



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

OFFICE OF CHEMICAL SAFETY  
AND POLLUTION PREVENTION

May 11, 2016

Jayne Walz  
Regulatory Affairs Manager  
Valent BioSciences Corporation  
870 Technology Way  
Libertyville, IL 60048

Subject: Labeling Notification per Pesticide Registration Notice (PRN) 98-10 – Addition of pest  
Product Name: DiPel DF Biological Insecticide Dry Flowable  
EPA Registration Number: 73049-39  
Application Date: 31 August 2015  
OPP Decision Number: 509013

Dear Ms. Walz:

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.

If you have any questions, please contact Jennifer Wingart by phone at (703) 347-0100 or via email at [wingart.jennifer@epa.gov](mailto:wingart.jennifer@epa.gov).

Page 2 of 2  
EPA Reg. No. 73049-39  
OPP Decision No. 509013

Sincerely,

A handwritten signature in black ink, appearing to read "SEIICHI MURASAKI". The signature is written in a cursive style with some capital letters.

Seiichi Murasaki  
Acting Product Manager 92  
Microbial Pesticides Branch  
Biopesticides and Pollution  
Prevention Division (7511P)  
Office of Pesticide Programs

Enclosure: Label stamped "Notification"

**MASTER LABEL**

**DIPEL® DF  
BIOLOGICAL INSECTICIDE  
DRY FLOWABLE**

**NOTIFICATION**

73049-39

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:

05/11/2016



**For Organic Production**

Active Ingredient:

<i>Bacillus thuringiensis</i> subsp. <i>kurstaki</i> strain ABTS-351 fermentation solids, spores, and insecticidal toxins*.....	54%
Other Ingredients.....	46%
Total.....	100%

\*Potency: 32,000 Cabbage Looper Units (CLU) per mg (14.5 billion CLU per pound)

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

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

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

EPA Registration No. 73049-39  
EPA Est. No. 33762-IA-1

Batch Code:\_\_\_\_\_

Net Content:\_\_\_\_\_

<b>FIRST AID</b>	
<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes</li> <li>• Call a poison control center or doctor for treatment advice</li> </ul>
<b>If inhaled</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for treatment advice</li> </ul>
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye</li> <li>• Call a poison control center or doctor for treatment advice</li> </ul>
<b>HOTLINE NUMBER</b>	
<p>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.</p>	

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

Harmful if inhaled or absorbed through the skin. Causes moderate eye irritation. Avoid breathing dust or spray mist. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove contaminated clothing and wash before reuse.

**Personal Protective Equipment (PPE):**

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves.
- Shoes plus socks.

Mixer/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.

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.

**Engineering Controls:**

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection 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.

IMPORTANT: When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down.

**User Safety Recommendations**

- Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- User should 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 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 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 interval. 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:

- Coveralls.
- Waterproof gloves.
- Shoes plus socks.

### **NON-AGRICULTURAL USE REQUIREMENTS**

The requirements in this box apply to uses 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.

Keep unprotected persons out of the treated areas until sprays have dried.

### STORAGE AND DISPOSAL

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

**Pesticide Storage:** Reclose containers of unused DiPel® DF. Store in a dry place inaccessible to children and out of sunlight.

**Pesticide Disposal:** Do not contaminate food or feed by disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

**Container Disposal:** Nonrefillable container. Do not reuse or refill this container. Completely empty bag into application equipment by shaking and tapping sides and bottom to loosen clinging particles. Offer for recycling, if available, or dispose of empty bag in a sanitary landfill or by incineration. Do not burn, unless allowed by State and local ordinances.

### DIRECTIONS FOR USE

See Chemigation section for chemigation use directions.

**Days to Harvest:** There are no restrictions on applying DiPel® DF up to the time of harvest. Individual state regulations may vary and should be consulted for allowable pre-harvest application intervals.

**Sites:** DiPel® DF may be used for any labeled pest in both field and greenhouse use as well as in self-contained, closed-system, ornamental ponds.

DiPel® DF is an 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® DF to be affected. Always follow these directions:

- Treat when larvae are young (early instars) before the crop is damaged.
- Larvae must be actively feeding on treated, exposed plant surfaces.
- Thorough spray coverage is needed to provide a uniform deposit of DiPel® DF at the site of larval feeding. Use overhead and drop nozzles to obtain good spray coverage on both sides of foliage. Use sufficient spray volume to insure uniform deposition on all plant surfaces.
- Under heavy pest population pressure, use the higher label rates, shorten the spray interval, and/or raise spray volume to improve spray coverage.
- 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 spray, make the treatment when egg hatch is essentially complete, but before crop damage occurs.

- A spreader-sticker which has been approved for use on growing and harvested crops should be added for hard-to-wet crops such as cabbage, or to improve weather-fastness of the spray deposits.
- DiPel® DF is a non-restricted use pesticide and does not require a restricted use permit for purchase and use.
- DiPel® DF may be tank mixed with other labeled insecticides to enhance control. Use of the resulting tank mix must be in accordance with the more restrictive label limitations and precautions. No dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing. Before tank mixing DiPel® DF with other labeled products, including spreader stickers, check for tank mix compatibility.

After ingesting a lethal dose of DiPel® DF, larvae stop feeding within the hour, and will die within several hours to 3 days. Mortality varies with larval size (instar), lepidopteran species, and dose consumed. Following ingestion, larvae become sluggish, discolor, then shrivel, blacken and die. Smaller larvae die more quickly.

DiPel® DF may be applied in conventional ground or aerial equipment with quantities of water sufficient to provide uniform coverage of infested plant parts. The volume of water needed per acre will depend on crop development, relative humidity, spray equipment, and local experience. Usually, selection of moderate to high spray volume will provide the best results in most equipment. For optimal results, use at least 20 gallons of water per acre for ground application. For aerial application use at least 3 gallons of water per acre; exception being arid areas, where 5 to 10 gallons are required. Add water to the mix tank and provide moderate agitation. While agitating, add the required amount of DiPel® DF. Continue agitation, and add other spray materials, if any. Add remaining water, if any, and agitate until fully mixed. Maintain the suspension with moderate agitation while loading and spraying. Do not mix more DiPel® DF than can be used in a 3 day period.

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

For Smaller Spray Volumes:

<b><u>If Rate is</u></b>	<b><u>Use This Amount</u></b>	
	<b><u>Per Gallon (wt)</u></b>	
1/4 lb./acre or 100 gals.	1/2 tsp.	(0.04 oz)
1/2 lb./acre or 100 gals.	1 tsp.	(0.08 oz)
1 lb./acre or 100 gals.	2 tsps.	(0.16 oz)
2 lb./acre or 100 gals.	4 tsps.	(0.32 oz)

## **CHEMIGATION USE DIRECTIONS**

Apply this product only through sprinkler including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move irrigation systems. Do not apply this product through any other type of irrigation system. Do not connect an irrigation system (including greenhouse systems) used for pesticide applications to a public water system.



Crop injury, lack of effectiveness, or illegal residues in the crop can result from non-uniform distribution of treated water. 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. Allow sufficient time for pesticide to be flushed through all lines and all nozzles before turning off irrigation water.

### **Spray Preparation**

First prepare a suspension of DiPel® DF in a mix tank. Fill tank with ½ to ¾ the desired amount of water. Start mechanical or hydraulic agitation. Add the required amount of DiPel® DF, and then the remaining volume of water. Then set the sprinkler to deliver a minimum of 0.1 to 0.3 inch of water per acre. Start sprinkler and uniformly inject the suspension of DiPel® DF into the irrigation water line so as to deliver the desired rate per acre. The suspension of DiPel® DF should be injected with a positive displacement pump into the main line ahead of a right angle turn to insure adequate mixing. Any questions on calibration should be directed to your State Extension Service Specialists, to equipment manufacturers or other experts.

NOTE: When treatment with DiPel® DF has been completed, further field irrigation over the treated area should be avoided for 24 to 48 hours to prevent washing the material off the crop.

### **GENERAL PRECAUTIONS FOR APPLICATIONS THROUGH SPRINKLER IRRIGATION SYSTEMS**

Maintain continuous agitation in the mix tank during mixing and application to insure a uniform suspension.

Greater accuracy in calibration and distribution will be achieved by injecting a larger volume for a more dilute solution per unit time.

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 pesticides and capable of being fitted with a system interlock. Do not apply when wind speed favors drift beyond the area intended for treatment, system connections or fittings leak, nozzles do not provide uniform distribution or lines containing the product must be dismantled and drained.

### Pests controlled by DiPel DF

Common name	Scientific name
Achema Sphinx Moth (Hornworm)	<i>Eumorpha achemon</i>
Alfalfa Caterpillar	<i>Colias eurytheme</i>
Almond Moth	<i>Caudra cautella</i>
Amorbia Moth	<i>Amorbia humerosana</i>
Armyworm	<i>Spodoptera spp., e.g. exigua, frugiperda, littoralis, Pseudaletia unipuncta</i>
Artichoke plume moth	<i>Platyptilia carduidactyla</i>
Azalea Caterpillar	<i>Datana major</i>
Bagworm	<i>Thyridopteryx ephemeraeformis</i>
Banana Moth	<i>Hypercompe scribonia</i>
Banana Skipper	<i>Erionota thrax</i>
Blackheaded Budworm	<i>Acleris gloverana</i>
California Oakworm	<i>Phryganidia californica</i>
Cankerworm	<i>Paleacrita merriccata</i>
Cherry Fruitworm	<i>Grapholita packardi</i>
China Mark Moth	<i>Nymphula stagnata</i>
Citrus Cutworm	<i>Xylomyges curialis</i>
Codling Moth	<i>Cydia pomonella</i>
Cotton Bollworm	<u><i>Helicoverpa spp., e.g. zea, amigera</i></u>
Cranberry Fruitworm	<i>Acrobasis vaccinii</i>
Cross-striped Cabbageworm	<i>Evergestis rimosalis</i>
Cutworm	<i>Various Noctuid species, e.g. Agrotis ipsilon</i>
Diamondback Moth	<i>Plutella xylostella</i>
Douglas Fir Tussock Moth	<i>Orgyia pseudotsugata</i>
Ello Moth (Hornworm)	<i>Erinnyis ello</i>
Elm Spanworm	<i>Ennomos subsignaria</i>
European Corn Borer	<i>Ostrinia nubilalis</i>
European Grapevine Moth	<i>Lobesia botrana</i>
European Skipper (Essex Skipper)	<i>Thymelicus lineola</i>
Fall Webworm	<i>Melissopus latiferreanus</i>
Filbert Leafroller	<i>Archips rosanus</i>
Fruittree Leafroller	<i>Archips argyrospilia</i>
Grape Berry Moth	<i>Paralobesia viteana</i>
Grape Leafroller	<i>Platynota stultana</i>
Grapeleaf Skeletonizer (ground only)	<i>Harrisina americana</i>
Green Cloverworm	<i>Plathypena scabra</i>
Greenstriped Mapleworm	<i>Dryocampa rubicunda</i>

Common name	Scientific name
Gummosos-Batrachedra Comosae (Hodges)	
Gypsy Moth	<i>Lymantria dispar</i>
Headworm	<i>Helicoverpa spp., e.g. zea, amigera</i>
Head Moth	
Hemlock Looper	<i>Lambdina fiscellaria</i>
Hornworm	<i>Manduca spp.</i>
Imported Cabbageworm	<i>Pieris rapae</i>
Indian Meal Moth	<i>Plodia interpunctella</i>
Io Moth	<i>Automeris io</i>
Jack Pine Budworm	<i>Choristoneura pinus</i>
Light brown apple moth	<i>Epiphyas postvittana</i>
Looper	<i>Various Noctuidae, e.g. Trichoplusia ni</i>
Melonworm	<i>Diaphania hyalinata</i>
Mimosa Webworm	<i>Homadaula anisocentra</i>
Obliquebanded Leafroller	<i>Choristoneura rosaceana</i>
Oleander Moth	<i>Syntomeida epilais</i>
Omnivorous Leafroller	<i>Playnota stultana</i>
Omnivorous Looper	<i>Sabulodes aegrotata</i>
Orangedog	<i>Papilio cressphontes</i>
Orange Tortrix	<i>Argyrotaenia citrana</i>
Oriental Fruit Moth	<i>Grapholita molesta</i>
Peach twig borer	<i>Anarsia lineatella</i>
Pine Butterfly	<i>Neophasia menapia</i>
Podworm	<i>Helicoverpa spp., e.g. zea, amigera</i>
Redbanded Leafroller	<i>Argyrotaenia velutinana</i>
Redhumped Caterpillar	<i>Schizura concinna</i>
Rindworm complex	<i>Various leps.</i>
Saddleback Caterpillar	<i>Sibine stimulea</i>
Saddle Prominent Caterpillar	<i>Heterocampa guttivitta</i>
Saltmarsh Caterpillar	<i>Estigmene acrea</i>
Sod Webworm	<i>Crambus spp.</i>
Soybean Looper	<i>Pseudoplusia includens</i>
Spanworm	<i>Ennomos subsignaria</i>
Spring and Fall Cankerworm	<i>Paleacrita vernata and Alsophila pometaria</i>
Spruce budworm	<i>Choristoneura fumiferana</i>
Tent Caterpillar	<i>Various Lasiocampidae</i>
Thecla-Thecla Basilides (Geyr)	<i>Thecla basilides</i>
Tobacco Budworm	<i>Heliothis virescens</i>
Tobacco Hornworm	<i>Manduca sexta</i>
Tobacco Moth	<i>Ephestia elutella</i>
Tomato Fruitworm	<i>Helicoverpa spp., e.g. zea, amigera</i>
Tufted Apple Budmoth	<i>Platynota idaeusalis</i>
Twig Borer	<i>Anarsia lineatella</i>
Variiegated Cutworm	<i>Peridroma saucia</i>
Variiegated Leafroller	<i>Platynota flavedana</i>
Velvetbean Caterpillar	<i>Anticarsia gemmatalis</i>

Common name	Scientific name
Walnut Caterpillar	<i>Datana integerrima</i>
Webworm	<i>Hyphantria cunea</i>
Western Tussock Moth	<i>Orgyia vetusta</i>
Southern cornstalk borer	<i>Diatraea crambidoides</i>
Sugarcane borer	<i>Diatraea saccharalis</i>
Corn earworm, cotton bollworm, tomato fruitworm	<i>Helicoverpa spp., e.g. zea, amigera</i>
Tobacco budworm	<i>Heliothis virescens</i>

### APPLICATION RATE

Field Crops	Application rate (pounds/acre)
<b>Vegetables, root and tuber (Crop Group 1)</b> Including: arracacha; arrowroot; artichoke, Chinese; artichoke, Jerusalem; beet, garden; beet, sugar; burdock, edible; canna, edible; carrot; cassava, bitter and sweet; celeriac; chayote (root); chervil, turnip-rooted; chicory; chufa; dasheen (taro); ginger; ginseng; horseradish; leren; parsley, turnip-rooted; parsnip; potato; radish; radish, oriental; rutabaga; salsify; salsify, black; salsify, Spanish; skirret; sweet potato; tanier; turmeric; turnip; yam bean; yam, true.	0.5-2
<b>Vegetable, bulb (Crop Group 3-07)</b> Including: Chive, fresh leaves; chive, Chinese, fresh leaves; daylily, bulb; elegans hosta; fritillaria, bulb; fritillaria, leaves; garlic, bulb; garlic, great-headed, bulb; garlic, serpent, bulb; kurrat; lady's leek; leek; leek, wild; lily, bulb; onion, Beltsville bunching; onion, bulb; onion, Chinese, bulb; onion, fresh; onion, green; onion, macrostem; onion, pearl; onion, potato, bulb; onion, tree, tops; onion, Welsh, tops; shallot, bulb; shallot, fresh leaves; cultivars, variety, and/or hybrids of these.	0.5-2.  Use 1-2 lb./Ac for control of <i>Helicoverpa spp.</i>

Field Crops	Application rate (pounds/acre)
<p><b>Vegetable, leafy, except brassica (Crop Group 4)</b> Including: Amaranth (Chinese spinach); arugula (roquette); cardoon; celery; celery, Chinese; celtuce; chervil; chrysanthemum, edible-leaved; chrysanthemum, garland; corn salad; cress,garden; cress, upland; dandelion; dock (sorrel); endive (escarole); fennel, Florence; lettuce, head and leaf; orach; parsley; purslane, garden; purslane, winter; radicchio (red chicory); rhubarb; spinach, New Zealand; spinach, vine; Swiss chard.</p>	<p>0.5-2.  Use higher rates for control of <i>Heliothis</i> spp.</p>
<p><b>Vegetable, brassica leafy (Crop Group 5)</b> Including: Broccoli; broccoli, Chinese (gai lon); broccoli raab (rapini); Brussels sprouts; cabbage; cabbage, Chinese (bok choy); cabbage, Chinese (napa); cabbage, Chinese mustard (gai choy); cauliflower; cavalo broccoli; collards; kale;kohlrabi; mizuna; mustard greens; mustard spinach; rape greens.</p>	<p>0.5-2.  Use 0.5 to 1.5 lb/Ac for looper control and 1-2 lb/Ac for <i>Heliothis</i> spp. control depending on larval stage and infestation levels. Use surfactants for hard to wet crops.</p>
<p><b>Vegetable, legume (succulent or dried) (Crop Group 6)</b> Including: Bean, (<i>Lupinus</i>) (includes grain lupin, sweet lupin, white lipin, and white sweet lupin); bean (<i>Phaseolus</i>) (includes field bean, kidney bean, lima bean, navy bean, pinto bean, runner bean, snap bean, tepary bean, wax bean); bean (<i>Vigna</i>) (includes adzuki bean, asparagus bean, blackeyed bean, catjang, Chinese longbean, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, yardlog bean); broad bean (fava); chickpea (garbanzo); guar; jackbean; lablab bean; lentil; pea (<i>Pisum</i>) includes dwarf pea, edible-podded pea, English pea, field pea, garden pea, green pea, snowpea, sugar snap pea); pigeon pea; soybean; soybean (immature seed); sword bean.</p>	<p>0.5-2.  Monitor insects and apply at more frequent intervals (3-5 days) for heavy populations to maintain control.</p>
<p><b>Vegetable, fruiting (Crop Group 8-10)</b> Including: African eggplant; bush tomato; bell pepper; cocona; currant tomato; eggplant; garden huckleberry; golj berry; groundcherry; martynia; naranjilla; okra; pea eggplant; pepino; nonbell pepper; roselle; scarlet eggplant; sunberry; tomatillo; tomato; tree tomato; cultivars, varieties, and/or hybrids of these.</p>	<p>0.5-2.  Use 1-2 lb/Ac for control of heavy populations or overlapping generations of <i>Spodoptera</i> spp. Scout tomato fields and apply when insects are hatching or are small.</p>

Field Crops	Application rate (pounds/acre)
<p><b>Vegetable, cucurbit (Crop Group 9)</b> Including: Chayote waxgourd (Chinese preserving melon); citron melon; cucumber; gherkin; gourd, edible (includes hyotan, cucuzza, hechima, Chinese okra); <i>Momordica</i> spp (includes balsam apple, balsam pear, bittermelon, Chinese cucumber); muskmelon (includes cantaloupe); pumpkin; squash, summer; squash, winter (includes butternutsquash, calabaza, hubbard squash, acorn squash, spaghetti squash); watermelon.</p>	<p>0.5-2.</p> <p>Use 1-2 lb/Ac for control of <i>Spodoptera</i> spp.</p>
<p><b>Fruit, citrus (Crop Group 10-10)</b> Including: Australian desert lime; Australian finger-lime; Australian round lime; Brown River finger lime; calamondin; citron; citrus hybrids; grapefruit; Japanese summer grapefruit; kumquat; lemon; lime; mediteranean mandarin; mount white lime; New Guines wild lime; orange, sour; orange, sweet; pummelo; Russell River lime; Satsuma mandarin; sweet lime; tachibana orange; Tahiti lime; tangelo; tangerine (mandarin); tangor; trifoliolate orange; uniq fruit; cultivars, varieties, and/or hybrid of these.</p>	<p>0.5-2.</p> <p>Use sufficient volume of water to ensure good canopy coverage and penetration.</p>
<p><b>Fruit, pome (Crop Group 11-10)</b> Including: Apple; azarole; crabapple; loquat; mayhaw; medlar; pear; pear, Asian; quince; quince, Chinese; quince, Japanese; tejocote; cultivars, varieties, and/or hybrid of these.</p>	<p>0.5-2.</p> <p>Scout orchards and apply when insects are hatching or small. For insect borers (e.g. codling moth) it is important to apply before the insect bores into the fruit. For leaf rollers, it is important to apply before leaves are rolled and insects are protected. DiPel DF can be used during bloom.</p>
<p><b>Fruit, stone (Crop Group 12)</b> Including: Apricot; cherry, sweet; cherry, tart; nectarine; peach; plum; plum, Chickasaw; plum, Damson; plum, Japanese; plumcot; prune (fresh).</p>	<p>0.5—2.</p> <p>Scout orchards and apply when insects are hatching or are small, are actively feeding on leaf surfaces, and before they enter fruit or roll leaves. DiPel DF can be used during bloom.</p>

Field Crops	Application rate (pounds/acre)
<p><b>Berry and small fruit group (Crop Group 13-07)</b> Including: Amur river grape; aronia berry; bayberry; bearberry; bilberry; blackberry (including Andean blackberry, arctic blackberry, bingleberry, black satin berry, boysenberry, brombeere, California blackberry, Chesterberry, Cherokee blackberry, Cheyenne blackberry, common blackberry, coryberry, darrowberry, dewberry, Dirksen thornless berry, evergreeb blackberry, Himalayaberry, hullberry, lavacabery, loganberry, lowberry, Lucretiaberry, mammoth blackberry, marionberry, mora, mures deronce, nectaberry, Northern dewberry, olallieberry, Oregon evergreen berry, phenomenalberry, rangeberry, ravenberry, rossberry, Shawnee blackberry, Southern dewberry, tayberry, youngberry, zarzamora, and cultivars, varieties and/or hybrid of these); blueberry, highbush; blueberry, lowbush; buffalo currant; buffaloberry; che; Chilean guava; chokeberry; cloudberry; cranberry; cranberry, highbush; currant, black; currant, red; elderberry; European barberry, gooseberry; grape; honeysuckle, edible; huckleberry; jostaberry; Juneberry (Saskatoon berry); kiwifruit, fuzzy; kiwifruit, hardy; lingonberry; maypop; mountain pepper berries; mulberry; muntries; native currant; partridgeberry; phalsa; pincherry; raspberry, black and red; riberry; salal; schisandra berry; sea buckthorn; serviceberry; strawberry; wild raspberry; cultivars, varieties, and/or hybrid of these.</p>	<p>0.5-2.</p> <p>For armyworm (<i>Spodoptera</i> spp.) and cutworm (e.g. <i>Agrotis ipsilon</i>), use the higher rate range. Ensure good coverage for optimal control</p>
<p><b>Nut, tree (Crop Group 14)</b> Including: Almond; beech nut; Brazil nut; butternut; cashew; chestnut; chinquapin; filbert (hazelnut); hicory nut; macadamia nut; pecan; walnut, black and English.</p>	<p>0.5-2.</p>
<p><b>Grain, cereal Crop Group 15)</b> Including: Barley; buckwheat; corn; millet, pearl; millet, proso; oats; popcorn; rice; rye; sorgum (milo); teosinte; wheat; wild rice.</p>	<p>0.5-2.</p>

Field Crops	Application rate (pounds/acre)
<p><b>Grass Forage, Fodder, and Hay (Crop group 17)</b> including: Any grass, Gramineae family (either green or cured) except sugarcane and those included in the cereal grains group, that will be fed to or grazed by livestock, all pasture and range grasses and grasses grown for hay or silage</p>	<p>0.5-2.</p> <p>If crop is in rapid growth phase, and/or there is ongoing egg laying and overlapping pest generations apply DiPel DF with increased frequency @ 3-7 days to maintain control. For armyworm (<i>Spodoptera</i> spp.) use the higher label rates.</p>
<p><b>Herbs and spices (Crop Group 19)</b> Including: Allspice; angelica; anise; anise, star; annatto (seed); balm; basil; borage; burnet; chamomile; caper buds; caraway; caraway, black; cardamom; cassia bark; cassia buds; catnip; celery seed; chervil (dried); chive; chive, Chinese; cinnamon; clary; clove buds; coriander leaf (cilantro or Chinese parsley); coriander seed (cilantro); costmary; cilantro (leaf); cilantro (seed); cumin; curry leaf); dill (dillweed); dill (seed); fennel (common); fennel, Florence (seed); fenugreek; grains of paradise, horehound; hyssop; juniper berry; lavender; lemongrass; lovage (leaf); lovage (seed); mace; marigold, marjoram; mustard (seed); nasturtium; nutmeg; parsley (dried); pennyroyal; pepper, black; pepper, white; poppy (seed); rosemary; rue; saffron; sage; savory, summer and winter; sweet bay; tansy; tarragon; thyme; vanilla; wintergreen; woodruff; wormwood.</p>	<p>0.5-2.</p> <p>Use 1-2 lb/Ac for control of <i>Spodoptera</i> spp.</p>
<p><b>Alfalfa (hay and seed)</b></p>	<p>0.5-2.</p> <p>If crop is in rapid growth phase, and/or there is ongoing egg laying and overlapping pest generations apply DiPel DF with increased frequency @ 3-7 days to maintain control. For armyworm (<i>Spodoptera</i> spp.) use the higher label rates.</p>
<p><b>Artichoke</b></p>	<p>0.5 – 2</p>
<p><b>Asparagus</b></p>	<p>0.5-2.</p>



Field Crops	Application rate (pounds/acre)
<b>Avocado</b>	0.5-2. Apply at or soon after egg hatch when insects are small.
<b>Banana</b>	0.5-1. Ensure good coverage to all foliage.
<b>Coffee</b>	1-2  For best results, drench bark and new shoots with 1-2 lbs of DiPel® DF per acre, mixing with a sufficient volume of water to ensure uniform coverage
<b>Cotton</b>	0.5-2.  Lower rate ranges (0.5-1 lb/Ac) can be used early season if the insects are small and pest pressure is not high. If <i>Helicoverpa</i> spp. is the dominate species, or pest pressure is high with variable larval stages, use 1.5-2 lb/Ac. Later in the season when insect development is rapid, use the higher rate of 1.5-2 lb/Ac to control <i>Helicoverpa</i> spp. As the canopy becomes denser, use higher water carrier volumes to penetrate foliage and ensure complete coverage. If additional activity or spectrum is required DiPel DF can be mixed with a pyrethroid or other approved insecticide. Follow the most restrictive label directions when tank mixing.

Field Crops	Application rate (pounds/acre)
<b>Flowers, bedding plants and Ornamentals</b>	0.5-2.  For best results, use a ground applicator, a minimum of 50 gallons total mix per acre, 50-100 psi and 3-7 nozzles per bed
<b>Fruit, tropical</b>	0.5-2.  Monitor populations and apply when insects are small and before they roll and web leaves in leaf rolling species.
<b>Hop</b>	0.5-2.  Use 1.5-2 lb/Ac when insect populations are high or when <i>Spodoptera</i> is the dominant pest.
<b>Kiwi fruit</b>	0.5-2.  Apply at hatch or when small insects are actively feeding. Monitor population and apply at 5-7 day intervals.
<b>Malanga</b>	0.5-2.
<b>Mint and peppermint</b>	0.5-2.  Use 1-2 lb/Ac for control of <i>Spodoptera</i> spp.
<b>Peanut</b>	0.5-1.  Apply at intervals necessary to maintain control. DiPel DF can be tank mixed with a pyrethroid for additional spectrum and control. Follow label directions from the most restrictive material when tank mixing products.

Field Crops	Application rate (pounds/acre)
<b>Pineapple</b>	0.25-0.5. Apply when insects are small before they damage fruit. Thorough coverage is required to get to the base of the fruit.
<b>Pomegranate</b>	0.5-2.
<b>Rape (Canola)</b>	0.5-2. Use 1-2 lb/Ac for <i>Heliothis</i> spp. control.
<b>Safflower</b>	0.5-2.
<b>Sugarcane</b>	0.5-2. For sugarcane borer control, best used with parasitic wasps. Apply when insects are actively feeding on foliage and before they bore into the plant.
<b>Sunflower</b>	0.5-1. Thorough coverage of larval feeding sites within flowers is necessary for adequate control.
<b>Tobacco</b>	0.5-1.
<b>Turf</b>	0.5-2.
<b>Watercress</b>	0.5-2. Apply when there is no standing water in the bed.

Crops	Application rate (pounds/acre)
<b>GREENHOUSE/SHADEHOUSE AND OUTDOOR NURSERY</b>	
Crops including but not limited to: <b>Vegetable, leafy, except brassica (Crop group 4), Vegetable, brassica leafy, (Crop group 5), Vegetable, fruiting, (Crop group 8), Herbs and spices (Crop group 19)</b>	0.5-2. Use higher rates for <i>Heliothis</i> spp.
<b>AQUATIC ORNAMENTALS</b>	
<b>Water lilies and other aquatic ornamentals</b>	¼ - ½ teaspoon/100 sq.ft (0.6 – 1.2 g/100 sq.ft)
<b>FORESTS AND ORNAMENTAL TREES</b>	
<b>Forest, Shade, Sugar maple trees and Ornamental Trees</b>	0.5-1 lb. /100 gallons.  For hydraulic sprayer. For mist blowers, mix the applicable amount (lbs.) in 10 gallons of water. Inclusion of a suitable spreader-sticker approved for forest insect control is recommended to improve coverage, rain fastness and/or resist wash-off.

**FOR USE IN SELF-CONTAINED, CLOSED-SYSTEM, ORNAMENTAL PONDS ONLY.**

For a 10' x 10' pond (100 sq. ft.) mix ¼ - ½ teaspoon of DiPel® DF in 1 quart of water and apply to pond surface. Adjust quantities accordingly based on specific pond size.

## TANK MIXES

Always read and follow all label directions, restrictions and precautions when using any pesticide alone or in tank mix combinations. The most restrictive labeling applies when using a tank mix.

Crops	Pests	Products	Application Rate (lb/A)	Special Instructions
Cotton	Armyworm Cotton Bollworm Looper Saltmarsh Caterpillar Tobacco Budworm	<i>DiPel</i> DF plus Pyrethroid	½ - 1 plus Labeled Use Rate	Treat when larvae are young (early instars) before the crop is damaged. Larvae must be actively feeding on treated, exposed surfaces.
Peanut	Armyworms Green Cloverworm Looper Podworm Velvetbean Caterpillar	<i>DiPel</i> DF plus Pyrethroid	½ - 1 plus Labeled Use Rate	Use sufficient spray volume to insure uniform coverage and deposition on all plant surfaces. Use the higher rate for high infestations.
Soybean	Armyworm Corn Earworm* Green Cloverworm Looper Podworm Saltmarsh Caterpillar Soybean Looper Velvetbean Caterpillar	<i>DiPel</i> DF plus Pyrethroid	½ - 1* plus Labeled Use Rate	Can be applied by air or ground. Will control pyrethroid resistant species of the pests listed on this 2(ee) recommendation. *For corn earworm, use the 1 lb/A rate. Refer to pyrethroid label for additional insects controlled

## DiPel® DF FOR STORED AGRICULTURAL COMMODITIES (For all states except California)

**GRAINS, SOYBEANS, SUNFLOWER SEED, CROP SEED, CONDIMENTAL SEEDS, SPICES, HERBS, BIRDSEED AND POPCORN.**

### Pest

### Rate

Indian Meal Moth<sup>1</sup>

3/8 lb./100 bu (undiluted

Almond Moth<sup>1</sup>

and diluted)\*

\*As a surface treatment, apply ½ lb. DiPel DF in 5-10 gal. of water per 500 sq. ft. of grain surface area, mix into top 4 inches. For commodities coarser than shelled corn, increase depth of treatment according to the habit of the pest.

<sup>1</sup>For the control and prevention of these pests, apply DiPel® DF in a constantly agitated water suspension to the top 4 inch surface layer of grain in the bin. Use a sprinkler can or sprayer to apply the suspension into the grain stream as the last (top) 4 inch layer is augured into the bin. Mix 1/20 lb. DiPel® DF per gallon of water. Apply 0.6 pint of this mixture per bushel as grain is augured into storage. Or, sprinkle the suspension onto the surface of the grain in the bin and mix thoroughly with a scoop or rake to the depth of 4 inches. More thorough coverage may be achieved by dividing the recommended concentration into three applications and mixing the grain between applications.

For the protection of bagged grain, including popcorn, apply the suspension to the entire grain mass and mix thoroughly prior to bagging.

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.

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® DF **will not control weevils or other beetles.**

### PEANUT

### Pest

### Rate

Indian Meal Moth

1/4 lb./ton\*

Almond Moth

\*Apply this rate to the top 4 - 8 feet of nuts when filling the warehouse.

To prevent and control these pests, spray an even coating of DiPel® DF on the farmer stock peanuts while filling the warehouse. To make the spray solution, mix 3-3/4 lbs. DiPel® DF per 5 gallons of water. Apply to 15 tons of commodity. Do not pre-mix more spray solution than will be used within 12 hours. Keep the spray suspension agitated during application, and use pressures and nozzles sufficient to handle this suspension.

Before filling the warehouse, clean thoroughly, then spray interior of the facility with a DiPel® DF suspension at the rate of ½ lb. DiPel® DF per 100 gallons water. Spray enough suspension to wet all cracks and crevices.

For bagged peanuts, treat the entire quantity at the rate indicated above.

## **FLUE-CURED TOBACCO**

### **Pest**

### **Rate**

Tobacco Moth	0.2 oz./100 lbs*
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\*Apply 0.2 ounce (approximately 2 ½ tsps.) of DiPel® DF in one quart of water per 100 pounds of tobacco as a fine mist spray. Avoid over wetting. Tobacco should have just enough moisture to be handled without shattering at the time of application.

### **Tobacco to be Stored up to Twelve Months.**

Spray loose leaves as the tobacco is being bundled from the curing barn. For tobacco on sticks, treat both sides of leaves.

### **Stored tobacco.**

For tobacco which is to be carried over, rebundle or restack sticks, fluff up tobacco and spray loose leaves.

For tobacco that has been stored over three weeks, apply at first sign of infestation; promptly open bundles, spray loose leaves, then bundle.

### **Treatment of Storage Barns.**

Treatment of storage barn floors and walls with DiPel® DF may aid in control of the Tobacco Moth.. Sweep out the area, especially cracks and corners, and all of the loose tobacco pieces in which the moth might breed. Make a spray mixture containing ½ oz. (6 tsps.) DiPel® DF per 2 ½ gallons of water. Apply this at a rate of ½ gallon per 1000 sq. ft. of surface area. Be sure to spray into cracks and between floorboards.

## **NOTICE TO USER**

To the extent consistent with applicable law, seller makes no warranty, express or implied, of merchantability, fitness or otherwise concerning the 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.

DiPel® is a registered trademark of Valent BioSciences Corporation  
2012

SUB LABEL I

For use on all crops listed on the master label with some changes in the application rates for commercial purposes.

**DIPEL® PRO DF  
BIOLOGICAL INSECTICIDE  
DRY FLOWABLE**



**For Organic Production**

Active Ingredient:

<i>Bacillus thuringiensis</i> subsp. <i>kurstaki</i> strain ABTS-351 fermentation solids, spores, and insecticidal toxins*	54%
Other Ingredients	46%
Total	100%

\*Potency: 32,000 **Cabbage Looper Units (CLU)** per mg (14.5 billion CLU per pound)

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

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

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

EPA Registration No. 73049-39  
EPA Est. No. 33762-IA-1

Batch Code: \_\_\_\_\_

Net Content: \_\_\_\_\_



<b>FIRST AID</b>	
<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes</li> <li>• Call a poison control center or doctor for treatment advice</li> </ul>
<b>If inhaled</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for treatment advice</li> </ul>
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye</li> <li>• Call a poison control center or doctor for treatment advice</li> </ul>
<b>HOTLINE NUMBER</b>	
<p>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.</p>	

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

Harmful if inhaled or absorbed through the skin. Causes moderate eye irritation. Avoid breathing dust or spray mist. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove contaminated clothing and wash before reuse.

**Personal Protective Equipment (PPE)**

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves.
- Shoes plus socks.

Mixer/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.

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.

**Engineering Controls:**

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection 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.

IMPORTANT: When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for “applicators and other handlers” and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down.

**User Safety Recommendations**

- Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- User should 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 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 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 interval. 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:

- Coveralls.
- Waterproof gloves.
- Shoes plus socks.

### **NON-AGRICULTURAL USE REQUIREMENTS**

The requirements in this box apply to uses 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.

Keep unprotected persons out of the treated areas until sprays have dried.

### STORAGE AND DISPOSAL

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

**Pesticide Storage:** Reclose containers of unused DiPel® DF. Store in a dry place inaccessible to children and out of sunlight.

**Pesticide Disposal:** Do not contaminate food or feed by disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

**Container Disposal:** Nonrefillable container. Do not reuse or refill this container. Completely empty bag into application equipment by shaking and tapping sides and bottom to loosen clinging particles. Offer for recycling, if available, or dispose of empty bag in a sanitary landfill or by incineration. Do not burn, unless allowed by State and local ordinances.

### DIRECTIONS FOR USE

See Chemigation section for chemigation use directions.

**Days to Harvest:** There are no restrictions on applying DiPel DF up to the time of harvest. Individual state regulations may vary and should be consulted for allowable pre-harvest application intervals.

**Sites:** DiPel® DF may be used for any labeled pest in both field and greenhouse use as well as in self-contained, closed-system, ornamental ponds.

DiPel® DF is an 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® DF to be affected. Always follow these directions:

- Treat when larvae are young (early instars) before the crop is damaged.
- Larvae must be actively feeding on treated, exposed plant surfaces.
- Thorough spray coverage is needed to provide a uniform deposit of DiPel® DF at the site of larval feeding. Use overhead and drop nozzles to obtain good spray coverage on both sides of foliage. Use sufficient spray volume to insure uniform deposition on all plant surfaces.
- Under heavy pest population pressure, use the higher label rates, shorten the spray interval, and/or raise spray volume to improve spray coverage.
- 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 spray, make the treatment when egg hatch is essentially complete, but before crop damage occurs.
- A spreader-sticker which has been approved for use on growing and harvested crops should be added for hard-to-wet crops such as cabbage, or to improve weather-fastness of the spray deposits.

- DiPel<sup>®</sup> DF is a non-restricted use pesticide and does not require a restricted use permit for purchase and use.
- DiPel<sup>®</sup> DF may be tank mixed with other labeled insecticides to enhance control. Use of the resulting tank mix must be in accordance with the more restrictive label limitations and precautions. No dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing. Before tank mixing DiPel<sup>®</sup> DF with other labeled products, including spreader stickers, check for tank mix compatibility.

After ingesting a lethal dose of DiPel<sup>®</sup> DF, larvae stop feeding within the hour, and will die within several hours to 3 days. Mortality varies with larval size (instar), lepidopteran species, and dose consumed. Following ingestion, larvae become sluggish, discolor, then shrivel, blacken and die. Smaller larvae die more quickly.

DiPel<sup>®</sup> DF may be applied in conventional ground or aerial equipment with quantities of water sufficient to provide uniform coverage of infested plant parts. The volume of water needed per acre will depend on crop development, relative humidity, spray equipment, and local experience. Usually, selection of moderate to high spray volume will provide the best results in most equipment. For optimal results, use at least 20 gallons of water per acre for ground application. For aerial application use at least 3 gallons of water per acre; exception being arid areas, where 5 to 10 gallons are required. Add water to the mix tank and provide moderate agitation. While agitating, add the required amount of DiPel<sup>®</sup> DF. Continue agitation, and add other spray materials, if any. Add remaining water, if any, and agitate until fully mixed. Maintain the suspension with moderate agitation while loading and spraying. Do not mix more DiPel<sup>®</sup> DF than can be used in a 3 day period.

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

For Smaller Spray Volumes:

<b><u>If Rate is</u></b>	<b><u>Use This Amount</u></b>	
	<b><u>Per Gallon (wt)</u></b>	
1/4 lb./acre or 100 gals.	½ tsp.	(0.04 oz)
½ lb./acre or 100 gals.	1 tsp.	(0.08 oz)
1 lb./acre or 100 gals.	2 tsps.	(0.16 oz)
2 lb./acre or 100 gals.	4 tsps.	(0.32 oz)

## **CHEMIGATION USE DIRECTIONS**

Apply this product only through sprinkler including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move irrigation systems. Do not apply this product through any other type of irrigation system. Do not connect an irrigation system (including greenhouse systems) used for pesticide applications to a public water system.

Crop injury, lack of effectiveness, or illegal residues in the crop can result from nonuniform distribution of treated water. 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. Allow sufficient time for pesticide to be flushed through all lines and all nozzles before turning off irrigation water.

### **Spray Preparation**

First prepare a suspension of DiPel® DF in a mix tank. Fill tank with ½ to ¾ the desired amount of water. Start mechanical or hydraulic agitation. Add the required amount of DiPel® DF, and then the remaining volume of water. Then set the sprinkler to deliver a minimum of 0.1 to 0.3 inch of water per acre. Start sprinkler and uniformly inject the suspension of DiPel® DF into the irrigation water line so as to deliver the desired rate per acre. The suspension of DiPel® DF should be injected with a positive displacement pump into the main line ahead of a right angle turn to insure adequate mixing. Any questions on calibration should be directed to your State Extension Service Specialists, to equipment manufacturers or other experts.

NOTE: When treatment with DiPel® DF has been completed, further field irrigation over the treated area should be avoided for 24 to 48 hours to prevent washing the material off the crop.

### **GENERAL PRECAUTIONS FOR APPLICATIONS THROUGH SPRINKLER IRRIGATION SYSTEMS**

Maintain continuous agitation in the mix tank during mixing and application to insure a uniform suspension.

Greater accuracy in calibration and distribution will be achieved by injecting a larger volume for a more dilute solution per unit time.

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 pesticides and capable of being fitted with a system interlock. Do not apply when wind speed favors drift beyond the area intended for treatment, system connections or fittings leak, nozzles do not provide uniform distribution or lines containing the product must be dismantled and drained.

**Pests controlled by DiPel DF**

<b>Common name</b>	<b>Scientific name</b>
Achema Sphinx Moth (Hornworm)	<i>Eumorpha achemon</i>
Alfalfa Caterpillar	<i>Colias eurytheme</i>
Almond Moth	<i>Caudra cautella</i>
Amorbia Moth	<i>Amorbia humerosana</i>
Armyworm	<i>Spodoptera spp., e.g. exigua, frugiperda, littoralis, Pseudaletia unipuncta</i>
Artichoke plume moth	<i>Platyptilia carduidactyla</i>
Azalea Caterpillar	<i>Datana major</i>
Bagworm	<i>Thyridopteryx ephemeraeformis</i>
Banana Moth	<i>Hypercompe scribonia</i>
Banana Skipper	<i>Erionota thrax</i>
Blackheaded Budworm	<i>Acleris gloverana</i>
California Oakworm	<i>Phryganidia californica</i>
Cankerworm	<i>Paleacrita merricata</i>
Cherry Fruitworm	<i>Grapholita packardi</i>
China Mark Moth	<i>Nymphula stagnata</i>
Citrus Cutworm	<i>Xylomyges curialis</i>
Codling Moth	<i>Cydia pomonella</i>
Cotton Bollworm	<i>Helicoverpa spp., e.g. zea, amigera</i>
Cranberry Fruitworm	<i>Acrobasis vaccinii</i>
Cross-striped Cabbageworm	<i>Evergestis rimosalis</i>
Cutworm	<i>Various Noctuid species, e.g. Agrotis ipsilon</i>
Diamondback Moth	<i>Plutella xylostella</i>
Douglas Fir Tussock Moth	<i>Orgyia pseudotsugata</i>
Ello Moth (Hornworm)	<i>Erinnyis ello</i>
Elm Spanworm	<i>Ennomos subsignaria</i>
European Corn Borer	<i>Ostrinia nubilalis</i>
European Grapevine Moth	<i>Lobesia botrana</i>
European Skipper (Essex Skipper)	<i>Thymelicus lineola</i>
Fall Webworm	<i>Melissopus latiferreanus</i>
Filbert Leafroller	<i>Archips rosanus</i>
Fruittree Leafroller	<i>Archips argyrospilia</i>
Grape Berry Moth	<i>Paralobesia viteana</i>
Grape Leafroller	<i>Platynota stultana</i>
Grapeleaf Skeletonizer (ground only)	<i>Harrisina americana</i>
Green Cloverworm	<i>Plathypena scabra</i>
Greenstriped Mapleworm	<i>Dryocampa rubicunda</i>
Gummosos-Batrachedra Comosae (Hodges)	?

Common name	Scientific name
Gypsy Moth	<i>Lymantria dispar</i>
Headworm	<u><i>Helicoverpa spp., e.g. zea, amigera</i></u>
Head Moth	?
Hemlock Looper	<i>Lambdina fiscellaria</i>
Hornworm	<i>Manduca spp.</i>
Imported Cabbageworm	<i>Pieris rapae</i>
Indian Meal Moth	<i>Plodia interpunctella</i>
Io Moth	<i>Automeris io</i>
Jack Pine Budworm	<i>Choristoneura pinus</i>
Light brown apple moth	<i>Epiphyas postvittana</i>
Looper	<i>Various Noctuidae, e.g. Trichoplusia ni</i>
Melonworm	<i>Diaphania hyalinata</i>
Mimosa Webworm	<i>Homadula anisocentra</i>
Obliquebanded Leafroller	<i>Choristoneura rosaceana</i>
Oleander Moth	<i>Syntomeida epilais</i>
Omnivorous Leafroller	<i>Platynota stultana</i>
Omnivorous Looper	<i>Sabulodes aegrotata</i>
Orangedog	<i>Papilio cresphontes</i>
Orange Tortrix	<i>Argyrotaenia citrana</i>
Oriental Fruit Moth	<i>Grapholita molesta</i>
Pine Butterfly	<i>Neophasia menapia</i>
Podworm	<u><i>Helicoverpa spp., e.g. zea, amigera</i></u>
Redbanded Leafroller	<i>Argyrotaenia velutinana</i>
Redhumped Caterpillar	<i>Schizura concinna</i>
Rindworm complex	<i>Various leps.</i>
Saddleback Caterpillar	<i>Sibine stimulea</i>
Saddle Prominent Caterpillar	<i>Heterocampa guttivitta</i>
Saltmarsh Caterpillar	<i>Estigmene acrea</i>
Sod Webworm	<i>Crambus spp.</i>
Soybean Looper	<i>Pseudoplusia includens</i>
Spanworm	<i>Ennomos subsignaria</i>
Spring and Fall Cankerworm	<i>Paleacrita vernata and Alsophila pometaria</i>
Spruce budworm	<i>Choristoneura fumiferana</i>
Tent Caterpillar	<i>Various Lasiocampidae</i>
Thecla-Thecla Basilides (Geyr)	<i>Thecla basilides</i>
Tobacco Budworm	<i>Heliothis virescens</i>
Tobacco Hornworm	<i>Manduca sexta</i>
Tobacco Moth	<i>Ephestia elutella</i>
Tomato Fruitworm	<u><i>Helicoverpa spp., e.g. zea, amigera</i></u>
Tufted Apple Budmoth	<i>Platynota idaeusalis</i>
Twig Borer	<i>Anarsia lineatella</i>



Common name	Scientific name
Variiegated Cutworm	<i>Peridroma saucia</i>
Variiegated Leafroller	<i>Platynota flavedana</i>
Velvetbean Caterpillar	<i>Anticarsia gemmatalis</i>
Walnut Caterpillar	<i>Datana integerrima</i>
Webworm	<i>Hyphantria cunea</i>
Western Tussock Moth	<i>Orgyia vetusta</i>
Southern cornstalk borer	<i>Diatraea crambidoides</i>
Sugarcane borer	<i>Diatraea saccharalis</i>
Corn earworm, cotton bollworm, tomato fruitworm	<i>Helicoverpa spp., e.g. zea, amigera</i>
Tobacco budworm	<i>Heliothis virescens</i>

Field Crops	Application rate (pounds/acre)
<b>Vegetables, root and tuber (Crop Group 1)</b> Including: arracacha; arrowroot; artichoke, Chinese; artichoke, Jerusalem; beet, garden; beet, sugar; burdock, edible; canna, edible; carrot; cassava, bitter and sweet; celeriac; chayote (root); chervil, turnip-rooted; chicory; chufa; dasheen (taro); ginger; ginseng; horseradish; leren; parsley, turnip-rooted; parsnip; potato; radish; radish, oriental; rutabaga; salsify; salsify, black; salsify, Spanish; skirret; sweet potato; tanier; turmeric; turnip; yam bean; yam, true.	0.5-2
<b>Vegetable, bulb (Crop Group 3-07)</b> Including: Chive, fresh leaves; chive, Chinese, fresh leaves; daylily, bulb; elegans hosta; fritillaria, bulb; fritillaria, leaves; garlic, bulb; garlic, great-headed, bulb; garlic, serpent, bulb; kurrat; lady's leek; leek; leek, wild; lily, bulb; onion, Beltsville bunching; onion, bulb; onion, Chinese, bulb; onion, fresh; onion, green; onion, macrostem; onion, pearl; onion, potato, bulb; onion, tree, tops; onion, Welsh, tops; shallot, bulb; shallot, fresh leaves; cultivars, variety, and/or hybrids of these.	0.5-2.  Use 1-2 lb./Ac for control of <i>Helicoverpa spp.</i>

Field Crops	Application rate (pounds/acre)
<p><b>Vegetable, leafy, except brassica (Crop Group 4)</b> Including: Amaranth (Chinese spinach); arugula (roquette); cardoon; celery; celery, Chinese; celtuce; chervil; chrysanthemum, edible-leaved; chrysanthemum, garland; corn salad; cress,garden; cress, upland; dandelion; dock (sorrel); endive (escarole); fennel, Florence; lettuce, head and leaf; orach; parsley; purslane, garden; purslane, winter; radicchio (red chicory); rhubarb; spinach, New Zealand; spinach, vine; Swiss chard.</p>	<p>0.5-2.  Use higher rates for control of <i>Heliothis</i> spp.</p>
<p><b>Vegetable, brassica leafy (Crop Group 5)</b> Including: Broccoli; broccoli, Chinese (gai lon); broccoli raab (rapini); Brussels sprouts; cabbage; cabbage, Chinese (bok choy); cabbage, Chinese (napa); cabbage, Chinese mustard (gai choy); cauliflower; cavalo broccoli; collards; kale;kohlrabi; mizuna; mustard greens; mustard spinach; rape greens.</p>	<p>0.5-2.  Use 0.5 to 1.5 lb/Ac for looper control and 1-2 lb/Ac for <i>Heliothis</i> spp. control depending on larval stage and infestation levels. Use surfactants for hard to wet crops.</p>
<p><b>Vegetable, legume (succulent or dried) (Crop Group 6)</b> Including: Bean, (<i>Lupinus</i>) (includes grain lupin, sweet lupin, white lipin, and white sweet lupin); bean (<i>Phaseolus</i>) (includes field bean, kidney bean, lima bean, navy bean, pinto bean, runner bean, snap bean, tepary bean, wax bean); bean (<i>Vigna</i>) (includes adzuki bean, asparagus bean, blackeyed bean, catjang, Chinese longbean, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, yardlog bean); broad bean (fava); chickpea (garbanzo); guar; jackbean; lablab bean; lentil; pea (<i>Pisum</i>) includes dwarf pea, edible-podded pea, English pea, field pea, garden pea, green pea, snowpea, sugar snap pea); pigeon pea; soybean; soybean (immature seed); sword bean.</p>	<p>0.5-2.  Monitor insects and apply at more frequent intervals (3-5 days) for heavy populations to maintain control.</p>
<p><b>Vegetable, fruiting (Crop Group 8-10)</b> Including: African eggplant; bush tomato; bell pepper; cocona; currant tomato; eggplant; garden huckleberry; golj berry; groundcherry; martynia; naranjilla; okra; pea eggplant; pepino; nonbell pepper; roselle; scarlet eggplant; sunberry; tomatillo; tomato; tree tomato; cultivars, varieties, and/or hybrids of these.</p>	<p>0.5-2.  Use 1-2 lb/Ac for control of heavy populations or overlapping generations of <i>Spodoptera</i> spp. Scout tomato fields and apply when insects are hatching or are small.</p>

Field Crops	Application rate (pounds/acre)
<p><b>Vegetable, cucurbit (Crop Group 9)</b> Including: Chayote waxgourd (Chinese preserving melon); citron melon; cucumber; gherkin; gourd, edible (includes hyotan, cucuzza, hechima, Chinese okra); <i>Momordica</i> spp (includes balsam apple, balsam pear, bittermelon, Chinese cucumber); muskmelon (includes cantaloupe); pumpkin; squash, summer; squash, winter (includes butternutsquash, calabaza, hubbard squash, acorn squash, spaghetti squash); watermelon.</p>	<p>0.5-2.</p> <p>Use 1-2 lb/Ac for control of <i>Spodoptera</i> spp.</p>
<p><b>Fruit, citrus (Crop Group 10-10)</b> Including: Australian desert lime; Australian finger-lime; Australian round lime; Brown River finger lime; calamondin; citron; citrus hybrids; grapefruit; Japanese summer grapefruit; kumquat; lemon; lime; mediteranean mandarin; mount white lime; New Guines wild lime; orange, sour; orange, sweet; pummelo; Russell River lime; Satsuma mandarin; sweet lime; tachibana orange; Tahiti lime; tangelo; tangerine (mandarin); tangor; trifoliolate orange; uniq fruit; cultivars, varieties, and/or hybrid of these.</p>	<p>0.5-2.</p> <p>Use sufficient volume of water to ensure good canopy coverage and penetration.</p>
<p><b>Fruit, pome (Crop Group 11-10)</b> Including: Apple; azarole; crabapple; loquat; mayhaw; medlar; pear; pear, Asian; quince; quince, Chinese; quince, Japanese; tejocote; cultivars, varieties, and/or hybrid of these.</p>	<p>0.5-2.</p> <p>Scout orchards and apply when insects are hatching or small. For insect borers (e.g. codling moth) it is important to apply before the insect bores into the fruit. For leaf rollers, it is important to apply before leaves are rolled and insects are protected. DiPel DF can be used during bloom.</p>
<p><b>Fruit, stone (Crop Group 12)</b> Including: Apricot; cherry, sweet; cherry, tart; nectarine; peach; plum; plum, Chickasaw; plum, Damson; plum, Japanese; plumcot; prune (fresh).</p>	<p>0.5—2.</p> <p>Scout orchards and apply when insects are hatching or are small, are actively feeding on leaf surfaces, and before they enter fruit or roll leaves. DiPel DF can be used during bloom.</p>

Field Crops	Application rate (pounds/acre)
<p><b>Berry and small fruit group (Crop Group 13-07)</b> Including: Amur river grape; aronia berry; bayberry; bearberry; bilberry; blackberry (including Andean blackberry, arctic blackberry, bingleberry, black satin berry, boysenberry, brombeere, California blackberry, Chesterberry, Cherokee blackberry, Cheyenne blackberry, common blackberry, coryberry, darrowberry, dewberry, Dirksen thornless berry, evergreeb blackberry, Himalayaberry, hullberry, lavacabery, loganberry, lowberry, Lucretiaberry, mammoth blackberry, marionberry, mora, mures deronce, nectaberry, Northern dewberry, olallieberry, Oregon evergreen berry, phenomenalberry, rangeberry, ravenberry, rossberry, Shawnee blackberry, Southern dewberry, tayberry, youngberry, zarzamora, and cultivars, varieties and/or hybrid of these); blueberry, highbush; blueberry, lowbush; buffalo currant; buffaloberry; che; Chilean guava; chokeberry; cloudberry; cranberry; cranberry, highbush; currant, black; currant, red; elderberry; European barberry, gooseberry; grape; honeysuckle, edible; huckleberry; jostaberry; Juneberry (Saskatoon berry); kiwifruit, fuzzy; kiwifruit, hardy; lingonberry; maypop; mountain pepper berries; mulberry; muntries; native currant; partridgeberry; phalsa; pincherry; raspberry, black and red; riberry; salal; schisandra berry; sea buckthorn; serviceberry; strawberry; wild raspberry; cultivars, varieties, and/or hybrid of these.</p>	<p>0.5-2.</p> <p>For armyworm (<i>Spodoptera</i> spp.) and cutworm (e.g. <i>Agrotis ipsilon</i>), use the higher rate range. Ensure good coverage for optimal control</p>
<p><b>Nut, tree (Crop Group 14)</b> Including: Almond; beech nut; Brazil nut; butternut; cashew; chestnut; chinquapin; filbert (hazelnut); hicory nut; macadamia nut; pecan; walnut, black and English.</p>	<p>0.5-2.</p>
<p><b>Grain, cereal Crop Group 15)</b> Including: Barley; buckwheat; corn; millet, pearl; millet, proso; oats; popcorn; rice; rye; sorgum (milo); teosinte; wheat; wild rice.</p>	<p>0.5-2.</p>

Field Crops	Application rate (pounds/acre)
<p><b>Grass Forage, Fodder, and Hay (Crop group 17)</b> including: Any grass, Gramineae family (either green or cured) except sugarcane and those included in the cereal grains group, that will be fed to or grazed by livestock, all pasture and range grasses and grasses grown for hay or silage</p>	<p>0.5-2.</p> <p>If crop is in rapid growth phase, and/or there is ongoing egg laying and overlapping pest generations apply DiPel DF with increased frequency @ 3-7 days to maintain control. For armyworm (<i>Spodoptera</i> spp.) use the higher label rates.</p>
<p><b>Herbs and spices (Crop Group 19)</b> Including: Allspice; angelica; anise; anise, star; annatto (seed); balm; basil; borage; burnet; chamomile; caper buds; caraway; caraway, black; cardamom; cassia bark; cassia buds; catnip; celery seed; chervil (dried); chive; chive, Chinese; cinnamon; clary; clove buds; coriander leaf (cilantro or Chinese parsley); coriander seed (cilantro); costmary; cilantro (leaf); cilantro (seed); cumin; curry leaf); dill (dillweed); dill (seed); fennel (common); fennel, Florence (seed); fenugreek; grains of paradise, horehound; hyssop; juniper berry; lavender; lemongrass; lovage (leaf); lovage (seed); mace; marigold, marjoram; mustard (seed); nasturtium; nutmeg; parsley (dried); pennyroyal; pepper, black; pepper, white; poppy (seed); rosemary; rue; saffron; sage; savory, summer and winter; sweet bay; tansy; tarragon; thyme; vanilla; wintergreen; woodruff; wormwood.</p>	<p>0.5-2.</p> <p>Use 1-2 lb/Ac for control of <i>Spodoptera</i> spp.</p>
<p><b>Alfalfa (hay and seed)</b></p>	<p>0.5-2.</p> <p>If crop is in rapid growth phase, and/or there is ongoing egg laying and overlapping pest generations apply DiPel DF with increased frequency @ 3-7 days to maintain control. For armyworm (<i>Spodoptera</i> spp.) use the higher label rates.</p>
<p><b>Artichoke</b></p>	<p>0.5 – 2</p>
<p><b>Asparagus</b></p>	<p>0.5-2.</p>

Field Crops	Application rate (pounds/acre)
<b>Avocado</b>	0.5-2. Apply at or soon after egg hatch when insects are small.
<b>Banana</b>	0.5-1. Ensure good coverage to all foliage.
<b>Coffee</b>	1-2  For best results, drench bark and new shoots with 1-2 lbs of DiPel® DF per acre, mixing with a sufficient volume of water to ensure uniform coverage
<b>Cotton</b>	0.5-2.  Lower rate ranges (0.5-1 lb/Ac) can be used early season if the insects are small and pest pressure is not high. If <i>Helicoverpa</i> spp. is the dominate species, or pest pressure is high with variable larval stages, use 1.5-2 lb/Ac. Later in the season when insect development is rapid, use the higher rate of 1.5-2 lb/Ac to control <i>Helicoverpa</i> spp. As the canopy becomes denser, use higher water carrier volumes to penetrate foliage and ensure complete coverage. If additional activity or spectrum is required DiPel DF can be mixed with a pyrethroid or other approved insecticide. Follow the most restrictive label directions when tank mixing.

Field Crops	Application rate (pounds/acre)
<b>Flowers, bedding plants and Ornamentals</b>	0.5-2.  For best results, use a ground applicator, a minimum of 50 gallons total mix per acre, 50-100 psi and 3-7 nozzles per bed
<b>Fruit, tropical</b>	0.5-2.  Monitor populations and apply when insects are small and before they roll and web leaves in leaf rolling species.
<b>Hop</b>	0.5-2.  Use 1.5-2 lb/Ac when insect populations are high or when <i>Spodoptera</i> is the dominant pest.
<b>Kiwi fruit</b>	0.5-2.  Apply at hatch or when small insects are actively feeding. Monitor population and apply at 5-7 day intervals.
<b>Malanga</b>	0.5-2.
<b>Mint and peppermint</b>	0.5-2.  Use 1-2 lb/Ac for control of <i>Spodoptera</i> spp.
<b>Peanut</b>	0.5-1.  Apply at intervals necessary to maintain control. DiPel DF can be tank mixed with a pyrethroid for additional spectrum and control. Follow label directions from the most restrictive material when tank mixing products.

Field Crops	Application rate (pounds/acre)
<b>Pineapple</b>	0.25-0.5. Apply when insects are small before they damage fruit. Thorough coverage is required to get to the base of the fruit.
<b>Pomegranate</b>	0.5-2.
<b>Rape (Canola)</b>	0.5-2. Use 1-2 lb/Ac for <i>Heliothis</i> spp. control.
<b>Safflower</b>	0.5-2.
<b>Sugarcane</b>	0.5-2. For sugarcane borer control, best used with parasitic wasps. Apply when insects are actively feeding on foliage and before they bore into the plant.
<b>Sunflower</b>	0.5-1. Thorough coverage of larval feeding sites within flowers is necessary for adequate control.
<b>Tobacco</b>	0.5-1.
<b>Turf</b>	0.5-2.
<b>Watercress</b>	0.5-2. Apply when there is no standing water in the bed.



Crops	Application rate (pounds/acre)
<b>GREENHOUSE/SHADEHOUSE AND OUTDOOR NURSERY</b>	
Crops including but not limited to: <b>Vegetable, leafy, except brassica (Crop group 4),</b> <b>Vegetable, brassica leafy, (Crop group 5),</b> <b>Vegetable, fruiting, (Crop group 8),</b> <b>Herbs and spices (Crop group 19)</b>	0.5-2. Use higher rates for <i>Heliothis</i> spp.
<b>AQUATIC ORNAMENTALS</b>	
<b>Water lilies and other aquatic ornamentals</b>	¼ - ½ teaspoon/100 sq.ft (0.6 – 1.2 g/100 sq.ft)
<b>FORESTS AND ORNAMENTAL TREES</b>	
<b>Forest, Shade, Sugar maple trees and Ornamental Trees</b>	0.5-1 lb. /100 gallons. For hydraulic sprayer. For mist blowers, mix the applicable amount (lbs.) in 10 gallons of water. Inclusion of a suitable spreader-sticker approved for forest insect control is recommended to improve coverage, rain fastness and/or resist wash-off.

**FOR USE IN SELF-CONTAINED, CLOSED-SYSTEM, ORNAMENTAL PONDS ONLY.**

\*For a 10' x 10' pond (100 sq. ft.) mix ¼ - ½ teaspoon of DiPel® DF in 1 quart of water and apply to pond surface. Adjust quantities accordingly based on specific pond size.

## TANK MIXES

Follow all label directions, restrictions and precautions when using any pesticide alone or in tank mix combinations. The most restrictive labeling applies when using a tank mix.

Crops	Pests	Products	Application Rate (lb/A)	Special Instructions
Cotton	Armyworm Cotton Bollworm Looper Saltmarsh Caterpillar Tobacco Budworm	<i>DiPel</i> DF plus Pyrethroid	½ - 1 plus Labeled Use Rate	Treat when larvae are young (early instars) before the crop is damaged. Larvae must be actively feeding on treated, exposed surfaces.
Peanut	Armyworms Green Cloverworm Looper Podworm Velvetbean Caterpillar	<i>DiPel</i> DF plus Pyrethroid	½ - 1 plus Labeled Use Rate	Use sufficient spray volume to insure uniform coverage and deposition on all plant surfaces. Use the higher rate for high infestations.
Soybean	Armyworm Corn Earworm* Green Cloverworm Looper Podworm Saltmarsh Caterpillar Soybean Looper Velvetbean Caterpillar	<i>DiPel</i> DF plus Pyrethroid	½ - 1* plus Labeled Use Rate	Can be applied by air or ground. Will control pyrethroid resistant species of the pests listed on this 2(ee) recommendation. *For corn earworm, use the 1 lb/A rate. Refer to pyrethroid label for additional insects controlled

## DiPel® DF FOR STORED AGRICULTURAL COMMODITIES (For all states except California)

**GRAINS, SOYBEANS, SUNFLOWER SEED, CROP SEED, CONDIMENTAL SEEDS, SPICES, HERBS, BIRDSEED AND POPCORN.**

### Pest

### Rate

Indian Meal Moth<sup>1</sup>  
Almond Moth<sup>1</sup>

3/8 lb./100 bu (undiluted  
and diluted)\*

\*As a surface treatment, apply ½ lb. DiPel® DF in 5-10 gal. of water per 500 sq. ft. of grain surface area, mix into top 4 inches. For commodities coarser than shelled corn, increase depth of treatment according to the habit of the pest.

<sup>1</sup>For the control and prevention of these pests, apply DiPel® DF in a constantly agitated water suspension to the top 4 inch surface layer of grain in the bin. Use a sprinkler can or sprayer to apply the suspension into the grain stream as the last (top) 4 inch layer is augured into the bin. Mix 1/20 lb. DiPel® DF per gallon of water. Apply 0.6 pint of this mixture per bushel as grain is augured into storage. Or, sprinkle the suspension onto the surface of the grain in the bin and mix thoroughly with a scoop or rake to the depth of 4 inches. More thorough coverage may be achieved by dividing the recommended concentration into three applications and mixing the grain between applications.

For the protection of bagged grain including popcorn, apply the suspension to the entire grain mass and mix thoroughly prior to bagging.

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.

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® DF **will not control weevils or other beetles.**

## PEANUT

<u>Pest</u>	<u>Rate</u>
Indian Meal Moth	1/4 lb./ton*
Almond Moth	

\*Apply this rate to the top 4 – 8 feet of nuts when filling the warehouse.

To prevent and control these pests, spray an even coating of DiPel® DF on the farmer stock peanuts while filing the warehouse. To make the spray solution, mix 3-3/4 lbs. DiPel® DF per 5 gallons of water. Apply to 15 tons of commodity. Do not pre- mix more spray solution than will be used within 12 hours. Keep the spray suspension agitated during application, and use pressures and nozzles sufficient to handle this suspension.

Before filling the warehouse, clean thoroughly, then spray interior of the facility with a DiPel® DF suspension at the rate of ½ lb. DiPel® DF per 100 gallons water. Spray enough suspension to wet all cracks and crevices.

For bagged peanuts, treat the entire quantity at the rate indicated above.

## **FLUE-CURED TOBACCO**

### **Pest**

### **Rate**

Tobacco Moth 0.2 oz./100 lbs\*

\*Apply 0.2 ounce (approximately 2 ½ tsps.) of DiPel® DF in one quart of water per 100 pounds of tobacco as a fine mist spray. Avoid over wetting. Tobacco should have just enough moisture to be handled without shattering at the time of application.

### **Tobacco to be Stored up to Twelve Months.**

Spray loose leaves as the tobacco is being bundled from the curing barn. For tobacco on sticks, treat both sides of leaves.

### **Stored Tobacco.**

For tobacco which is to be carried over, rebundle or restack sticks, fluff up tobacco and spray loose leaves.

For tobacco that has been stored over three weeks, apply at first sign of infestation; promptly open bundles, spray loose leaves, then bundle.

### **Treatment of Storage Barns.**

Treatment of storage barn floors and walls with DiPel® DF may aid in control of the Tobacco Moth.. Sweep out the area, especially cracks and corners, and all of the loose tobacco pieces in which the moth might breed. Make a spray mixture containing ½ oz. (6 tsps.) DiPel® DF per 2 ½ gallons of water. Apply this at a rate of ½ gallon per 1000 sq. ft. of surface area. Be sure to spray into cracks and between floorboards.

## **NOTICE TO USER**

To the extent consistent with applicable law, seller makes no warranty, express or implied, of merchantability, fitness or otherwise concerning the 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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