

SPINOSAD

GROUP

5

INSECTICIDE

ExsolantTM XHL

For the control of lepidopterous larvae (worms or caterpillars), leafminers and thrips

ACTIVE INGREDIENT:

Spinosad (a mixture of spinosyn A and spinosyn D)..... 44.0%

OTHER INGREDIENTS: 56.0%

TOTAL 100.0%

Contains 4lb of active ingredient per gallon.

KEEP OUT OF REACH OF CHILDREN CAUTION

SEE INSIDE LABEL BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS AND DIRECTIONS FOR USE

For Medical Emergencies,
Call (877) 325-1840

For Chemical Spill, Leak, Fire,
or Exposure, Call CHEMTREC
(800) 424-9300

EPA Reg. No. 71368-146



Net Contents
1 Gal. (3.78 L)
Non-refillable container

Manufactured for:
Nufarm, Inc.
11901 S. Austin Avenue
Alsip, IL 60803

 **nufarm**

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Warranty Disclaimer

Limitation of Liability

Storage and Disposal

FIRST AID

IF ON SKIN OR CLOTHING

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call poison control center or doctor for treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-877-325-1840 for emergency medical treatment information.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Harmful if absorbed through skin. Avoid contact with skin, eyes or clothing. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

All applicators and other handlers must wear a minimum of:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, polyvinyl chloride (PVC) ≥ 14 mils, or Viton ≥ 14 mils
- Shoes plus socks

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

USER SAFETY RECOMMENDATIONS

Users Should:

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

ENVIRONMENTAL HAZARDS

This product is toxic to aquatic invertebrates. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high-water mark. Do not contaminate water when disposing of equipment washwaters. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from treated areas. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Applying this product when rain is not predicted for the next 24 hours will help reduce potential risk to aquatic invertebrates by reducing pesticide runoff from the treatment area into water bodies. This product is highly toxic to bees and other pollinating insects exposed to direct treatment, or to residues in/on blooming crops or weeds. Protect pollinating insects by following label directions intended to minimize drift and reduce risk to these organisms. Apply this product only as specified on the label.

PHYSICAL AND CHEMICAL HAZARDS

Do not mix or allow coming in contact with oxidizing agents, hazardous chemical reaction may occur.

DIRECTIONS FOR USE

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

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. 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 enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

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AGRICULTURAL USE REQUIREMENTS *(continued)*

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

- Coveralls
- Chemical-resistant gloves made of barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, polyvinyl chloride (PVC) ≥ 14 mils, or Viton ≥ 14 mils
- Shoes plus socks

NON-AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. Refer to label booklet under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

Product Information

Exsolant XHL is an insect control product for control of many foliage feeding pests including lepidoptera larvae (worms or caterpillars), Colorado potato beetles, leafminers and thrips infesting labeled crops. This product's active ingredient, spinosad, is biologically derived from the fermentation of *Saccharopolyspora spinosa*, a naturally occurring soil organism. Mix Exsolant XHL with water and apply as a foliar spray with aerial or ground equipment equipped for conventional insecticide spraying.

The use of this product to manufacture or formulate other pesticide products is prohibited.

Product Use Precautions

Integrated Pest Management (IPM) Programs

Exsolant XHL is recommended for IPM programs in labeled crops. Apply Exsolant XHL when field scouting indicates target pest densities have reached the economic threshold, i.e., the point at which the insect population must be reduced to avoid economic losses beyond the cost of control. Other than reducing the target pest species as a food source, Exsolant XHL does not have a significant impact on certain parasitic insects or the natural predaceous arthropod complex in treated crops, including big-eyed bugs, ladybird beetles, flower bugs, lacewings, minute pirate bugs, damsel bugs, assassin bugs, predatory mites or spiders. The feeding activities of these beneficials will aid in natural control of other insects and reduce the likelihood of secondary pest outbreaks. If Exsolant XHL is tank mixed with any insecticide that reduces its selectivity in preserving beneficial predatory insects, the full benefit of Exsolant XHL in an IPM program may be reduced.

Insect Resistance Management (IRM)

For resistance management, Exsolant XHL contains spinosad, a Group 5 insecticide. Any insect population may contain individuals naturally resistant to Exsolant XHL and other Group 5 insecticides. The resistant individuals may dominate the insect population if this group of insecticides are used repeatedly in the same fields. Appropriate resistance-management strategies should be followed.

To delay development of insecticide resistance, the following practices are recommended:

- Carefully follow the specific label guidelines within the use directions sections of this label, especially in regard to IRM recommendations.
- Rotate the use of Exsolant XHL or other Group 5 insecticides within a growing season, or among growing seasons, with different groups that control the same pests.
- Use tank mixtures with insecticides from a different group that are equally effective on the target pest when such use is permitted. Do not rely on the same mixture repeatedly for the same pest population. Consider any known cross-resistance issues (for the targeted pests) between the individual components of a mixture. In addition, consider the following recommendation provided by the Insecticide Resistance Action Committee (IRAC):
 - Individual insecticides selected for use in mixtures should be highly effective and be applied at the rates at which they are individually registered for use against the target species.
 - Mixtures with components having the same IRAC mode of action classification are not recommended for insect resistance management.
 - When using mixtures, consider any known cross-resistance issues between the individual components for the targeted pest(s).
 - Mixtures become less effective if resistance is already developing to one of both active ingredients, but they may still provide pest management benefits.
 - The insect resistance management benefits of an insecticide mixture are greatest if the two components have similar periods of residual insecticidal activity. Mixtures of insecticides with unequal periods of residual insecticide activity may offer an insect resistance management benefit only for the period where both insecticides are active.
- Applications should be targeted against early insect developmental stages whenever possible.
- Adopt an integrated pest management program for insecticide use that includes scouting, uses historical information related to pesticide use, crop rotation, record keeping, and which considers cultural, biological and other chemical control practices.
- Monitor after application for unexpected target pest survival. If the level of survival suggests the presence of resistance, consult with your local university specialist or certified pest control advisor.
- Contact your local extension specialist, certified crop advisor, and/or manufacturer for insecticide resistance management and/or IPM recommendations for the specific site and resistant pest problems.
- For further information or to report suspected resistance, contact your local Nufarm Americas Inc. representative.

Mixing Directions

Always shake well before use. Avoid freezing.

Application Rate Reference Table

Application Rate of Exsolant XHL (fl oz/acre)	Active Ingredient Equivalent (lb ai/acre)	Acres per Gallon of Exsolant XHL
.75	0.023	170
1.5	0.047	85
2	0.062	64
3	0.094	43
4	0.125	32
5	0.156	26

Exsolant XHL- Alone: Fill the spray tank with water to about 1/2 of the required spray volume. Start agitation and add the required amount of Exsolant XHL. Continue agitation while mixing and filling the spray tank to the required spray volume. Maintain sufficient agitation during application to ensure uniformity of the spray mix. Do not allow water or spray mixture to back-siphon into the water source.

It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Exsolant XHL- Tank Mix: When tank mixing Exsolant XHL with other materials, a compatibility test (jar test) using relative proportions of the tank mix ingredients should be conducted prior to mixing ingredients in the spray tank. If foliar fertilizers are used, the jar test should be repeated with each batch of fertilizer utilizing the mixing water source. Do not use acidifying buffering agents in tank mixes with Exsolant XHL. Vigorous, continuous agitation during mixing, filling and throughout application is required for all tank mixes.

Sparger pipe agitators generally provide the most effective agitation in spray tanks. To prevent foaming in the spray tank, avoid stirring or splashing air into the spray mixture.

Mixing Order for Tank Mixes: Fill the spray tank with water to 1/4 to 1/3 of the required spray volume. Start agitation. Add different formulation types in the order indicated below, allowing time for complete dispersion and mixing after addition of each product. Allow extra dispersion and mixing time for dry flowable products.

Add different formulation types in the following order:

1. Water dispersible granules
2. Wettable powders
3. Exsolant XHL and other aqueous suspensions

Maintain agitation and fill spray tank to 3/4 of total spray volume. Then add:

4. Emulsifiable concentrates and water-based solutions
5. Spray adjuvants, surfactants and oils
6. Foliar fertilizers

Finish filling the spray tank. Maintain continuous agitation during mixing, final filling and throughout application. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be resuspended before spraying is resumed. A sparger agitator is particularly useful for this purpose.

Premixing: Dry and flowable formulations may be premixed with water (slurried) and added to the spray tank through a 20 to 35 mesh screen. This procedure assures good initial dispersion of these formulation types.

Spray Tank pH: A spray tank pH between 6.0 and 9.0 is suggested to achieve maximum performance of Exsolant XHL. If the water source is outside of this pH range, or if tank mixing other pesticides, adjuvants, or foliar nutrients will cause the pH to fall outside of this range, consider adjusting the spray tank pH to be between 6.0 and 9.0 before adding Exsolant XHL. To do this, add all other tank mix components first, then check the spray tank pH, adjust if desired, and then add Exsolant XHL. If you require additional information on how to adjust spray tank pH, contact your Nufarm Americas Inc. representative.

Use of Adjuvants: Adjuvants may be used to improve the control of leafminers and thrips in situations where achieving uniform plant coverage is difficult (such as closed crop canopy or dense foliage), or penetration into waxy leaf surfaces is required for pest control.

- Use only adjuvant products labeled for agricultural use and follow the manufacturer's label directions. A nominal concentration of 1 to 2 quarts per 100 gallons (0.25 to 0.5% v/v) is generally sufficient.
- For leafminers and thrips, emulsified crop oils or methylated crop oil plus organosilicone combination products are recommended.
- When using adjuvants, always conduct a jar test to determine the compatibility of the various components in the spray mixture. Crop safety should be evaluated in a small area of the crop whenever there is a significant change in spray mixture ingredients or source of water for the spray mixture.
- Do not use diesel fuel or pure mineral oil.

- Adjuvants may require organic certification; consult your organic certifier.
- When an adjuvant is to be used with this product, Nufarm Americas Inc. recommends the use of a Chemical Producers and Distributors Association certified adjuvant.

Application Directions

Proper application techniques help ensure thorough spray coverage and correct dosage for optimum insect control. The following directions are provided for ground and aerial application of Exsolant XHL. Attention should be given to sprayer speed and calibration, wind speed, and foliar canopy to ensure adequate spray coverage.

MANDATORY SPRAY DRIFT

Aerial Applications:

- Do not release spray at a height greater than 10 feet above the vegetative canopy, unless a greater application height is necessary for pilot safety.
- Applicators are required to use a medium or coarser droplet size (ASABE S572.1).
- Applicators must use ½ swath displacement upwind at the downwind edge of the field.
- Do not apply when wind speeds exceed 15 miles per hour at the application site.
- If the wind speed is greater than 10 mph, the boom length must be 65% or less of the wingspan for fixed wing aircraft and 75% or less of the rotor diameter for helicopters. Otherwise, the boom length must be 75% or less of the wingspan for fixed-wing aircraft and 90% or less of the rotor diameter for helicopters.
- Do not apply during temperature inversions.

Ground Boom Applications:

- User must only apply with the release height recommended by the manufacturer, but no more than 4 feet above the ground or crop canopy.
- Applicators are required to use a medium or coarser droplet size (ASABE S572.1).
- Do not apply when wind speeds exceed 15 miles per hour at the application site.
- Do not apply during temperature inversions.

SPRAY DRIFT ADVISORIES

THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT.
BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.

IMPORTANCE OF DROPLET SIZE

An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if application are made improperly or under unfavorable environmental conditions.

Controlling Droplet Size – Ground Boom

- Volume – Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.
- Pressure – Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.
- Spray Nozzle – Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.

Controlling Droplet Size – Aircraft

- Adjust Nozzles – Follow nozzle manufacturers' recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented with the airflow in flight.

BOOM HEIGHT – Ground Boom

Use the lowest boom height that is compatible with the spray nozzles that will provide uniform coverage. For ground equipment, the boom should remain level with the crop and have minimal bounce.

RELEASE HEIGHT – Aircraft

Higher release heights increase the potential for spray drift. When applying aurally to crops, do not release spray at a height greater than 10 ft above the crop canopy, unless a greater application height is necessary for pilot safety.

SHIELDED SPRAYERS

Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.

TEMPERATURE AND HUMIDITY

When making application in hot and dry conditions, use larger droplets to reduce effects of evaporation.

TEMPERATURE INVERSIONS

Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The presence of an inversion can be indicated by ground fog or by movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Avoid applications during temperature inversions.

WIND

Drift potential generally increased with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS.

- Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.

Orchard Spraying Application

Dilute Spray Application: This application method is based upon the premise that all plant parts are thoroughly wetted, to the point of runoff, with spray solution. To determine the number of gallons of dilute spray required per acre, contact your state agricultural experiment station, certified pest control advisor, or extension specialist for assistance.

Concentrate Spray Application: Apply Exsolant XHL in a manner that achieves uniform coverage of the entire crop canopy, but not past the point of runoff. For optimum control of target pests, complete and uniform spray coverage is essential. The spray volume required to achieve complete and uniform coverage will depend upon tree size and shape, leaf size, and density, and the application equipment used. To determine the required spray volume per acre, contact your state agricultural experiment station, certified pest control advisor, or extension specialist for assistance. Use of tree row volume is appropriate.

Chemigation Application

Exsolant XHL may be applied through properly equipped chemigation systems for insect control in corn, cranberries, ornamentals and potatoes. Follow use directions for these crops in the Uses section of this label. Do not apply Exsolant XHL by chemigation to other labeled crops except as specified in Nufarm Americas Inc. product bulletins.

Directions for Sprinkler Chemigation: Exsolant XHL may be applied through overhead sprinkler irrigation systems that will apply water uniformly, including center pivot, lateral move, end tow, side (wheel) roll, traveler, solid set, micro sprinkler, or hand move. Do not apply this product through any other type of irrigation system. Sprinkler systems that deliver a low coefficient of uniformity such as certain water drive units are not recommended.

For continuously moving systems, the mixture containing Exsolant XHL must be injected continuously and uniformly into the irrigation water line as the sprinkler is moving. If continuously moving irrigation equipment is used, apply in no more than 0.25 inch of water. For irrigation systems that do not move during operation, apply in no more than 0.25 inch of irrigation immediately before the end of the irrigation cycle.

Directions for Drip Chemigation: Exsolant XHL may be applied through surface or buried drip systems or micro-sprinklers. Drip irrigation application procedures are designed to minimize soil adsorption and maximize the bio-availability of Exsolant XHL to target pests. For best results, make the application in conjunction with continuous drip irrigation or a normal drip irrigation cycle as described in the following steps:

1. **Pre-irrigation:** Moderate pre-irrigation is required. Soil in the vicinity of emitters should be at or above field capacity prior to injection of Exsolant XHL.
2. **Application Rate:** Apply an amount equivalent to the labeled broadcast application rate for the labeled crop.
3. **Injection:** Prior to injection, fully charge the drip irrigation system and make sure it is in operation. Injection of Exsolant XHL should occur without interruption following pre-irrigation. Mix Exsolant XHL in a dilution volume sufficient for a 1- to 4-hour injection period based upon the system calibration. Continuously agitate the mixture in the injection system supply tank throughout the injection cycle. Inject the diluted mixture of Exsolant XHL into the center of the irrigation water stream using a suitable dip tube to encourage thorough mixing and even distribution within the drip irrigation system. This is especially important if flow is slow or laminar

Chemigation Preparation: The following use directions are to be followed when this product is applied through sprinkler irrigation systems. Thoroughly clean the chemigation system and tank of any fertilizer or chemical residues and dispose of the residues according to state and federal laws. Flush the injection system with soap or a cleaning agent and water. Determine the amount of Exsolant XHL needed to cover the desired acreage. Mix according to instructions in the Mixing Directions section above. Continually agitate the mixture during mixing and application.

Chemigation Equipment Calibration: In order to calibrate the irrigation system and injector to apply the mixture containing Exsolant XHL, determine the following: 1) Calculate the number of acres irrigated by the system; 2) Calculate the amount of product required and premix; 3) Determine the irrigation rate and determine the number of minutes for the system to cover the intended treatment area; 4) Calculate the total gallons of insecticide mixture needed to cover the desired acreage. Divide the total gallons of insecticide mixture needed by the number of minutes (minus time to flush out) to cover the treatment area. This value equals the gallons per minute output that the injector or eductor must deliver. Convert the gallons per minute to milliliters or ounces per minute if needed. Calibrate the injector system with the system in operation at the desired irrigation rate. It is suggested that the injection pump/system be calibrated at least twice before operation and that the system should be monitored during operation.

Chemigation Operation: Start the water pump and irrigation system and let the system achieve the desired pressure and speed before starting the injector. Check for leaks and uniformity and make repairs before any chemigation takes place. Start the injection system and calibrate according to manufacturer's specifications. This procedure is necessary to deliver the desired rate per acre in a uniform manner.

When the application is finished, allow the entire irrigation and injection system to be thoroughly flushed clean before stopping the system.

Chemigation Precautions:

- Lack of effectiveness or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.
- If you have questions about calibration, contact state extension service specialists, equipment manufacturers or other experts.
- Do not connect an irrigation system used for pesticide application (including greenhouse systems) to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place with current certification. Specific local regulations may apply and must be followed.
- A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall operate the system and make necessary adjustments should the need arise and continuously monitor the injection.
- Do not apply when wind speed favors drift beyond the area intended for treatment. End guns must be turned off during the application if they irrigate nontarget areas.
- Do not allow irrigation water to collect or run off and pose a hazard to livestock, wells, or adjoining crops.
- Do not enter treated area during the reentry interval specified in the Agricultural Use Requirements section of this label unless required PPE is worn.
- Do not apply through sprinkler systems that deliver a low coefficient of uniformity such as certain water drive units.
- Limit application of Exsolant XHL by drip irrigation systems to coarse textured soils with low organic matter content. Product effectiveness is reduced in soils with significant clay or organic matter.
- Do not tank mix Exsolant XHL with other pesticides or agricultural products when applying through drip irrigation systems.
- If Exsolant XHL is applied by drip irrigation, do not make broadcast foliar applications of Exsolant XHL during the crop cycle.

Chemigation Specific Equipment Requirements:

- The system must contain an air gap or approved backflow prevention device, or approved functional check valve, vacuum relief valve (including inspection port), and low-pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back flow. Refer to the American Society of Agricultural Engineer's Engineering Practice 409 for more information or state specific regulations.
- The pesticide injection line must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection chemical supply.
- A pesticide injection pump must also contain a functional interlock, e.g., mechanical or electrical to shut off chemical supply 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 when the water pressure drops too low or water flow stops.
- Use of public water supply requires approval of a backflow prevention device or air gap (preferred) by both state and local authorities.
- Systems must use a metering device, such as a positive displacement injection pump (or flow meter on eductor) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock. An electric powered pump must meet Section 675 for “Electrically Driven or Controlled Irrigation Machines” NEC 70.
- To insure uniform mixing of the insecticide in the water line, inject the mixture in the center of the pipe diameter or just ahead of an elbow or tee in the irrigation line so that the turbulence created at those points will assist in mixing. The injection point must be located after all backflow prevention devices on the water line.
- The tank holding the insecticide mixture should be free of rust, fertilizer, sediment, and foreign material, and equipped with an in-line strainer situated between the tank and the injection point.

Uses

Asparagus

(Post Harvest Protection of Ferns Only)

Pest and Application Rates:

Pest	Exsolant XHL (fl oz/acre)
asparagus beetle	1 – 2

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of the labeled pest. Make applications **only to asparagus ferns**. Treat when pests appear, targeting eggs at hatch or small larvae. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control asparagus beetle in asparagus fern. Use a higher rate in the rate range for heavy infestations or advanced growth stages of the beetle. Heavy infestations may require repeat applications, but follow resistance management guidelines.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** This use is only for asparagus ferns; do not apply within 60 days of spear harvest.
- **Minimum Treatment Interval:** Do not make applications less than 4 days apart.
- Do not apply more than a total of 9 fl oz of Exsolant XHL(0.28 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than three applications per crop.
- Do not feed treated ferns to meat or dairy animals.

Banana and Plantain

(For use in California, Florida, Hawaii, Texas and Puerto Rico only)

Pests and Application Rates:

Pests	Exsolant XHL	
	(fl oz/acre)	Dilute Spray (oz/100 gal)
banana rust thrips ¹	4	1.6
caterpillars		
Hawaiian flower thrips ¹		

¹Control of thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions. Dilute sprays assume an average volume of 300 gallons per acre.

Application Timing: Apply no later than two weeks after bunch emergence and before flower petals senesce and again one to two days before bunch cover.

Application Rate: Apply as a directed fine spray toward bunches and spray to runoff.

Spray Volume: Dilute sprays are sprayed to the point of runoff. The application rate range for dilute sprays in the table is based upon a spray volume of 300 gallons per acre. Gallonage of dilute sprays will vary depending upon tree size, density of canopy, stage of seasonal growth, and spacing in the orchard.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 8 weeks of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than four applications per crop or apply more than six times per calendar year.

Berry, Low Growing (Subgroup 13-07G)¹ except cranberry and lowbush berry

¹Bearberry; bilberry; blueberry, cloudberry; lingonberry; muntries; partridgeberry; strawberry; cultivars, varieties, and/or hybrids of these.

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms, including beet armyworms European grapevine moth leafrollers light brown apple moth thrips ¹	2 - 3

¹For thrips, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications

Application Timing: Treat when pests appear, targeting eggs at hatch or small larvae. For **thrips**, a 3-to 4-day re-treatment schedule may be necessary if there is heavy pest pressure or if the pest population is increasing rapidly. For control of all other pests, a 5- to 7-day re-treatment schedule may be necessary if the crop is growing rapidly or if there is heavy pest pressure. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for larger larvae or moderate to severe pest infestations. Heavy infestations may require repeat applications but follow resistance management guidelines.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. For thrips, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 5 days apart.
- Do not apply more than a total of 9 fl oz of Exsolant XHL(0.28 lb ai spinosad) per acre per calendar year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than three applications of a Group 5 insecticide per calendar year. See Resistance Management regarding number of applications for specific pests.

Berry, Low Growing, Except Strawberry (Subgroup 13-07H)¹
(Insect Suppression)

¹Bearberry; bilberry; blueberry; lowbush; cloudberry; cranberry; lingonberry; muntries; partridgeberry; cultivars, varieties, and/or hybrids of these

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms currant fruitfly European grapevine moth fireworms leafrollers light brown apple moth loopers sparganothis fruitworm thrips	2 – 5

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of each of the labeled pests. Treat when pests appear, targeting eggs at hatch or small larvae. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Application rate within the rate range will depend upon plant size and volume of foliage present and pest pressure. Use a higher rate in the rate range for larger larvae or moderate to severe infestations and/or larger plant volume.

Chemigation: Exsolant XHL may be applied to cranberries by chemigation at labeled rates. Refer to the Chemigation Application section.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 21 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per calendar year.

Bulb Vegetables (Crop Group 3-07A & 3-07B)¹

¹Chive, 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, bulb; onion, Chinese, bulb; onion, Beltsville bunching; onion, fresh; onion, green; onion, macrostem; onion, pearl; onion, potato, bulb; onion, tree, tops; onion, Welsh, tops; shallot, bulb; shallot, fresh leaves; cultivars, varieties, and/or hybrids of these.

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms dipteran leafminers European corn borer fleabeetle loopers	1.5 – 3
thrips (suppression) ¹	2 – 4

¹ Control of thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants under Mixing Directions. If thorough coverage is desired, then high pressure (>70 psi) directed sprays with dual directed nozzles can assist leaf penetration of onion.

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of each of the labeled pests. Treat when pests appear, targeting eggs at hatch or small larvae. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for larger larvae or heavier infestations.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 4 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than five applications per calendar year.

Bushberries (Subgroup 13-07B)¹

(Insect Suppression)

¹Aronia berry; blueberry, highbush; blueberry, lowbush; buffalo currant; Chilean guava; currant, black; currant, red; elderberry; European, barberry; gooseberry; cranberry, highbush; honeysuckle, edible; huckleberry; jostaberry; Juneberry; native currant; salal; sea buckthorn; cultivars, varieties, and/or hybrids of these.

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms blueberry gall midge cherry fruitworm cranberry fruitworm currant fruitfly European grapevine moth fireworms leafrollers light brown apple moth loopers spotted wing drosophila thrips ^{1, 2}	2 - 3

¹Control of thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

²See special use restrictions below for Fresno, Kern, and Tulare counties in California.

Application Timing: Treat when pests appear, targeting eggs at hatch or small larvae. Heavy infestations may require repeat applications but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: The amount of Exsolant XHL applied per acre will depend upon plant size and volume of foliage present and pest pressure. Use a lower rate in the rate range for light infestations and/or small plants and a higher rate in the rate range for heavy infestations and/or larger plants.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least

one application. Do not make more than three applications of Group 5 insecticides for thrips in a season. Only two applications are allowed per acre per year in Fresno, Kern, and Tulare counties in the state of California (See special use restrictions). Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 6 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per calendar year. See Resistance Management and Special Use Restrictions regarding number of applications for specific pests and specific locations.

Special Use Restrictions for Fresno, Kern, and Tulare Counties in California

- Thrips (suppression) rate: The Exsolant XHL use rate is 3 fl oz/acre.
- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 6 days apart.
- Do not apply more than a total of 6 fl oz of Exsolant XHL (0.188 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than two applications per calendar year.

Caneberries (Subgroup 13-07A)¹

¹Blackberry, loganberry, red and black raspberry, cultivars and/or hybrids of these

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms European grapevine moth green fruitworm leafrollers light brown apple moth raspberry fruitworm sawfly	2 - 3

Application Timing: Treat when pests appear, targeting eggs at hatch or small larvae. Heavy infestations may require repeat applications, but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: The amount of Exsolant XHL applied per acre will depend upon plant size and volume of foliage present and pest pressure. Use a higher rate in the rate range for larger larvae or moderate to severe infestations and/or larger plant volume.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 5 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per calendar year.

Coffee

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
lepidopterous larvae, such as: armyworms, banana moth, cutworms, loopers	2 – 3
coffee leafminer ¹	3 – 5

¹Control may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing: Treat when pests appear, targeting eggs at hatch or small larvae. Heavy infestations may require repeat applications, but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: The amount of Exsolant XHL applied per acre will depend upon plant size and volume of foliage present and pest pressure. Use a higher rate in the rate range for larger larvae or moderate to severe infestations and/or larger plant volume.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 7 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 5 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL (0.45 lb ai spinosad) per acre per crop.
- **Maximum Number of Applications:** Do not make more than six applications per calendar year.

Corn (Field, Sweet, Seed, Popcorn) and Teosinte

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms (including fall armyworm) European corn borer	0.8 - 3
beet armyworm corn earworm southwestern corn borer western bean cutworm	1.5 - 3

Application Timing: Scout for **European corn borer** and **armyworms** with enough regularity to monitor egg laying and egg hatch. Time applications of Exsolant XHL to coincide with peak egg hatch of each generation. Frequent treatments may be necessary when the crop is growing rapidly, during silking or under heavy pest pressure. For **corn earworm** control, a 1- to 2-day re-treatment schedule may be necessary at silking. For control of all other pests, a 5- to 7-day re-treatment schedule may be necessary if the crop is growing rapidly or if there is heavy pest pressure.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for heavy infestations or advanced growth stages of target pests.

Spray Delivery: For control of **first generation European corn borer** and **armyworms**, apply broadcast or as a directed spray into the leaf whorls. For control of **corn earworm**, apply broadcast or direct spray to ear zone. Use sufficient spray volume and nozzle pressure to ensure thorough wetting of the silks.

Chemigation: Exsolant XHL may be applied to corn by chemigation at labeled rates. Refer to the Chemigation Application section.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

Sweet Corn, Popcorn, Seed Corn

- **Preharvest Interval:** Do not apply within 28 days of fodder harvest, 1 day of grains harvest or 7 days of forage harvest.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per calendar year.

Field Corn and Teosinte

- **Preharvest Interval:** Do not apply within 28 days of grain or fodder harvest or 7 days of forage harvest.
- Do not apply more than a total of 6 fl oz of Exsolant XHL(0.188 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than three applications per calendar year.

Cottonseed (Subgroup 20-C)¹

¹ Cultivars, varieties, and/or hybrids of these.

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
European corn borer cotton bollworm (pre-bloom) cotton leafperforator tobacco budworm	1.5 - 3
armyworms (including beet armyworm, fall armyworm) cotton bollworm (post-bloom) leafminers loopers (including soybean looper, cabbage looper) saltmarsh caterpillar thrips	2 – 3

Application Timing:

Tobacco Budworm and/or Cotton Bollworm: For the most effective control, scout fields twice per week and apply Exsolant XHL when the majority of the population is within the time of blackhead egg stage to 1/8-inch larval length. The following table illustrates the size of development of worms in relation to age and stage of development (instar) as a guide to timing treatments for optimum control:

Age (Days)	Average Size (Inches)	Instar ¹
Hatch	1/16	1st
3	1/4	2nd
5	1/2	3rd
8	7/8	4th
10	1	5th

¹Note: A scouting schedule of only once per week is risky since hatching worms will have grown to 3rd instar before the next scouting observation has determined the need to spray.

Beet Armyworm: Economic thresholds vary with local conditions and sampling methods. The following is an example of one such method: apply Exsolant XHL when field scouting reveals three or more occurrences of egg hatch or larval feeding per 100 feet of row.

Loopers: Economic thresholds vary with local conditions and sampling methods. The following is an example of one such method: apply Exsolant XHL when field scouting reveals four larvae per 1 foot of row or 25% defoliation.

Application Rate: Use a higher rate in the rate range and higher spray volume when one or more of the following is true: tobacco budworms or bollworms are more than 1/4 inch in length; target pest population is 2X above state threshold level; or foliage canopy is tall/dense and worms are present in the lower part of the canopy. Heavy infestations may require repeat applications, but follow resistance management guidelines.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area. For **tobacco budworm** and/or **cotton bollworm** where early season conservation of beneficial insects is practical, use Exsolant XHL to control the 1st and 3rd generation of tobacco budworm and/or cotton bollworm. Where conservation of beneficial insects is not as critical (for example, fields have received non-selective early season treatments for boll weevil or lygus bugs), use Exsolant XHL to control either the 2nd or 3rd generation of tobacco budworm and/or cotton bollworm.

Restrictions:

- **Preharvest Interval:** Do not apply within 28 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 5 days apart for high rates of application.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per growing season for all methods of application, including foliar, soil and seed treatment uses.

Cucurbit Vegetables (Crop Group 9)¹

¹Cucumber, edible gourds, muskmelons (cantaloupe, honeydew and other hybrids and/or cultivars of *Cucumis melo*), pumpkin, summer squash, watermelon, winter squash

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms cabbage looper melon worm pickleworm rindworms	2 – 4
leafminers ¹ thrips ¹	3 – 4

¹Control of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing: Treat when pests appear, targeting eggs at hatch or small larvae. Heavy infestations may require repeat applications, but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional area local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for heavy infestations or advanced growth stages of target pests.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 3 days of harvest for all crops except cucumbers. Do not apply within 1 day of harvest for cucumbers.
- **Minimum Treatment Interval:** Do not make applications less than 5 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per season for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per crop.

Dates

Pests and Application Rates:

Pest	Exsolant XHL	
	(fl oz/acre)	Dilute Spray (fl oz/100 gal)
carob moth	4	1.4

Application Timing: Apply Exsolant XHL as a foliar spray when pests appear or in accordance with local conditions. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a concentrate or dilute spray using conventional, power operated spray equipment ensuring good coverage (see Orchard Spraying Application section under Application Directions).

Spray Volume: Dilute sprays are sprayed to the point of runoff. The application rate for dilute sprays in the table is based upon a spray volume of 300 gallons per acre. Gallonage of dilute sprays will vary depending upon tree size, density of canopy, stage of seasonal growth, and spacing in the orchard.

Resistance Management: Do not make more than three consecutive applications of Group 5 insecticides (spinetoram and spinosad) within a crop season. If additional treatments are required after three consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 7 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than three applications of Exsolant XHL for carob moth control.

Fig

Pests and Application Rates:

Pests	Exsolant XHL	
	(fl oz/acre)	Dilute Spray (fl oz/100 gal)
navel orangeworm	2 – 5	0.5 – 1.25

Application Timing: Apply Exsolant XHL as a foliar spray when pests appear or in accordance with local conditions. Apply as a concentrate or dilute spray using conventional, power operated spray equipment (see Orchard Spraying Application section under Application Directions). Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: The amount of Exsolant XHL applied per acre will depend upon tree size and volume of foliage present and pest pressure. Use a higher rate in the rate range for large trees or heavy infestations.

Spray Volume: Dilute sprays are sprayed to the point of runoff. The application rate range for dilute sprays in the table is based upon a spray volume of 400 gallons per acre. Gallonage of dilute sprays will vary depending upon tree size, density of canopy, stage of seasonal growth, and spacing in the orchard.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 7 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than four applications per calendar year.

Fruit, Citrus (Crop Group 10-10)¹

¹Australian desert lime; Australian finger lime; Australian round lime; Brown River finger lime; Calamondin; Citron; Citrus hybrids; Grapefruit; Japanese summer grapefruit; Kumquat; Lemon; Lime; Mediterranean mandarin; Mount White lime; New Guinea wild lime; Orange; Pummelo; Russell River lime; Satsuma mandarin; Sweet lime; Tachibana orange; Tahiti lime; Tangelo; Tangerine (Mandarin); Tango; Trifoliate orange; Uni; fruit; Cultivars; varieties and/or hybrids of these

Pests and Application Rates :

Pests	Exsolant XHL (fl oz/acre)
citrus leafminer citrus orangedog citrus thrips ¹ European grapevine moth light brown apple moth	2 – 5

¹Control of thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing: Treat when pests appear or in accordance with local economic thresholds. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional area use recommendations for your area.

Application Rate: The amount of Exsolant XHL applied per acre will depend upon tree size and pest pressure. Use a lower rate in the rate range for light infestations and/or small trees and a higher rate in the rate range for heavy infestations and/or large trees.

Resistance Management: Citrus thrips are present most of the time on the crop during the growing season and have demonstrated a high potential to develop resistance to insect control products. Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. For **citrus thrips**, rotate to another class of effective products for the next two applications after using two applications of Exsolant XHL within a season. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 6 days apart.

- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than three applications per calendar year.
- Do not apply to citrus nurseries or citrus in greenhouses.

Fruit, Pome (Crop Group 11-10)¹

¹Apple; Azarole; Crabapple; Loquat; Mayhaw; Hook. & Arn.; Medlar; Pear; Pear, Asian; Quince; Quince, Chinese; Quince, Japanese; Tejocote; Cultivars, varieties and/or hybrids of these.

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
leafminers ¹ spotted tentiform western tentiform	2 - 5
apple maggot (suppression) codling moth European grapevine moth leafrollers oblique-banded pandemis light brown apple moth oriental fruit moth thrips ¹ tufted apple budmoth	3 - 5

¹Control of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing: Optimal timing for **leafminers** and **leafrollers** may vary between species and geographic location. For **leafminers**, monitor the moth flights and infestation densities of both the sap-feeding and tissue-feeding stage. For optimum control, treat at first appearance of leaf mining activity. For **leafrollers**, monitor the moth flights and the infestation densities of the larval stages. Repeat application as necessary to maintain control. Closely follow regional spray recommendations for **codling moth** and **oriental fruit moth** treatments based upon biofix dates and pheromone trap catches. **Codling moth** and **oriental fruit moth** larvae must be controlled before they penetrate the fruit. **Codling moth** and **oriental fruit moth** applications will provide control for no more than 10 days. Repeat application as necessary to maintain control. Consult with your Nufarm Americas Inc. representative, state agricultural experiment station, certified pest control advisor or extension specialist for specific application timings in your area.

Application Rate: The amount of Exsolant XHL applied per acre will depend upon tree size and pest pressure. Use a lower rate in the rate range for light infestations and/or small trees and a higher rate in the rate range for heavy infestations and/or larger trees.

Resistance Management: Do not make more than three consecutive applications of Group 5 insecticides (spinetoram and spinosad) within a crop season. If additional treatments are required after three consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area. Do not treat consecutive generations of codling moth, oriental fruit moth, and leafrollers.

Restrictions:

- **Preharvest Interval:** Do not apply within 7 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 10 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- Do not apply more than three sprays targeted at leafrollers per season.
- **Maximum Number of Applications:** Do not make more than four applications per calendar year.

Fruit, Small, Vine Climbing, except fuzzy kiwifruit (Subgroup 13-07F)¹

¹Amur river grape; gooseberry; grape; kiwifruit, hardy; Maypop; schisandra berry; cultivars varieties, and/or hybrids of these.

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
climbing cutworms European grapevine moth grape berry moth grape leafroller grape leaf skeletonizer light brown apple moth omnivorous leafroller orange tortrix redbanded leafroller thrips	2 - 4

Application Timing: Treat when pests appear, targeting eggs at hatch or small larvae. Heavy infestations may require repeat applications, but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Carefully adjust equipment and spray volume to assure thorough uniform coverage of infested parts of the crop. Use a higher rate in the rate range for larger larvae or moderate to severe infestations and/or larger plant volume.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 3 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 5 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per season west of the Rocky Mountains, and no more than 12 fl oz of Exsolant XHL(0.36 lb ai spinosad) per acre per season east of the Rocky Mountains for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than five applications per calendar year.

Fruit, Stone (Crop Group 12-12)¹

¹ Apricot; Apricot, Japanese; Capulin; Cherry, black; Cherry, Nanking; Cherry, sweet; Cherry, tart; Jujube, Chinese; Nectarine; Peach; Plum; Plum, American; Plum, beach; Plum, Canada; Plum, cherry; Plum, Chickasaw; Plum, Damson; Plum, Japanese; Plum, Klamath; Plumcot; Plum, prune; Sloe; cultivars, varieties, and/or hybrids of these.

Pests and Application Rates:

Pests	Exsolant XHL	
	(fl oz/acre)	Dilute Spray (fl oz/100 gal)
cherry fruit fly, such as: black cherry eastern cherry western cherry fruit fly (suppression) European grapevine moth green fruitworm lepidopteran leafminers ¹ such as: spotted tentiform western tentiform leafrollers, such as: fruit tree oblique-banded pandemis redbanded variegated light brown apple moth oriental fruit moth peach twig borer thrips ¹ western cherry fruit fly	2 - 4	0.7 – 1.4

¹Control of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing: **Peach twig borer** applications can be made dormant, delayed dormant or as summer sprays. Optimal timing for **lepidopteran leafminers** and **leafrollers** may vary between species and geographic location. For **lepidopteran leafminers**, monitor the moth flights and the infestation densities of both the sap-feeding and tissue-feeding stages, but for optimal control, treat before significant tissue-feeding miners are observed. For **leafrollers**, monitor the moth flights and the infestation densities of the larval stages and re-treat as necessary to maintain control; thorough coverage is necessary for optimal control. For **cherry fruit fly**, **western cherry fruit fly** and **other related species**, maintain protective sprays at 7-days intervals while adults are present and fruit is susceptible to attack. For **oriental fruit moth**, no more than 10 days of

residual control can be expected. If longer residual is required, make a second application of Exsolant XHL or other insecticide labeled for **oriental fruit moth**.

For **thrips**, a 3- to 4-day re-treatment schedule may be necessary at flowering. After flowering, a 5- to 7-day re-treatment schedule may be followed. For **cherry fruit fly**, maintain protective sprays at 7-day intervals while adults are present and fruit is susceptible to attack. For all pests, consult with your Nufarm Americas Inc. representative, state agricultural experiment station, certified pest control advisor or extension specialist for specific application timings in your area.

Application Rate: Use a higher rate in the rate range for large trees, heavy infestations, or advanced growth stages of target pest, especially if spray volume or coverage is marginal.

Spray Volume: Dilute sprays are sprayed to the point of runoff. The application rate range in the table is based upon a spray volume of 300 gallons per acre. Gallonage of dilute sprays will vary depending upon tree size, density of canopy, stage of seasonal growth, and spacing in the orchard.

Resistance Management: Do not make more than three consecutive applications of Group 5 insecticides (spinetoram and spinosad) within a crop season. If additional treatments are required after three consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area. Do not treat consecutive generations of oriental fruit moth and leafrollers.

Restrictions:

- **Preharvest Interval:** Do not apply within 14 days of harvest for apricots, within 7 days of harvest for cherries, and other stone fruit crops, or within 1 day of harvest for nectarines, peaches, plums and prunes.
- **Minimum Treatment Interval:** Unless otherwise stated, do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not apply more than three sprays targeted at leafrollers per season.

Grass Crops, Grass Grown for Seed, Pastures, and Rangeland

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
beet armyworm fall armyworm southern armyworm true armyworm	1 – 2

Application Timing: Scout at least weekly and consider the impact of both pests and beneficials. Treat when economic thresholds are exceeded, targeting eggs at hatch or small larvae. Heavy infestations may require repeat applications, but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations applicable to your area.

Application Rate: Use a higher rate in the rate range for heavy infestations or advanced growth stages of target pests.

Resistance Management: Do not apply more than three times in any 21-day period. Whenever Exsolant XHL is applied up to three times in succession, follow it by no use of Exsolant XHL for a 21-day period or rotation to another insecticide class.

Restrictions:

- **Preharvest Interval:** Do not apply within 3 days of harvest for hay or fodder. There is no preharvest interval for forage.
- Do not apply more than a total of 6 fl oz of Exsolant XHL(0.188 lb ai spinosad) per acre per season for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per season.

Herbs (Subgroup 19A)¹

(Insect Suppression)

¹Angelica, balm, basil, borage, burnet, camomile, catnip, chervil (dried), chive, chive (Chinese), culantro (leaf), clary, coriander (leaf), costmary, curry (leaf), dillweed, horehound, hyssop, lavender, lemongrass, lovage (leaf), marigold, marjoram, nasturtium, parsley (dried) pennyroyal, rosemary, rue, sage, savory (summer and winter), sweet bay, tansy, tarragon, thyme, wintergreen, woodruff, wormwood

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms loopers thrips (suppression)	2 – 3

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of each of the labeled pests. Treat when pests appear, targeting eggs at hatch or small larvae. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for larger larvae or high infestations and/or larger plant volume. Heavy infestations may require repeat applications, but follow resistance management guidelines.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 5 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.47 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than five applications per calendar year or more than three applications per crop.

Hops, Dried Cones

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms loopers thrips (suppression)	2 – 3

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of each of the labeled pests. Treat when pests appear, targeting eggs at hatch or small larvae. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for larger larvae or high infestations and/or larger plant volume. Heavy infestations may require repeat applications, but follow resistance management guidelines.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 5 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.47 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than five applications per calendar year.

Leafy Greens (Subgroup 4-16A)¹, Leaf Petiole Vegetable (Subgroup 22B)², Celtuce and Fennel, Florence, Fresh Leaves and Stalk, Leaves of Root and Tuber Vegetables (Crop Group 2)³ and Leaves of Legume Vegetables (Crop Group 7A)⁴, Turnip Greens, and Watercress

¹Amaranth, Chinese; amaranth, leafy; aster, Indian; blackjack; cat's whiskers; cham-chwi; cham-na-mul; chervil, fresh leaves; chipilin; chrysanthemum, garland; cilantro, fresh leaves; corn salad; cosmos; dandelion, leaves; dang-gwi, leaves; dillweed; dock; dol-nam-mul; ebolo; endive; escarole; farnflower; feather cockscomb; good king henry; huauzontle; jute, leaves; lettuce, bitter; lettuce, head; lettuce, leaf; orach; parsley, fresh leaves; plantain, buckhorn; primrose, English; purslane, garden; purslane, winter; radicchio; spinach; spinach, Malabar; spinach, New Zealand; spinach, tanier; Swiss chard; violet, Chinese, leaves; cultivars, varieties, and hybrids of these commodities.

²Cardoon; celery; celery, Chinese; fuki; rhubarb; udo; zuiki; cultivars, varieties, and hybrids of these commodities.

³Bitter cassava, black salsify, carrot, celeriac (celery root), chicory, dasheen (taro), edible burdock, garden beet, oriental radish (daikon), parsnip, radish, rutabaga, sugar beet, sweet cassava, sweet potato, tanier, true yam, turnip, turnip-rooted chervil

⁴Any cultivar of bean and field pea (except soybean)

Pests and Application Rates:

Pests	Exsoltant XHL (fl oz/acre)
diamondback moth	0.8-1.5
cabbage looper imported cabbage worm	1.5 - 3
armyworms (including beet armyworm)	2 - 4
leafminers ¹ thrips ¹	3 - 5

¹Control of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing: Scout at least weekly and consider the impact of both pests and beneficials. Treat when economic thresholds are exceeded, targeting eggs at hatch or small larvae. Heavy infestations may require repeat applications, but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for heavy infestations or advanced growth stages of target pests.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

• **Preharvest Intervals:**

Leafy vegetables (including watercress): Do not apply within 1 day of harvest.

Leaves of root, tuber and legume vegetables: Do not apply within 3 days of harvest.

• **Minimum Treatment Interval:** Do not make applications less than 4 days apart.

• Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.

• **Maximum Number of Applications:** Do not make more than six applications per year.

• Do not apply to seedling leafy crops grown for transplant within a greenhouse or shade house.

Legume Vegetables (Succulent and Dried Beans and Peas) (Crop Group 6)¹

¹Adzuki bean, blackeyed pea, chickpea, cowpea, crowder pea, edible-pod pea, English pea, fava bean, field bean, field pea, garbanzo bean, garden pea, green pea, kidney bean, lentil, lima bean, lupins, mungbean, navy bean, pigeon pea, pinto bean, runner bean, snap bean, snow pea, sugar snap pea, tepary bean, wax bean, yardlong bean

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
European corn borer (eggs and larvae)	1.5 - 3
armyworms corn earworm loopers	2 - 3
leafminers ¹ thrips ¹	2.3 - 3

¹Control of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of each of the labeled pests. Heavy infestations may require repeat applications, but follow resistance management guidelines. Treat when pests appear, targeting eggs at hatch or small larvae. For **European corn borer**, initiate when moth flights first appear and use the lower rate of the rate range to control eggs and larvae every three days before they enter the plant. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for heavy infestations or advanced growth stages of target pests.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Minimum Treatment Interval:** Do not make applications less than 5 days apart.
- **Maximum Number of Applications:** Do not make more than six applications per crop.

Succulent Beans and Peas:

- **Preharvest Interval:** Do not apply within 3 days of harvest.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per season for all methods of application, including foliar, soil and seed treatment uses.

Dried Beans and Peas:

- **Preharvest Interval:** Do not apply within 28 days of harvest.
- Do not apply more than a total of 6 fl oz of Exsolant XHL(0.188 lb ai spinosad) per acre per season for all methods of application, including foliar, soil and seed treatment uses.
- Do not feed forage or hay to meat or dairy animals.

Nongrass Animal Feeds (Forage, Fodder, Straw, and Hay) (Crop Group 18)¹

¹ Alfalfa, clover, crown vetch, kudzu, lespedeza, lupin, milk vetch, sainfoin, trefoil, vetch, velvet bean

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
alfalfa weevil (suppression) beet armyworm fall armyworm southern armyworm true armyworm	1 – 2

Application Timing: Scout at least weekly and consider the impact of both pests and beneficials. Treat when economic thresholds are exceeded, targeting eggs at hatch or small larvae. Heavy infestations may require repeat applications, but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations applicable to your area.

Application Rate: Use a higher rate in the rate range for heavy infestations or advanced growth stages of target pests.

Resistance Management: Do not apply more than three times in any 21-day period. Whenever Exsolant XHL is applied up to three times in succession, this should be followed by no use of Exsolant XHL for a 21- day period or rotation to another insecticide class.

Restrictions:

- **Preharvest Interval:** Do not apply within 3 days of harvest for hay or fodder. There is no preharvest interval for forage.
- Do not apply more than a total of 6 fl oz of Exsolant XHL(0.188 lb ai spinosad) per acre per season for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per season.
- Do not allow cattle to graze from treated area until spray has dried.

Ornamentals (Herbaceous and Woody) Growing Outdoors, in Nurseries (Including Conifer Seed Orchards), or in Greenhouses

Pests and Application Rates:

Pests	Exsolant XHL fl oz/gallon	Exsolant XHL fl oz/100 gallons	Exsolant XHL fl oz/acre
chrysomelid leaf feeding beetles, such as: elm leaf (1) viburnum leaf (larvae) willow leaf (1) European grapevine moth lepidopterous larvae, such as: azalea caterpillar bagworm beet armyworm cabbage looper California oakworm cankerworm diamondback moth E. tent caterpillar fall webworm Florida fern caterpillar geranium budworm gypsy moth light brown apple moth oblique banded leafroller oleander caterpillar orange striped oakworm spruce budworm tussock moths (hickory, whitemarked) W. tent caterpillar winter moth yellownecked caterpillar (2) sawfly larvae, such as: European pine pear redheaded pine shore fly thrips (exposed) in greenhouse settings, such as: (3) Cuban laurel western flower	0.02 (0.45mL)	1.5 (44.4 mL)	6 (177.5 mL)

Pests and Application Rates: *(continued)*

Pests	Exsolant XHL fl oz/gallon	Exsolant XHL fl oz/100 gallons	Exsolant XHL fl oz/acre
dipterous gall midges pinyon spindlegall thrips (exposed) in outdoor settings, such as: Cuban laurel western flower (3)	0.03 (0.75 mL)	2.8 (81.4 mL)	11 (325.3 mL)
dipterous leafminers, such as: serpentine (4) emerald ash borer (5) lewis mites Nantucket pine tip moth spider mites, such as: spruce two-spotted (6) (See 6 below for mite suppression/control expectations)	0.05 (1.5 mL)	5 (148 mL)	14.5 (429mL)

Numbers in parentheses (-) refer to Pest-Specific Use Directions.

Pest-Specific Use Directions (for pest control in the greenhouse or nursery, also refer to Greenhouse Pest Resistance Avoidance Recommendations):

- Elm leaf beetle** and **willow leaf beetle** (adults and larvae): For effective control, apply in the spring or early summer when feeding is observed.
- For effective control of the following lepidopterous larvae:
 - **Bagworms:** Apply when bags are small and larvae are actively feeding.
 - **Beet armyworms:** Apply when larvae are small.
 - **Tent caterpillars** and **fall webworms:** Apply early when webs are first observed and direct the spray into the web and surrounding foliage within at least 3 feet of the nest.
 - **Gypsy moth larvae:** Apply when larvae are small and all eggs have hatched.
 - **Spruce budworms:** Apply when larvae are exposed and actively feeding.
- Exposed thrips (Cuban laurel and western flower):** For effective control, apply early at first signs of infestation and repeat until infestation is controlled. For thrips, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications.

4. **Serpentine leafminers:** For effective control, apply early when stippling or mining of leaves is first observed and repeat until infestation is controlled. Three sequential applications at 7-day intervals can maximize control. Addition of a nonionic spray adjuvant such as DYNE-AMIC spray adjuvant at 0.1% v/v in greenhouse settings has been shown to enhance control of leafminers (follow surfactant manufacturer's label directions).
5. Apply to foliage and bark of tree when adult **emerald ash borer** are first observed emerging from the bark or when adult emerald ash borer are first noticed feeding on the leaves of the tree. Reapply every 7 to 10 days until no additional adult emerald ash borer activity is observed. Application to trees already heavily infested may not prevent the eventual loss of the tree due to existing pest damage and tree stress.
6. **Spruce spider mites** and **two-spotted spider mites:** Apply when spider mites are first observed prior to webbing and before mite populations have become severe. Reapply after 7 to 10 days (3 to 5 days in greenhouses and structures that can be altered to be closed or open) to contact newly hatched nymphs and repeat until infestation is managed. **Uniform coverage of both upper and lower leaf surfaces is critical.**

Note: Control of spider mites in certain research trials has been variable. The variability between these evaluations is not well understood but may be due to late application timing when mite populations and webbing were severe, poor spray coverage of both the upper and lower leaf surfaces, or interaction of the leaf surface with residues of Exsolant XHL. Addition of a nonionic spray adjuvant such as Activate Plus, DYNE-AMIC, Joint Venture, Phase, and Thoroughbred at 0.1% v/v in greenhouse settings and at label rates in outdoor settings has been shown to improve spray coverage and enhance control of spider mites (follow surfactant manufacturer's label directions).

Application Timing: Dilute Exsolant XHL in water and apply using suitable hand or power-operated application equipment (such as portable pump-up, backpack, hydraulic, boom) in a manner to provide complete and uniform plant coverage. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area. Use of Exsolant XHL in lath and shadehouses is permitted.

Application Rate: Exsolant XHL may be used up to a maximum labeled rate of 0.05 fl oz per gallon (5 fl oz per 100 gallons, 15 fl oz per acre) per application on trees and ornamentals as a general treatment regardless of the target insect pest. Use pest specific rates when a single insect pest or group of insect pests within a rate category is the only intended target.

Spray Volume: Attempt to penetrate dense foliage, but avoid over-spraying to the point of excessive runoff. Uniform coverage of both upper and lower leaf surfaces is critical for effective insect control.

Chemigation: Exsolant XHL may be applied to ornamentals by chemigation at labeled rates. Refer to the Chemigation Application section.

Phytotoxicity: Exsolant XHL has been tested alone on a wide variety of herbaceous and woody ornamental plants without phytotoxic symptoms. However, because it is not possible to test all possible tank mix combinations (including adjuvants) and ornamental plant species, varieties, and cultivars, and because environmental factors and varietal and plant stage of growth may affect phytotoxic expression, it is recommended that a small group of test plants be treated at the anticipated use rate of Exsolant XHL either alone or in tank mix combinations and observed for at least 5 to 7 days to determine phytotoxicity before treating large numbers of those plants.

Note: The professional user assumes responsibility for determining if Exsolant XHL is safe to treated plants when applied either alone or in tank mixtures under commercial growing conditions. Research has demonstrated that some spotting of saintpaulia (African violet) flowers may occur.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. For thrips, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Minimum Treatment Interval:** Except for greenhouses and structures that can be altered to be closed or open, do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.

Nut, Tree (Crop Group 14-12)¹

¹ African nut-tree; Almond; Beechnut; Brazil nut; Brazilian pine; Bunya; Bur oak; Butternut; Cajou nut; Candlenut; Cashew; Chestnut; Chinquapin; Coconut; Coquito nut; Dika nut; Ginkgo; Guiana chestnut; Hazelnut (Filbert); Heartnut; Hickory nut; Japanese horse-chestnut; Macadamia nut; Mongongo nut; Monkey-pot; Monkey puzzle nut; Okari nut; Pachira nut; Peach palm nut; Pecan; Pequi; Pili nut; Pine nut; Pistachio; Sapucaia nut;Tropical almond; Walnut, black; Walnut, English; Yellowhorn; Cultivars, varieties, and/or hybrids of these

Pests and Application Rates:

Pests	Exsolant XHL	
	(fl oz/acre)	Dilute Spray (fl oz/100 gal)
codling moth European grapevine moth fall webworm filbert worm hickory shuckworm light brown apple moth navel orange worm oblique banded leafroller peach twig borer pecan nut casebearer redhumped caterpillar walnut caterpillar walnut husk fly	2 - 5	0.5 – 1.3

Application Timing: Apply Exsolant XHL as either a dormant or a foliar spray when pests appear or in accordance with local conditions. Apply as a concentrate or dilute spray using conventional, power operated spray equipment (see Orchard Spraying Application section under Application Directions). Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Use of Crop Oils: Crop oils labeled for agricultural use may be added to the dormant spray solution for suppression of overwintering mites and scale insects. Consult specific oil labels and University of California recommendations for precautions and restrictions regarding the use of oils in nut and fruit trees.

Application Rate: The amount of Exsolant XHL applied per acre will depend upon tree size and volume of foliage present and pest pressure. Use a higher rate in the rate range for large trees or heavy infestations.

Spray Volume: Dilute sprays are sprayed to the point of runoff. The application rate range in the table is based upon a spray volume of 400 gallons per acre. Gallonage of dilute sprays will vary depending upon tree size, density of canopy, stage of seasonal growth, and spacing in the orchard.

Resistance Management: Do not make more than three consecutive applications of Group 5 insecticides (spinetoram and spinosad) within a crop season. If additional treatments are required after three consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest of all tree nuts and pistachios.
- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not apply more than three sprays targeted at leafrollers per season.

Peanut

(Not for Use in California)

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms, including: beet armyworm fall armyworm true armyworm yellowstriped armyworm cabbage looper corn earworm European corn borer green cloverleaf worm red-necked peanut worm saltmarsh caterpillar soybean looper tobacco budworm velvetbean caterpillar	1.5 - 3

Application Timing: Regularly monitor the population size of each of the labeled pests. Treat when pests appear, targeting eggs at hatch or small larvae. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Use a higher rate in the rate range for larger larvae or moderate to severe infestations and/or larger plant volume.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 3 days of nut harvest or within 14 days of forage.
- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than three applications per calendar year.
- **Grazing Restrictions:** Do not allow grazing of crop residue or harvest of crop residue for hay until 14 days after the last application.

Peppermint and Spearmint

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
armyworms cutworms dipteran leafminers ¹ loopers thrips (suppression) ¹	2 – 5

¹ Control of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions. Control in peppermint and spearmint has been variable; high pressure directed sprays can assist leaf penetration of peppermint and spearmint.

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of each of the labeled pests. Treat when pests appear, targeting eggs at hatch or small larvae. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Heavy infestations may require repeat applications, but follow resistance management guidelines. Use a higher rate in the rate range for heavier infestations or advanced growth stages of target pests.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 7 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 4 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than four applications per calendar year or more than three applications per crop.

Pineapple

(Insect Suppression)

(For use in Hawaii only)

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
lepidopteran larvae such as: armyworms banana moth fruit borer caterpillar (<i>Thecia basilides</i>) <i>Gummosos-Batrachedra</i> <i>commosae</i> pineapple caterpillar pink cornworm sugarcane bud moth	2 - 3

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of each of the labeled pests. Treat when pests appear, targeting eggs at hatch or small larvae. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Heavy infestations may require repeat applications, but follow resistance management guidelines.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 7 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per calendar year.

Pomegranate

Pests and Application Rates:

Pests	Exsolant XHL	
	(fl oz/acre)	Dilute Spray (fl oz/100 gal)
carob moth filbert moth leafrollers, such as: oblique-banded omnivorous fruit tree pandemis redbanded variegated light brown apple moth navel orangeworm oriental fruit moth peach twig borer thrips ¹ western cherry fruit fly	2 – 4	0.7 – 1.4

¹Control of thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing.

Application Timing: Optimal timing for **leafrollers** may vary between species and geographic location. Monitor the moth flights and the infestation densities of the larval stages. Thorough coverage is necessary for optimal control. Consult with your Nufarm Americas Inc. representative, state agricultural experiment station, certified pest control advisor or extension specialist for specific application timings in your area.

Application Rate: Use a higher rate in the rate range for large trees, heavy infestations, or advanced growth stages of target pest, especially if spray volume or coverage is marginal.

Spray Volume: Dilute sprays are sprayed to the point of runoff. The application rate range in the table is based upon a spray volume of 300 gallons per acre. Gallonage of dilute sprays will vary depending upon tree size, density of canopy, stage of seasonal growth, and spacing in the orchard.

Resistance Management: Do not make more than three consecutive applications of Group 5 insecticides (spinetoram and spinosad) within a crop season. If additional treatments are required after three consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area. Avoid treating consecutive generations of oriental fruit moth and leafrollers.

Restrictions:

- **Preharvest Interval:** Do not apply within 7 days of harvest.
- **Minimum Treatment Interval:** A 10- to 14-day re-treatment schedule may be necessary to maintain control if the crop is growing rapidly or if there is heavy pest pressure.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not apply more than three sprays targeted at leafrollers per season.

Quinoa

Pests and Application Rates:

Insect Suppression Only

Pests	Exsolant XHL (fl oz/acre)
armyworms ¹ loopers leafminers ²	1.5 - 3
thrips ² cutworms	3

¹With the exception of yellowstriped armyworm and western yellowstriped armyworm.

²Control of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants under Mixing Directions.

Application Timing: Scout weekly throughout the season to monitor and track populations of **leafminers** and **thrips** to determine when economic thresholds are exceeded. Scout weekly throughout the season to monitor and track pest and beneficial populations. For tracking **lepidopterous larvae**, scout with enough regularity to monitor the population size of each of the labeled pests. Treat when economic thresholds are exceeded, targeting eggs at hatch or small larvae. Heavy infestations may require repeat applications, but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for heavy infestations, advanced growth stages of target pests, or difficult spray coverage situations.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. For thrips, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications. Do not make more than three applications of Group 5 insecticides for thrips in a season. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 21 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 4 days apart.
- Do not apply more than a total of 10 fl oz of Exsolant XHL(0.30 lb ai spinosad) per acre per year.
- **Maximum Number of Applications:** Do not make more than three applications per calendar year.

Root and Tuber Vegetables (Crop Group 1)¹ and Globe Artichoke

¹ Arracacha, arrowroot, bitter cassava, black salsify, carrot, celeriac, chayote root, chicory, Chinese artichoke, chufa, dasheen, edible burdock, edible canna, garden beet, ginger, ginseng, horseradish, Jerusalem artichoke, leren, oriental radish, parsnip, potato, radish, rutabaga, salsify, skirret, Spanish salsify, sugar beet, sweet cassava, sweet potato, tanier, true yam, turmeric, turnip, turnip-rooted chervil, turnip-rooted parsley, yam bean

Pests and Application Rates:

Crops	Pests	Exsolant XHL (fl oz/acre)
black salsify carrot chicory ginseng horseradish parsnip salsify skirret Spanish salsify turnip-rooted chervil turnip-rooted parsley celeriace edible burdock oriental radish radish rutabaga turnip	armyworms dipteran leafminers European corn borer fleabeetle loopers thrips ¹	1.5 -3

(continued)

Pests and Application Rates: *(continued)*

Crops	Pests	Exsolant XHL (fl oz/acre)
arracacha	Colorado potato beetle	1.5 -5
arrowroot	European corn borer	
artichoke	armyworms	2.3 - 5
bitter cassava	artichoke plume moth	
chayote root	dipteran leafminers	
Chinese artichoke	(<i>Liriomyza</i>)	
chufa	loopers	
dasheen	thrips ¹	
edible canna		
garden beet		
ginger		
Jerusalem artichoke		
leren		
potato		
sugar beet		
sweet cassava		
sweet potato		
tanier		
true yam		
turmeric,		
yam bean		

¹Control of thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of each of the labeled pests. Treat when pests appear, targeting eggs at hatch or small larvae. When plants are growing rapidly, repeat applications may be necessary to protect new foliage. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for larger larvae or heavier infestations. Heavy infestations may require repeat applications but follow resistance management guidelines.

Chemigation: Exsolant XHL may be applied to potatoes by chemigation at labeled rates. Refer to the Chemigation Application section.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area. Do not apply Exsolant XHL to consecutive generations of **Colorado potato beetle** and do not make more than two applications per single generation of Colorado potato beetle.

Restrictions:

- **Garden beet and sugar beet**

Preharvest Interval: Do not apply within 3 days of harvest.

Minimum Treatment Interval: Do not make applications less than 7 days apart.

Do not apply more than a total of 11 fl oz of Exsolant XHL(0.33 lb ai spinosad) per crop for all methods of application, including foliar, soil and seed treatment uses.

Maximum Number of Applications: Do not make more than four applications per crop.

- **Black salsify, carrot, chicory, ginseng, horseradish, parsnip, salsify, skirret, Spanish salsify, turnip-rooted chervil, turnip-rooted parsley:**

Preharvest Interval: Do not apply within 3 days of harvest.

Minimum Treatment Interval: Do not make applications less than 5 days apart.

Do not apply more than a total of 11 fl oz of Exsolant XHL(0.33 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.

Maximum Number of Applications: Do not make more than four applications per calendar year.

- **Arracacha, arrowroot, bitter cassava, chayote root, Chinese artichoke, chufa, dasheen, edible canna, ginger, Jerusalem artichoke, leren, potato, sweet cassava, sweet potato, taniar, true yam, turmeric, yam bean**

Preharvest Interval: Do not apply within 7 days of harvest.

Minimum Treatment Interval: Do not make applications less than 7 days apart.

Do not apply more than a total of 11 fl oz of Exsolant XHL(0.33 lb ai spinosad) per crop for all methods of application, including foliar, soil and seed treatment uses.

Maximum Number of Applications: Do not make more than four applications per crop.

- **Globe Artichoke**

Preharvest Interval: Do not apply within 2 days of harvest.

Minimum Treatment Interval: Do not make applications less than 7 days apart.

Do not apply more than a total of 11 fl oz of Exsolan XHL(0.33 lb ai spinosad) per crop for all methods of application, including foliar, soil and seed treatment uses.

Maximum Number of Applications: Do not make more than four applications per crop.

- **Celeriac, edible burdock, Oriental radish, radish, rutabaga, turnip and other root vegetables not specifically listed:**

Preharvest Interval: Do not apply within 3 days of harvest.

Minimum Treatment Interval: Do not make applications less than 5 days apart.

Do not apply more than a total of 9 fl oz of Exsolan XHL(0.28 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.

Maximum Number of Applications: Do not make more than three applications per calendar year.

Small Cereal Grains and Grain Amaranth¹

¹Small cereal grains barley, buckwheat, milo, oats, pearl millet, proso millet, rye, sorghum, triticale, wheat

Pests and Application Rates:

Pests	Exsolan XHL (fl oz/acre)
cereal leaf beetle	1 – 3
armyworms corn earworm (headworm) grasshoppers (suppression) southwestern corn borer	1.5 - 3

Application Timing: Scout for **armyworms** and **grasshoppers** with enough regularity to monitor egg laying and egg hatch and treat when thresholds are reached. Time applications of Exsolan XHL to coincide with peak egg hatch and/or small larval stage of growth of each generation.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for heavy infestations, advanced growth stages of target pests, or difficult spray coverage situations.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least

one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 21 days of grain or straw harvest or within 3 days of forage, fodder or hay harvest.
- **Minimum Treatment Interval:** Do not make applications less than 4 days apart.
- Do not apply more than a total of 10 fl oz of Exsolant XHL(0.30 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than three applications per calendar year.
- Do not allow cattle to graze treated area until spray has dried.

Soybean

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
green clover worm soybean looper true armyworm velvet bean caterpillar	1.1 – 1.5
armyworms, such as: beet armyworm fall armyworm yellowstriped armyworm corn earworm (podworm) saltmarsh caterpillar	1.5 - 2

Application Timing: Treat when field counts or crop injury indicates damaging pest populations are present or developing. Time applications to treat small larvae and use sufficient spray volume to ensure good coverage.

Application Rate: Use a higher rate in rate range for heavy infestations and/or difficult spray coverage situations.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least

one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 28 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 4 days apart.
- Do not apply more than a total of 5 fl oz of Exsolant XHL(0.186 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than four applications per calendar year.
- Do not feed treated forage or hay to meat or dairy animals.

Spices (Except Black Pepper) (Subgroup 19B)¹

¹Allspice, anise (seed), annatto (seed), black caraway, caper (buds), caraway, cardamom, cassia (buds), celery (seed), cinnamon, clove (buds), common fennel, coriander (seed), culantro (seed), cumin, dill (seed), Florence fennel (seed), fenugreek, grains of paradise, juniper (berry), lovage (seed), mace, mustard (seed), nutmeg, poppy (seed), saffron, star anise, vanilla, white pepper

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
lepidopteran larvae	2 – 3
flea beetles dipteran leafminers ¹ thrips ¹	3 – 5

¹Suppression of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants under Mixing Directions.

Application Timing: For determining when to treat, scout with enough regularity to monitor the population size of each of the labeled pests. Treat when pests appear, targeting eggs at hatch or small larvae. Consult your Nufarm Americas Inc. representative, extension specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for larger larvae or heavy infestations. Heavy infestations may require repeat applications, but follow resistance management guidelines.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Interval:** Do not apply within 14 days of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 10 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai of spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than five applications per calendar year.

Tree Farms or Plantations

Conifers, including Christmas trees, and deciduous trees

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
European grapevine moth lepidopterous larvae, such as: bagworm fall webworm gypsy moth hemlock looper jackpine budworm pine tip moth redhumped caterpillar spruce budworm tent caterpillar tussock moths light brown apple moth sawfly larvae, such as: European pine pear redheaded pine	1 - 4

Application Timing: Time applications to reach larvae when small or just hatching. Repeat application as necessary to maintain control, but follow resistance management guidelines. Consult with your Nufarm Americas Inc. representative, state agricultural experiment station, certified pest control advisor or extension specialist for information on application timing for specific pests in your area.

Application Rates: The rate of Exsolant XHL applied per acre will depend upon tree size and severity of infestation. Use a higher rate in the rate range for large trees or heavy infestations. Apply in sufficient volume to ensure thorough coverage.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per year for all methods of application, including foliar, soil and seed treatment uses.

Tropical Tree Fruits¹

(Insect Suppression)

¹ Acerola, atemoya, avocado, biriba, black sapote, canistel, cherimoya, custard apple, feijoa, guava, ilama, jaboticaba, longan, lychee, mamey sapote, mango, papaya, passionfruit, pitaya (dragon fruit), pulasan, rambutan, sapodilla, soursop, Spanish lime, star apple, starfruit, sugar apple, ti leaves, wax jambu (wax apple), white sapote

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
European grapevine moth katydid lepidopterous larvae avocado leafroller citrus peelminer cutworms fruit tree leafroller naval orange worm orange tortrix western tussock moth light brown apple moth thrips ¹	2 - 5

¹Control of thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing: Treat when pests appear or in accordance with local economic thresholds. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate: The amount of Exsolant XHL applied per acre will depend upon tree size and pest pressure. Use a lower rate in the rate range for light infestations and/or small trees and a higher rate in the rate range for heavy infestations and/or large trees.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area.

Restrictions:

- **Preharvest Intervals:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 7 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL (0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.

- **Maximum Number of Applications:** In order to prevent or delay resistance development in thrips, do not apply Exsolant XHL more than two times per year.
- For resistance management purposes, do not apply to tropical tree fruits grown in nurseries or in greenhouses.

Vegetable, Brassica, Head and Stem (Crop Group 5-16)¹, Brassica, Leafy Greens (Subgroup 4-16B)² and Kohlrabi

¹Broccoli, Brussels sprouts, cabbage, cauliflower, Chinese cabbage (napa), cultivars, varieties, and hybrids of these commodities.

²Arugula; broccoli, Chinese; broccoli raab; cabbage, abyssinian; cabbage, Chinese, bok choy; cabbage, seakale; collards; cress, garden; cress, upland; hanover salad; kale; maca, leaves; mizuna; mustard greens; radish, leaves; rape greens; rocket, wild; shepherd's purse; turnip greens; watercress; cultivars, varieties, and hybrids of these commodities.

In the state of Georgia, do not apply Exsolant XHL to: broccoli rabe, Chinese cabbage (bok choy), collards, kale, mizuna, mustard greens, mustard spinach and rape greens.

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
diamondback moth	0.8 – 2
cabbage looper imported cabbageworm	1.5 – 3
armyworms (including beet armyworm) leafminers ¹ thrips ¹	2 – 5
flea beetle (suppression)	2 – 4
Cabbage root maggot (suppression)	2.5 – 5

¹Control of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

Application Timing (except cabbage root maggot): Treat when pests appear, targeting eggs at hatch or small larvae. For all listed pests, heavy infestations may require repeat applications, but follow resistance management guidelines. Consult your Nufarm Americas Inc. representative, extension service specialist, certified crop advisor or your state agricultural experiment station for any additional local use recommendations for your area.

Application Rate (except cabbage root maggot): Apply Exsolant XHL as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for heavy infestations or advanced growth stages of target pests.

Resistance Management (except cabbage root maggot): Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. For **diamondback moth and thrips**, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications. Do not make more than three applications of Group 5 insecticides for thrips in a season. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area. Make treatment decisions for the entire farm and consider area wide programs if other growers are in close proximity. Do not make more than six applications of Exsolant XHL per calendar year for diamondback moth over an entire farm (an area of abutting or nearby fields).

Specific Use Directions for cabbage root maggot:

For cabbage root maggot suppression, apply Exsolant XHL at 2.5 to 5 fl oz/acre. For 20-inch plant row spacing, i.e. two plant lines per 40 inch bed, apply Exsolant XHL at 0.1 to 0.19 fl oz per 1000 linear feet of plant row. For 30-inch plant row spacing, apply Exsolant XHL at 0.15 to 0.29 fl oz per 1000 linear feet of plant row. Use proportional amounts for other row spacings, but do not exceed 10 fl oz per acre of Exsolant XHL per application. Application volume of at least 100 gallons of water per acre is recommended.

Performance may be reduced at lower application volumes. Optimum application timing is based on field scouting. Begin applications when adult activity is observed in or near the field.

For direct seeded crops, an application should be made when the crop has developed to about the second true leaf stage and a second application should be made two to three weeks later. Direct the spray in a narrow band at the base of the plants and on the adjacent soil. The recommended width of the spray band is four inches.

For transplanted crops, an application should be made immediately after transplanting and a second application should be made two to three weeks later. Application to a narrow band of soil within 24 hours before transplanting is permitted, provided that the transplants are placed accurately within the band of treated soil and there is minimal disturbance of the treated soil during transplanting.

A third application may be needed under high cabbage root maggot pest pressure conditions, such as when there is a large amount of debris from a previous brassica crop or when adjacent brassica fields are being harvested. For optimum control, direct the spray in a narrow band at the base of the plants.

Do not make more than three applications of Group 5 insecticides (spinetoram and spinosad) per crop cycle for cabbage root maggot suppression.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 4 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL(0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per calendar year.
- Do not apply to seedling cole crops grown for transplant within a greenhouse, shade house, or field plot.
- In the state of Georgia, do not apply Exsolant XHL to: broccoli rabe, Chinese cabbage (bok choy), collards, kale, mizuna, mustard greens, mustard spinach and rape greens.

Vegetable, Fruiting (Crop Group 8-10)¹ and Okra

¹African eggplant; Bush tomato; Cocona; Currant tomato; Eggplant; Garden huckleberry; Goji berry; Groundcherry; Martynia; Naranjilla; Okra; Pea eggplant; Pepino Pepper, bell; Pepper, nonbell; Roselle; Scarlet eggplant; Sunberry; Tomatillo; Tomato; Tree tomato; Cultivars, varieties and/or hybrids of these

Pests and Application Rates:

Pests	Exsolant XHL (fl oz/acre)
lepidopterous larvae (maintenance only)	0.8 – 1.5
Colorado potato beetle European corn borer European grapevine moth hornworms light brown apple moth loopers tomato fruitworm	1.5 – 3
armyworms (including beet armyworm) flea beetle (suppression) flower thrips ^{1, 2} thrips palmi ^{1, 2} tomato pinworm	2 - 4

(continued)

Pests and Application Rates: (continued)

Pests	Exsolant XHL (fl oz/acre)
leafminers ¹ (<i>Liriomyza</i> spp.)	3 – 5

¹Control of leafminers and thrips may be improved with the addition of an adjuvant to the spray mixture. See Use of Adjuvants section under Mixing Directions.

²For thrips, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications.

Application Timing: Scout weekly throughout the season to monitor and track populations of **leafminers** and **thrips** to determine when economic thresholds are exceeded. Scout weekly throughout the season to monitor and track pest and beneficial populations. For tracking **lepidopterous larvae**, scout with enough regularity to monitor the population size of each of the labeled pests. Time applications of Exsolant XHL to coincide with peak egg hatch in species without overlapping generations. Consult current pest management recommendations for specific guidelines.

Application Rate: Apply as a foliar spray at the rate specified to control target pests. Use a higher rate in the rate range for heavy infestations or advanced growth stages of target pests.

Resistance Management: Do not make more than two consecutive applications of Group 5 insecticides (spinetoram and spinosad). If additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least one application. For thrips, if additional treatments are required after two consecutive applications of Group 5 insecticides, rotate to another class of effective insecticides for at least two applications. Consult your local Nufarm Americas Inc. representative, extension specialist, certified crop advisor, or state agricultural experiment station for information on alternative effective products to use in your area. Do not apply Group 5 insecticides to consecutive generations of Colorado potato beetle and do not make more than two applications per single generation of Colorado potato beetle.

Restrictions:

- **Preharvest Interval:** Do not apply within 1 day of harvest.
- **Minimum Treatment Interval:** Do not make applications less than 4 days apart.
- Do not apply more than a total of 15 fl oz of Exsolant XHL (0.45 lb ai spinosad) per acre per crop for all methods of application, including foliar, soil and seed treatment uses.
- **Maximum Number of Applications:** Do not make more than six applications per calendar year.
- Do not apply to seedling fruiting vegetables and okra grown for transplant within a greenhouse, shade house, or field plot.

STORAGE AND DISPOSAL

DO NOT contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Store in a cool place, **DO NOT** store in direct sunlight. Protect from freezing temperatures. **PESTICIDE DISPOSAL:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

Nonrefillable Containers 5 Gallons or Less

Nonrefillable container. DO NOT reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill or by incineration, or by other procedures approved by State and local authorities.

WARRANTY DISCLAIMER

The directions for use of this product must be followed carefully. **TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1)THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE.** UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

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If you do not agree with or do not accept any of directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.

RV093025[1]

All other trademarks are the property of their respective owners

Exsolant™ XHL

For the control of lepidopterous larvae (worms or caterpillars), leafminers and thrips

ACTIVE INGREDIENT:

Spinosad (a mixture of spinosyn A and spinosyn D)...44.0%

OTHER INGREDIENTS:56.0%

TOTAL100.0%

Contains 4lb of active ingredient per gallon.

KEEP OUT OF REACH OF CHILDREN CAUTION

SEE INSIDE LABEL BOOKLET FOR ADDITIONAL
PRECAUTIONARY STATEMENTS AND DIRECTIONS FOR USE

For Medical Emergencies, Call (877) 325-1840

For Chemical Spill, Leak, Fire, or Exposure,

Call CHEMTREC (800) 424-9300

FIRST AID

IF ON SKIN OR CLOTHING

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call poison control center or doctor for treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-877-325-1840 for emergency medical treatment information.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Harmful if absorbed through skin. Avoid contact with skin, eyes or clothing. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

STORAGE AND DISPOSAL

DO NOT contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Store in a cool place, **DO NOT** store in direct sunlight. Protect from freezing temperatures.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

Nonrefillable Containers 5 Gallons or Less

Nonrefillable container. **DO NOT** reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill or by incineration, or by other procedures approved by State and local authorities.

Net Contents
1 Gal. (3.78 L)
Non-refillable container

EPA Reg. No. 71368-146

Manufactured for:

Nufarm, Inc.

11901 S. Austin Avenue, Alsip, IL 60803

PULL HERE TO OPEN

15473000

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