



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

November 25, 2015

Maria Pilar Herrero
Regulatory Manager
Valent BioSciences Corporation
870 Technology Way
Libertyville, IL 60048

Subject: Labeling Notification per Pesticide Registration Notice (PRN) 98-10 – Adding a pest to current label
Product Name: DiPel ES Biological Insecticide Emulsifiable Suspension
EPA Registration Number: 73049-17
Application Date: 11 September 2015
OPP Decision Number: 510971

Dear Ms. Herrero:

The U.S. Environmental Protection Agency (EPA) is in receipt of your application for notification under Pesticide Registration Notice (PRN) 98-10 for the above referenced product. The Biopesticides and Pollution Prevention Division (BPPD) has conducted a review of this request for its applicability under PRN 98-10 and finds that the action requested falls within the scope of PRN 98-10.

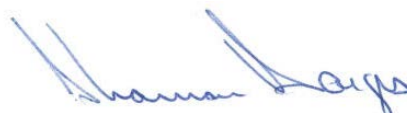
The labeling submitted with this application has been stamped “Notification” and will be placed in our records. You must submit one (1) copy of the final printed labeling with the modifications.

Should you wish to add/retain a reference to your company’s website on your label, then please be aware that the website becomes labeling under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and is subject to review by the EPA. If the website is false or misleading, the product will be considered to be misbranded and sale or distribution of the product is unlawful under FIFRA section 12(a)(1)(E). 40 CFR § 156.10(a)(5) lists examples of statements the EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product’s label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the EPA find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA-approved registration, the website will be referred to the EPA’s Office of Enforcement and Compliance Assurance.

Page 2 of 2
EPA Reg. No. 73049-17
OPP Decision No. 510971

If you have any questions, please contact Nicola Steinmetz of my team by phone at (703) 347-8567 or via email at steinmetz.nicola@epa.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Shannon Borges".

Shannon Borges, Team Leader
Microbial Pesticides Branch
Biopesticides and Pollution
Prevention Division (7511P)
Office of Pesticide Programs

Enclosure

NOTIFICATION

73049-17

The applicant has certified that no changes, other than those reported to the Agency have been made to the labeling. The Agency acknowledges this notification by letter dated:

11/25/2015

**DIPEL ES
BIOLOGICAL INSECTICIDE
EMULSIFIABLE SUSPENSION**

Active Ingredient:

<i>Bacillus thuringiensis</i> , subsp. <i>kurstaki</i> , strain ABTS-351, fermentation solids, spores, and insecticidal toxins.....	23.7%
Other Ingredients.....	76.3%
Total.....	100.0%

Potency: 17,600 Cabbage Looper Units per mg of product or 64 billion Cabbage Looper Units per gallon of product.

The percent active ingredient does not indicate product performance and the potency measurements are not Federally standardized.

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

Valent BioSciences Corporation
870 Technology Way, Suite 100
Libertyville, IL 60048

List No.

Lot No.

EPA Reg. No. 73049-17

EPA Est. No. 33762-IA-1

NET CONTENTS: GALLONS

FIRST AID	
If on skin or clothing	<ul style="list-style-type: none"> • Take off contaminate clothing. • Rinse skin immediately with plenty of water for 15 - 20 minutes. • Call a <u>poison control center</u> or doctor for treatment advice
If in eyes	<ul style="list-style-type: none"> • Hold eyes 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 <u>poison control center</u> or doctor for treatment advice.
HOTLINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-892-0099 (24 hours) for emergency medical treatment and/or transport emergency information. For all other information, call 1-800-6-Valent.	
NOTE TO PHYSICIAN	
Contains petroleum distillate - vomiting may cause aspiration pneumonia.	

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)
CAUTION**

Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling.

Personal Protective Equipment

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category E on an EPA chemical resistance category selection chart.

Applicators and other handlers must wear:

- w Long-sleeved shirt and long pants.
- w Chemical-resistant gloves, such as barrier laminate, or nitrile rubber, or neoprene rubber or viton.
- w Shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Mixers/loaders and applicators must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements in the Worker Protections Standard (WPS) for agricultural pesticides [40 CFR

170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco products or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

This product must not be applied aerially within ¼ mile of any habitats of endangered species or threatened lepidoptera. No manual application can be made within 300 feet of any threatened or endangered lepidoptera.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted entry intervals. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

- w Coveralls
- w Chemical resistant gloves, such as barrier laminate or nitrile rubber or neoprene rubber or viton
- w Shoes plus socks

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not enter treated areas without protective clothing until sprays have dried.

MODE OF ACTION

After eating a lethal dose of DiPel ES, larvae stop feeding within the hour, and will die within several days. Dying larvae move slowly, discolor, then shrivel, blacken and die.

DiPel ES may be used in either the field or greenhouse for the control of any labeled pest.

GENERAL INSTRUCTIONS

DiPel ES is a highly selective insecticide for use against listed caterpillars (larvae) of Lepidopterous insects. Close scouting and early attention to infestations is highly recommended. Larvae must eat deposits of DiPel ES to be affected. Always follow these directions:

- w Treat when larvae are young (early instars) and before economic thresholds of damage have been exceeded.
- w Larvae must be actively feeding on treated, exposed plant parts.
- w Thorough spray coverage is needed to provide a uniform deposit of DiPel ES at the site of larvae feeding. For some crops directed drop nozzles by ground machine are required.
- w Under heavy pest population pressure, use the higher label rates, shorten the spray interval, and/or increase spray volume to improve coverage.
- w Tank mixes with a contact insecticide may enhance control.
- w Repeat applications at an interval sufficient to maintain control, usually 3 to 14 days depending on plant growth rate, moth activity, rainfall after treating, and other factors. If attempting to control a pest with a single application, make the treatment when egg hatch is essentially complete, but before economic crop damage occurs.
- w A spreader-sticker or surfactant which has been approved for use on growing and harvested crops should be added for hard-to-wet crops. (Not recommended for chemigation)
- w DiPel ES is a non-restricted use pesticide and does not require a restricted use permit for purchase or use.

GROUND, AERIAL, AND CHEMIGATION APPLICATIONS

DiPel ES may be applied in ground, aerial equipment, or sprinkler irrigation (except in California) systems, with quantities of water sufficient to provide thorough coverage of infested plant parts. The amount of water needed per acre will depend on crop development, weather, application equipment, and local experience.

Do not spray when wind speed favors drift beyond the area intended for use.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all of these factors when making decisions.

Mixing Recommendations: Important - do not add DiPel ES to the mix tank before introducing the desired quantity of water. Start the mechanical or hydraulic agitation to provide moderate circulation before adding DiPel ES. Add the desired volume of DiPel ES to the mix tank and continue circulation. Include rinse water from the container. Maintain the suspension while loading and spraying. Do not mix more DiPel ES than can be used in a 2-day period. Rinse and

flush spray equipment thoroughly following each use. Selection of fluid to flush the application system will depend on what type of mixture was used during the application period. Use a strainer no finer than 50 mesh in conventional spray systems.

CAUTION:

DiPel ES should not be used in combination with Comite[®], Bravo[®], Captafol, Captan (except seed) or Dyrene[®].

Spray Volume Recommendations: For conventional aerial applications use at least 2 gallons of total volume per acre in water based sprays, except in the Western U.S. where 5 to 10 gallons is the usual minimum. For ground application, use at least 5 gallons of volume per acre. For Ultra Low Volume (ULV) aerial applications, mix DiPel ES with vegetable or cottonseed oil and apply in a total volume of 1.0 - 2.25 quarts per acre or apply undiluted.

Mixing Recommendations: DiPel ES may be injected in the undiluted product form (neat) or diluted with water. Follow general mixing recommendations and keep the ratio at 3 parts water to 1 part DiPel ES. Provide mild agitation of the diluted mixture throughout the chemigation cycle. **DO NOT AGITATE EXCESSIVELY.** For undiluted injection for chemigation make sure tank and injection system are free of all residual water. Flush and clean nurse tank, lines, screen canister, and pump with diesel fuel or a non-emulsifiable oil until they are water-free before and after application. Use a 20-mesh screen. Continue agitation during injection.

Chemigation Instructions (all states except California):

Apply this product only through sprinkler systems such as center pivot, lateral move, end tow, side (wheel) roll, traveler, solid set, or hand move. Do not apply this product through any other type of irrigation system. Use irrigation levels of 0.15 to 0.5 inches of water per acre. Up to 1 inch of irrigation water may be used, but efficacy may be reduced.

For all crops except cranberry, application of DiPel ES may be made continuously during irrigation. For cranberry, apply during the end of the irrigation period, after it is determined that the heads are operating properly for 8-20 minutes depending on the size of the system.

Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.

Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.

A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

The active ingredient in DiPel ES may settle in the tank and injection lines. Adequate agitation must be provided before and during the injection period. Use only in systems that apply product

uniformly and have appropriate check valves. Do not apply where wind speed favors drift beyond the area intended for treatment.

When application is complete, thoroughly flush the injection system and sprinkler lines.

The system must contain a functional check valve, vacuum relief valve, and low Systems must use a metering pump, such as a positive displacement injection pump (e.g. diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

A. Public Water Systems

Public water system means a system for the provision to the public of piped water for human consumption that has at least 15 service connections or regularly serves an average of at least 25 individuals daily for at least 60 days out of the year.

Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.

B. Sprinkler Chemigation

The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with a system interlock. Do not apply when wind speed favors drift beyond the area intended for treatment.

Use of DiPel ES on Field Corn, Seed Corn, Sweet Corn, Silage Corn or Popcorn

DiPel ES for Corn
(All States Except California)

Crop	Pest	Pints/Acre (Ground Equipment¹)	Pints/Acre (Chemigation)	Pints/Acre (Aerial Application)
Corn: Field Corn Seed Corn Sweet Corn Popcorn Silage Corn	European Corn Borer ² and Southwestern Corn Borer (First generation population)	1.5 - 2.5	1.5 - 2.5	-----
	European Corn Borer and Southwestern Corn Borer (Second generation population)	1.5 - 2.5	1.5 - 2.5	1.5 - 2.5
	Corn Earworm ⁴ Variegated Cutworm Webworms Armyworms ³ Western ³ Bean Cutworm	2.0 - 4.0 1.5 - 2.5 1.5 - 2.5 2.0 - 4.0 1.5 - 2.5	----	2.0 - 4.0 1.5 - 2.5 1.5 - 2.5 2.0 - 4.0 1.5 - 2.5

¹Apply in 6 to 8 inch band directly over whorls. Refer to table below for over the row rates.

FLUID OUNCES APPLIED PER 1000 ROW FEET

Row Width	Label rate/A	
	1.5 pts.	2.5 pts
30	1.4 oz/1000 ft	2.3 oz/1000 ft
32	1.5 oz/1000 ft	2.5 oz/1000 ft
36	1.7 oz/1000 ft	2.8 oz/1000 ft

Timing of Application:

A. ²Corn Borer

Application should be made when young larvae are present for first or second generation corn borers. One application against the first generation of larvae should provide economic control. Two or more application may be required against second generation borers if there is an extended period of egg deposition.

First Generation:

DiPel ES should be applied on seed corn when no more than 15% to 25% of the corn plants show "shot hole" feeding in the whorls.

With irrigated or sweet corn, apply DiPel ES when not more than 25% to 35% of the whorls show feeding signs.

With dryland corn, apply DiPel ES when not more than 35% to 40% of the leaves show "shot hole" feeding signs.

Second Generation:

Apply DiPel ES when the field count shows not more than 50 egg masses per 100 plants and the first hatch is taking place. If worm pressures are intense, a second application may be necessary.

Cool weather may cause corn borer larvae to seek protected areas of the corn plant and to reduce the amount of feeding normally done on exposed plant parts. This alteration in feeding behavior will hamper the effectiveness of DiPel ES.

Contact State and Local Extension Service for specific economic threshold and application recommendations.

B. ³Armyworm and Western Bean Cutworm

For control of armyworm, treat when plants first exhibit feeding signs in the whorl or leaves. Multiple applications at approximately 3-5 day intervals may be necessary when populations are heavy. High-spray gallonage (50 to 75 gallons per acre) will improve coverage and control. DiPel ES may be used to control small armyworms and the Western Bean Cutworm (1st and 2nd instar) when populations are light and full coverage sprays are applied. Repeat treatments as necessary. If mature worms or heavy populations are present a contact insecticide should be used to enhance control.

C. ⁴Corn Earworm

Treat every 1 to 3 days or at wider intervals depending on pest pressure, temperature and geographical location. Begin treatments when 5 percent of the upper ears show silk. When populations are heavy, treat when first silk is seen and every 1-3 days thereafter until harvest.

TANK MIX DIRECTIONS FOR CONTROL OF CORN PESTS

DiPel ES can be mixed with esfenvalerte (1.9EC), permethrin (25W, 3.2EC, 25WP), methomyl (90% water soluble powder, 24% liquid, 29% liquid) or methyl parathion (microencapsulated 2 lbs/gallon) for use on sweet corn against armyworms and corn earworm in accordance with the more restrictive label limitations and precautions. No label dosage rates should be exceeded.

Crop	Pest	Pints/Acre (Ground and Aerial Applications)
Sweet Corn and Field Corn	Corn Earworm Armyworms ³	0.75 ⁵ - 4.0 ⁵ 0.75 ⁵ - 4.0 ⁵

(⁵Tank Mix Only)

DIPEL ES FOR COTTON

EARLY SEASON PROGRAM

Pre-squaring stage:

DiPel ES may be used for early season management of *Helicoverpa spp.* and *Heliothis virescens* under conditions of continuous low egg deposition. Use DiPel ES alone at 0.5 pint/acre or in combination with a recommended ovicide, boll weevil sprays, or Pix applications. When egg pressure is moderate to high DiPel ES should be tank mixed with an ovicide. A spray interval of 5-7 days is recommended for a total of 3 applications, if necessary, especially if continued egg pressure occurs during this period.

Pre-bloom stage:

For control of light to moderate populations, use DiPel ES at 0.75 to 2.0 pints/acre in combination with an ovicide such as LARVIN (thiodicarb). Repeat treatments at 4 to 5 day intervals or as long as necessary to maintain control. Applications should be directed at brown eggs and newly hatched larvae. Larvae should not exceed 2,500 per acre (approximately 4 percent of plants infested) before treatments are initiated. Close scouting is essential for well timed applications.

MID SEASON PROGRAM

Pre-bloom to first mature boll stage:

Use DiPel ES at 0.75 to 4.0 pints/acre in combination with 1/2 to 2/3 rate of a recommended synthetic pyrethroid during midseason. Use the lower rates under moderate pressure and increase rates if necessary to maintain control.

LATE SEASON PROGRAM

Mature bloom boll stage:

Use DiPel ES at 0.75 to 6.0 pints/acre in combination with recommended carbamate or organophosphate insecticides. This product will aid in controlling worms escaping from organophosphate insecticides.

DiPel ES can be mixed with other insecticides in accordance with the more restrictive label limitations and precautions. This product cannot be mixed with any other product having a label which prohibits such mixing.

Spray Volumes:

For aerial applications, use a minimum of 2 gallons of total volume per acre in water based sprays except in the western U.S. where 5 to 10 gallons is the usual minimum. For ground applications, use at least 5 gallons of total volume per acre with 3 nozzles per row. For banded applications, use a minimum of 2 nozzles per row with ground sprayer or cultivator. Rates

should not be less than 0.5 pint/acre on a broadcast basis. For ULV applications, mix 1 to 2 pints DiPel ES with 1 to 2.5 pints vegetable or cottonseed oil and apply in a total volume of 1.0 - 2.25 quarts per acre. Adjust the spray system to deliver a fine droplet spectrum. Generally, rotary atomizers produce a finer droplet spectrum for ULV applications.

For all states except California (For use in California, see California Crops Section of this label)

Crop	Pest	Pints/Acre (Ground, Aerial, and Chemigation Applications)
Cotton	Tobacco Budworm ⁶	1.0 - 6.0
	Cotton Bollworm ⁶	1.0 - 6.0
	Armyworms ⁵	2.0 - 6.0
	Looper	1.0 - 6.0
	Saltmarsh Caterpillar	1.0 - 4.0

Timing of Applications:

A. Armyworm

⁵DiPel ES may be used to control small armyworms (1st and 2nd instar) when populations are light and full coverage sprays are applied. Repeat treatments as necessary. If mature worms or heavy populations are present a contact insecticide should be used to enhance control.

B. Tobacco Budworm

⁶Use DiPel ES to control light to moderate populations of newly hatched worms in pest management programs. Use under close scouting when beneficial insects are active or building. Repeat treatments at 4 to 5 day intervals or as long as necessary and results are acceptable. DiPel ES can be mixed with Larvin for use on cotton against tobacco budworm and cotton bollworm in accordance with the more restrictive of label limitations and precautions. No label dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing. DiPel ES may be used alone for *Helicoverpa spp.* and *Heliothis virescens* control only on preblossoming cotton where few or no eggs are present. If significant eggs are present, use only in combination with ovicidal rates of Larvin. Larvin is a registered trademark of Aventis Group.

DIPEL ES FOR PEANUTS

(All states except California)

Crop	Pest	Pints/Acre (Ground, Aerial and Chemigation Applications)
Peanut	Green Cloverworm	1.0 - 2.0
	Looper	1.0 - 2.0
	Podworm ⁷	1.0 - 4.0
	Armyworms ⁷	2.0 - 4.0
	Velvetbean Caterpillar	1.0 - 2.0

Timing of Application

⁷Podworm and Armyworm

This product may be used to control podworm and armyworms when populations are light to moderate and good spray coverage can be achieved. Use DiPel ES at 1.0 to 4.0 pints/acre (2 to 4 pints per acre for armyworm) when small larvae first appear. Applications should be made to coincide with egg lay and early instar larvae. Under conditions of higher pressure and rapid plant development, the addition of a contact insecticide in combination with DiPel ES is recommended. Treatments should be repeated as necessary to maintain acceptable control.

DIPEL ES FOR ALFALFA, HAY AND OTHER FORAGE CROPS

(For all states except California)

Crop	Pest	Pints/Acre (Ground, Aerial and Chemigation Applications)
Alfalfa (Hay and Seed)	Armyworms ⁹	2.0 - 4.0
	Looper	1.0 - 2.0
Hay and Other Forage Crops ⁸	Alfalfa Caterpillar	1.0 - 2.0
	European Skipper	1.0 - 2.0
	Webworm	1.0 - 2.0

⁸For Use in California - See the California Crops Section on this Label.

Application Timing:

Armyworm

⁹This product may be used to control small armyworms (1st and 2nd instar) when populations are light and full coverage sprays are applied. Repeat treatment as necessary. If mature worms or heavy populations are present a contact insecticide should be used to enhance control.

DIPEL ES FOR SUNFLOWERS

(All states except California)

Crop	Pest	Pints/Acre (Ground, Aerial and Chemigation Applications)
Sunflower:	Sunflower Moth ¹⁰	1.5 - 2.5
Oil Seed and Confectionery	Banded Sunflower Moth ¹⁰	1.5 - 2.5

Application Timing:

¹⁰For moderate pest pressure make a single application prior to 75% bloom. A second application, 5 days later, may be necessary to control severe infestations. Treat when larvae are exposed and small.

In Texas, begin treatment when early-instar larvae are present and no more than 20% of the heads are in bloom. Use a spray interval of 4-6 days for a total of 3 applications, if necessary, to reduce the worm population to an acceptable level, especially if continued egg deposition occurs during the period.

DIPEL ES FOR TREES AND SHRUBS

(All states except California)

Crop	Pest	Oz./100 Gal./A. ¹¹ (Ground Equipment)	Oz./Acre (Aerial ¹² Application)
Forest, Shade, Sugar Maple, Trees & Shrubs	Bagworm	8 to 32	8 to 32
	Blackheaded Budworm	16 to 32	16 to 32
	Browntail Moth	16 to 60	16 to 60
	Buck Moth	16 to 80	16 to 80
	California Oakworm	8 to 32	8 to 32
	Douglas Fir Tussock Moth	16 to 60	16 to 60
	Eastern Pine Looper	24 to 48	24 to 48
	Eastern Tent Caterpillar	8 to 32	8 to 32
	Elm Spanworm	8 to 32	8 to 32
	Fall Webworm	8 to 32	8 to 32
	Forest Tent Caterpillar	16 to 32	16 to 32
	Green Striped Maple Worm	16 to 32	16 to 32
	Gypsy Moth ¹³	16 to 80	16 to 80
	Hemlock Looper	24 to 48	24 to 48
	Jack Pine Budworm ¹³	16 to 32	16 to 32
	Leafrollers	16 to 32	16 to 32
	Mimosa Webworm	8 to 16	--
	Oak Leaf-tier	16 to 32	16 to 32
	Oak Skeletonizer	16 to 32	16 to 32
	Pine Butterfly	16 to 32	16 to 32
	Redhumped Caterpillar	8 to 32	8 to 32
	Saddleback Caterpillar	8 to 32	--
	Saddled Prominent Caterpillar	8 to 32	8 to 32
Spring & Fall Cankerworm	8 to 32	8 to 32	
Spruce Budworms ¹³	16 to 60	16 to 60	
Tortrix	16 to 32	16 to 32	
Western Tussock Moth	8 to 32	8 to 32	

¹¹ Water dilution rate for hydraulic sprayer may be varied depending on coverage. For mist blowers, mix the applicable amount (oz.) in up to 10 gallons of water.

¹² For aerial application, use in up to 10 gallons of water depending on type and density of trees. For best results spray systems which deliver droplet VMD (Volume Median Diameter) of 150 microns or less should be used. DiPel ES should always be mixed with at least an equal amount of water for diluted applications. Note: For Hemlock Looper and Eastern Pine Looper use 1-2 applications, undiluted, beginning at peak first instar. When applying two applications, apply each application at a recommended rate of 24 ounces/A. First application is applied at peak first instar and second application is at second instar. For the high rate, i.e. 48 ounces/A, apply single application only at peak first instar.

¹³ Use rates greater than 16 ounces in northern state for heavy populations. This product may be sprayed undiluted for the control of Spruce Budworm, Jack Pine Budworm and Gypsy Moth.

DIPEL ES FOR OTHER CROPS

(All states except California)

Crop	Pest	Pints/Acre (Ground and Aerial Applications)
Avocado	Amorbia Moth (Western Avocado Leafroller)	1.0 - 4.0 ¹⁴
	Omnivorous Leafroller	1.0 - 4.0
	Omnivorous Looper	1.0 - 4.0
	Orange Tortrix	1.0 - 4.0
Citrus ¹⁵	Citrus cutworm ¹⁶	1.0 - 4.0
	Fruittree leafroller	1.0 - 4.0
	Orangedog	0.5 - 2.0
Fruiting Vegetables such as Eggplant, Pepper, and Tomato	Loopers	1.0 - 2.0
	Tomato Fruitworm ²²	1.0 - 4.0
	Variegated Cutworm	1.0 - 2.0
	Saltmarsh Caterpillar	1.0 - 2.0
	Hornworm	1.0 - 2.0
	Armyworms ¹⁸	2.0 - 4.0
Hops	Armyworms ¹⁸	2.0 - 4.0
	Looper	1.0 - 2.0
Leafy and Cole Crops ¹⁹ such as Broccoli, Brussels Sprout, Cabbage, Cauliflower, Celery, Chinese Cabbage, Collard, Endive, Kale, Kohlrabi, Lettuce (Head and Leaf), Mustard Greens, Parsley, and Spinach	Looper	1.0 - 2.0
	Imported Cabbageworm	1.0 - 2.0
	Diamondback Moth	1.0 - 2.0
	Armyworms ¹⁸	2.0 - 4.0
Legume Vegetables such as Bean, Pea Lentil and Soybean	Looper	1.0 - 2.0
	Green Cloverworm	1.0 - 2.0
	Velvetbean Caterpillar	1.0 - 2.0
	Podworm ¹⁸	1.0 - 4.0
	Armyworms ¹⁸	2.0 - 4.0
	Soybean Looper	1.0 - 2.0
	Saltmarsh Caterpillar	1.0 - 2.0
Rangeland	Range Caterpillar ¹⁷	0.5 - 1.0
Root and Tuber ¹⁵ Crops such as Sugar Beet, Carrot and Potato	Armyworms ¹⁸	2.0 - 4.0
	Cutworm	1.0 - 2.0
	Diamondback Moth	1.0 - 2.0
	Hornworm	1.0 - 2.0
	Looper	1.0 - 2.0
	European Corn Borer	1.0 - 2.0
Small Grains such as Barley, Sorghum, Wheat or Oats	Armyworms ¹⁸	2.0 - 4.0
	Variegated Cutworm	1.0 - 2.0
	Looper	1.0 - 2.0
	Corn Earworm	1.0 - 4.0
	Webworm	1.0 - 2.0

Crop	Pest	Pints/Acre (Ground and Aerial Applications)
Small Fruits and Berries ²⁰ such as: Blueberry, Grape, Cranberry, and Strawberry	Spanworm	1.0 - 4.0
	Gypsy Moth	1.0 - 2.5
	Blossom Worm	1.0 - 4.0
	Sparganothis Fruitworm	1.0 - 4.0
	Fireworm	1.0 - 4.0
	Cranberry Fruitworm	1.0 - 4.0
	Armyworms	2.0 - 4.0
	Black Cutworm	1.0 - 2.5
	Looper	1.0 - 2.5
Tent Caterpillars	1.0 - 2.5	
Stone Fruit such as Cherry, Plum, Peach, Prune and Nectarine Pome Fruit such as Apple and Pear Tree Nuts such as Almond, Pecan, Walnut and Filbert Pomegranate	Leafrollers	1.0 - 4.0
	Fall Webworm	1.0 - 4.0
	Walnut Caterpillar	1.0 - 4.0
	Cankerworm	1.0 - 4.0
	Gypsy Moth	1.0 - 4.0
	Codling Moth	1.0 - 4.0
	Tent Caterpillar	1.0 - 4.0
	Redhumped Caterpillar	1.0 - 4.0
	Tufted Apple Budmoth	1.0 - 4.0
	Armyworms ¹⁸	2.0 - 4.0
	Oriental Fruit Moth	1.0 - 4.0
	Cutworm	1.0 - 4.0
	Peach Twig Borer ²¹	1.0 - 4.0
Pecan Nut Casebearer	1.0 - 4.0	
Navel Orangeworm ²¹	2.0 - 4.0	
Sugar cane	Grass Looper	1.0 - 4.0
	Fall armyworm ¹⁸	2.0 - 6.0
	Sugarcane Borer ¹⁸	2.0 - 6.0
Tobacco	Tobacco Budworm	1.0 - 2.0
	Hornworm	0.5 - 1.0
	Looper	1.0 - 2.0
Banana	Banana Skipper	1.0 - 4.0
	Owleye Moth	1.0 - 4.0
	Saddleback Caterpillar	1.0 - 4.0
	Hagmoth	1.0 - 4.0
	Hagworm	1.0 - 4.0
	Bagworm	1.0 - 4.0
	Vaquita – <i>Oisphanes</i> sp	1.0 - 4.0

¹⁴ Use a minimum of 200 gallons water per acre by ground rig or 10 gallons by aircraft.

¹⁵ For use in California - see the California crops section of this label.

¹⁶ Apply to light to moderate populations of newly-hatched citrus cutworm larvae.

¹⁷ Use in 1 to 2 qts. water per acre against 1st through 4th instar larvae.

¹⁸ DiPel ES may be used to control small armyworms, podworms and/or sugarcane borer (1st and 2nd instar) when populations are light and full coverage sprays are applied.

- Repeat treatment as necessary. If mature worms or heavy populations are present a contact insecticide should be used to enhance control.
- 19 Do not apply by air to plants after transplant or other stress before 6 weeks in the field. Use more than 25 gallons of water per acre by ground and 5 gallons of water per acre by air. Do not tank mix DiPel ES with Bravo, Captan or other fungicides that are not compatible with spray oils.
- 20 Treat when larvae are young and before economic thresholds of damage have been exceeded. If hatch occurs over an extended period of time, multiple application should be considered. Use higher rates when pest pressure is heavy and/or older larvae are present. Tank mixes of DiPel ES plus a low rate of a contact insecticide (such as phosmet) registered for use on small fruit and berries may enhance control of heavy populations and large larvae. The use of an approved spreader sticker is recommended.
- 21 See note under California Crops (Peach Twig Borer and Navel Orangeworm)
- 22 Apply weekly in a preventative program.

DIPEL ES FOR STORED AGRICULTURAL COMMODITIES

(All states except California)

Crop	Pest	Product Rate
Stored agricultural commodities - grains, soybeans, sunflower seed, crop seed, condimental seeds, spices, herbs, birdseed and popcorn.	Indian Meal Moth, (<i>Plodia interpunctella</i>) Almond Moth	¾ pts/100 bu undiluted or diluted

DiPel ES is compatible with common seed treatments including Captan, Methoxychlor, Carboxin (Vitavax) and Malathion. Fumigation has not been found to decrease the effectiveness of DiPel ES.

For the protection of bagged grain including birdseed, apply the dosage to the entire grain mass and **mix thoroughly** prior to bagging.

As a surface treatment, apply 15 fl oz of DiPel ES in 5-10 gallons of water per 500 sq. ft. of grain surface area and mix into the top 4 inches. For commodities coarser than shelled corn, increase depth of treatment according to habit of the pest.

To auger into the bin, apply the dosage into the grain stream as the last (top) four inch layer is augered into the bin. Mix 1.45 fl oz. DiPel ES per gallon of water. Apply 0.6 pint of this mixture per bushel.

This treatment controls the moth larvae. If an infestation is present when the grain is treated, moth emergence may continue for several days. If immediate control of severe infestations is desired, grain should be fumigated prior to application of this treatment. DiPel ES will not control weevils or other beetles. Treatments can be applied to stored grain at any time, but for best results, make application immediately after harvest before moth activity occurs. In areas where late fall harvested grain is not subject to infestation

because of low temperatures, application can be delayed until late winter or early spring before moth activity begins. Control for a full storage season should normally be expected, however repeat application if infestation recurs.

Grain treated with DiPel ES can be used at any time after treatment for any use.

CALIFORNIA CROPS

Crop	Pest	Pints/Acre (Ground and Aerial Applications)
Citrus	Citrus Cutworm ²²	1.0 - 4.0
	Fruitree Leafroller	1.0 - 4.0
	Orangedog	0.5 - 2.0

Crop	Pest	Pints/Acre (Ground and Aerial Applications)
Cotton ²³	Armyworms ²⁴	2.0 - 4.0
	Looper	1.0

Crop	Pest	Pints/Acre (Ground and Aerial Applications)
Alfalfa (Hay and Seed) Hay and Other Forage Crops	Armyworms ²⁴	2.0 - 4.0
	Alfalfa Caterpillar	1.0 - 2.0
Root and Tuber such as, Sugar Beet, Carrot, and Potato	Armyworms ²⁴	2.0 - 4.0

Crop	Pest	Pints/Acre (Ground and Aerial Applications)
Tree Nuts , such as Almond, Pecan , Walnut and Filbert	Peach Twig Borer ²⁵	2.0 - 4.0
	Navel Orangeworm ²⁶	2.0 - 4.0
Stone Fruit , such as Cherry, Plum Peach, Prune and Nectarine	Peach Twig Borer ²⁵	2.0 - 4.0

²² Apply to light to moderate populations of newly hatched larvae.

²³ See the Cotton Section of this Label for Further Use Directions

²⁴ This product may be used to control small armyworms (1st and 2nd instar) when populations are light and full coverage sprays are applied. Repeat treatment as necessary. If mature worms or heavy populations are present a contact insecticide should be used to enhance control.

Application Timing:

25 Make two applications during bloom for control of over wintering larvae; the first between popcorn and the beginning of bloom and the second seven to ten days later, but no later than petal fall. Spring sprays (the May spray) directed against first generation larvae should be determined by the use of pheromone traps and degree-day calculations.

Control of second generation larvae requires critical timing and should begin at 12% hull split in almonds and prior to fruit entry in other crops.

26 Applications may be directed against the spring-hatched larvae by timing based on monitoring of egg traps. Hull split sprays should include two applications: The first at the initiation of hull split or initiation of egg laying following hull split, and the second seven to ten days later.

For Small Spray Volumes:

If Rate Is: Use This Amount Per Gallon

1/2 pt./acre or 100 gals.	1/2 tsp.
1 pt./acre or 100 gals	1 tsp.
2 pts./acre or 100 gals.	2 tsps.
4 pts./acre or 100 gals.	4 tsps.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

Storage: Keep containers tightly closed when not in use. Do not store at temperatures greater than 100° F. Roll or shake the container before dispensing.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Do not contaminate water when disposing of equipment washwaters.

Container Disposal: Nonrefillable container. Do not reuse or refill this container.

Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Once cleaned, some agricultural plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or manufacturer, or contact Ag Container Recycling Council at 202-861-3144 or www.acrecycle.org . If recycling is not available puncture and dispose of the container in a sanitary landfill, or by other procedures approved by state and local authorities.

NOTICE TO USER

Seller makes no warranty, express or implied, of merchantability, fitness or otherwise concerning use of this product other than as indicated on the label. User assumes all risks of use, storage or handling not in strict accordance with accompanying directions.

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