manufacturing use only. The TGAI will be used for incorporation into end-use products intended for agricultural application for the control of Diamondback Moth and other insect pests.

Use Practice Limitations: "For Manufacturing Use Only"
"For Use in Manufacturing or Formulating Registered Pesticide Products"

C. ESTIMATED USAGE

None used yet since this will be the first registered product.

D. DATA REQUIREMENTS

The Agency has supported the request for waivers from the requirements of studies/data for acute mammalian toxicity and nontarget organisms. These data were waived based on the following criteria from the Agency publication entitled “Generic Fact Sheet for Lepidopteran Pheromones (12/99)”: 1) low toxicity in animal testing, 2) expected low exposure to humans, 3) no risk to human health is expected; and 4) adverse effects to nontarget organisms are not expected because these pheromones are released in very small quantities in the environment and act on a select group of insects. Product analysis data requirements were adequately satisfied.

The data requirements for granting this registration under Section 3(c)(5) of FIFRA have been reviewed by the Biopesticides and Pollution Prevention Division (BPPD). Based on the submitted information, the Agency foresees no unreasonable adverse effects to human health and the environment from the use of this pheromone, and recommends an unconditional registration.

E. REGULATORY HISTORY

On June 20, 2000, the Agency received an application from Bedoukian Research, Inc. to register Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone, containing 95.0 % of (Z)-11-hexadecenyl acetate as a active ingredient. A notice of receipt of the application for registration of (Z)-11-hexadecenyl acetate as a new active ingredient was published in the Federal Register on December 13, 2000 (65 FR 77874) with a 30-day comment period. No comments were received as a result of this publication.

F. CLASSIFICATION

Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone is a synthetic compound that mimics naturally occurring substances of insect origin and functions by a non-toxic mode of action on its target pest, therefore, this compound is classified as a biochemical pesticide.

G. FOOD CLEARANCES/TOLERANCES

Lepidopteran pheromones are exempt from the requirement of a tolerance in or on raw agricultural commodities. This exemption pertains to only those situations when the pheromone is applied to

growing crops at a rate not to exceed 150 grams active ingredient per acre per year in accordance with good agricultural practices (40 CFR §180.1153).

II SCIENCE ASSESSMENT

A. PHYSICAL/CHEMICAL PROPERTIES ASSESSMENT

All product chemistry data requirements for Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone are satisfied.

1. Product Identity and Mode of Action

a. Product Identity:

The new active ingredient, (Z)-11-hexadecenyl acetate, is a technical grade synthetic pheromone. The TGAI is clear liquid with a mild fatty odor. The product chemistry data submitted by the registrant satisfies the requirement for product identity.

b. Mode of Action:

Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone, in combination with other pheromones, will be used for the control of Diamondback Moth and other insects.

Per the Generic Fact Sheet for Lepidopteran Pheromones (dated 12/99); “All of the lepidopteran pheromones that EPA has approved for pesticide use are chemicals produced by female moths to attract a mate. The pesticide products contain synthetic versions of these naturally occurring compounds. Sometimes the relative amounts of several pheromone chemicals in a pesticide product determine which specific pests are controlled.

When the pesticide product releases the pheromone into the air where males are looking for females, the males become confused and cannot easily locate the females. As a result, many of the females do not mate and lay eggs, and there are many fewer offspring than usual.”

2. Food Clearances/Tolerances

Currently, a tolerance exemption exists for lepidopteran pheromones such as Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone used at a rate not to exceed 150 grams active ingredient per acre per year in accordance with good agricultural practices (40 CFR 180.1153).

3. Physical And Chemical Properties Assessment

The physical and chemical characteristics of the TGAI were submitted to support the registration. These are summarized in Table 1.

Table 1. Product chemistry data requirements

GUIDELINE NO.	STUDY	RESULTS	MRID NO.
151-10 (OPPTS 880.110)	Product identity;	Submitted data satisfies the data requirements for product identity, manufacturing process, and discussion of formation of impurities	451518-01
151-11 (OPPTS 880.1200)	Manufacturing process;		453285-01
151-12 (OPPTS 880.1400)	Discussion of formulation of unintentional ingredients		
151-13 (OPPTS 880.1500)	Analysis of samples	Submitted data satisfy the data requirements for analysis of samples	451518-01
151-15 (OPPTS 880.1600)	Certification of limits	Limits listed in the CSF are adequate	451518-01 453285-01
151-16 (OPPTS 880.1700)	Analytical method	Acceptable	451518-01 453285-01
	PHYSICAL / CHEMICAL PROPERTIES FOR the MP		
63-2 (OPPTS 830.6302)	Color	Colorless to pale yellow	451518-01
63-3 (OPPTS 830.6302)	Physical State	Clear liquid	451518-01

GUIDELINE NO.	STUDY	RESULTS	MRID NO.
63-4 (OPPTS 830.6304)	Odor	Mild, fatty	451518-01
63-5 (OPPTS 830.7200)	Melting point	NA (product is a liquid)	
63-6 (OPPTS 830.7220)	Boiling point	Approx. 145°C at 0.2 mm Hg	451518-01
63-7 (OPPTS 830.7300)	Density/Specific gravity	Approx. 0.87 gm/mL	451518-01
63-8 (OPPTS 830.7840)	Solubility	2.2 x 10 ⁻⁸ mol/L (estimated) at 25°C in water	451518-01
63-9 (OPPTS 830.7950)	Vapor Pressure	3.85 x 10 ⁻⁵ mm Hg at 25°C	451518-01
63-12 (OPPTS 830.7000)	pH	NA	
63-13 (OPPTS 830.6313)	Stability	study has been submitted, awaiting MRID number	
63.15 (OPPTS 830.6315)	Flammability	Flash point >230°C	451518-01
63.17 (OPPTS 830.6317)	Storage stability	Expected to be stable under normal storage conditions for a minimum of 1 year	451518-01
63-18 (OPPTS 830.7100)	Viscosity	NA	

GUIDELINE NO.	STUDY	RESULTS	MRID NO.
Z-11-Hexadecenyl Acetate	Technical Pheromone	Biopesticide Registration Action Document	
63-19 (OPPTS 830.6319)	Miscibility	NA	
63-20 (OPPTS 830.6320)	Corrosion characteristics	Not Corrosive	451518-01
63-11 (OPPTS 830.7550)	Octanol/water partition coef.	$K_{ow} = 3.7 \times 10^{-5}$ (estimated)	451518-01

B. HUMAN HEALTH ASSESSMENT

1. Toxicology Assessment

The active ingredient, (Z)-11-hexadecenyl acetate, is a lepidopteran pheromone. The data available to the Agency (Federal Register Notice 1/26/94) on lepidopteran and other arthropod pheromones, including several aromatic pheromones, have indicated no acute mammalian toxicity at the limit dose levels for the following studies: acute oral toxicity ($LD_{50} > 5,000$ mg/kg - category IV, nontoxic); acute dermal toxicity ($LD_{50} > 2,000$ mg/kg - category III, nontoxic); acute inhalation toxicity (LD_{50} generally > 5 mg/L - category III-IV, practically nontoxic), no evidence of mutagenicity (Ames *Salmonella* assay), minimal eye and skin irritation (category IV), pheromones are also not likely to be dermal sensitizers (Beuhler hypersensitivity test). Since the lack of toxicity of lepidopteran pheromones is well established, the Agency has agreed to waive toxicity data requirements for (Z)-11-hexadecenyl acetate.

Mammalian toxicity data for (Z)-11-hexadecenyl acetate are summarized in Table 2.

Table 2. Mammalian toxicity data requirements

Guideline No.	STUDY	RESULTS	MRID NO.
81-1 (OPPTS 870.1100)	Acute oral toxicity	Waived*	NA
81-2 (OPPTS 870.1200)	Acute dermal toxicity	Waived*	NA

81-3 (OPPTS 870.1300)	Acute inhalation toxicity	Waived*	NA
81-4 (OPPTS 870.2400)	Primary eye irritation	Waived*	NA
81-5 (OPPTS 870.2500)	Primary dermal irritation	Waived*	NA
81-6 (OPPTS 870.2600)	Dermal sensitization	Waived*	NA
152-16 (no OPPTS guideline number)	Hypersensitivity incidents		Incident data must be reported

*per Agency rationale on Lepidopteran pheromones, see Lepidopteran Pheromone Fact Sheet

The Agency has supported the request for waivers from the requirements of studies/data for acute mammalian toxicity and nontarget organisms. These data were waived based on the following criteria from the Agency publication entitled “Generic Fact Sheet for Lepidopteran Pheromones (12/99).”: 1) low toxicity in animal testing, 2) expected low exposure to humans, 3) no risk to human health is expected; and 4) adverse effects to nontarget organisms are not expected because these pheromones are released in very small quantities in the environment and act on a select group of insects. Product analysis data requirements were adequately satisfied.

2. Dose Response Assessment

Based on available information and data from the open scientific literature and the Agency FR Notice (1/26/94) regarding experimental use permits, no toxicity endpoints were identified.

3. Dietary Exposure and Risk Characterization

Data waivers were requested by the registrant for toxicology and environmental data requirements for this active ingredient. These data waivers were granted per the Agency publication entitled “Generic Fact Sheet for Lepidopteran Pheromones (12/99).” This document reports that no risks to human health are expected from the use of lepidopteran pheromones based on the low toxicity in animal testing and expected low exposure to humans. Further, adverse effects on nontarget organisms are not expected because these pheromones are released in very small quantities in the environment and act on a select group of insects. Additionally, the “Generic Fact Sheet for Lepidopteran Pheromones (12/99)” states

that; “the safety record for lepidopteran pheromones has allowed the Agency to conclude that consumption of food containing residues of the pheromones present no risk.”

4. Occupational and Residential Exposure

a. Occupational Exposure and Risk Characterization

The end-use product will be applied via microencapsulated beads or dispensers, therefore, the potential for dermal, eye, and inhalation exposures to the pesticide exists for both the pesticide handler and applicator. The Agency will require appropriate signal word and precautionary statements to mitigate any risk from exposure via dermal, eye, or inhalation routes. However, due to the lack of mammalian toxicity, worker exposure data on (Z)-11-hexadecenyl acetate are not required. The Agency will require appropriate signal word and precautionary statements to mitigate any risk from exposure via these routes.

b. Residential, School and Daycare Exposure and Risk Characterization

No indoor residential, school or daycare uses currently appear on the label. Although accidental nondietary exposure to sites where children are present may occur, the health risk is expected to be minimal based on low mammalian toxicity, insignificant exposure due to high volatility of the compound, and a history of safe use.

5. Drinking Water Exposure and Risk Characterization

No significant exposure is expected from an accumulation of (Z)-11-hexadecenyl acetate in the aquatic environment when used according to the precautionary label language.

6. Acute and Dietary Risks for Sensitive Subpopulations, Particularly Infants and Children

The Agency has concluded that the potential for pheromone residues is not a dietary hazard to the general population, including infants and children. This decision was based on the following criteria: 1) low acute and subchronic mammalian toxicity, 2) the known metabolism; and 3) the history of safe use of similar lepidopteran pheromones. Also, for food uses of pheromones, the toxicity and residue data have allowed for the conclusion that an exemption from the requirement of a tolerance is appropriate and adequate to protect human health, including that of infants and children (40 CFR 181.1153).

7. Aggregate Exposure from Multiple Routes Including Dermal, Oral and Inhalation

(Z)-11-hexadecenyl acetate is a synthetic compound which mimics naturally occurring pheromones of insect origin with a non-toxic mode of action to target pests. Low oral, dermal, and inhalation toxicity has been demonstrated by the data summarized above. Based on this information, BPPD has concluded

that aggregate exposure to such lepidopteran pheromones over a lifetime will not pose appreciable risks to human health. Moreover, the toxicity and exposure data are sufficiently complete to adequately address the potential for additional sensitivity of infants and children to residues of (Z)-11-hexadecenyl acetate. The Agency concludes that there is reasonable certainty of no harm to infants and children from aggregate exposure to residues of (Z)-11-hexadecenyl acetate.

C. ENVIRONMENTAL ASSESSMENT

1. Ecological Effects Hazard Assessment

The Agency has reviewed and evaluated ecotoxicity data for a number of chemically similar lepidopteran pheromones, therefore no ecological data are required for (Z)-11-hexadecenyl acetate. The Agency published the following ecotoxicity findings for tests on pheromones in the Federal Register (59 FR 3681; January 26, 1994): high toxicity to aquatic invertebrates and moderate toxicity to fish, but practically no toxicity to birds tested. Data for one lepidopteran pheromone indicated low toxicity to bobwhite quail, with an acute oral LD₅₀ of >2,000 mg/kg of body weight and dietary LC₅₀ of >5,000 mg/kg. However, this pheromone showed high toxicity to a nontarget, freshwater aquatic invertebrate (*Daphnia magna*) with a LC₅₀ of between the solubility limit of 0.2 mg/l and a calculated LC₅₀ of 0.58 mg/l. Another lepidopteran pheromone was found to be moderately toxic to both *Daphnia magna* (LC₅₀ = 8.6 mg/l) and the freshwater rainbow trout (LC₅₀ = 5.9 mg/l). These results demonstrated the potential toxicity of lepidopteran pheromones to aquatic organisms.

The Biochemical Pesticides Branch supports the request for data waivers from the requirements of studies/data for nontarget organisms. These data were waived based on the following criteria from the Agency publication entitled “Generic Fact Sheet for Lepidopteran Pheromones (12/99).”: 1) low toxicity in animal testing, 2) expected low exposure to humans, 3) no risk to human health is expected; and 4) adverse effects to nontarget organisms are not expected because these pheromones are released in very small quantities in the environment and act on a select group of insects.

2. Environmental Fate and Ground Water Data

Exposure assessments on this type of product (biochemical pesticide) are not performed unless significant human health or ecological effects issues arise in the Tier I studies for either of these disciplines (40 CFR §158.690 (c) and (d)). Since Tier II studies were not triggered, there is no requirement for environmental fate data.

3. Ecological Exposure and Risk Characterization

The Biochemical Pesticides Branch supports the request for waivers from the requirements of studies/data for nontarget organisms. Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone is a lepidopteran pheromone. The rationale for supporting the waiver is found in Agency publication

entitled "Generic Fact Sheet for Lepidopteran Pheromones (12/99). This document indicates that adverse effects to nontarget organisms are not expected because these pheromones are released in very small quantities in the environment and act on a select group of insects. As a result, no toxicology or environmental fate and effects data were deemed necessary for registration.

Mitigating label language will further reduce the risk to aquatic organisms. The precautionary labeling of end-use products stipulates, "Keep out of lakes, ponds, and streams. Do not contaminate water by disposal of wastes", for the dispensers, and "Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of wastes" for the sprayable bead formulations.

Table 3. Non-Target Toxicity studies - Tier I Guideline Requirements for (Z)-11-hexadecenyl acetate

Guideline No.	Study	Result	MRID
71-1 (OPPTS 850.2100)	Avian acute oral	Waived*	NA
71-2 (OPPTS 850.2200)	Avian dietary	Waived*	NA
72-1 (OPPTS 850.1075)	Freshwater fish LC ₅₀	Waived*	NA
154-9 (OPPTS 880.4250)	Freshwater invertebrate LC ₅₀	Waived*	NA

*per Agency rationale on Lepidopteran pheromones, see Lepidopteran Pheromone Fact Sheet

D. EFFICACY DATA

No efficacy data were required to be submitted to the Agency, since no public health uses are involved.

IV. RISK MANAGEMENT DECISION

A. DETERMINATION OF ELIGIBILITY

Section 3(c)(5) of FIFRA provides for the registration of new active ingredients if it is determined that (A) its composition is such as to warrant the proposed claims for it; (B) its labeling and other materials required to be submitted comply with the requirements of FIFRA; (C) it will perform its intended function without unreasonable adverse effects on the environment; and (D) when used in accordance with widespread and commonly recognized practice, it will not generally cause unreasonable adverse effects on the environment.

To satisfy criteria “A” above, (Z)-11-hexadecenyl acetate is similar in composition to other registered lepidopteran pheromone products. Pheromones are suitable alternatives to other more toxic lepidopteran pest control products. Criteria “B” is satisfied by the current label and by the data presented in this document. It is believed that the (Z)-11-hexadecenyl acetate will not cause any unreasonable adverse effects, is an effective biochemical insecticide for lepidopterous pests, and does provide protection as claimed satisfying criteria “C”. Criteria “D” is satisfied in that the toxicological properties of this product are less toxic than any other product currently in use, and the products are similar to other presently registered lepidopterous pheromone products. Therefore, (Z)-11-hexadecenyl acetate technical pheromone is eligible for registration. The technical compound will be formulated into pheromone end-use products, for use to control pests in/on agricultural commodities.

B. REGULATORY POSITION

1. Conditional/Unconditional Registration

Based on the data submitted, BPPD recommends that (Z)-11-Hexadecenyl Acetate Technical Pheromone is eligible for registration under Section 3(c)(5) of FIFRA. BPPD foresees no adverse effects to human health or the environment from the use of the pheromone at rates not to exceed 150 grams a.i./acre/year.

2. Tolerance Reassessment

The existing tolerance exemption for lepidopteran pheromones (40 CFR 180.1153) is applicable to (Z)-11-Hexadecenyl Acetate Technical Pheromone.

3. Codex Harmonization

There are no Codex harmonization considerations since there is currently no Codex tolerance for (Z)-11-Hexadecenyl Acetate pheromone residues.

4. Nonfood Re/Registrations

There are no nonfood issues at this time.

5. Risk Mitigation

Since there are no risk issues, mitigation measures are not required at this time for dietary risk, occupational and residential risk, risks to nontarget organisms (plants and wildlife), or ground and surface water contamination for this a.i. Risk to aquatic organisms will be mitigated by appropriate label precautions.

6. Endangered Species Statement

The Agency recognizes that the use of Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone will cause no effect to endangered species because of (Z)-11-Hexadecenyl Acetate's low toxicity, expected low exposure scenario (manufacturing use only), and target species specificity.

C. LABELING RATIONALE

It is the Agency's position that the labeling for Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone containing 95% of (Z)-11-hexadecenyl acetate complies with the current pesticide labeling requirements.

1. Human Health Ha(Z)ard

a. Worker Protection Standard

This product does not come under the provisions of the Worker Protection Standards (WPS).

b. Non-Worker Protection Standard

There are no non-WPS human health hazard issues.

c. Precautionary Labeling

The Agency has examined the toxicological data base for (Z)-11-hexadecenyl acetate product and concluded that the proposed precautionary labeling (i.e. Signal Word, First Aid Statement and other label statements) adequately mitigates the risks associated with the proposed uses.

End-Use Product Precautionary Labeling: For Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone, "CAUTION". Harmful if swallowed, inhaled, or absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing vapor. Remove contaminated clothing and wash before reuse. Wash thoroughly with soap and water after handling.

d. Spray Drift Advisory

No spray drift advisory statement is necessary for this use

2. Environmental Hazards Labeling

End-Use Product Environmental Hazards Labeling: "Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance contact you State Water Board or Regional Office of the EPA.

3. Application Rate

Manufacturing use only. End-use pheromone products come in a variety of formulations ranging from controlled release plastics to automatic metered dispensers

D. LABELING

(1) Product name: **Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone**

Active Ingredient:

(Z)-11-Hexadecenyl Acetate.....95.0%

Other Ingredients5.0%

Total 100.00%

The product shall contain the following information:

- Product Name
- Ingredient Statement
- Registration Number
- "Keep Out of Reach of Children"
- Signal Word (CAUTION)

V. ACTIONS REQUIRED BY REGISTRANTS

Reports of incidences of adverse effects to humans or domestic animals under FIFRA, Section 6(a)2 and incidents of hypersensitivity under 40 CFR Part 158.690(c), guideline reference number 152-16. There are no data requirements, label changes and other responses necessary for the reregistration of the end-use product since the product is being registered after November 1984 and is, therefore, not subject to reregistration. There are also no existing stocks provisions at this time.

vi. Appendix A

Table 4 lists the use sites for the product. The label for the product is also attached.

Table 4. Manufacturing Use Only. Registration/Reregistration

<p>Bedoukian (Z)-11-Hexadecenyl Acetate Technical Pheromone</p> <p><u>Use Sites</u> Manufacturing use only. The TGAI will be used for incorporation into end-use products intended for agricultural application for the control of the insect pest Diamondback moth.</p>	<p>Official date registered:</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------