

PM 18 275-65

File  
10/26

United States Environmental Protection Agency  
Washington, D.C. 20460

Office of  
Prevention, Pesticides and  
Toxic Substances

OCT 15 1993

Marvin H. Alphin  
ABBOTT LABORATORIES  
DR. JOSEPH C. WHITE DIRECTOR, REGULATORY  
14TH AND SHERIDAN RD.  
NORTH CHICAGO IL 60064

Subject: Label Amendment Submission of 06/09/93  
in Compliance with WPS Labeling Requirements  
EPA Reg No. 275-65  
DIPEL ES

Dear Registrant:

The labeling cited above and submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, is accepted subject to the comments listed below.

Based on your certification, the Agency has accepted only those changes to your labeling which are necessary to comply with PR Notices 93-7 and 93-11, which reflect the WPS labeling requirements of 40 CFR part 156, subpart K. Any other labeling changes submitted in connection with this amendment application and not directly related to compliance with PR Notice 93-7 or 93-11 have neither been reviewed nor accepted by the Agency. If you wish to make any such changes, you must submit a separate amendment application proposing them. If your product registration is currently suspended, acceptance of this labeling amendment does not affect the suspension in any way.

A copy of your proposed labeling stamped "Accepted with comments" is attached. Make any required changes described in the attached and send three copies of final labeling as soon as it is available to:

20/26

Document Processing Desk (FIN-LABEL)  
Office of Pesticide Programs (H-7504C)  
U.S. Environmental Protection Agency  
401 M Street SW  
Washington, DC 20460-3001

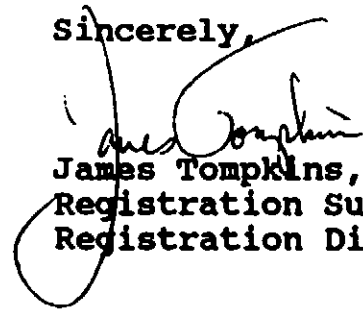
Hand or courier deliveries of final labels may be made to:

Document Processing Desk (FIN-LABEL)  
Room 266A Crystal Mall 2  
1921 Jefferson Davis Highway  
Arlington, VA 22202

Please correct the typographical errors circled on the draft before printing final labeling.

In your final labeling the "Agricultural Use Requirements" text" must be contained in a clearly separate box. This box may be set apart by a line, by another graphical device, by a different color background, or in any other way that clearly distinguishes it from surrounding text.

Sincerely,



James Tompkins, Deputy Chief  
Registration Support Branch  
Registration Division (H7505W)

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DIPEL ES

EMULSIFIABLE SUSPENSION  
BIOLOGICAL INSECTICIDE

Active Ingredient:

|                                                              |        |
|--------------------------------------------------------------|--------|
| <i>Bacillus thuringiensis</i> , subsp. <i>kurstaki</i> ..... | 3.5%   |
| Inert Ingredients.....                                       | 96.5%  |
| Total.....                                                   | 100.0% |

Potency: 17,600 International Units per mg of product or 74 billion International Units per gallon of product.

Potency units should not be used to adjust use rates beyond those specified in the Directions For Use section.

KEEP OUT OF REACH OF CHILDREN

CAUTION

ACCEPTED  
with COMMENTS  
In EPA Letter Dated

OCT 15 1993

Under the Federal Insecticide,  
Fungicide, and Rodenticide Act  
as amended, for the pesticide  
registered under EPA Reg. No.

275-65

List No.  
EPA Reg. No. 275-65  
EPA Est. No. 33762-IA-1

NET CONTENTS: GALLONS

**STATEMENT OF PRACTICAL TREATMENT**

In case of contact immediately flush eyes or skin with plenty of water. Get medical attention if irritation persists.

**HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)**

**Caution**

Avoid contact with skin, eyes or clothing.

**Personal Protective Equipment**

Some of the information on this label is required by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug, and Cosmetic Act (FFDCA). For more information on the requirements of these laws, contact the U.S. Environmental Protection Agency (EPA) at 1-800-455-7434.

**Application and Other Precautions**

- Long-sleeved shirt and long pants
- Chemical-resistant gloves (such as barrel laminate, or nitrile rubber, or neoprene rubber or viton)
- 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.

**User Safety Recommendations**

**Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

### DIRECTIONS FOR USE

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

[Redacted text]

#### AGRICULTURAL USE REQUIREMENTS

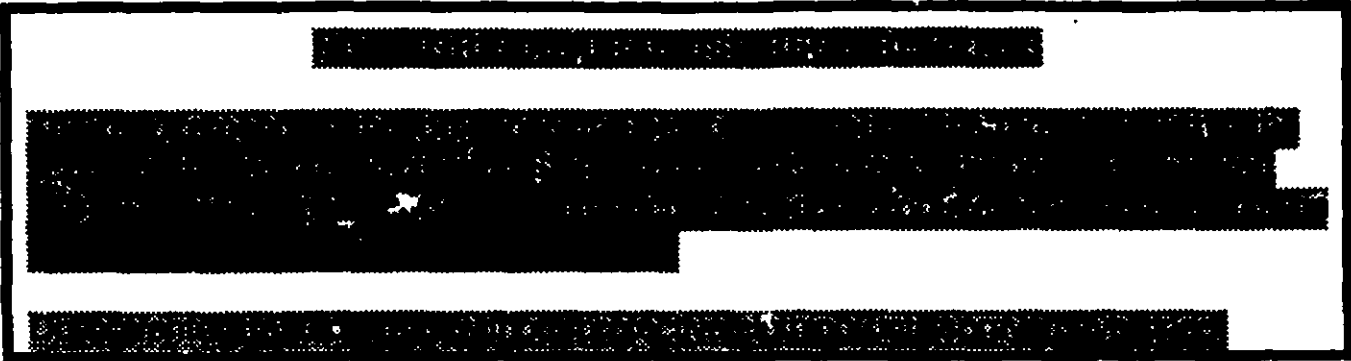
Use this product only in accordance with its label and the Worker Protection Standard, 40 CFR Part 170. This Standard covers the protection of agricultural workers on farms, forests, nurseries, greenhouses, and handlers of agricultural pesticides. It contains provisions for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on the 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 level (REI) of 12 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:

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



**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:** Triple rinse (or equivalent). Then puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**~~Re-Entry Statement~~**

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

~~Written or oral warnings must be given to workers who are expected to be in a treated area or in an area about to be treated with this product. Oral warnings must include the following information:~~

~~Inform workers of area of fields that must not be entered without appropriate protective clothing until sprays have dried. In case of accidental exposure, wash with plenty of water. If there is any irritation in eyes after washing, get medical attention.~~

~~When oral warnings are given, warnings shall be given in a language customarily understood by workers. Oral warnings must be given if there is reason to believe that written warnings cannot be understood by workers.~~

~~Written warnings must include the following information:~~

~~"Area treated with DiPel ES on (date of application). Do not enter without appropriate protective clothing until sprays have dried. In case of accidental exposure, wash with plenty of water. If there is any irritation in eyes after washing, get medical attention."~~

~~Do not apply this product in such a manner as to directly or through drift expose workers or other persons. The area being treated must be vacated by unprotected persons.~~

### **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.

### **APPLICATION 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:

- Treat when larvae are young (early instars) and before economic thresholds of damage have been exceeded.
- Larvae must be actively feeding on treated, exposed plant parts.
- 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.
- Under heavy pest population pressure, use the higher label rates, shorten the spray interval, and/or increase spray volume to improve coverage.
- Tank mixes with a contact insecticide may enhance control.
- 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.
- 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)

**APPLICATION INSTRUCTIONS (continued)**

- DiPel ES is a non-restricted use pesticide and does not require a restricted use permit for purchase or use.

**GROUND AND AERIAL APPLICATIONS**

DiPel ES may be applied in ground, aerial equipment, or sprinkler irrigation 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.

**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.

**Spray Volume Recommendations:** For conventional aerial applications use at least 3 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 8 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.

**CHEMIGATION (All states except California)**

**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.



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## **APPLICATION INSTRUCTIONS (continued)**

### **Application Instructions:**

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 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 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.

**APPLICATION INSTRUCTIONS (continued)**

**CHEMIGATION (continued)**

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.

Chemigation systems connected to public water systems<sup>1</sup> 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.

<sup>1</sup>A public water system is 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.

The pesticide injection pipeline must contain a functional, normally closed, solenoid-operated valve located on the intake to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

The systems must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.

**Control of European and Southwestern Corn Borers on Field Corn, Seed Corn, Sweet Corn, Silage Corn or Popcorn**

**DIPel ES for Corn  
(All States Except California)**

| Crop                                                                     | Pest                                                                                             | Pints/Acre<br>(Ground<br>Equipment*) | Pints/Acre<br>(Chemigation) | Pints/Acre<br>(Aerial<br>Application) |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------|---------------------------------------|
| Corn:<br>Field Corn<br>Seed Corn<br>Sweet Corn<br>Popcorn<br>Silage Corn | European Corn<br>Borer and<br>Southwestern<br>Corn Borer (First<br>generation<br>population)     | 1.5 - 2.5                            | 1.5 - 2.5                   | -----                                 |
|                                                                          | European Corn<br>Borer and<br>Southwestern<br>Corn Borer<br>(Second<br>generation<br>population) | 1.5 - 2.5                            | 1.5 - 2.5                   | 1.5 - 2.5                             |

\*Apply 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:**

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.

**APPLICATION INSTRUCTIONS (continued)****Timing of Application (continued)****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.

**CONTROL OF OTHER CORN PESTS**  
(All states except California)

| Crop                                                            | Pest                              | Pints/Acre<br>(Ground and Aerial<br>Applications) |
|-----------------------------------------------------------------|-----------------------------------|---------------------------------------------------|
| Field Corn, Sweet Corn<br>Seed Corn, Silage Corn and<br>Popcorn | Corn Earworm                      | 2.0 - 4.0                                         |
|                                                                 | Variegated Cutworm                | 1.5 - 2.5                                         |
|                                                                 | Webworms                          | 1.5 - 2.5                                         |
|                                                                 | Armyworms <sup>1</sup>            | 2.0 - 4.0                                         |
|                                                                 | Western <sup>1</sup> Bean Cutworm | 1.5 - 2.5                                         |

**TANK MIX DIRECTIONS FOR CONTROL OF OTHER CORN PESTS**

| Crop                      | Pest                   | Pints/Acre<br>(Ground and Aerial<br>Applications) |
|---------------------------|------------------------|---------------------------------------------------|
| Sweet Corn and Field Corn | Corn Earworm           | 0.75* - 4.0*                                      |
|                           | Armyworms <sup>1</sup> | 0.75* - 4.0*                                      |

**Directions for Use: (\*Tank Mix Only)**

DiPel ES can be mixed with esfenvalerine (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.

**Timing of Application:**

**Armyworms:** 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.

**Corn 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.

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.

**DIPEL ES FOR COTTON**

**EARLY SEASON PROGRAM**

**Pre-squaring stage:**

DiPel ES may be used for early season management of *Helicoverpa zea* 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 4.0 pints/acre in combination with recommended carbamate or organophosphate insecticides. This product will aid in controlling worms escaping from organophosphate insecticides.

**DIPEL ES FOR COTTON (continued)**

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 3 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 8 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)

| Crop    | Pest                         | Pints/Acre<br>(Ground, Aerial, and<br>Chemigation Applications) |
|---------|------------------------------|-----------------------------------------------------------------|
| Cotton* | Tobacco Budworm <sup>2</sup> | 1.0 - 4.0                                                       |
|         | Cotton Bollworm <sup>2</sup> | 1.0 - 4.0                                                       |
|         | Armyworms <sup>1</sup>       | 2.0 - 4.0                                                       |
|         | Looper                       | 1.0 - 2.0                                                       |
|         | Saltmarsh Caterpillar        | 1.0 - 2.0                                                       |

\*For Use in California - See the California Crops Section of this Label.

**Timing of Applications:**

<sup>1</sup>DiPel 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.

<sup>2</sup>Use 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

**DIPEL ES FOR COTTON (continued)**

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 zea* 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 Rhone-Poulenc Ag Company.

**DIPEL ES FOR PEANUTS**

(All states except California)

| Crop   | Pest                                                                                                   | Pints/Acre<br>(Ground, Aerial and<br>Chemigation Applications) |
|--------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Peanut | Green Cloverworm<br>Looper<br>Podworm <sup>1</sup><br>Armyworms <sup>1</sup><br>Velvetbean Caterpillar | 1.0 - 2.0<br>1.0 - 2.0<br>1.0 - 4.0<br>2.0 - 4.0<br>1.0 - 2.0  |

<sup>1</sup>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 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<br>(Ground, Aerial and<br>Chemigation Applications) |
|-----------------------------|------------------------|----------------------------------------------------------------|
| Alfalfa (Hay and Seed)      | Armyworms <sup>1</sup> | 2.0 - 4.0                                                      |
|                             | Looper                 | 1.0 - 2.0                                                      |
| Hay and Other Forage Crops* | Alfalfa Caterpillar    | 1.0 - 2.0                                                      |
|                             | European Skipper       | 1.0 - 2.0                                                      |
|                             | Webworm                | 1.0 - 2.0                                                      |

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

**Application Timing:**

<sup>1</sup>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.

**DIPEL ES FOR SUNFLOWERS**

(All states except California)

| Crop                                     | Pest                               | Pints/Acre<br>(Ground, Aerial and<br>Chemigation Applications) |
|------------------------------------------|------------------------------------|----------------------------------------------------------------|
| Sunflower:<br>Oil Seed and Confectionery | Sunflower Moth <sup>1</sup>        | 1.5 - 2.5                                                      |
|                                          | Banded Sunflower Moth <sup>1</sup> | 1.5 - 2.5                                                      |

**Application Timing:**

<sup>1</sup>For 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.*<br>(Ground Equipment) | Oz./Acre<br>(Aerial** Application) |
|--------------------------------------------------------|----------------------------------|----------------------------------------|------------------------------------|
| Forest,<br>Shade,<br>Sugar<br>Maple,<br>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<br>Moth      | 16 to 60                               | 16 to 60                           |
|                                                        | Eastern Pine Looper              | 24 to 48                               | 24 to 48                           |
|                                                        | Eastern Tent Caterpillar         | 3 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<br>Worm      | 16 to 32                               | 16 to 32                           |
|                                                        | Gypsy Moth <sup>1</sup>          | 16 to 80                               | 16 to 80                           |
|                                                        | Hemlock Looper                   | 24 to 48                               | 24 to 48                           |
|                                                        | Jack Pine Budworm <sup>1</sup>   | 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<br>Caterpillar | 8 to 32                                | 8 to 32                            |
| Spring & Fall<br>Cankerworm                            | 8 to 32                          | 8 to 32                                |                                    |
| Spruce Budworms <sup>1</sup>                           | 16 to 60                         | 16 to 60                               |                                    |
| Tortrix                                                | 16 to 32                         | 16 to 32                               |                                    |
| Western Tussock Moth                                   | 8 to 32                          | 8 to 32                                |                                    |

**DIPEL ES FOR TREES AND SHRUBS (continued)**

(All states except California)

\*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.

\*\* 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.

<sup>1</sup> 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)

**APPLICATION RATE**

| Crop                                                                                                                                                                                                                  | Pest                                                                         | Pints/Acre<br>(Ground and Aerial Applications)   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------|
| <b>Leafy and Cole Crops (***)</b><br>such as Broccoli, Brussels Sprout, Cabbage, Cauliflower, Celery, Chinese Cabbage, Collard, Endive, Kale, Kohlrabi, Lettuce (Head and Leaf), Mustard Greens, Parsley, and Spinach | Looper<br>Imported Cabbageworm<br>Diamondback Moth<br>Armyworms <sup>1</sup> | 1.0 - 2.0<br>1.0 - 2.0<br>1.0 - 2.0<br>2.0 - 4.0 |

\*\*\* 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

**DIPEL ES FOR OTHER CROPS (continued)**

(All states except California)

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.

| Crop                                                         | Pest                   | Pints/Acre<br>(Ground and Aerial Applications) |
|--------------------------------------------------------------|------------------------|------------------------------------------------|
| Legume Vegetables<br>such as Bean, Pea<br>Lentil and Soybean | Looper                 | 1.0 - 2.0                                      |
|                                                              | Green Cloverworm       | 1.0 - 2.0                                      |
|                                                              | Velvetbean Caterpillar | 1.0 - 2.0                                      |
|                                                              | Podworm <sup>1</sup>   | 1.0 - 4.0                                      |
|                                                              | Armyworms <sup>1</sup> | 2.0 - 4.0                                      |
|                                                              | Soybean Looper         | 1.0 - 2.0                                      |
|                                                              | Saltmarsh Caterpillar  | 1.0 - 2.0                                      |

<sup>1</sup> DiPel ES may be used to control small armyworms and/or podworms (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 RATE**

| Crop                                                           | Pest                   | Pints/Acre<br>(Ground and Aerial Applications) |
|----------------------------------------------------------------|------------------------|------------------------------------------------|
| Tobacco                                                        | Tobacco Budworm        | 1.0 - 2.0                                      |
|                                                                | Hornworm               | 0.5 - 1.0                                      |
|                                                                | Looper                 | 1.0 - 2.0                                      |
| Fruiting Vegetables<br>such as Eggplant, Pepper, and<br>Tomato | Loopers                | 1.0 - 2.0                                      |
|                                                                | Tomato Fruitworm       | 1.0 - 4.0                                      |
|                                                                | Variegated Cutworm     | 1.0 - 2.0                                      |
|                                                                | Saltmarsh Caterpillar  | 1.0 - 2.0                                      |
|                                                                | Hornworm               | 1.0 - 2.0                                      |
|                                                                | Armyworms <sup>1</sup> | 2.0 - 4.0                                      |
| Rangeland                                                      | Range Caterpillar      | 0.5 - 1.0                                      |

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

**DIPEL ES FOR OTHER CROPS (continued)**

(All states except California)

| Crop    | Pest                                         | Pints/Acre<br>(Ground and Aerial<br>Applications) |
|---------|----------------------------------------------|---------------------------------------------------|
| Avocado | Amorbia Moth (Western<br>Avocado Leafroller) | 1.0 - 4.0                                         |
|         | Omnivorous Leafroller                        | 1.0 - 4.0                                         |
|         | Omnivorous Looper                            | 1.0 - 4.0                                         |
|         | Orange Tortrx                                | 1.0 - 4.0                                         |

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

| Crop                                                      | Pest                   | Pints/Acre<br>(Ground and Aerial<br>Applications) |
|-----------------------------------------------------------|------------------------|---------------------------------------------------|
| Small Grains<br>such as Barley, Sorghum,<br>Wheat or Oats | Armyworms <sup>1</sup> | 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                                         |

**Application Timing:**

<sup>1</sup> 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.

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**DIPEL ES FOR OTHER CROPS (continue)**

(All states except California)

**APPLICATION RATE**

| <b>Crop</b>                                                              | <b>Pest</b>            | <b>Pints/Acre<br/>(Ground and Aerial<br/>Applications)</b> |
|--------------------------------------------------------------------------|------------------------|------------------------------------------------------------|
| <b>Root and Tuber*</b><br>Crops such as Sugar Beet,<br>Carrot and Potato | Armyworms <sup>1</sup> | 2.0 - 4.0                                                  |
|                                                                          | Cutworm                | 1.0 - 2.0                                                  |
|                                                                          | Diamondback Moth       | 1.0 - 2.0                                                  |
|                                                                          | Horworm                | 1.0 - 2.0                                                  |
|                                                                          | Looper                 | 1.0 - 2.0                                                  |
|                                                                          | European Corn Borer    | 1.0 - 2.0                                                  |

\*For Use in California - See the California Crops Section of this Label.

| <b>Crop</b>                                                                                                                                                                                                             | <b>Pest</b>                   | <b>Pints/Acre<br/>(Ground and Aerial<br/>Applications)</b> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------------------------------|
| <b>Stone Fruit such as<br/>Cherry, Plum, Peach, Prune<br/>and Nectarine</b><br><b>Pome Fruit<br/>such as Apple and Pear</b><br><b>Tree Nuts such as<br/>Almond, Pecan, Walnut and<br/>Filbert</b><br><b>Pomegranate</b> | 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 <sup>1</sup>        | 2.0 - 4.0                                                  |
|                                                                                                                                                                                                                         | Oriental Fruit Moth           | 1.0 - 4.0                                                  |
|                                                                                                                                                                                                                         | Cutworm                       | 1.0 - 4.0                                                  |
|                                                                                                                                                                                                                         | Peach Twig Borer <sup>2</sup> | 1.0 - 4.0                                                  |
|                                                                                                                                                                                                                         | Pecan Nut Casebearer          | 1.0 - 4.0                                                  |
| Navel Orangeworm <sup>3</sup>                                                                                                                                                                                           | 2.0 - 4.0                     |                                                            |
| <b>Hops</b>                                                                                                                                                                                                             | Armyworms <sup>1</sup>        | 2.0 - 4.0                                                  |
|                                                                                                                                                                                                                         | Looper                        | 1.0 - 2.0                                                  |

**DIPEL ES FOR OTHER CROPS (continued)**

(All states except California)

**Application Timing:**

- <sup>1</sup> 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.
- <sup>2</sup> See note under California Crops (Peach Twig Borer)
- <sup>3</sup> See note under California Crops (Navel Orangeworm)

**APPLICATION RATE**

| Crop                                                                          | Pest <sup>1</sup>      | Pints/Acre<br>(Ground and Aerial Applications) |
|-------------------------------------------------------------------------------|------------------------|------------------------------------------------|
| Small Fruits and Berries such as: Blueberry, Grape, Cranberry, and Strawberry | Spanworm               | 1.0 - 2.5                                      |
|                                                                               | Gypsy Moth             | 1.0 - 2.5                                      |
|                                                                               | Blossom Worm           | 1.0 - 2.5                                      |
|                                                                               | Sparganothis Fruitworm | 1.0 - 2.5                                      |
|                                                                               | Fireworm               | 1.0 - 2.5                                      |
|                                                                               | Cranberry Fruitworm    | 1.0 - 2.5                                      |
|                                                                               | Armyworms              | 2.0 - 4.0                                      |
|                                                                               | Black Cutworm          | 1.0 - 2.5                                      |
|                                                                               | Looper                 | 1.0 - 2.5                                      |
|                                                                               | Tent Caterpillars      | 1.0 - 2.5                                      |

**Application Timing:**

- <sup>1</sup> 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.

**CALIFORNIA CROPS**

| <b>Crop</b>    | <b>Pest</b>                             | <b>Pints/Acre<br/>(Ground and Aerial<br/>Applications)</b> |
|----------------|-----------------------------------------|------------------------------------------------------------|
| <b>Cotton*</b> | <b>Armyworms<sup>1</sup><br/>Looper</b> | <b>2.0 - 4.0<br/>1.0</b>                                   |

\*See the Cotton Section of this Label for Further Use Directions

| <b>Crop</b>                                                           | <b>Pest</b>                                          | <b>Pints/Acre<br/>(Ground and Aerial<br/>Applications)</b> |
|-----------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------|
| <b>Alfalfa<br/>(Hay and Seed)<br/>Hay and Other Forge Crops</b>       | <b>Armyworms<sup>1</sup><br/>Alfalfa Caterpillar</b> | <b>2.0 - 4.0<br/>1.0 - 2.0</b>                             |
| <b>Root and Tuber<br/>such as, Sugar Beet, Carrot,<br/>and Potato</b> | <b>Armyworms<sup>1</sup></b>                         | <b>2.0 - 4.0</b>                                           |

**Application Timing:**

- <sup>1</sup> 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.

Add attached sections on fruit crops to California crops list.



**CALIFORNIA CROPS (continued)**

| Crop                                                               | Pest                                                           | Plnts/Acre<br>(Ground and Aerial<br>Applications) |
|--------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------|
| Tree Nuts, such as Almond,<br>Pecan, Walnut and Filbert            | Peach Twig Borer <sup>1</sup><br>Navel Orangeworm <sup>2</sup> | 2.0 - 4.0<br>2.0 - 4.0                            |
| Stone Fruit, such as Cherry,<br>Plum Peach, Prune and<br>Nectarine | Peach Twig Borer <sup>1</sup>                                  | 2.0 - 4.0                                         |

**Application Timing:**

- <sup>1</sup> Make two applications during bloom for control of overwintering 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.

- <sup>2</sup> 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.

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**For Small Spray Volumes:**

| <u>If Rate Is:</u>        | <u>Use This Amount Per Gallon</u> |
|---------------------------|-----------------------------------|
| 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.                           |

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**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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