

Group 11 Insecticide

Foray[®] 48B
Biological Insecticide Aqueous Suspension

For Use in Forests, Woodlands, and Other Treed Areas

RESTRICTED
READ THE LABEL BEFORE USING

GUARANTEE:

Bacillus thuringiensis subsp. kurstaki strain ABTS-351..... Potency: 10,600 Cabbage
Looper Units (CLU)/mg of product (equivalent to 10 billion CLU/kg).

The potency measurements are not internationally standardized.

REGISTRATION NO. 24977 PEST CONTROL PRODUCTS ACT

POTENTIAL SENSITIZER
CAUTION EYE IRRITANT
READ THE LABEL BEFORE USING

Net contents: L (Litres)

Date of manufacture: _____

Lot No.:

Best Before:

Registrant:
Valent BioSciences LLC
1910 Innovation Way, Suite 100
Libertyville, IL 60048
USA
1-800-323-9597

Canadian Agent:
Valent Canada, Inc.
201-203 Hanlon Creek Blvd.
Guelph, Ontario N1C 0A1

PRECAUTIONS:

KEEP OUT OF REACH OF UNAUTHORIZED PERSONNEL.

MAY CAUSE SENSITIZATION

CAUTION EYE IRRITANT

Avoid contact with skin, eyes, and clothing. Avoid breathing dust/spray mist. Wear a long sleeved shirt, long pants, waterproof gloves, 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/repair activities. When applicators use closed systems (e.g. enclosed cabs) the personal protective equipment requirements may be reduced or modified. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

FIRST AID	
If on skin or clothing	Rinse skin immediately with plenty of water. Remove contaminated clothing and wash separately before reuse. If irritation occurs and persists or is severe, seek medical attention.
If in eyes	Hold eye open and rinse slowly and gently with water. Remove contact lenses, if present, then continue rinsing eye. If irritation occurs and persists or is severe, seek medical attention.
If inhaled	Move person to fresh air, apply respiration if needed and seek medical attention.
If swallowed	Rinse mouth and throat with copious amounts of water. DO NOT induce vomiting. Promptly contact a physician or poison control centre. DO NOT give anything by mouth to an unconscious person.
General	Seek medical attention if irritation or signs of toxicity occur and persist or is severe. 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, Foray 48B Biological Insecticide Aqueous Suspension should be stored in the original container at 0 - 25°C and used within 12 months of the date of manufacture. After extended storage, vigorously shake or stir contents to assure a uniform suspension.

DISPOSAL:

Do not reuse this container for any purpose. This is a recyclable container, and is to be disposed of at a container collection site. Contact your local distributor/dealer or municipality for the location of the nearest collection site.

Before taking the container to the collection site:

Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank. Make the empty, rinse container unsuitable for further use.

If there is no container collection site in your area, dispose of the container in accordance with provincial requirements.

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.

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. As this pesticide is not registered for control of pests in aquatic systems, DO NOT use to control aquatic pests.

DO NOT allow spray mixture to stand in the tank for more than 12 hours. Recirculate mixture before loading and/or application.

Foray 48B Biological Insecticide Aqueous Suspension contains spores and insecticidal crystals of a naturally occurring strain of *Bacillus thuringiensis* sub-species *kurstaki*.

Foray 48 B is highly specific to some lepidopteran larvae. It is a stomach poison only and therefore must be ingested by the larvae to be effective. After ingestion of a sufficient dose, feeding ceases and death will follow in 2 - 5 days.

In general, larvae should be treated when they are newly hatched. Young larvae (early instars) are most susceptible to the effects of *Bacillus thuringiensis* sub-species *kurstaki* and less damage will have been caused by larval feeding. Thorough spray coverage with well-distributed deposits of Foray 48B Biological Insecticide Aqueous Suspension is necessary to assure that the feeding larvae ingest a toxic dose.

Foray 48B Biological Insecticide Aqueous Suspension is a water based formulation which may be applied undiluted or diluted with clean water. Dilute with minimal quantities of water only when required to improve deposit. Do not use petroleum-based solvents. Foray 48B Biological Insecticide Aqueous Suspension does not settle out rapidly, so continual agitation is not recommended and should be avoided

Even though Foray 48B Biological Insecticide Aqueous Suspension deposits are relatively resistant to wash-off, avoid application when significant rainfall is imminent. For early morning applications, foliage should not be wet with dew to the point of runoff.

Consult with recognized forest pest control authority or Valent BioSciences Corporation representative regarding appropriate timing and method of application. The timing and number of applications required for effective control will depend upon foliage development and larval activity. For effective control, applications should coincide with sufficient foliage development (shoot elongation or leaf expansion) to ensure maximum spray deposit.

To the extent possible, apply treatments after egg hatch has been completed to assure that the maximum number of larvae are present during the treatment period. If Foray 48B Biological Insecticide Aqueous Suspension is applied in later larval instars and/or extremely high larval populations, use the higher label rates and/or additional applications.

To control eastern spruce budworm, treat prior to 5th instar larval development and when bud flush/shoot development is sufficient to allow good deposit on emerging needles.

Timing of treatment of the two-year cycle spruce budworm depends on the year of its life cycle. For first year larvae treat early instars when bud flush/shoot development is sufficient to allow good deposit on emerging needles. For second year larvae treat larvae at peak 4th instar when bud flush/shoot development is sufficient to allow good deposit on emerging needles.

For consistently acceptable control of western spruce budworm, two-year cycle spruce budworm and western blackhead budworm, higher rates and volumes of spray may be required to achieve satisfactory deposit in mountainous terrain.

Treat against gypsy moth when larvae are in 2nd and 3rd instar and when leaf expansion is 40 – 50%; when egg hatch is extended, 2 or more applications, 7-10 days apart, may be required.

For best control of eastern or western hemlock looper, apply when larvae are young (early instars) before extensive damage occurs and/or when a majority of buds have flushed or shed bud caps. Repeat applications at intervals to maintain control, usually 3-14 days depending on larval growth and weather. If control is sought with a single spray, wait until egg hatch is essentially complete.

To control Whitemarked Tussock Moth in conifers, apply first at peak second instar, then make a second application 2-5 days later.

For control of Jackpine budworms, apply undiluted at 20-30 BCLU/ha to early larval instars; double applications several days apart may be considered. For consistent control of very high larval populations, one single application at higher rates up to 60 BCLU/ha may be required.

For control of Eastern and Western Blackheaded Budworm apply two applications at 30 BCLU/ha or one application at 60 BCLU/ha. For two applications at 30 BCLU/ha make the first application at the late egg hatch and follow up with a second application 3 to 7 days later. For a single application at 60 BCLU/ha apply after 100% egg hatch.

To control pale-winged gray, make one application of Foray 48B Biological Insecticide Aqueous Suspension at close to 100% egg hatch.

GROUND APPLICATION:

With ground equipment, provide thorough coverage while minimizing runoff. Dilute Foray 48B Biological Insecticide Aqueous Suspension only to provide sufficient volume for thorough coverage.

For mist blower applications, add the recommended volume of Foray 48B Biological Insecticide Aqueous Suspension to water, at a mix ratio ranging from 1:20 to 1:50. Do not exceed 150 litres/hectare total mixture.

For high volume hydraulic sprayers, add the recommended volume of Foray 48B Biological Insecticide Aqueous Suspension to water at a mix ratio ranging from 1:50 to 1:500. Do not exceed 1500 litres/hectare total mixture.

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/mask 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 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 regularly.

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.

RESTRICTED USES:

FORESTS, WOODLANDS AND RESIDENTIAL AREAS

NOTICE TO USER: This pest control product is to be used only in accordance with the directions on the label. It is an offence under the Pest Control Products Act to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

NATURE OF RESTRICTION: This product is to be used only in the manner authorized; contact local pesticide regulatory authorities about use permits which may be required.

Forestry Use: Ground/Aerial Application for sites greater than 500 ha.

Woodland Use: Aerial Application for sites 500 ha or less.

Residential Use: Aerial Application. Consult local Transport Canada office regarding air regulations for urban and/or forestry applications. Foray 48B Biological Insecticide Aqueous Suspension may be used for aerial application in urban areas for treatment of residential areas and municipal recreational areas (including parks, parkland, vacant lots, shelterbelts, and rights of way under municipal jurisdiction).

Undiluted applications are recommended for most labeled pests; however, Foray 48B Biological Insecticide Aqueous Suspension may be diluted with water and applied at the rates indicated in the dose rate table. Total volume of spray material to be applied per hectare depends upon target pest, target foliage, weather, spray equipment and droplet size.

Recommended droplet size spectra are from 30 – 80 microns for coniferous foliage and 50 – 150 microns for broadleaf foliage.

DOSE RATES: AERIAL AND GROUND APPLICATION¹ FORESTS, WOODLANDS, ORNAMENTALS AND OTHER TREED AREAS

Target insect	RATE Litre/ha	DOSE BCLU/ha
Eastern Spruce Budworm	1.6 – 2.4	20 – 30
Western Spruce Budworm	2.4 – 3.1	30 – 40
Gypsy Moth	2.4 – 4.0	30 – 50
Jackpine Budworm ²	1.6 – 4.8	20 – 60
Forest Tent Caterpillar	1.0 – 1.6	12 – 20
Spring & Fall Cankerworm	1.0 – 1.6	12 – 20
Eastern Hemlock Looper	2.4 – 3.2	30 – 40
Western Hemlock Looper	2.4 – 3.2	30 – 40
Satin Moth	4.0	50
Whitemarked Tussock Moth	4.0	50
Pale-winged Gray	3.1	40
Douglas-fir Tussock Moth ³	4.0	50
Eastern Blackheaded Budworm	2.4 – 4.8	30 – 60
Two-year Cycle Spruce Budworm	2.4 – 3.1	30 – 40
Western Blackheaded Budworm	2.4 – 4.8	30 - 60

¹ See the restricted uses for aerial application to forests, woodlands, and residential areas, and ground application to forests.

² For control of Jackpine budworms, apply undiluted at 20-30 BCLU/ha to early larval instars; double applications several days apart may be considered. For consistent control of very high larval populations, one single application at higher rates up to 60 BCLU/ha may be required.

³ For control of Douglas-fir tussock moth, target application at the peak of second instar and make a second application 2-5 days later.

RESISTANCE MANAGEMENT RECOMMENDATIONS:

For resistance management, please note that Foray 48B Biological Insecticide Aqueous Suspension contains a Group 11 insecticide. Any insect population may contain individuals naturally resistant to Foray 48B Biological Insecticide Aqueous Suspension and other Group 11 insecticides. The resistant individuals may dominate the insect population if this group of insecticides is 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 Foray 48B Biological Insecticide Aqueous Suspension 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.

2020-08-25

Sub.No. 2020-3528

- For further information or to report suspected resistance, contact Valent BioSciences LLC at 1-800-323-9597

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