

**BOOKLET**

**ORTHENE® 97% SOLUBLE GRANULE  
SYSTEMIC INSECTICIDE**

**GROUP 1B INSECTICIDE**



**DANGER  
POISON**

**EYE AND SKIN IRRITANT  
READ LABEL BEFORE USING**

**KEEP OUT OF REACH OF CHILDREN**

**AGRICULTURAL  
NOT FOR INDOOR RESIDENTIAL USE**

**ACTIVE INGREDIENT:**

Acephate (O,S-dimethyl acetylphosphoramidothioate).....97%

**REGISTRATION NO. 29499**

**PEST CONTROL PRODUCTS ACT**

**NET CONTENTS: 580 grams to 5.0 kg**

**For product information call: 1-866-761-9397**

**Arysta LifeScience North America, LLC  
15401 Weston Parkway, Suite 150  
Cary, NC 27513**

**xxxxxxV001**

**FOR 24-HOUR MEDICAL EMERGENCY ASSISTANCE:**

**Call PROSAR:** 1-866-303-6952 or 1-651-603-3432.

**FOR 24-HOUR CHEMICAL EMERGENCY (spill, leaks, fire, exposure, or accident):**

**Call CHEMTREC:** 1-800-424-9300 or 1-703-527-3887.

**READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH LABEL CAUTIONS, WARNINGS AND DIRECTIONS.**

**KEEP PESTICIDE IN ORIGINAL CONTAINER. DO NOT PUT CONCENTRATE OR DILUTE INTO FOOD OR DRINK CONTAINERS.**

**PRECAUTIONS**

**KEEP OUT OF REACH OF CHILDREN AND UNAUTHORIZED PERSONNEL.**

Fatal or poisonous if swallowed.

May irritate eyes and skin. Do not breathe spray mist. Avoid eye or skin contact with spray mist. Do not contaminate lakes, streams or ponds. Avoid contamination of feed and foodstuffs. Do not apply under conditions involving possible drift to food, forage or other plantings that might be damaged or the crops thereof rendered unfit for sale, use or consumption. Store in cool, dry place. Protect from excessive heat.

**PERSONAL PROTECTIVE EQUIPMENT**

**Mixing/Loading/Application:**

**A. Mixing and loading in all agricultural scenarios**

- Mixers/loaders must wear maximum level PPE (i.e., chemical-resistant coveralls over a long-sleeved shirt and long pants, shoes plus socks, chemical-resistant gloves and a respirator).

**B. Applying using groundboom, soil injection equipment**

- Applicators must wear cotton coveralls over a long-sleeved shirt and long pants, shoes plus socks, chemical-resistant gloves and a respirator.
- When handling 24 kg a.i. or less in one day (e.g., approximately 18 ha at highest agricultural rate of 1.31 kg a.i./ha), workers may use an open cab.
- When handling more than 24 kg a.i. in one day, workers must use a closed cab (no gloves or respirator are required in a closed cab) or wear maximum level PPE (chemical-resistant coveralls over a long-sleeved shirt and long pants, shoes plus socks, chemical-resistant gloves and a respirator).

**C. Applying using airblast (mist-blower) equipment**

- Applicators must use a closed cab and wear a long-sleeved shirt and long pants.
- No gloves or respirator are required in a closed cab.
- If the use of a closed cab is not feasible, applicators may use an open cab and wear maximum level PPE (i.e., chemical-resistant coveralls over a long-sleeved shirt and long pants, chemical-resistant gloves and a respirator) and a chemical-resistant headgear.

**D. Applying using handheld equipment**

- Mixers/loaders/applicators must wear cotton coveralls over a long-sleeved shirt and long pants, chemical-resistant gloves and a respirator.
- Mixers/loaders/applicators must not handle more than 1500 L/day of diluted product.

**Post application:**

Do not enter or allow worker entry into treated areas during the re-entry intervals (REIs) as listed below:

Brussels sprouts	12 hours
Cabbage	12 hours
Cauliflower	12 hours
Celery	1 day*
Corn	5 days*
Cranberries	12 hours
Lettuce	1 day*
Peppers	1 day
Potatoes	1 day*
Cut flowers/roses	1 day
Saskatoon berries	3 days
Tobacco	1 day*
Tomatoes	12 hours
Ornamentals	12 hours
Trees	3 days*

\* Workers conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for the following time after the REI:

Corn	4 weeks
Celery	2 weeks
Lettuce	2 weeks
Tobacco	2 weeks
Potatoes	1 week
Trees	1 week

**ENVIRONMENTAL PRECAUTIONS**

**TOXIC** to bees. Bees may be exposed to direct treatment, spray drift, and residues on/in leaves, pollen and nectar in flowering crops or weeds. Because the active ingredient is systemic, bees can also be exposed to product residues in flowers, leaves, pollen and/or nectar resulting from soil or foliar applications, or from tree-injections.

Minimize the spray drift to reduce harmful effects on bees in habitats close to the application site. Avoid applications when bees are foraging in the treatment area in ground cover containing blooming weeds. To further minimize exposure to pollinators, refer to the complete guidance “Protecting Pollinators during Pesticide Spraying – Best Management Practices” on the Health Canada website ([www.canada.ca/pollinators](http://www.canada.ca/pollinators)). Follow crop specific directions for application timing.

For applications on crops that are highly attractive to pollinators (cranberry and outdoor ornamentals excluding coniferous trees), or when using managed bees for pollination services:

**DO NOT** apply during the crop blooming period or during the 9 day period before the crop blooms.

For applications on all other crops:

Avoid application during the crop blooming period. If applications must be made during the crop blooming period, restrict applications to evening when most bees are not foraging.

**TOXIC** to birds, small wild mammals and aquatic organisms. Observe buffer zones specified under DIRECTIONS FOR USE.

Toxic to certain beneficial insects. Minimize spray drift to reduce harmful effects on beneficial insects in habitats next to the application site such as hedgerows and woodland.

This product demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

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

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

#### **FIRST AID**

**IF SWALLOWED**, call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.

**IF IN EYES**, hold eye open and rinse slowly and gently with water for 15–20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.

**IF INHALED**, move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.

**IF ON SKIN OR CLOTHING**, take off contaminated clothing. Rinse skin immediately with plenty of water for 15–20 minutes. Call a poison control centre or doctor for treatment advice.

Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

#### **TOXICOLOGICAL INFORMATION**

Acephate is an organophosphate that is a cholinesterase inhibitor. Typical symptoms of overexposure to cholinesterase inhibitors include headache, nausea, dizziness, sweating, salivation, runny nose and eyes. This may progress to muscle twitching, weakness, tremors, incoordination, vomiting, abdominal cramps and diarrhea in more serious poisonings. A life-threatening poisoning is signified by loss of consciousness, incontinence, convulsions, and respiratory depression with a secondary cardiovascular component. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate degree of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as pralidoxime chloride, may be therapeutic if used early; however, use only in conjunction with

atropine. In cases of severe acute poisoning, use antidotes immediately after establishing an open airway and respiration. With oral exposure, the decision of whether to induce vomiting or not should be made by an attending physician.

### **DECONTAMINATION**

NOTE: Hydrated limes, Hypochlorite oxidants, and other alkaline material should NOT be used in clean up procedures. Spills of **ORTHENE® 97% SOLUBLE GRANULE SYSTEMIC INSECTICIDE (“ORTHENE 97% SG”)** should be scooped into disposable containers. If **ORTHENE 97% SG** is spilled, spread a heavy clay absorbent over spill. Shovel material into disposable container.

### **STORAGE**

To prevent contamination, store this product away from food or feed.

### **DISPOSAL**

1. Triple or pressure rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Follow provincial instructions for any required additional cleaning of the container prior to its disposal.
3. Make the empty container unsuitable for further use.
4. Dispose of the container in accordance with provincial requirements.

For further information on the disposal of unused, unwanted product contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of spills and for clean-up of spills.

### **NOTICE TO USER**

This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *PEST CONTROL PRODUCTS ACT* to use this product in a way that is inconsistent with the directions on the label.

### **DIRECTIONS FOR USE ON CROPS**

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

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

Apply with ground application equipment only.

**DO NOT** apply by aerial application equipment.

Toxic to bees. To protect pollinators, follow the instructions regarding bees in the Environmental Precautions section.

Field sprayer application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE S572.1) fine classification. Boom height must be 60 cm or less above the crop or ground.

Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools, and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature inversions, application equipment and sprayer settings.

Airblast application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** direct spray above plants to be treated. Turn off outward pointing nozzles at row ends and outer rows. **DO NOT** apply when wind speed is greater than 16 km/h at the application site as measured outside of the treatment area on the upwind side.

This product cannot be applied as a foliar application in residential areas. Residential areas are defined as any site where bystanders including children could be exposed during or after application. This includes homes, schools, public buildings or any other areas where the general public including children could be exposed.

Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools, and recreational areas is minimal. Take into consideration wind speed, wind directions, temperature inversions, application equipment and sprayer settings.

#### **Buffer Zones:**

Spot treatments using hand-held equipment **DO NOT** require a buffer zone.

The buffer zones specified in the table below are required between the point of direct application and the closest downwind edge of (1) sensitive freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands), and (2) estuarine or marine habitats.

Method of Application	Buffer Zone (metres) Required for the Protection of Aquatic Habitat With Water Depth of:		
	< 1 metre	1 – 3 metres	> 3 metres
Field sprayer*	15	5	0
Airblast (early growth stage)	25	10	3

The buffer zones for this product can be modified based on weather conditions and spray equipment configuration by accessing the Buffer Zone Calculator on the Pest Management Regulatory Agency web site.

For tank mixes, consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture and apply using the coarsest spray (ASAE) category indicated on the labels for those tank mix partners.

#### **RESISTANCE MANAGEMENT RECOMMENDATIONS**

For resistance management, please note that **ORTHENE 97% SG** contains a Group 1B insecticide. Any insect population may contain individuals naturally resistant to **ORTHENE 97% SG** and other Group 1B insecticides. The resistant individuals may dominate the insect population if this group of insecticides is used repeatedly in the same fields. Other resistance mechanisms that are not linked to site of action but are specific for individual chemicals, such as

enhanced metabolism, may also exist. Appropriate resistance-management strategies should be followed.

To delay insecticide resistance:

- Where possible, rotate the use of **ORTHENE 97% SG** or other Group 1B insecticides with different groups that control the same pests.
- Use tank mixtures with insecticides from a different group when such use is permitted.
- Insecticide use should be based on an IPM program that includes scouting and record keeping, and considers cultural, biological and other chemical control practices.
- Monitor treated pest population for resistance development.
- Contact your local extension specialist or certified crop advisors for any additional pesticide resistance-management and/or IPM recommendations for the specific site and pest problems in your area.
- For further information or to report suspected resistance contact Arysta LifeScience North America, LLC at 1-866-761-9397.

**GENERAL APPLICATION INSTRUCTIONS AND LIMITATIONS**

**DO NOT** handle more than 1500 L of diluted spray solution per day when using hand-held spray equipment.

Mix thoroughly and spray entire plant covering both sides of foliage. Spray when insects are present or feeding injury is first noticed. Repeat if re-infestation occurs.

SITE	PESTS	RATE (product)	APPLICATION INSTRUCTIONS AND LIMITATIONS
Cabbage, Brussels Sprouts, Cauliflower	Cabbage looper, Imported cabbageworm, Diamondback moth larvae, Green peach aphid	580-850 g/ha	Apply in 225 to 1650 L of water using conventional ground application equipment. Use the high rate only when heavy pest infestations are present.  Do not feed trimmings to livestock or allow animals to graze on treated areas.  Do not apply more than 2 applications per season.  Re-entry Interval (REI): 12 hours Preharvest Interval (PHI): 28 days

SITE	PESTS	RATE (product)	APPLICATION INSTRUCTIONS AND LIMITATIONS
Head lettuce (crisp head type only)	Cabbage looper, Imported cabbageworm, Diamondback moth larvae, Green peach aphid	580-850 g/ha	<p>Apply in 225 to 1650 L of water using conventional ground application equipment. Use the high rate only when heavy pest infestations are present.</p> <p>Do not feed trimmings to livestock or allow animals to graze on treated areas.</p> <p>Do not apply more than 4 applications per season.</p> <p>Re-entry Interval (REI): 1 day Workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 2 weeks after the REI.</p> <p>PHI: 7 days</p>
Celery	Green peach aphid, Tarnished plant bug	580-850 g/ha	<p>Apply in 225 to 1650 L of water. Apply with ground equipment only. Apply when insects reach economic threshold levels.</p> <p>Do not apply more than 4 applications per season.</p> <p>REI: 1 day Workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 2 weeks after the REI.</p> <p>PHI: 21 days</p>
Corn (Seed and Sweet)	European corn borer	580-850 g/ha	<p>Apply in 220 to 1000 L of spray mix using conventional ground application equipment. Use the high rate only when heavy pest infestations are present. For European corn borer, apply when egg mass count indicates an economically damaging population.</p> <p>Do not feed corn fodder or forage from treated crop to livestock.</p> <p>Do not apply more than 2 applications per season.</p> <p>REI: 5 days Workers re-entering this crop and conducting activities that involve</p>



SITE	PESTS	RATE (product)	APPLICATION INSTRUCTIONS AND LIMITATIONS
			<p>significant foliar contact must wear gloves and cotton coveralls for 4 weeks after the REI. PHI: 21 days for sweet corn; NA for seed corn</p>
Potato	Green peach aphid, Potato aphid, Potato flea beetle, Potato leafhopper, Tarnished plant bug	580-850 g/ha	<p>Apply in 225 to 1650 L of water per hectare using conventional ground application equipment. Use the high rate only when heavy pest infestations are present. Begin applications at first sign of insects and repeat on a 7- to 10-day schedule as necessary.</p> <p>Do not apply more than 4 applications per season.</p> <p>REI: 1 day Workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 1 week after the REI. PHI: 21 days</p>
Saskatoon berries (non-bearing)	Woolly elm aphid	6.57g/L of water	<p><b>Soil Injection Application:</b> Provides control of woolly elm aphid in non-bearing Saskatoon berry plants. Can be used in first three years of establishment. Apply once per year in mid July or early August.</p> <p>Mix 6.57g product/10 L of water (equivalent to 6.37 g a.i./10 L of water). Apply 2 L of this solution per plant. The solution is injected with a probe; 3 to 5 injections for each plant to a depth of 12 cm. The injection should be made 15 cm from the stem of the plant. DO NOT enter or allow worker entry into treated areas during the restricted entry interval (REI) of 3 days</p>
Saskatoon berries (bearing)	Woolly elm aphid Woolly apple aphid	6.57g/L of water	<p><b>Soil Injection Application:</b> Provides control of woolly elm aphid and woolly apple aphid in bearing Saskatoon berry plants.</p> <p>Apply once per year in mid July or early August after harvest is complete.</p> <p>Mix 6.57 g product/10 L of water</p>

SITE	PESTS	RATE (product)	APPLICATION INSTRUCTIONS AND LIMITATIONS
			<p>(equivalent to 6.37 g ai./10 L of water). Apply 2 L of this solution per plant. The solution is injected with a probe; 3 to 5 injections for each plant to a depth of 12 cm. The injection should be made 15 cm from the stem of the plant. A rate of 1.3 g product per plant and a planting density of 2000 plants per hectare is a rate of 2.6 kg/ha. DO NOT enter or allow worker entry into treated areas during the restricted entry interval (REI) of 3 days.</p> <p>PHI: 11 months</p>
Sweet Pepper (Bell type)	Green peach aphid, Pepper maggot	580 g/ha	<p>Apply in 225 to 1650 L of water with conventional ground application equipment. Begin applications when eggs or insects appear. Maintain a 7- to 10-day spray schedule until insects have been reduced below economic levels</p> <p>For outdoor use only.</p> <p>Do not apply more than 2 applications per season.</p> <p>REI: 1 day PHI: 7 days</p>
	European corn borer	850 g/ha	
Tobacco (Flue cured)	Tomato hornworm, Flea beetle, Green peach aphid	580-850 g/ha	<p>Apply in at least 100 L of water using conventional ground application equipment. Apply on a 7-day schedule or as needed. Use 850 g product/ha for control of established populations. DO NOT apply more than 4628 grams of product/ha per season.</p> <p>REI: 1 day Workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 2 weeks after the REI.</p> <p>PHI: 3 days</p>
	Darksided cutworm (pre-plant)	<p>580 g/ha (cover crop treatment)</p> <p>1160 g/ha (soil treatment)</p>	<p>Treat either the rye or wheat cover crop or the soil using at least 200 L of water per hectare. Applications are most effective when applied late afternoon or early evening when temperatures are 13°C or higher. Apply soon after the</p>

SITE	PESTS	RATE (product)	APPLICATION INSTRUCTIONS AND LIMITATIONS
			<p>cutworms have hatched (mid to late April, 4 to 5 days before plowing.).</p> <p>REI: 1 day Workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 2 weeks after the REI.</p>
	Darksided cutworm (post-plant)	1160 g/ha	<p>Apply in sufficient water to give good coverage of seedlings. Apply in the late afternoon or evening.</p> <p>REI: 1 day Workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 2 weeks after the REI.</p>
Tobacco	Darksided cutworm, Potato flea beetle, Root maggot, Green peach aphid, Thrips	850-1315 g/ha	<p><b>Transplant water treatment:</b> Provides control for approximately 2 to 3 weeks after transplanting. Apply in a minimum of 1200 L of transplant water per hectare. Do not apply more than 1275 g a.i./ha as a transplant water application as some phytotoxicity may occur.</p> <p>REI: 1 day Workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 2 weeks after the REI.</p>
	Wireworm	850 g/ha	<p><b>Transplant water treatment:</b> Apply in 1200 L of transplant water per hectare. Make one application per season at transplanting.</p> <p>REI: 1 day Workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 2 weeks after the REI.</p>
Cranberry	Blackheaded fireworm	580 g/ha	Apply one prebloom application to control the first generation of blackheaded

SITE	PESTS	RATE (product)	APPLICATION INSTRUCTIONS AND LIMITATIONS
			fireworm where field scouting indicates insect numbers warrant treatment. Apply in 225 to 1650 L of water per hectare using conventional ground equipment. A second application may be made post bloom if insect numbers indicate it is required.REI: 12 hours
Tomato	Cutworms, Potato flea beetle, Root maggots, Wireworms, Aphids, Thrips, Colorado potato beetle	928 g/ha	<b>Transplant water application:</b> To provide control of listed pests for approximately 2 to 3 weeks after transplanting, apply in 2000 L of water per hectare. This rate is based on 14,000 plants per hectare.  REI: 12 hours

### DIRECTIONS FOR USE ON ORNAMENTALS (Outdoor and Greenhouse)

**ORTHENE 97% SG** effectively controls many insects that attack flowers, ornamentals and shrubs. **ORTHENE 97% SG** controls insects that are present and remains effective for an extended period of time because it is systematically absorbed by plants. Mix thoroughly and spray entire plant covering both sides of foliage. Spray when insects are present or feeding injury is first noticed.

Cut flowers (greenhouse and field): DO NOT apply more than 0.83 kg a.i./ha

Other ornamentals: DO NOT apply more than 1.31 kg a.i./ha

Re-entry Interval (REI) for ornamental shrubs and flowers (except for roses): 12 hours

REI for cut flowers/roses: 1 day

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

Toxic to bees. To protect pollinators, follow the instructions regarding bees in the Environmental Precautions section.

### Application Rates (product)

Mist blower: 1353 g / 1000 L

Hydraulic sprayer: 657 g / 1000 L

SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
Abelia, Forsythia	Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Spray 2 times, 7 to 10 days apart.
Alyssum, Daisy	Flower thrips	Spray 2 times, 7 to 10 days apart.

SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
Arborvitae	Aphids, Bagworm, Spider mites (except twospotted)	Repeat application once only, if re-infestation occurs.  To control spider mites, spray 2 times, 7 to 10 days apart.
Aster	Aphids, Armyworms (fall, beet and yellowstriped), Flower thrips, Leafminer	Repeat application once only, if re-infestation occurs.  To control flower thrips, spray 2 times, 7 to 10 days apart.
Azalea	Aphids, Greenhouse whitefly, Lace bug, Mealybugs, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium), Spider mites (except twospotted)	Repeat application once only, if re-infestation occurs.  To control greenhouse whitefly, mealybugs, scale insects and spider mites (other than twospotted), spray 2 times, 7 to 10 days apart.
Barberry, Ligustrum, Mahonia	Aphids, Greenhouse whitefly	Repeat application once only, if re-infestation occurs.  To control greenhouse whitefly, spray 2 times, 7 to 10 days apart.
Bloodleaf (Iresine), Dusty miller, Gazania, Mock orange, Photinia, Pittosporum, Tulip	Aphids	Repeat application once only, if re-infestation occurs.
Boston ivy	Potato leafhopper	Repeat application once only, if re-infestation occurs.
Bottlebrush	Spider mites (except twospotted)	Spray 2 times, 7 to 10 days apart.
Boxwood, Euonymous, Hibiscus, Nandina, Rose of Sharon	Aphids, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Repeat application once only, if re-infestation occurs.  To control scale insects, spray 2 times, 7 to 10 days apart.
Calendula	Aphids, Armyworms (fall, beet and yellowstriped), Flower thrips, Potato leafhopper, Tobacco budworm	Repeat application once only, if re-infestation occurs.  To control flower thrips, spray 2 times, 7 to 10 days apart.
Camellia	Greenhouse whitefly, Mealybugs,	Spray 2 times, 7 to 10 days apart.

SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
	Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium), Spider mites (except twospotted)	
Cedar	Bagworm, Gypsy moth	Repeat application once only, if re-infestation occurs.
Cotoneaster	Aphids, Lace bug, Pear slug (pear sawfly larvae), Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Repeat application once only, if re-infestation occurs.  To control scale insects, spray 2 times, 7 to 10 days apart.
Dahlia	Armyworms (fall, beet and yellowstriped), Potato leafhopper, Twospotted spider mite	Repeat application once only, if re-infestation occurs.  To control twospotted spider mite, spray 2 times, 7 to 10 days apart.
Daylily	Flower thrips, Twospotted spider mite	Spray 2 times, 7 to 10 days apart.
Deutzia	Aphids, Leafminer	Repeat application once only, if re-infestation occurs.
Geranium	Tobacco budworm, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Repeat application once only, if re-infestation occurs.  To control scale insects, spray 2 times, 7 to 10 days apart.
Gladiolus	Flower thrips, Gladiolus thrips	Spray 2 times, 7 to 10 days apart.
Hydrangea, Primrose	Aphids, Twospotted spider mite	Repeat application once only, if re-infestation occurs.  To control twospotted spider mites, spray 2 times, 7 to 10 days apart.
Ivy	Aphids, Mealybugs	Repeat application once only, if re-infestation occurs.  To control mealybugs, spray 2 times, 7 to 10 days apart.
Juniper	Bagworm, Meadow spittlebug, Spider mites (except twospotted)	Repeat application once only, if re-infestation occurs.  To control spider mites (other than twospotted spider mite), spray 2 times, 7 to 10 days apart.
Lantana	Greenhouse whitefly	Spray 2 times, 7 to 10 days apart.

SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
Lilac	Aphids, Leafminer, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Repeat application once only, if re-infestation occurs.  To control scale insects and spider mites (other than twospotted spider mite), spray 2 times, 7 to 10 days apart.
Marigold	Flower thrips, Leafminer, Sunflower moth, Twospotted spider mite	Repeat application once only, if re-infestation occurs.  To control flower thrips and twospotted spider mite, spray 2 times, 7 to 10 days apart.
Pachysandra, Phlox	Twospotted spider mite	Spray 2 times, 7 to 10 days apart.
Petunia	Armyworms (fall, beet and yellowstriped), Flower thrips, Tobacco budworm	Repeat application once only, if re-infestation occurs.  To control flower thrips, spray 2 times, 7 to 10 days apart.
Pyracantha	Aphids, Lace bug, Yellownecked caterpillar, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Repeat application once only, if re-infestation occurs.  To control scale insects, spray 2 times, 7 to 10 days apart.
Rhododendron	Lace bug	Repeat application once only, if re-infestation occurs.
Rose (field grown)	Aphids, Armyworms (fall, beet and yellowstriped), Flower thrips, Meadow spittlebug, Obliquebanded leafroller, Rose midge, Tussock moth, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium), Spider mites	Repeat application once only, if re-infestation occurs.  To control flower thrips, scale insects and spider mites, spray 2 times, 7 to 10 days apart.  Do not use for cut flowers.
Salvia	Aphids, Flower thrips, Greenhouse whitefly	Repeat application once only, if re-infestation occurs.  To control flower thrips and greenhouse whitefly, spray 2 times, 7 to 10 days apart.
Snapdragon	Aphids, Armyworms (fall, beet and yellowstriped), Flower thrips,	Repeat application once only, if re-infestation occurs.  To control flower thrips, spray 2 times, 7 to

SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
	Tobacco budworm	10 days apart.
Spirea	Aphids, Obliquebanded leafroller	Repeat application once only, if re-infestation occurs.
Staghorn sumac	Obliquebanded leafroller	Repeat application once only, if re-infestation occurs.
Sumac	Psyllids	Repeat application once only, if re-infestation occurs.
Viburnum	Aphids, Greenhouse whitefly, Twospotted spider mite	Repeat application once only, if re-infestation occurs.  To control greenhouse whitefly and twospotted spider mite, spray 2 times, 7 to 10 days apart.
Wisteria	Aphids, Mealybugs,  Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Repeat application once only, if re-infestation occurs.  To control mealybugs and scale insects, spray 2 times, 7 to 10 days apart.
Yew (taxus)	Mealybugs	Spray 2 times, 7 to 10 days apart.
Yucca	Flower thrips, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Spray 2 times, 7 to 10 days apart.
Zinnia	Flower thrips, Greenhouse whitefly, Lace bug, Leafminer	Repeat application once only, if re-infestation occurs.  To control flower thrips and greenhouse whitefly, spray 2 times, 7 to 10 days apart.

## DIRECTIONS FOR USE ON TREES

**ORTHENE 97% SG** effectively controls many insects that attack trees. **ORTHENE 97% SG** controls insects that are present and remains effective for an extended period of time because it is systematically absorbed by plants. Mix thoroughly and spray entire plant covering both sides of foliage. Spray when insects are present or feeding injury is first noticed.

DO NOT apply more than 1.31 kg a.i./ha

REI for trees: 3 days (workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 1 week after the REI.)

### Application Rates (product)

Mist blower: 1353 g / 1000 L

Hydraulic sprayer: 657 g / 1000 L



SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
Alder	Fall webworm, Leafminer, Psyllids	Repeat application once only, if re-infestation occurs.
Arborvitae	Aphids, Bagworm, Spider mites (except twospotted)	Repeat application once only, if re-infestation occurs.  To control spider mites, spray 2 times, 7 to 10 days apart.
Ash	Aphids, Fall webworm, Gypsy moth, Lace bug, Sawflies (open feeders: blackheaded ash), Tent caterpillars (eastern and forest), Tussock moth	Repeat application once only, if re-infestation occurs.
Aspen, Flowering almond, Flowering quince	Aphids	Repeat application once only, if re-infestation occurs.
Birch	Aphids, Cankerworms (spring and fall), Fall webworm, Gypsy moth, Leafminer, Sawflies (open feeders: dusky birch), Tent caterpillars (eastern and forest), Tussock moth, Yellownecked caterpillar	Repeat application once only, if re-infestation occurs.
Cedar	Bagworm, Gypsy moth	Repeat application once only, if re-infestation occurs.
Cockspur hawthorn	Cankerworms (spring and fall)	Repeat application once only, if re-infestation occurs.
Cypress	Bagworm, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium), Spider mites	Repeat application once only, if re-infestation occurs.  To control scale insects and spider mites, spray 2 times, 7 to 10 days apart.
Elm (Chinese or Siberian)	Elm leaf beetle (larvae), Tussock moth, Armyworms (fall, beet and	Repeat application once only, if re-infestation occurs.

SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
	yellowstriped) on Chinese elm only, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium) on Chinese Elm only	To control scale insects, spray 2 times, 7 to 10 days apart.
Fir	Aphids, Tussock moth, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium), Fall webworm, Spider mites (except twospotted)	Repeat application once only, if re-infestation occurs.  To control scale insects and spider mites (other than twospotted spider mite), spray 2 times, 7 to 10 days apart.
Flowering cherry	Obliquebanded leafroller, Tent caterpillars (eastern and forest)	Repeat application once only, if re-infestation occurs.
Flowering plum	Aphids, Tent caterpillars (eastern and forest)	Repeat application once only, if re-infestation occurs.
Hackberry	Psyllids, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Repeat application once only, if re-infestation occurs.  To control scale insects, spray 2 times, 7 to 10 days apart.
Hawthorn	Aphids, Cankerworms (spring and fall), Gypsy moth, Tent caterpillars (eastern and forest)	Repeat application once only, if re-infestation occurs.
Hemlock	Gypsy moth, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium), Spider mites (except twospotted)	Repeat application once only, if re-infestation occurs.  To control scale insects and spider mites (other than twospotted spider mite), spray 2 times, 7 to 10 days apart.
Holly	Leafminer, Obliquebanded leafroller, Psyllids, Tussock moth, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium), Spider mites (except twospotted)	Repeat application once only, if re-infestation occurs.  To control scale insects and spider mites (other than twospotted spider mite), spray 2 times, 7 to 10 days apart.
Honeylocust	Spider mites (except twospotted)	Spray 2 times, 7 to 10 days apart.
Juniper	Bagworm,	Repeat application once only, if re-

SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
	Meadow spittlebug, Spider mites (except twospotted)	infestation occurs.  To control spider mites (other than twospotted spider mite), spray 2 times, 7 to 10 days apart.
Larch	Sawflies (open feeders: redheaded pine)	Repeat application once only, if re-infestation occurs.
Linden	Aphids, Bagworm, Cankerworms (spring and fall), Fall webworm, Tussock moth, Yellownecked caterpillar	Repeat application once only, if re-infestation occurs.
Locust	Leafminer	Repeat application once only, if re-infestation occurs.
Maple	Aphids, Bagworm, Cankerworms (spring and fall), Gypsy moth, Potato leafhopper, Tent caterpillars (eastern and forest), Tussock moth, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Repeat application once only, if re-infestation occurs.  To control scale insects, spray 2 times, 7 to 10 days apart.
Mountain ash, Pincherry	Pear slug (pear sawfly larvae)	Repeat application once only, if re-infestation occurs.
Mulberry (fruitless), Laurel, Magnolia	Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	Spray 2 times, 7 to 10 days apart.
Oak	Aphids, Cankerworms (spring and fall), Fall webworm, Gypsy moth, Lace bug, Leafminer, Obliquebanded leafroller, Oak leaf shredder (white and red oak only), Tent caterpillars (eastern and forest), Tussock moth, Yellownecked caterpillar, Scale insects (crawlers: cottony maple, hemlock, oystershell,	Repeat application once only, if re-infestation occurs.  To control scale insects and spider mites (other than twospotted spider mite), spray 2 times, 7 to 10 days apart.

SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
	cottony cushion, lecanium), Spider mites (except twospotted)	
Pine	Bagworm, Gypsy moth, Nantucket pine tip moth, Sawflies (open feeders: redheaded pine, European pine), Tussock moth, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium), Spider mites (except twospotted)	Repeat application once only, if re- infestation occurs.  To control scale insects and spider mites (other than twospotted spider mite), spray 2 times, 7 to 10 days apart.
Poplar	Aphids, Fall webworm, Gypsy moth, Poplar tentmaker, Tent caterpillars (eastern and forest), Tussock moth	Repeat application once only, if re- infestation occurs.
Slippery elm	Casebearers	Repeat application once only, if re- infestation occurs.
Spruce	Gypsy moth, Leafminer, Sawflies (open feeders: redheaded pine, yellowheaded spruce), Tussock moth, Spider mites (except twospotted)	Repeat application once only, if re- infestation occurs.  To control spider mites (other than twospotted spider mite), spray 2 times, 7 to 10 days apart.
Sweetgum	Bagworm	Repeat application once only, if re- infestation occurs.
Sycamore	Aphids, Bagworm, Casebearers, Fall webworm, Lace bug, Obliquebanded leafroller, Tussock moth	Repeat application once only, if re- infestation occurs.
Wild cherry	Tussock moth	Repeat application once only, if re- infestation occurs.
Willow	Aphids, Bagworm, Willow leaf beetle (larvae), Fall webworm, Gypsy moth, Poplar tentmaker, Psyllids,	Repeat application once only, if re- infestation occurs.  To control scale insects, spray 2 times, 7 to 10 days apart.

SITE	PESTS	APPLICATION INSTRUCTIONS AND LIMITATIONS
	Sawflies (open feeders: dusky birch), Tent caterpillars (eastern and forest), Tussock moth, Scale insects (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium)	
Yew (taxus)	Mealybugs	Spray 2 times, 7 to 10 days apart.

### GREENHOUSE USE ON ROSES

PESTS	RATE (a.i.)	APPLICATION INSTRUCTIONS AND LIMITATIONS
Aphid, Flower thrips, Omnivorous leafroller, Rose midge, Whitefly	Hydraulic sprayer: 637 g/1000 L	Spray to wet foliage completely.
<b>Note:</b> <ul style="list-style-type: none"> <li>DO NOT apply more than 0.83 kg a.i./ha.</li> <li>DO NOT enter or allow worker entry into treated areas during the restricted entry interval (REI) of 1 day.</li> </ul>		

### CHRISTMAS TREE PLANTATIONS, FARM WOODLOTS, TREE NURSERIES, SHELTER BELTS, RIGHT OF WAYS, MUNICIPAL PARKS (excluding National and Provincial Parks)

PESTS	RATE (product )	APPLICATION INSTRUCTIONS AND LIMITATIONS
Aphid, Armyworm (fall, beet and yellowstriped), Bagworm, Cankercworm (fall and spring), Casebearer, Fall webworm, Flower thrips, Gladiolous thrips, Greenhouse whitefly, Gypsy moth, Lace bug, Leaf beetle larvae (elm and willow), Leafminer, Meadow spittlebug, Mealybug, Nantucket pine tip moth, Oak leafshredder,	Hydraulic sprayer: 657 g/1000 L  Mist blower: 1353 g/1000 L	Consult Canadian Forestry Service office or provincial forestry authority for information on timing of sprays and method of application.  DO NOT apply to American elm, flowering crabapple, sugar maple, cottonwood, redbud and weigelia, as foliage injury may occur. Before treating rare or unusual varieties, it is advisable to test it on a few plants before spraying large numbers.  Clean sprayer after use by flushing with water. Do not use household bleach or cleaning agent.

PESTS	RATE (product )	APPLICATION INSTRUCTIONS AND LIMITATIONS
Obliquebanded leafroller, Psyllid, Pear slug (pear sawfly larvae), Poplar tentmaker, Potato leafhopper, Rose midge, Scale insect (crawlers: cottony maple, hemlock, oystershell, cottony cushion, lecanium), Sawflies (open feeders: dusky birch, blakheaded ash, redheaded pine, European pine, yellowheaded spruce sawfly), Spider mites, Sunflower moth, Tent caterpillars (eastern and forest), Tobacco budworm, Tussock moth, Yellownecked caterpillar		
<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• DO NOT apply more than 1.31 kg a.i./ha</li> <li>• Re-entry interval (REI) for trees: 3 days (workers re-entering this crop and conducting activities that involve significant foliar contact must wear gloves and cotton coveralls for 1 week after the REI.)</li> </ul>		

**FOR USE BY TRUNK INJECTION FOR CONTROL OF INSECT AND MITE PESTS OF ORNAMENTAL DECIDUOUS AND CONIFEROUS TREES, AS LISTED ON THIS LABEL (refer to the table under DIRECTIONS FOR USE ON TREES above)**

**NOTICE TO USER: READ THE FOLLOWING BEFORE USING THIS PRODUCT FOR TRUNK INJECTION IN ORNAMENTAL DECIDUOUS AND CONIFEROUS TREES:**

The DIRECTIONS FOR USE for this product for the use by trunk injection in Ornamental Deciduous and Coniferous Trees were developed by persons other than Arysta LifeScience North America, LLC and accepted for registration by Health Canada under the User Requested Minor Use Label Expansion program. **ARYSTA LIFESCIENCE NORTH AMERICA, LLC MAKES NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO PERFORMANCE (EFFICACY) OR CROP TOLERANCE (PHYTOTOXICITY) CLAIMS FOR THIS PRODUCT WHEN USED ON ORNAMENTAL DECIDUOUS AND CONIFEROUS TREES.**

Accordingly, the Buyer and User assume all risks related to performance and crop tolerance arising, and agree to hold Arysta LifeScience North America, LLC harmless from any claims based on efficacy or phytotoxicity in connection with the use(s) described below.

**TRUNK INJECTION IN ORNAMENTAL DECIDUOUS AND CONIFEROUS TREES**

**ORTHENE 97% SG** can be used to inject ornamental deciduous and coniferous trees in residential areas, rural lands, farms, business and office complexes, shopping complexes, multi-family residential complexes, golf courses, airports, cemeteries, parks, ravines, playgrounds, and athletic fields to control insect and mite pests, as listed in the table under DIRECTIONS FOR USE ON TREES above.

- Not for use on trees used to produce fruits, nuts, or syrup for consumption.
- Applications are not recommended for trees with a Diameter at Breast Height (DBH) of 7.5 cm or less.
- Do not apply more than one application per tree within 24 months.

All mixing should be carried out by a certified applicator or under the supervision of a certified applicator. Personal protective equipment for mixing and loading should include eye protection, respirator, coveralls, neoprene apron, nitrile gloves and rubber boots. Personal protective equipment for injections should include eye protection, coveralls, nitrile gloves and rubber boots.

**Mix Rate:**

Pre-mix **ORTHENE 97% SG** at a ratio of 100 grams per 45 mL, or 221 grams per 100 mL, of water for use with the following injection application methods and rates.

Apply 0.3 mL for each 2.5 cm Diameter at Breast Height (DBH) of tree. Determine the diameter of tree being injected at breast height. Multiply diameter (cm) of tree x 0.3 mL to calculate the total amount of **ORTHENE 97% SG** required. Inject **ORTHENE 97% SG** as indicated below or with BioForest Inc. EcoJect System, a refillable injection tool. Refer to EcoJect user manual and the APPLICATION METHOD FOR TRUNK INJECTION IN ORNAMENTAL DECIDUOUS AND CONIFEROUS TREES, below, for instruction on injection hole drilling, how to determine the number of injection holes and how many refillable canisters should be used per tree.

Should a less viscous (more flow) mix be required for compatibility with the injection method (i.e. pipette), pre-mix **ORTHENE 97% SG** at a ratio of 83 grams per 50 mL of water and apply 0.4 mL for each 2.5 centimetres Diameter at Breast Height (DBH) of tree.

**APPLICATION METHOD FOR TRUNK INJECTION IN ORNAMENTAL DECIDUOUS AND CONIFEROUS TREES**

**Smaller Trees (pipette method):**

1. Pre-drill the tree with the number of holes required to accommodate the total amount of **ORTHENE 97% SG** to be applied. Use the countersink bit provided or drill to the depth indicated on the 5/32 bit. Each hole will hold 1 mL of product. Space the holes equally around the tree circumference. Holes should be drilled at a 45-degree angle toward the ground and placed towards the base of the tree, just above the root flare. Holes only need to be drilled to the depth of the countersink bit or the depth mark on the 5/32 bit. This will ensure sufficient depth into the sapwood and create a reservoir to a volume of 1 mL.
2. Pre-load the provided pipette with the total amount of **ORTHENE 97% SG** to be applied. If the amount of **ORTHENE 97% SG** to be applied exceeds the volume of the pipette, fill the pipette to its complete volume and subtract this from the amount of **ORTHENE 97% SG** to be applied. Fill the pipette with the remaining amount to be applied to continue the application. Repeat if necessary. If using a 1mL pipette, fill to the complete volume of the pipette for application to each hole.

3. Insert the pipette nozzle just into the reservoir opening (do not push the nozzle into the hole to occupy the reservoir volume) and depress the pipette pump. Each activation of the pipette pump applies to 1 mL of product into the reservoir.
4. Following each application of **ORTHENE 97% SG**, seal the reservoir hole with beeswax.

**Smaller Trees (syringe method):**

1. Pre-drill the tree with the number of holes required to accommodate the total amount of **ORTHENE 97% SG** to be applied. Use the countersink bit provided or drill to the depth indicated on the 5/32 bit. Each hole will hold 1 mL of product. Space the holes equally around the tree circumference. Holes should be drilled at a 45-degree angle toward the ground and placed towards the base of the tree, just above the root flare. Holes only need to be drilled to the depth of the countersink bit or the depth mark on the 5/32 bit. This will ensure sufficient depth into the sapwood and create a reservoir to a volume of 1 mL.
2. Use a catheter tip to avoid punctures and injuries. Pre-load the syringe to capacity or with the total amount of **ORTHENE 97% SG** to be applied.
3. Insert the catheter tip of the syringe just into the reservoir opening (do not push the entire tip into the hole to occupy the reservoir volume) and depress the syringe plunger while noting the plunger movement along the milliliter graduations. Depress the plunger only to a distance equivalent to 1 mL graduation as indicated on the syringe barrel. This will apply 1 mL of product into the reservoir.
4. Repeat step 3 for each hole drilled in the tree and seal the reservoir hole with beeswax following each application.

**Larger Trees (EcoJect System):**

1. Pre-drill the tree with the number of holes required to accommodate the total amount of **ORTHENE 97% SG** to be applied. Each hole will receive 4 mL of product; therefore, dividing the total amount of **ORTHENE 97% SG** to be applied by 4 will result in the number of holes required. Use the 5/32" drill bit provided and drill only to the depth indicated on the bit. Space the holes equally around the tree circumference. Holes may be drilled straight into the tree (90 degrees) and placed towards the base of the tree, just above the root flare.
2. Force the EcoJect nozzle into the hole (tap with a hammer, if necessary) in order to secure a seal between the EcoJect nozzle and the tree. Secure the filled EcoJect canister to the nozzle. This will activate the pump mechanism in the canister and cause 4 mL of **ORTHENE 97% SG** to enter the hole.
3. Remove the EcoJect nozzle and canister together from the hole and seal the hole with beeswax.
4. Repeat steps 2 and 3 for each hole in the tree.

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