

**Container Label**

Group 11 Insecticide

**DIPEL® 2X DF**

Biological Insecticide  
Dry Flowable (Wettable Granules)  
COMMERCIAL

READ THE LABEL AND ATTACHED BROCHURE BEFORE USING

ACTIVE INGREDIENT:

*Bacillus thuringiensis*, var. *kurstaki* strain ABTS-351 fermentation  
solids, spores, and insecticidal toxins. . . . .57.0%

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

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

WARNING CONTAINS THE ALLERGEN SOY

REGISTRATION NO. 26508  
PEST CONTROL PRODUCTS ACT

CAUTION EYE IRRITANT  
CAUTION SKIN IRRITANT  
POTENTIAL SENSITIZER  
KEEP OUT OF REACH OF CHILDREN

Lot No.  
Date of Manufacture:  
Net Contents: 0.5 kg; 5 kg

Registrant:  
Valent BioSciences LLC  
870 Technology Way  
Libertyville, Illinois 60048, USA

Canadian Agent:  
Valent Canada, Inc.  
201-230 Hanlon Creek Blvd.  
Guelph, Ontario N1C 0A1

**PRECAUTIONS:**

KEEP OUT OF REACH OF CHILDREN

May cause sensitization. May irritate eyes. May irritate skin. Avoid contact with skin, eyes, or clothing. Avoid breathing dust or spray mist. Wear a long-sleeved shirt, long pants, shoes and socks, eye goggles, and NIOSH approved respirator with any N-95, R-95 or P-95 filter for biological products when handling, mixing/loading or applying the product and during all clean-up and repair activities. When applicators use closed systems (e.g. enclosed cabs) the personal protective equipment may be reduced or modified. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

Restricted Entry Interval: DO NOT enter or allow worker entry into treated areas for 4 hours or until sprays have dried, unless wearing waterproof gloves, long-sleeved shirt, long pants, socks and shoes.

If this pest control product is to be used on a commodity that may be exported and you require information regarding Maximum Residue Limits for an importing country, please contact BioSciences LLC.

**ENVIRONMENTAL PRECAUTIONS:**

To reduce runoff from treated areas into aquatic habitats, avoid applications to areas with a moderate to steep slope, compacted soil or clay.

- Avoid application when heavy rain is forecast.
- Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

<b>FIRST AID</b>	
If on skin or clothing	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15–20 minutes. Call a poison control centre or doctor for treatment advice.
If in eyes	Hold eye open and rinse slowly and gently with water for 15–20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.
If inhaled	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.
If swallowed	Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.
General	Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

**TOXICOLOGICAL INFORMATION:** Treat symptomatically.

**STORAGE:**

In order to ensure microbial purity and potency DiPel 2X DF Biological Insecticide should be stored in the original container at 0 to 25°C and use within 36 months of the date of manufacture. Store container upright and keep tightly closed when not in use.

**DISPOSAL:**

1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Follow provincial instruction for any required additional cleaning of the container prior to its disposal.
3. Make the empty container unsuitable for further use.
4. Dispose of the container in accordance with provincial requirements.
5. For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

**NOTICE TO USER:**

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Registrant:  
Valent BioSciences LLC  
870 Technology Way  
Libertyville, Illinois 60048, USA  
1-800-323-9597

Canadian Agent:  
Valent Canada, Inc.  
201-230 Hanlon Creek Blvd.  
Guelph, Ontario N1C 0A1

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**RESISTANCE MANAGEMENT RECOMMENDATIONS:**

For resistance management, please note that DiPel 2X DF Biological Insecticide contains a Group 11 insecticide. Any insect population may contain individuals naturally resistant to DiPel 2X DF Biological Insecticide and other Group 11 insecticides. The resistant individuals may dominate the insect population if this group of insecticides are used repeatedly in the same site. Other resistance mechanisms that are not linked to site of action but are specific for individual chemicals, such as enhanced metabolism, may also exist. The following appropriate resistance management strategies should be followed to delay insecticide resistance:

- Where possible, rotate the use of DiPel 2X DF Biological Insecticide or other Group 11 insecticides with different groups that control the same pests in a site.
- Insecticide use should be based on an Integrated Pest Management program that includes scouting, record keeping, and considers cultural, biological and other chemical control practices.
- Monitor treated pest populations for resistance development.
- Contact your local extension specialist or certified crop advisors for any additional pesticide resistance management and/or integrated pest management recommendations for the specific site and pest problems in your area.
- For further information or to report suspected resistance, contact Valent BioSciences LLC at 1-800-323-9597

**DIRECTIONS FOR USE:**

DO NOT apply this product through any type of irrigation system.

DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

DO NOT allow effluent or runoff from greenhouses containing this product to enter lakes, streams, ponds or other waters.

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 2X DF Biological Insecticide at the site of larval feeding. Use overhead and drop nozzles to obtain good spray coverage on both side of foliage. Use sufficient spray volume to ensure uniform deposition on all plant surfaces.
- Repeat applications at an interval sufficient to maintain control, usually 3 to 14 days, depending on plant growth rate, moth activity, rainfall after treatment 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.
- Consult provincial guidelines and regional advisors for specific information about the timing and number of applications.
- A spreader-sticker approved for use on growing and harvested crops should be used for hard-to-wet crops such as cabbage or to improve weather fastness of the spray deposits.
- DiPel 2XDF Biological Insecticide may be applied up to the day of harvest.
- DO NOT allow spray mixture to stand in the tank for more than 12 hours

#### **MIXING INSTRUCTIONS:**

Partially fill spray tank with water and provide moderate agitation. Add the required amount of DiPel 2X DF Biological Insecticide while maintaining agitation. Add remaining water, if any. Maintain moderate agitation while loading and spraying. Do not mix more DiPel 2X DF Biological Insecticide than can be used in a 12-hour period.

#### **Aerial Application Instructions:**

Apply only by fixed-wing or rotary aircraft equipment that has been functionally and operationally calibrated for the atmospheric conditions of the area and the application rates and conditions of this label.

Label rates, conditions and precautions are product specific. Apply only at the rate recommended for aerial application on this label. Where no rate for aerial application appears for the specific use, this product cannot be applied by any type of aerial equipment.

Ensure uniform application by using appropriate marking devices and/or electronic guidance equipment.

#### **Use Precautions:**

Apply only when meteorological conditions at the treatment site allow for complete and even coverage. Apply only when meteorological conditions are in compliance with local and /or provincial authorities.

#### **Operator Precautions:**

DO NOT allow the pilot to mix product to be loaded onto the aircraft. However, loading of premixed product with a closed system is permitted. It is desirable that the pilot has communication capabilities at each treatment site at the time of application.

The field crew and the mixer/loaders must wear the personal protective equipment described in the PRECAUTIONS section of this label. When handlers/loaders use closed systems to load product onto the aircraft, the handler requirement for eye goggles and a NIOSH-approved respirator with any N-95, R-95, or P-95 filter for biological products may be waived. When reduced personal protective equipment is worn, the respirator/mask and eye goggles must be immediately available for use in an emergency such as a spill or equipment breakdown.

All personnel on the job site must wash hands and face thoroughly before eating and drinking. Protective clothing must be washed before reuse. Decontaminate aircraft cockpit and vehicle cabs if contamination occurs.

**Product Precautions:**

Read and understand the entire label before opening this product. If you have questions, call the manufacturer at 1-800-323-9597 or obtain technical advice from the distributor or from your provincial agricultural or forestry representative. Application of this specific product must meet and/or conform to the aerial uses and rates on this label.

**APPLICATION RATE:**

CROP	PEST	Rate (g/ha)
APPLES	Leafrollers* (Fruitree, European, Obliquebanded, Three-lined)	1125-1675
	Winter moth**  *Apply in 600-800 L/ha at pink stage and, if populations are heavy, at petal fall using an air-blast orchard sprayer. Weekly applications may be necessary if egg hatch is asynchronous. Best results are obtained if applications are made in the evening or on a cloudy day.  **For use in combination with Ripcord or Cymbush. See the respective labels for specific instructions.	280



CROP	PEST	Rate (g/ha)
LOWBUSH BLUEBERRIES	Blueberry spanworm ( <i>Itame argillacearia</i> ) Chainspotted geometer ( <i>Cingilia catenaria</i> ) Rannoch looper ( <i>Itame brunneata</i> )  Maximum of four applications per year. Apply in a minimum of 300L/ha. Apply when larvae in the first or second instar are present at or above the economic threshold.	550-1125
BROCCOLI	Cabbage looper Diamondback moth Imported cabbageworm	275-550 55-140 55-140
CABBAGE	Cabbage looper Imported cabbageworm Diamondback moth	275-550 55-275 275
CAULIFLOWER	Cabbage looper Imported cabbageworm	275-550 55-140
CHINESE CABBAGE BOK CHOY CHINESE BROCCOLI ASIAN RADISH	Diamondback moth Cabbage looper  Imported cabbageworm  Maximum of five (5) applications. Ground application only. Apply in 400L water/ha. Treat when larvae are young and actively feeding	275 275-550  55-140
CHOKECHERRY ORCHARDS and SHELTERBELTS	Fall Webworm  One application per year; Mix 0.288 kg product in 1000L of water; apply at a rate of 22L mixture per 100 m <sup>2</sup> apply as soon as tents are visible; ground application; apply as a foliar spray until foliage is wet but not dripping.	635
COLLARDS	Cabbage looper	275-550
CRANBERRIES	Green and Brown spanworm	275-550

CROP	PEST	Rate (g/ha)
GINSENG	Leafrollers  Maximum of two applications per year; ground application; apply in 760-1250 L/ha water; for best control apply when larvae are in early instar stage; apply again if scouting indicates heavy infestation or if egg hatch is asynchronous.	565 - 1125
GRAPE	Grape Berry Moth – Begin applications after adult flight begins, before egg hatch. Use a high water volume to ensure complete coverage. Monitor moth activity. The application may be repeated if needed every 7-10 days up to 6 applications per year.  Leafrollers - The application may be repeated if needed every 3-14 days up to 4 applications per year.  Bagworms including snailcase bagworm - One application per year to be applied when larvae are feeding on grape, in late summer.	1125  1125  125-250 g/400L water
HERB AND SPICES GROUP (including celery seed, parsley (dried), mustard seed, nasturtium, basil, caraway, catnip, chervil (dried), coriander, dill and fennel); mint	Cabbage Looper ( <i>Trichoplusia ni</i> Hubner)  Maximum of 5 application per year; apply in 600 - 800 L of water. Use diluted spray mixture within a 12 hour period. Apply after egg hatch when the majority of larvae are young and actively feeding.	275 - 550 (8.2 - 17.6 BCLU/ha)
HIGHBUSH BLUEBERRIES	Cranberry Fruitworm* Cherry Fruitworm*  *Apply at egg hatch of the target pest, from petal fall through to green fruit stage in a minimum of 300 L/ha of water using an air blast orchard sprayer or suitable alternative ground application equipment. Best results are obtained if applications are made in the evening or on a cloudy day. DiPel 2X DF Biological Insecticide may be applied up to the day of harvest. *Maximum of four applications per season, usually 3-14 days apart. Weekly applications may be necessary if the egg hatch is asynchronous.	1680 g/ha or 1.68 kg/ha  (54 BCLU/ha)

CROP	PEST	Rate (g/ha)
HOPS	Hop Looper	275-550
	European Corn Borer	560-1120
	For application use foliar air-blast sprayer. Use sufficient spray volume to ensure thorough coverage and uniform deposition on all plant surfaces. Apply at first sign of infestation when larvae are small. Repeat application at an interval sufficient to maintain control, usually 3 to 14 days, depending on plant growth rate, moth activity, rainfall after treatment and other factors.	
KALE	Cabbage Looper	275-550
LETTUCE	Cabbage Looper	275-550
MUSTARD GREENS	Cabbage Looper	275-550
NUT CROPS - Hazelnuts, Walnuts, Sweet chestnuts, Pecans	Leafrollers* (Fruitree, European, Obliquebanded, Three-lined)	1125-1675
PARSLEY	Cabbage Looper	275
PEARS	Leafrollers* (Fruitree, European, Obliquebanded, Three-lined)	1125-1675
	Fruitworm** *Apply in 600-800 L/ha at pink stage and, if populations are heavy, at petal fall using an air-blast orchard sprayer. Weekly applications may be necessary if egg hatch is asynchronous. Best results are obtained if applications are made in the evening or on a cloudy day. **Apply in 2000 L/ha at pink stage to petal drop in evening or on cloudy days using an air-blast orchard sprayer.	1125-1675
POTATOES	Cabbage Loopers ( <i>Trichoplusia ni</i> ) Maximum of 4 applications per season; apply in a minimum of 600 L/ha of water. <b>Ground application only.</b>	560-1120

CROP	PEST	Rate (g/ha)
QUINOA	European Corn Borer  Apply when pinhole feeding is observed in at least 5% of the plants. Repeat at 7-day intervals if corn borer population increases, or as advised by regional advisors. DiPel 2X DF is only effective against small larvae and must be applied before larvae begin stalk-boring.	560-1120
RED RASPBERRIES	Early Season Obliquebanded Leafroller* *Apply with ground equipment at prebloom and bloom	550-1125
SPINACH	Cabbage looper	275-550
STONE FRUIT Apricot, Cherry Nectarine Peach Plum/Prune	Leafrollers* (Fruittree, European, Obliquebanded, Three-lined)  Fruitworm**  *Apply in 600-800 L/ha at pink stage and, if populations are heavy, at petal fall using an airblast orchard sprayer. Weekly applications may be necessary if egg hatch is asynchronous. Best results are obtained if applications are made in the evening or on a cloudy day.  **Apply in 2000 L/ha at pink stage to petal drop in evening or on cloudy days using an airblast orchard sprayer.	1125-1675  1125-1675
SUNFLOWERS	Sunflower Moth*  *Applied aerially, mix the applicable amount (grams) per minimum of 20 liters of water. Apply when 20-50% heads in bloom. Thorough coverage of larval feeding sites within flowers is necessary for adequate control. Apply when provincial authorities recommend treatment based on pheromone trap counts. A second application may be required if trap counts are high.	315-625

CROP	PEST	Rate (g/ha)
SWEET and FIELD CORN	European Corn Borer  Apply when pinhole feeding is observed in at least 5% of the plants. Repeat at 7-day intervals if corn borer population increases, or as advised by regional advisors. DiPel 2X DF Biological Insecticide is only effective against small larvae and must be applied before larvae begin stalk-boring.	560-1120
TIMOTHY	Essex (European) skipper	140-275
TURNIP GREEN	Cabbage looper	275-550
TOBACCO	Hornworm	55-140
TOMATOES	Cabbage looper Tomato fruitworm* Tomato hornworm  *Apply ever 5 to 7 days	275-550 550 140-275
CROP GROUP 13 -07 (berries and small fruit) Blackberry, blueberry (highbush, lowbush), currant (black, red), elderberry, gooseberry, huckleberry, raspberry (black, red), amur river grape, aronia berry, bayberry, bearberry, bilberry, buffalo currant, buffaloberry, che, chokecherry, cloudberry, cranberry, European barberry, grape, highbush cranberry, honeysuckle, jostaberry, juneberry, lingonberry, mayopop, mulberry, muntries, native currant, partridgeberry, pincherry, riberry, salal, sea buckthorn, serviceberry, strawberry, wild raspberry.	Fruittree leafroller European leafroller Obliquebanded leafroller Three-lined leafroller  Treat when larvae are young (early instar) before the crop is damaged. Repeat applications at an interval sufficient to maintain control, usually 3 – 14 days.  Spray volume: 600 L/ha  Thorough coverage of all foliage is essential.	525 – 1125

CROP	PEST	Rate (g/ha)
OUTDOOR ORNAMENTALS (BOXWOOD)	<p>Box Tree Moth (<i>Cydalima perspectalis</i>)</p> <p>Treat when larvae are young and actively feeding on exposed plant surfaces.</p> <p>Repeat applications at an interval sufficient to maintain control, usually 7 days.</p> <p>Use sufficient volume to ensure thorough coverage.</p>	560 – 1120g/ha

**APPLICATION RATE:  
FOR GREENHOUSE USE**

CROP	PEST	RATE
GROUP 8-09 FRUITING VEGETABLES (EGGPLANT, AFRICAN EGGPLANT, SCARLET EGGPLANT, GROUNDCHERRY, MARTYNIA, OKRA, BELL PEPPERS, NON-BELL PEPPER, TOMATILLO TOMATOES FOR FRUIT AND TRANSPLANT PRODUCTION)	<p><i>Duponchelia fovealis</i></p> <p>Make applications when egg hatch is essentially complete when larvae are small but before crop damage occurs. Apply the product such that it flows along the stem, coating it well. Thorough coverage of foliage and stem is necessary.</p> <p>Apply every 7 days as required by monitoring.</p>	625 g/1000 L
	<p>Lepidopteran leafminers</p> <p>Apply at egg hatch. Thorough coverage of foliage and stems is necessary. Apply every 7 to 10 days as required by monitoring.</p>	500 – 1000 g/1000 L

CROP	PEST	RATE
GREENHOUSE STRAWBERRY	<p>Fruittree leafroller European leafroller Obliquebanded leafroller Three-lined leafroller</p> <p>Treat when larvae are young (early instar) before the crop is damaged. Repeat applications at an interval sufficient to maintain control, usually 3 – 14 days.</p> <p>Spray volume: 600 L/ha</p> <p>Thorough coverage of all foliage is essential.</p>	525 – 1125 g/ha
GREENHOUSE EGGPLANT	<p>Cabbage looper</p> <p>Apply at egg hatch to target young larvae (early instars). For best control thorough spray coverage is required. Ensure uniform deposits of DiPel 2X DF at sites of feeding and include treatment to both sides of foliage. Under heavy population pressure, or for larger larvae, shorten the spray interval or use the higher rate range. Repeat applications at an interval to maintain control, usually 3-14 days. DiPel 2X DF Biological Insecticide may be applied up to the day of harvest.</p> <p>Maximum of four applications per season, usually 3-14 days apart. Weekly applications may be necessary if the egg hatch is asynchronous.</p>	75-150 g/250 L

<b>CROP</b>	<b>PEST</b>	<b>RATE</b>
PEPPERS	<p data-bbox="560 279 764 312">Cabbage looper</p> <p data-bbox="560 354 1114 789">Apply at egg hatch to target young larvae (early instars). For best control through spray coverage is required. Ensure uniform deposits of DiPel 2X DF at sites of feeding and include treatment to both sides of foliage. Under heavy population pressure, or for larger larvae, shorten the spray interval or use the higher rate range. Repeat applications at an interval to maintain control, usually 3-14 days. DiPel 2X DF Biological Insecticide may be applied up to the day of harvest.</p> <p data-bbox="560 831 1101 968">Maximum of four applications per season, usually 3-14 days apart. Weekly applications may be necessary if the egg hatch is asynchronous.</p>	75-150g/250 L
TOMATO	<p data-bbox="560 991 764 1024">Cabbage looper</p> <p data-bbox="560 1066 1114 1501">Apply at egg hatch to target young larvae (early instars). For best control through spray coverage is required. Ensure uniform deposits of DiPel 2X DF at sites of feeding and include treatment to both sides of foliage. Under heavy population pressure, or for larger larvae, shorten the spray interval or use the higher rate range. Repeat applications at an interval to maintain control, usually 3-14 days. DiPel 2X DF Biological Insecticide may be applied up to the day of harvest.</p> <p data-bbox="560 1543 1101 1680">Maximum of four applications per season, usually 3-14 days apart. Weekly applications may be necessary if the egg hatch is asynchronous.</p>	75-150g/250 L



CROP	PEST	RATE
GREENHOUSE CUCUMBER	<p><i>Duponchelia fovealis</i></p> <p>Make applications when egg hatch is essentially complete when larvae are small but before crop damage occurs. Apply the product such that it flows along the stem, coating it well. Thorough coverage of foliage and stem is necessary.</p> <p>Loopers  Alfalfa looper (<i>Autographa californica</i>)  Cabbage looper (<i>Trichoplusia ni</i>)  <i>Chrysodeixis spp.</i></p> <p>Apply at egg hatch to target young larvae (early instars). For best control thorough spray coverage is required. Ensure uniform deposits of DiPel 2X DF Biological Insecticide at sites of feeding and include treatment to both sides of foliage. Under heavy population pressure, or for larger larvae, shorten the spray interval or use the higher rate range. Repeat application at an interval to maintain control, usually 3-14 days. DiPel 2X DF Biological Insecticide may be applied up to the day of harvest. Weekly applications may be necessary if the eggs hatch is asynchronous.</p>	<p>625 g/1000 L</p> <p>75 – 150 g/250 L</p>
GREENHOUSE WASABI ( <i>Wasabia japonica</i> )	<p>Cabbage Looper, <i>Trichoplusia ni</i></p> <p>Alfalfa Looper, <i>Autographa californica</i></p> <p>Apply at first signs of infestation. Treat when the larvae are young (early instars) before the crop is damaged. Larvae must be actively feeding on treated exposed plant surfaces</p> <p>Repeat applications at interval sufficient to maintain control, usually 7 to 10 days. Maximum of 8 applications per year.</p>	75-150g/250L

<b>CROP</b>	<b>PEST</b>	<b>RATE</b>
GREENHOUSE ORNAMENTALS GREENHOUSE HERBS	<i>Duponchelia fovealis</i>  Make applications when egg hatch is essentially complete when larvae are small but before crop damage occurs. Apply the product such that it flows along the stem, coating it well and into the top layer of the soil around the base of the plant. Thorough coverage of foliage and stem is necessary. Apply every 7 days as required by monitoring.	625 g/1000 L
ROSES	Omnivorous leafroller* * Apply to upper and lower portions of the leaves to run-off. Repeat applications will be necessary if a new hatch occurs	250 g/400L
CHRYSANTHEMUMS	Cabbage looper* * Apply to upper and lower portions of the leaves to run-off. Repeat applications will be necessary if a new hatch occurs	125-250 g/400L

ORNAMENTAL AND SHADE TREES	g per 400L Hydraulic Sprayer*
Spruce budworm (Spruce)	125-250
Gypsy moth	125-250
Bagworm	125-250
Spring and Fall cankerworm	125
Fall webworms	125
Elm spanworm	250
Tent caterpillar	65-125
*For most blowers, mix the application amount (grams) with 40 liters of water.	

SEA BUCKTHORN (Ornamental use only)	g per 400L Hydraulic Sprayer*
Gypsy moth	125-250
*For most blowers, mix the application amount (grams) with 40 liters of water.	

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