

Agri Star[®]
By Albaugh Inc.

SPECIMEN LABEL

IMPULSE[™] 1.6 FL

For control of certain insects infesting various crops

NET CONTENTS:
1 GALLON

Manufactured for:

ALBAUGH, INC.

1525 NE 36th Street
Ankeny, Iowa 50021

**FOR CHEMICAL SPILL, LEAK,
FIRE, OR EXPOSURE, CALL
CHEMTREC (800) 424-9300**

ACTIVE INGREDIENT:

Imidacloprid, 1-[(6-Chloro-3-pyridinyl)methyl]-

N-nitro-2-imidazolidinimine 17.4%

INERT INGREDIENTS: 82.6%

TOTAL: 100.0%

Contains 1.6 pounds of imidacloprid per gallon.

EPA Reg. No. 42750-109

EPA Est. No. 37429-GA-002

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

FIRST AID

IF SWALLOWED:	<ul style="list-style-type: none">• Call a poison control center 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 center or doctor.• Do not give anything by mouth to an unconscious person.
IF IN EYES:	<ul style="list-style-type: none">• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.• Call a poison control center or doctor for treatment advice.
IF ON SKIN OR CLOTHING:	<ul style="list-style-type: none">• Take off contaminated clothing.• Rinse skin immediately with plenty of water for 15 to 20 minutes.• Call a poison control center or doctor for treatment advice.

In case of emergency call CHEMTREC toll free at 1-800-424-9300. Have a product container or label with you when calling a poison control center or doctor, or going for treatment.

NOTE TO PHYSICIAN: No specific antidote is available. Treat the patient symptomatically.

See inside booklet for additional PRECAUTIONARY STATEMENTS.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Harmful if swallowed or absorbed through skin. Avoid contact with skin, eyes, or clothing.

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material such as, barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyethylene, polyvinyl chloride (PVC) or viton
- Shoes plus socks

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

ENGINEERING CONTROLS STATEMENTS

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

USER SAFETY RECOMMENDATIONS

User should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing 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

Do not apply directly to water, 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.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area. This product is toxic to wildlife and highly toxic to aquatic invertebrates.

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

OBSERVE THE FOLLOWING PRECAUTIONS WHEN MIXING AND APPLYING IN THE VICINITY OF AQUATIC AREAS SUCH AS LAKES; RESERVOIRS; RIVERS; PERMANENT STREAMS, MARSHES OR NATURAL PONDS; ESTUARIES AND COMMERCIAL FISH FARM PONDS.

SPRAY DRIFT MANAGEMENT

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

Mixing and Loading Requirements

To avoid potential contamination of groundwater, the use of a properly designed and maintained containment pad for mixing and loading of any pesticide into application equipment is recommended. If containment pad is not used, maintain a minimum distance of 25 feet between mixing and loading areas and potential surface to groundwater conduits such as field sumps, uncased well head, sinkholes or field drains.

For Aerial Applications:

The spray boom should be mounted on the aircraft so as to minimize drift caused by wing tip vortices. The minimum practical boom length should be used, and must not exceed 75% of the wing span or rotor diameter.

Importance of Droplet Size

An important factor influencing drift is droplet size. Small droplets (<150-200 microns) drift to a greater extent than large droplets. Within typical equipment specifications, applications should be made to deliver the largest droplet spectrum that provides sufficient control and coverage. Formation of very small droplets may be minimized by appropriate nozzle selection.

Wind Speed Restrictions

Drift potential increases at wind speeds of less than 3 mph (due to inversion potential) or more than 10 mph. However, many factors, including droplet size, canopy and equipment specifications determine drift potential at any given wind speed. Do not apply when winds are greater than 15 mph and avoid gusty and windless conditions. Risk of exposure to sensitive aquatic areas can be reduced by avoiding applications when wind direction is toward the aquatic area.

Restrictions During Temperature Inversions

Do not make aerial or ground applications during temperature inversions. Drift potential is high during temperature inversions. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain close to the ground and move laterally in a concentrated cloud. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however if fog is not present, inversions can also be identified by the movement of smoke from a ground source. 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 mixing.

Airblast (Air Assist) Specific Recommendations for Tree Crops and Vineyards

Airblast sprayers carry droplets into the canopy of trees/vines via a radially, or laterally directed airstream. The following specific drift management practices should be followed:

- Adjust deflectors and aiming devices so that spray is only directed into the canopy;
- Block off upward pointed nozzles when there is no overhanging canopy;
- Use only enough air volume to penetrate the canopy and provide good coverage;
- Do not allow the spray to go beyond the edge of the cultivated area (i.e., turn off sprayer when turning at end rows);
- Only spray inward, toward the orchard or vineyard, for applications to the outside rows.

No-Spray Zone Requirements for Foliar Applications

Do not apply by ground within 25 feet, or by air within 150 feet of lakes; reservoirs; rivers; permanent streams, marshes or natural ponds; estuaries and commercial fish farm ponds.

Runoff Management

Do not cultivate within 10 feet of the aquatic areas to allow growth of a vegetative filter strip. When used on erodible soils, best management practices for minimizing runoff should be employed. Consult your local Natural Resources Conservation Service for recommendations in your use area.

Endangered Species Notice

Under the Endangered Species Act, it is a Federal Offense to use any pesticide in a manner that results in the death of a member of an endangered species. Consult your local county bulletin, County Extension Agent, or Pesticide State Lead Agency for information concerning endangered species in your area.

Resistance Management

Some insects may develop resistance to imidacloprid after repeated use. Users should incorporate resistance management practices such as rotating classes of insecticides when possible.

Insect species that have acquired a tolerance to imidacloprid and other neonicotinoid (Group 4A) insecticides may become dominant if Group 4A are used repeatedly. This can eventually result in the loss of this class of insecticides as a viable control.

Do not make over three consecutive applications of IMPULSE™ 1.6 FL and/or other Group 4A neonicotinoid class products having a similar mode of action. Following a neonicotinoid series of treatments, Albaugh recommends rotation to application with products that control with a different mode of action before making more applications of neonicotinoid products. Using a rotation of insecticide classes approach, along with other IPM practices, is an effective strategy for minimizing insect pest's resistance to this class of chemistry.

Soil applications of neonicotinoid class insecticides to crops should be factored into the resistance management plans for foliar applications to the crops.

Other Group 4A, neonicotinoid products labeled for foliar treatments include: Actara, Assail, CALYPSO®, Centric, Intruder, LEVERAGE® and TRIMAX®. Other 4A Group, neonicotinoid products used as soil treatment include: ADMIRE® and Platinum.

Additional information on insect resistance management can be obtained from your local extension specialist, certified crop advisor, product manufacturer or visit the Insecticide Resistance Action Committee (IRAC) on the web at <http://irac-online.org/>.

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 12 hours.

Exception: If the product is soil-injected or soil-incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

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 any waterproof material such as, barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyethylene, polyvinylchloride (PVC) or viton
- Shoes plus socks

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area. Handle and open container in a manner as to prevent spillage. If the container is leaking, invert to prevent leakage. If container is leaking or material spilled for any reason or cause, carefully dam up spilled material to prevent runoff. Refer to Precautionary Statements on label for hazards associated with the handling of this material. Do not walk through spilled material. Absorb spilled material with absorbing type compounds and dispose of as directed for pesticides below. In spill or leak incidents, keep unauthorized people away.

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

CONTAINER DISPOSAL: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

APPLICATION DIRECTIONS

DO NOT Apply IMPULSE™ 1.6 FL in Enclosed Structures Such as Greenhouses or Planthouses.

Apply IMPULSE™ 1.6 FL as a directed or broadcast foliar spray. Thorough coverage of foliage without runoff is required for maximum insecticidal efficacy. Use of adequate spray volumes and correctly calibrated application equipment is critical. Use of a spray adjuvant may enhance thorough coverage. Lack of adequate coverage and retention of IMPULSE™ 1.6 FL on foliage and fruit can delay or lessen insect control. IMPULSE™ 1.6 FL may be applied with ground or aerial application equipment that has been properly calibrated.

Minimum recommended spray volumes (unless otherwise specified on crop sections) are:

- 10 gallons/Acre by ground application
- 5 gallons/Acre through aerial equipment

IMPULSE™ 1.6 FL may also be applied by overhead chemigation (see “CHEMIGATION DIRECTIONS FOR USE” section below) if allowed in crop specific recommended application section.

IMPULSE™ 1.6 FL application to crops grown for production of true seed intended for private or commercial planting may be allowed under State specific supplemental labeling. Extreme caution should be taken to minimize exposure of IMPULSE™ 1.6 FL to honey bees and other pollinators. Do not use IMPULSE™ 1.6 FL on crops requiring bee pollination during bloom and a minimum of 10 days prior to bloom. Additional information on IMPULSE™ 1.6 FL uses for these crops and other questions may be obtained from the Cooperative Extension Service, PCAs, consultants or local Albaugh representatives.

Do not exceed application of more than 0.5 lbs. active ingredient per acre, per crop season, regardless of formulation or method of application, unless specified within a crop specific recommended applications section for a given crop.

Mixing Instructions

1. Add 50% of the required amount of water to the spray tank
2. Begin agitation
3. Add labeled rate of IMPULSE™ 1.6 FL
4. Add balance of water needed.

Maintain sufficient agitation during both mixing and application. IMPULSE™ 1.6 FL may be tank mixed with other pesticides and/or fertilizer solutions. Refer to “Compatibility Note” below. When tank mixing IMPULSE™ 1.6 FL with other pesticides, prepare the tank mixture as recommended above and follow suggested “Mixing Order” below.

Mixing Order for Tank Mixes

1. Wettable powders
2. IMPULSE™ 1.6 FL, or other flowables second,
3. Emulsifiable concentrates

Maintain good agitation as each pesticide is added. Do not add the next product until the previous is thoroughly mixed. If a fertilizer solution is added, a fertilizer pesticide compatibility agent may be needed. Maintain constant agitation during both mixing and application to ensure uniformity of spray mixture.

Compatibility Note

Unless the applicator has prior knowledge of the compatibility of the intended tank mixture, Albaugh recommends a small scale test by adding proportionate amounts of each ingredient in the appropriate order, to a clear pint or quart sized jar. Cap and shake for 5 minutes, then let set for 5 minutes. Any visual indication of poor mixing or formation of precipitates that cannot be easily re-dispersed indicates incompatibility and the mixture that should not be used.

CHEMIGATION DIRECTIONS FOR USE

Refer to “GENERAL DIRECTIONS FOR USE” section before proceeding with chemigation application.

Types of Irrigation Systems

Chemigation applications of IMPULSE™ 1.6 FL may be made to crops through overhead sprinkler chemigation systems if specified in crop-specific recommendations sections. Do not apply IMPULSE™ 1.6 FL through any other type of irrigation system.

Water Volume

IMPULSE™ 1.6 FL chemigation applications should be made as concentrated as possible. Retention of IMPULSE™ 1.6 FL on target site of insect infestation is necessary for optimum activity. Chemigation of IMPULSE™ 1.6 FL in water volumes exceeding 0.10 inches/Acre are not recommended.

Uniform Water Distribution and System Calibration

The irrigation system must provide uniform distribution of treated water. Crop injury, lack of effectiveness or illegal pesticide residues in the crop can result from non-uniform distribution of treated water. The system must be calibrated to uniformly apply the rates specified. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.

Chemigation Monitoring

A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

Drift

Do not apply when the wind speed favors drift beyond the area intended for treatment.

Required System Safety Devices

The system must contain a functional check valve, vacuum relief valve, and low-pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow. The pesticide injection pipeline must contain a functional automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or normally shut down. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

Using Water from Public Water Systems

DO NOT APPLY IMPULSE™ 1.6 FL THROUGH ANY IRRIGATION SYSTEM PHYSICALLY CONNECTED TO A PUBLIC WATER SYSTEM. Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. IMPULSE™ 1.6 FL may be applied through irrigation systems that may be supplied by a public water system only if the water from the public water system is discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and to top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe. Before beginning chemigation, always make sure that the air gap exists and that there is no blockage of the overflow of the reservoir tank.

An irrigation system using water supplied from a public water system must also meet the following requirements. The pesticide injection pipeline must contain a functional automatic quick-closing check valve to prevent the flow of fluid toward the injection pump.

ROTATIONAL CROPS*

Treated areas may be replanted with any crop specified on an imidacloprid label, or any crop for which a tolerance exists for the active ingredient, as soon as practical following the last application. For crops not listed on an imidacloprid label, or for crops for which no tolerances for the active ingredient have been established, a 12-month plant-back interval should be observed.

PLANTBACK INTERVAL	COMMENT
Immediate Plant-back:	Any crop listed on this label plus the following crops not on this label: barley, canola, corn (field, sweet and pop), rapeseed, sorghum, sugar beet and wheat.
30-Day Plant-back:	Cereals (including buckwheat, millet, oats, rice, rye and triticale), soybeans, safflower
12-Month Plant-back:	All other crops

*Cover crops for soil building or erosion control may be planted any time, but do not graze or harvest for food or feed.

FIELD CROPS

Apply as foliar spray at specified rate per acre when insect pressure reaches economic threshold. Uniform coverage is required to achieve best control and a spray adjuvant may help improve coverage. Two applications may be required to achieve control when initial insect populations are high. Retreatment should be based on field scout reports. IMPULSE™ 1.6 FL may be tank mixed with other labeled insecticides to increase control or control pests not controlled by imidacloprid. Apply only through properly calibrated ground, aerial or chemigation application equipment insuring thorough coverage.

COTTON

For control of Aphids, Flea hoppers, Bandedwinged whitefly, Plant bugs (east of Rocky Mountains), Green stink bug, Southern green stink bug, Bollworm/Budworm (ovicidal effect) apply 2.5 to 5.0 fluid ounces per acre (3.8 fluid ounces: CA only) and suppression of Lygus bug (west of Rocky Mountains), and Whiteflies (other than bandedwinged whitefly) apply 3.8 to 5.0 fluid ounces per acre. (3.8 fluid ounces per acre: CA only) as a broadcast or directed spray to infested area. Apply only through properly calibrated ground, aerial or chemigation application equipment insuring thorough coverage.

Tank Mix Recommendations

For early season control of Thrips apply 2.5 to 3.8 fluid ounces of IMPULSE™ 1.6 FL per acre + 1.6 to 3.2 fluid ounces of Bidrin® 8* per acre as a broadcast or directed foliar spray to infested area. For mid to late season control of plant bugs, stink bugs (including Brown stink bug), Grasshoppers, Saltmarsh caterpillar and Cotton leafperforator apply 2.5 to 3.8 fluid ounces of IMPULSE™ 1.6 FL per acre + 4.0 to 8.0 fluid ounces of Bidrin® 8* per acre as a broadcast spray of directed foliar spray to infested area.

Notes and Restrictions for Cotton:

- Pre-Harvest Interval (PHI): 14 days
- Minimum interval between applications: 7 days
- Maximum IMPULSE™ 1.6 FL allowed per season: 25.0 fluid ounces/Acre (0.31 lb AI/A); For CA: 22 fluid ounces/Acre (0.28 lb. AI/A)
- Maximum number of IMPULSE™ 1.6 FL applications per crop season: 6
- Do not graze treated fields after any application of IMPULSE™ 1.6 FL.

Refer to the Bidrin® 8 product label for specific use recommendations; observe all restrictions and precautions that appear on the label.

POTATO

For control of Aphids, Colorado potato beetle, Flea beetles, Leafhoppers and Psyllids apply 3.8 fluid ounces per acre as a broadcast or directed spray to infested area. Apply only through properly calibrated ground, aerial or chemigation application equipment insuring thorough coverage.

Notes and Restrictions for Potatoes:

- Pre-Harvest Interval (PHI): 7 days
- Minimum interval between applications: 7 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 15.2 fluid ounces/Acre (0.19 lb. AI/A)

TOBACCO

For control of Aphids apply 2.0 to 4.0 fluid ounces per acre as a broadcast or directed spray to infested area. Use higher rate when insect pressure is heavy.

For control of Flea beetles and Japanese beetle apply 4.0 fluid ounces per acre as a broadcast or directed spray to infested area.

Notes and Restrictions for Tobacco:

- Pre-Harvest Interval (PHI): 14 days
- Minimum interval between applications: 7 days
- Maximum number of IMPULSE™ 1.6 FL allowed per crop season: 22.4 fluid ounces/Acre (0.28 lb. AI/A)

Apply only through properly calibrated ground, aerial or chemigation application equipment insuring thorough coverage.

VEGETABLE AND SMALL FRUIT CROPS

Apply as foliar spray at specified rate per acre when insect pressure reaches economic threshold. Uniform coverage is required to achieve best control and a spray adjuvant may help improve coverage. Two applications may be required to achieve control when initial insect populations are high. Retreatment should be based on field scout reports. IMPULSE™ 1.6 FL may be tank mixed with other labeled insecticides to increase control or control pests not controlled by imidacloprid. Apply only through properly calibrated ground, aerial or chemigation application equipment insuring thorough coverage.

FRUITING VEGETABLES (Not for use on crops grown for seed unless allowed by state-specific supplemental labeling)

Eggplant, Ground cherry, Okra, Pepper (including bell, chili, cooking, pimento and sweet), Tomato, Pepinos, Tomatillo

For control of Aphids, Colorado potato beetle, Leafhoppers and Whiteflies apply 3.8 fluid ounces per acre.

For control of Pepper weevil (Pepper only) apply 6.2 fluid ounces per acre. Make applications prior to a damaging population becoming established.

Notes and Restriction for Fruiting Vegetables:

- Pre-Harvest Interval (PHI): 0 days
- Minimum interval between applications: 5 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 19.0 fluid ounces/Acre (0.24 lb. AI/A)

Applications of IMPULSE™ 1.6 FL must be part of a full-season resistance management program that uses alternate applications products from multiple classes of chemistry and different modes of action. For pepper weevil, apply specified dosage of IMPULSE™ 1.6 FL by ground equipment only, timing applications prior to a damaging population becoming established. Good coverage of foliage and fruit is necessary for optimum control.

GLOBE ARTICHOKE

For control of Aphids and Leafhoppers apply 4.0 to 10.0 fluid ounces per acre. Use higher rates when pest pressure is more severe.

Notes and Restrictions for Global Artichoke:

- Pre-Harvest Interval (PHI): 7 days
- Minimum interval between applications: 14 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 40.0 fluid ounces/Acre (0.50 lb. AI/A)

HEAD and STEM BRASSICA VEGETABLES²

Broccoli, Broccoli raab (rapini), Brussels sprouts, Cabbage, Cauliflower, Cavalo broccoli, Chinese (gai ion) broccoli, Chinese (bok choy) cabbage, Chinese (napa) cabbage, Chinese mustard (gai choy) cabbage, Collards, Kale, Kohlrabi, Mizuna, Mustard greens, Mustard spinach, Rape greens

LEAFY VEGETABLES²

Amaranth (leafy amaranth, Chinese spinach, tampala), Arugula (rocket), Chervil, Chrysanthemum (edible leaved and garland), Cilantro, Corn salad, Cress (garden), Cress (upland, yellow rocket, winter cress), Dandelion, Dock (sorrel), Endive (escarole), Lettuce (head and leaf), Orach, Parsley, Purslane (garden and winter), Radicchio (red chicory). Spinach (Including New Zealand and vine [Malabar spinach, Indian spinach]), Watercress (commercial production only). Applications must not be made to native cress growing in streams or other bodies of water¹, Watercress (upland)¹

For control of Aphids, Flea beetles, Leafhoppers, and Whiteflies apply 3.8 fluid ounces per acre.

Notes and Restrictions for Head and Stem Brassica Vegetables and Leafy Vegetables:

- Pre-Harvest Interval (PHI): 7 days
- Minimum interval between applications: 5 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 19.0 fluid ounces/Acre (0.24 lb. AI/A)

¹Use not permitted in California unless otherwise directed by supplemental labeling.

²Not for use on crops grown for seed unless allowed by state-specific supplemental labeling.

LEGUMES VEGETABLES¹ (except soybean, dry)

Edible Podded and Succulent Shelled Pea/and Bean and Dried Shelled Pea and Bean

Bean (*Lupinus spp.*, includes grain lupin, sweet lupin, white lupin, and white sweet lupin)

Bean (*Phaseolus spp.*, includes field bean, kidney bean, lima bean, navy bean, pinto bean, runner bean, snap bean, tery bean, wax bean)

Bean (*Vigna spp.*, includes adzuki bean, asparagus bean, blackeyed pea, catjang, Chinese longbean, cowpea, Crowder pea, moth bean, mung bean, rice bean, Southern pea, urd bean, yardlong bean)

Pea (*Pisum spp.*, includes dwarf pea, edible pea, edible-pod pea, English pea, field pea, garden pea, green pea, snow pea, sugar snap pea)

Other Beans and Peas (Broad bean [fava], chickpea [garbanzo bean], Guar, Jackbean, Lablab bean [hyacinth bean], lentil, Pigeon pea, soybean [immature seed], Sword bean)

For control of Aphids, Leafhoppers and Whiteflies apply 3.5 fluid ounces per acre.

Note and Restrictions for Legume Vegetables:

- Pre-Harvest Interval (PHI): 7 days
- Minimum interval between applications: 7 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 10.5 fluid ounces/Acre (0.13 lb. AI/A)

¹Not for use on crops grown for seed unless allowed by state-specific supplemental labeling.

ROOT, TUBEROUS and CORM VEGETABLES¹

Arracacha, Arrowroot, Artichoke (Chinese and Jerusalem), Beet (garden)², Burdock (edible)², Canna (edible, Queensland arrowroot), carrot², Cassava (bitter and sweet)², Celeriac², Chayote (root), Chervil (turnip-rooted)², Chicory², Chufa, Dasheen (taro)², Ginger, Ginseng, Horseradish, Leren, Parsley (turnip-rooted)³, Parsnip², Radish², Oriental radish (daikon)², Rutabaga², Salsify (black)², Salsify (oyster plant), Salsify (Spanish), Skirret, Sweetpotato², Tanier (cocoyam)², Turmeric, Turnip², Yam bean (jicama, manioc pea), Yam (true)²

For recommended applications on potato see "FIELD CROPS" section.

For control of Aphids, Flea beetles, Leafhoppers and Whiteflies apply 3.5 fluid ounces per acre.

Note and Restrictions for Root Tuberosus and Corm Vegetables:

- Pre-Harvest Interval (PHI): 7 days
- Minimum interval between applications: 5 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 3.5 fluid ounces/Acre on radish; 10.5 fluid ounces/Acre (0.13 lb. AI/A) on other crops.
- Maximum IMPULSE™ 1.6 FL applications per crop season: 1 on radish; 3 on other crops

¹Not for use on crops grown for seed unless allowed by state-specific supplemental labeling.

²Tops or greens from these crops may be utilized for food or feed.

STRAWBERRY

For control of Aphids, Spittlebugs and Whiteflies apply 3.8 fluid ounces per acre.

Notes and Restrictions for Strawberries:

- Pre-Harvest Interval (PHI): 7 days
- Minimum interval between applications: 5 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 11.4 fluid ounces/Acre (0.14 lb. AI/A)
- Do not apply during bloom or within 10 days prior to bloom or when bees are actively foraging.

TREE, BUSH AND VINE CROPS

Apply as foliar spray at specified rate per acre when insect pressure reaches economic threshold. Uniform coverage is required to achieve best control and a spray adjuvant may help improve coverage. Two applications may be required to achieve control when initial insect populations are high. Retreatment should be based on field scout reports. IMPULSE™ 1.6 FL may be tank mixed with other labeled insecticides to increase control or control pests not controlled by imidacloprid.

BUSHBERRY

Blueberry, Currant, Elderberry, Gooseberry, Huckleberry, Juneberry, Lingonberry, Salal

For control of Aphids and Leafhoppers/Sharpshooters apply 3.0 to 4.0 fluid ounces per acre. Use higher rates when pest pressure is more severe.

For control of Japanese beetles (adults), Blueberry Maggot and Thrips apply 6.0 to 8.0 fluid ounces per acre. Use higher rates when pest pressure is more severe.

For control of Blueberry maggot apply 8.0 fluid ounces per acre.

Notes and Restrictions for Bushberries:

- Pre-Harvest Interval (PHI): 3 days
- Minimum interval between applications : 7 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 40.0 fluid ounces/Acre (0.5 lb. AI/A)
- Maximum number of IMPULSE™ 1.6 FL applications per crop season: 5
- Maximum application volume (water): 20.0 GPA – ground; 5.0 GPA – aerial.
- Do not apply pre-bloom or during bloom or when bees are actively foraging.

CITRUS

Calamondin, Citrus citron, Citrus hybrids (includes chironja, tangelo and tangor), Grapefruit, Kumquat, Lemon, Lime, Mandarin (tangerine), Pummelo, Orange (sweet and sour), Satsuma mandarin, White sapote (*Casimiroa spp.*), and other cultivars and/or hybrids of these.

Pests Controlled	Rate fluid ounces/100 gallons	Rate fluid ounces/Acre
Aphids Asian citrus psyllid Black fly Leafhoppers/Sharpshooters Leafminers Mealy bugs Scales Whiteflies	3.5-5.0 (for dilute applications)	10.0-20.0 (depending on tree size, target pest and infestation pressure)
Thrips (suppression only)	3.5-5.0	10.0-20.0

Notes and Restrictions for Citrus

- Pre-Harvest Interval (PHI): 0 days
- Minimum interval between applications: 10 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 40.0 fluid ounces/Acre (0.5 lb. AI/A)
- Do not apply during bloom or within 10 days prior to bloom or when bees are actively foraging.

Applications

Aerial application of IMPULSE™ 1.6 FL may result in slower activity and reduced control to results from ground application.

Scales – time applications to the crawler stage. Treat each generation. Where concentrated applications are appropriate, increase the spray solution concentration to apply an equivalent rate per acre to that applied in the diluted application. The 20.0 fluid ounce/Acre rate is based on full-sized trees. This rate may be reduced proportionally for smaller trees.

GRAPE

American bunch grape, Muscadine grape and Viniferous grape

For control of Leafhoppers/Sharpshooters and Mealybugs apply 3.0 to 3.8 fluid ounces per acre. Use higher rates when pest pressure is more severe.

For control of Grapeleaf skeletonizer^{1/} apply 3.8 fluid ounces per acre. Control can usually be achieved with ground applications that provide more thorough coverage of foliage. Aerial applications may only provide suppression due to lack of thorough coverage.

Notes and Restrictions for Grapes:

- Pre-Harvest Interval (PHI): 0 days
- Minimum interval between applications: 14 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 7.6 fluid ounces/Acre (0.1 lb. AI/A)
- IMPULSE™ 1.6 FL may be applied by ground application only in California.

Applications

^{1/}Grapeleaf skeletonizer control can be expected from applications that provide thorough coverage of foliage. Aerial applications may provide suppression.

HOPS

For control of Aphids apply 8.0 fluid ounces per acre.

Notes and Restrictions for Hops:

- Pre-Harvest Interval (PHI): 28 days
- Minimum interval between applications: 21 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 24.0 fluid ounces/Acre (0.10 lb. AI/A)

PECAN (Use not permitted in California unless otherwise directed by supplemental labeling)

For control of Aphids (use higher rate for Black pecan aphid), Phylloxera and Spittlebugs apply 3.5 to 7.0 fluid ounces per acre. Use higher rate when pest pressure is more severe.

Notes and Restrictions for Pecans:

- Do not apply after shuck split.
- Pre-Harvest Interval (PHI): 7 days
- Minimum interval between applications: 10 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 28.0 fluid ounces/Acre (0.35 lb. AI/A)

STONE FRUIT

Apricot, Cherry (including sweet and tart), nectarine, Peach, Plum (including Chickasaw, Damson and Japanese), Plumcot, Prune (fresh and dried)

Pests Controlled	Rate fluid ounces/Acre
Aphids Green June beetle Japanese beetle Leafhoppers/Sharpshooters Plant bugs Rose chafer San Jose scale	4.0 - 8.0
Cherry fruit fly (maggot of Eastern and Western)	6.0 - 8.0
Pest suppressed	
Plum curculio Stink bugs	8.0
<ul style="list-style-type: none"> • Aerial application of IMPULSE™ 1.6 FL may result in slower activity and reduced control relative to results from ground application. • Minimum application volume (water): 50 GPA – ground application; 25 GPA – aerial application • Do not apply pre-bloom or during bloom or when bees are actively foraging. 	

Notes and Restrictions for Apricot, Nectarine and Peach:

- Pre-Harvest Interval (PHI): 0 day
- Minimum interval between applications: 7 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 24.0 fluid ounces/Acre (0.30 lbs. AI/A)

Notes and Restrictions for Cherries, Plums, Plumcot and Prune:

- Pre-Harvest Interval (PHI): 7 day
- Minimum interval between applications: 10 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 40.0 fluid ounces/Acre (0.50 lbs. AI/A)

Applications

Aerial application of IMPULSE™ 1.6 FL may result in slower activity and reduced control relative to results from ground application.

TROPICAL FRUIT

Acerola, Avocado, Black sapote, Canistel, Feijoa, Jaboticaba, Guava, Longan, Lychee, Mamey sapote, Mango, Papaya, Passionfruit, Pulasan, rambutan, Sapodilla, Spanish lime, Star apple, Starfruit, Wax jambu

For control of Aphids, Leafhoppers/Sharpshooters, Thrips, and Whiteflies apply 8.0 fluid ounces per acre.

For suppression of Scales apply 8.0 fluid ounces per acre.

Notes and Restrictions

- Pre-Harvest Interval (PHI): 7 days
- Minimum interval between applications: 10 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 40.0 fluid ounces/Acre (0.50 lb. AI/A)
- Maximum number IMPULSE™ 1.6 FL applications per crop season: 5
- Do not apply pre-bloom or during bloom or when bees are actively foraging.

Aerial application of IMPULSE™ 1.6 FL may result in slower activity and reduced control compared to ground application due to less thorough coverage.

POME FRUIT

Apple, Crabapple. Loquat, Mayhaw, Pear (including Oriental pear), Quince

Pests Controlled	Rate fluid ounces/Acre ¹
Leafhoppers	4.0 - 8.0
Aphids (except woolly apple aphid) Leafminers San Jose scale	8.0
FOR PEAR ONLY Mealybugs Pear psylla	20.0

Leafhoppers – Apply low rate for low to moderate populations of white apple leafhoppers and high rate for high populations or for other leafhopper species. Apply IMPULSE™ 1.6 FL while most leafhoppers are in the nymphal stage.

Leafminer – For first generation leafminer control, make application after pollination is complete and bees are no longer present in the orchard. Greatest leafminer control will result from the earliest possible application. For second and succeeding generations of leafminer, better control will be obtained from applications made early in the adult flight against egg and early instar larvae. A second application may be required 10 days later if severe pressure continues or if generations are overlapping. A single application may result in suppression only. IMPULSE™ 1.6 FL will not control late instar larvae.

Mealybugs – Apply maximum gallonage for tree with ground equipment. Ensure good spray coverage of the trunk and scaffolding limbs or other resting sites of mealybugs.

Rosy apple aphid – Apply prior to leafrolling caused by rosy apple aphid.

San Jose scale – Time applications to the crawler stage. Treat each generation.

¹The amount of IMPULSE™ 1.6 FL required per acre will depend on tree size and volume of foliage present. The rate per acre is based on a standard of 400 gallons of dilute spray solution per acre for large trees. To calculate the rate needed on smaller trees, multiply the pest specific rate (e.g., for aphid control, 2 fluid ounces/100 gallons) times the number of 100 gallons of spray solution required to thoroughly wet foliage just prior to the point of runoff, on one acre of the trees being treated. For concentrate sprays, apply the same amount of IMPULSE™ 1.6 FL per acre as would be applied in a dilute spray based on tree size and foliage volume.

Notes and Restrictions for Pome Fruits:

- Pre-Harvest Interval (PHI): 7 days
- Minimum interval between applications: 10 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 40.0 fluid ounces/Acre (0.5 lb. AI/A)
- Do not apply pre-bloom or during bloom or when bees are actively foraging.

Aerial application of IMPULSE™ 1.6 FL may result in slower activity and reduced control compared to ground application due to less thorough coverage.

OTHER CROPS

Apply as foliar spray at specified rate per acre when insect pressure reaches economic threshold. Uniform coverage is required to achieve best control and a spray adjuvant may help improve coverage. Two applications may be required to achieve control when initial insect populations are high. Retreatment should be based on field scout reports. IMPULSE™ 1.6 FL may be tank mixed with other labeled insecticides to increase control or control pests not controlled by imidacloprid.

POPLAR/COTTONWOOD (includes members of the genus *Populus* grown for pulp or timber)

(Use not permitted in California unless otherwise directed by supplemental labeling)

For control of Aphids and Leaf beetles apply 4.0 to 8.0 fluid ounces per acre. Use higher rates when pest pressure more severe.

Notes and Restrictions for Poplar/Cottonwood:

- Minimum interval between applications: 10 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 40.0 fluid ounces/Acre (0.50 lb. AI/A)
- Do not apply pre-bloom or during bloom or when bees are actively foraging.

Aerial application of IMPULSE™ 1.6 FL may result in slower activity and reduced control compared to ground application due to less thorough coverage.

CHRISTMAS TREE

For control of Aphids, Adelgids and Sawflies apply 4.0 to 8.0 fluid ounces per acre. Use higher rate when pest pressure more severe.

Notes and Restrictions for Christmas Trees:

- Minimum interval between applications: 7 days
- Maximum IMPULSE™ 1.6 FL allowed per crop season: 40.0 fluid ounces/Acre (0.50 lb. AI/A)

Aerial application of IMPULSE™ 1.6 FL may result in slower activity and reduced control compared to ground application due to less thorough coverage.

Gall-forming Adelgids – time applications to coincide with full bud-swell or first bud-break of earliest bud-breaking trees. After galls form, spraying will no longer be effective.

IMPORTANT: READ BEFORE USE

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