

Lessons learned in Southern California: pest control company, pesticide applications

Dawn Fluharty



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18 years in the green industry including; sales and sales management, horticultural education and training and operations management.



PCA (Pest Control Advisor) license



Member of CAPCA (California Association of Pest Control Advisors), Western Chapter of the International Society of Arboriculture



Board Member of Street Tree Seminars and Bay Area Urban Forest Ecosystems Council Board.



QAL license and board member of PAPA (Pesticide Applicators Professional Association).



Identifying contractors who will competently perform the tree treatment work at the best available cost.

Preserving trees has been proven to be more cost effective to municipalities than remove and replace

Urban tree canopy provides numerous quantifiable benefits to the community



Identifying Scope of Work

- Identify approximate quantity of trees to be preserved
- Identify species, dbh, condition and location
- Identify treatment time frame desired
 Consider pest location and activity



Sources of Data GIS Inventory Windshield Inventory Record as you treat



Background to develop project

- Develop work maps with tree locations
- Research potential contractors
- Determine contract duration and likelihood of renewal
- Develop or utilize city indemnity clause
 - Insurance provision
 - Limit city liability
- What credentials required? ISA, TCIA cert?
- Pesticide Licensure
- Determine if a performance bond is required
- Any WMBE requirement?



Scope of Project

Create a Project Manual

- Location and size of trees
- Contract interval
- Application equipment to be used
- Specific material rates/size class
- Supervision of Work Crews
- Record keeping requirements
- Payment terms

- Maximum contract amount
- Training requirements
- Contingencies
- Certification requirements
- Product procurement
 distributor relationship



Request For Proposal

Cover Letter

- Title of project
- Bid or RFP number
- Closing or due date with address where due
- Pre bid meeting time and location (1 week prior to close)
- List of requirements
 - Insurance certificate
 - Signed contract
 - Deposit

References

Etc



Project Manual

Utilize an existing city project manual (perhaps pruning or removal) and imbed treatment language

- Table of Contents
- Standard Terms and Conditions
- Scope of Work Treatment specifics
- Evaluation and Award Criteria
- Signature Page



Determining Contract Prices

- Total Contract Price
- Price per DBH Class
- Lowest and Best Bid

	ITEMIZED PRICES	
	Project Number NRM2013	-1002
₩	Project Title Emerald Ach	Borer Tree Maintenance Services FY13
KAN383 CITT	Project fille <u>Emeraid Ash</u>	BOIET THEE Maintenance Services (1115
DBH* SIZE CLASS (inches)	BID PRICE PER DBH*	TOTAL BID PRICE PER TREE (ASSUMES 1 TREE PER SIZE CLASS)
4		\$0.00
5		\$0.00
6		\$0.00
7		\$0.00
8		\$0.00
9		\$0.00
10		\$0.00
11		\$0.00
12		\$0.00
13		\$0.00
14		\$0.00
15	and the second second	\$0.00
16		\$0.00
17		\$0.00
18		\$0.00
19		\$0.00
20		\$0.00
21		\$0.00
22		\$0.00
23		
24		\$0.00
25		\$0.00
26		\$0.00
27		\$0.00
28		\$0.00
29		\$0.00
30		\$0.00
TOTAL B	ID ALL SIZE CLASSES	\$0.00
DBH = Diameter at	Breast Height (4.5')	



Pre-Bid Meeting

Requiring all bidders or their representatives to attend a pre bid meeting is strongly advised

- Washes out questions
- Helps you determine potential bidder qualifications







Period of Questions

Common Questions

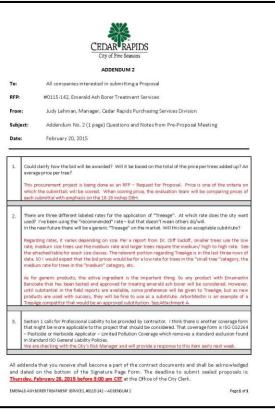
- What rate
- Can I substitute a different chemical?
- Can I utilize a different treatment technique?
- Insurance questions
- Extension of treatment timeframe?

Require questions in writing to be considered



Publish amendment and send to all bidders

Clarifies any questions raised at pre bid meeting or submitted in writing





Training and Proof of Performance

- Require Manufacturer training of all applicators
- Recommend city staff training by manufacturer
- Assign a project coordinator
- Require material usage logs
- Training on evaluating tree health





Evaluating Performance

- Require Cell Phone Contact with job Foreman
- Week 1 Assure record keeping requirements
- Require local distributor relationship
- Inspect injected trees randomly
- Material Usage Reports







Record Keeping

- Inventory tag Not necessary with GIS
- GIS updates
- Follow DOA posting requirement
- Excel Work Reports
 - Address nearest tree
 - DBH
 - Species
 - ML product used
 - Treated date





Property Address	DBH	Species	EPA Reg # Product	ML used	Tag number	Date
1231 Oak		15 BE	100-1309-74578	75	1301	4/7/2016
1234 Oak		18 BE	100-1309-74578	90	1302	4/7/2016
1347 Oak		11 BE	100-1309-74578	44	1303	4/7/2016
1349 Oak		30 Syc	100-1309-74578	180	1304	4/7/2016
1411 Oak		22 LO	100-1309-74578	110	1305	4/7/2016
1512 Sycamore		32 Syc	100-1309-74578	192	1306	4/7/2016
1410 Elm		15 BE	100-1309-74578	75	1307	4/7/2016





Public Information Campaign

- Door explaining project
- Special contractor pricing for private trees
- City newsletter or mailer
- PSA
- Awareness ribbons
- Tree valuation tags
- Media Shoot





Given the major presence of the Ash Tree in our area, and the certainty that inaction will lead to the loss of all these trees, we have begun injecting selected public way Ash Trees in your area with this insecticide which is called TREE-ige by its manufacturer.





Maintaining Community Forests





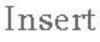




- Easy
- Injects in the Xylem
- No equipment to purchase
- Low Pressure 4-6 psi
- Use on small numbers of trees
- Do not leave unattended

Measure





Drain

















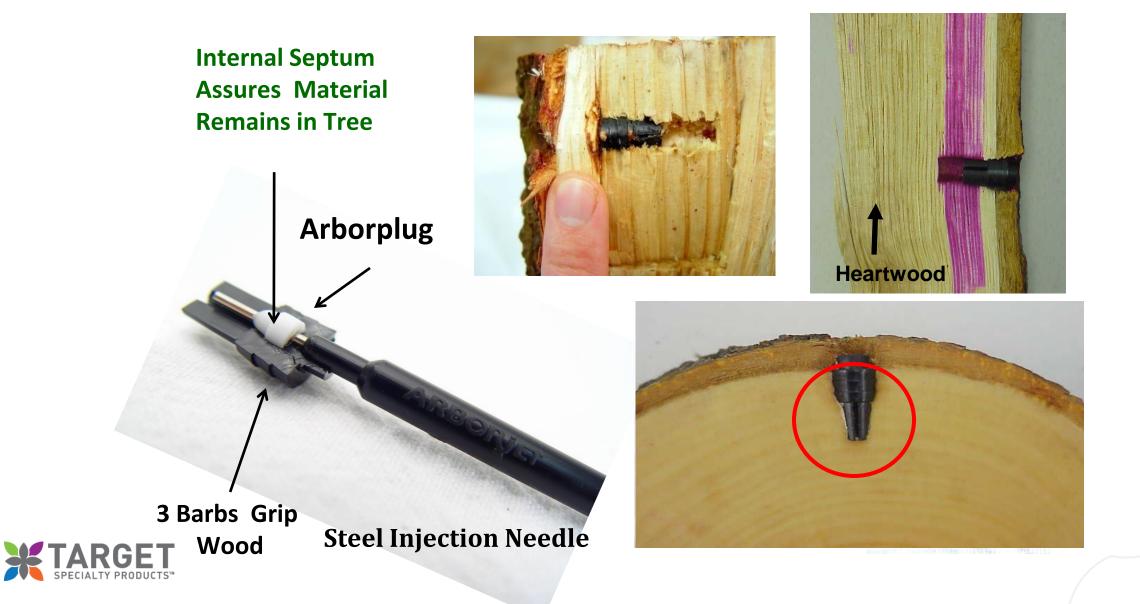
QUIK-jetA/R[™]

ARBORIE

- Precise Dose & measurement visible
- Easy One thumb operation
- Fast Fast and smooth injections
- Air Powered Connects to an air tank
- Lightweight & Durable Only 2 pounds



To Plug or not to Plug.....?



Getting Started with Treatment





Licensing



Licensing and Certification Program

A to Z Licensing Index

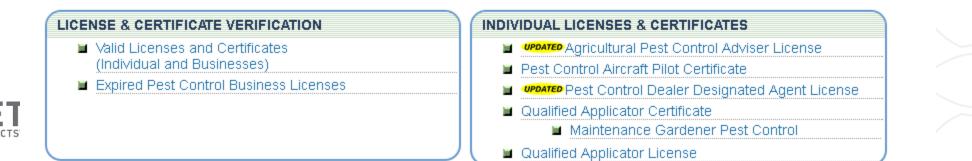
Sign up to receive e-mail updates on DPR's Licensing Program activities.

About Licensing

Visit the local County Agricultural Commissioner for private applicator certificate information. Visit the Structural Pest Control Board for structural pest control licensing information. Visit the California Department of Public Health for vector control technician certification information.

What's New in Licensing

- ->> College courses currently approved to meet the PCA minimum education requirements
- ->> **UPDATED** 2017 Exam schedule, PDF (102 kb)
- License Renewal: Frequently Asked Questions (FAQ) for Individual License Holders, PDF (286 kb) Contains answers to the most common questions DPR receives from license holders about license renewals.
- Letter to all CE Sponsors about topics that can be approved for CE:
 Approval of CE topics, PDF (81 kb)







LICENSING

- ->> A-Z Licensing Index
- ->> Current Licensees
- License Types and Requirements
- ->> Exam Schedule
- ->> Study Materials
- ->> Continuing Education
- ->> Fees
- ->> Forms

Qualified Applicator License

Back to Licensing and Certification Program Back to License Types and Requirements

Sign up to receive e-mail updates on DPR's Licensing Program activities.

New and Amended Applications

- ->> Complete application packet, PDF (216 kb)
 - ----> Category descriptions, PDF (65 kb)
 - ->> Study materials, PDF (345 kb)
- ->> Exam Preparation
 - » Knowledge Expectations
 - Laws, Regulations, and Basic Principles of Safe and Effective Pesticide Use (Core Exam), PDF (154 kb)
 - ->> Residential, Industrial, and Institutional (Category A), PDF (158 kb)
 - ->> Landscape Maintenance (Category B), PDF (152 kb)
 - ->> Right-of-Way Pest Control (Category C), PDF (258 kb)
 - Plant Agriculture (Category D), PDF (160 kb)
 - Forest Pest Control (Category E), PDF (256 kb)
 - Demonstration and Research (Category J), PDF (142 kb)
 - ->> Field Fumigation Pest Control (Subcategory O), PDF (314 kb)
 - Microbial Pest Control (Subcategory P), PDF (274 kb)
 - Sulfur dioxide use in wineries, PDF (136 kb), En Español, PDF (198 kb) licensing requirements related to sulfur dioxide use
 - ->> **UPDATED** 2017 Exam schedule, PDF (102 kb)
 - Re-examination or adding new category application, PDF (220 kb) (PR-PML-083)



Control Options

Cultural /Sanitation -

Tree removal, branch pruning, chipping, wound painting, solarization, restrict firewood movement

Biological – Native shift or introduction of natural enemies, biocontrol of fungal symbionts

Trapping/Pheromones (attractants/repellents) – New karimone (quercivorol) being used for detection

Chemical -

Contact sprays create barrier (bifenthrin) Systemics – soil injection/drench, trunk injection





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dile Systems Insectionle for use with the Arbartet Interior System in the Management of Specific Incess Peess of Farrents, Trees, Landscape Ornamentals and Interna-ACTIVE INGREDIENTI

Initialized Information pridry (netry) for the Constant of Constan - HAT TOTAL DATes No. 2020. • DATE No. 2020. 10.220 Net Casteria Tre Induited Castales KEEP OUT OF REACH OF CHILDREN

WARNING! participer a minute ingly, as an air praticipi has

term fully replaced to pro-THE ARRONAL PLACE INCLUSION (INCLUDING IN BUILDING IN THE ARRONAL PLACEMENT

PRECAUTIONARY STATEMENTS

HAZARDSTO HUMANSAND DOMESTIC ANIMALS: WARNING: Harmful if svalloved, inhaled or absorbed through the skin, Causes substantial, but temporary eye injury Do not get in eyes or on dothing. Wear safety glasses. Wash thoroughly with scap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated dothing before reuse. Keep children and pets away from treatment area until injection and uptake are complete.

FIRST AID

IF SMALLOWED-

 Call a poison control center or doctor immediately for treatment: advice. Have person sip a glass of water if able to svallow.

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:

 Hold eye open and rinse slowly and gently with water for 15-30 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue

ringing eye.

 Call a poison control center or a doctor for further treatment advice. IF INHALED:

Move person to thesh air.

If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.

Call a poison control center or a doctor for further treatment advice. IF ON \$KIN OF CLOTHING:

Take off contaminated dothing.

Rines skin immediately with plenty of water for 15-20 minutes.

 Call a poison control center or a doctor for further treatment advice. Have the product container or label with you when calling a poison control center or doctor, or going for treatment, You may also contact the informa-Chemical Emergency Response System at 1-800-535-5053.

Note to Physician: No specific anticiple is available. Treat the patient symptomatically. ENVIRONMENTAL HAZARDS:

This pesticide is highly toxic to fish and 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 wathwater or rinsate. This product is highly taxic to honeybees. Do not apply this product to pollen-shedding or nectar producing plants visited by honeybees while plant is in bloom.

PHYSICAL OR CHEMICAL HAZARDS: Do not use or store near heat or open flame.

DIRECTIONS FOR USE

It is a violation of Federal Low to use this product in a manner inconsistent with its labeling. IMPORTANT: Read the entire label before use. Failure to follow label directions may result in poor control or plant injury. Failure to follow label directions. may cause injury to people, animals and environment. The buyer accepts and understands that failure to follow label directions is the responsibility of the buyer.

APPLICATION TO TREES AND ORNAMENTALS

IMA-jet is a systemic insecticide used to control a variety of insect pests of ornamental or forest trees. Plets controlled include aphids, whiteflies, soft scales, adelpids, gall forming wasps, leaftoppens, lace bugs, mealybugs, psylicis, serpentine leafminers, sawfiles, thrips and leaf feeding beetles. Use IPIA-jet as directed in trees in residential, business and commercial areas, golf courses, airports, cemeteries, parks, street trees, playgrounds, athletic fields, commercial forestry production, seed orchard trees, numeries, and in private, municipal, state, federal, county and local recreational forests.

WHENTO TREAT: For optimum results, apply PA-jet prior to infestation. Also apply when insects are infesting and feeding upon the tree. IMA-jet insecticide moves upward into the tree's canopy from the application sites. Systemic activity occurs only after the active ingredient is translocated upward in the tree. This product must be applied below the bark into the sapwood (i.e., the vascular) tissues.

In the case of severe infestation, use the highest label rate for the targeted pest. In trees larger than 24" use the highest rate listed for that insect pest. Dosages are designed for insect control and retreatment is generally not necessary during the year after initial treatment. Monitor insect activity to establish a damage threshold for retreatment. Repeat applications as necessary.

The need for an application can be based on historical monitoring of the site, previous records or experiences, current season adult trapping and other methods. Due to potential foliar injury or poor (i.e. slow) uptake, do not apply to trees stressed by drought or extreme heat.

BASIC INJECTION PROCEDURE: for insect control, this product must be placed into the tree's sapwood, the conductive tissue that moves water to the cancey. Make applications around the base of the tree, inject into tree roots exposing them by careful expansion or alternatively into the trunk flare or tissue immediately above the trunk flare, locating the injection site in the first few xylem (us, sapwood) elements. Drill holes through the bark and into the sepwood a minimum of 3/8" deep. When using the Arborjet Arborplug, drill a minimum of 5/8" deep into the supercod.

CALCULATING APPLICATION RATE: The dauges and number of application sites are based on tree diameter.

To determine the application/dose rate per tree:

I) Measure the tree dameter in inches at chest height (54" from ground) to find the Diameter at Breast Height (DBH). (If measuring tree circumfer-

ence, divide circumference by 3 to obtain the DBH in inches.) 2) Calculate the number of injection sites by dividing the DBH in inches by 2.

3) Multiply the tree DBH by the dosage rate (see table below for appropriate dosage rate) to calculate the total dose in milliters per tree.

4) Divide the total dose by the number of injection sites to determine required dosage per injection site.

Example: For a tree with a DBH of 12 inches (or discumference of 36 inches) and 4 mL dosage rate:

DBH = 12" (circumference 36" + 3 = 12").

Divide DBH of 12" by 2 = 6 injection sites.

Multiply DBH of 12 by 4mL = 48 mL total dose per tree.

4) Divide 48 mL by 6 injection sites = 8 mL per injection site to deliver the required douge.

To apply a higher dosage into trees or to speed application, increase the number of injection sites, placing them from 2 to 8" apart. Treat Cycade (i.e., gymnosperms) using this method of application. In resinous conifers (such as pine and spruce), start the injection immediately after drilling. A prolonged delay may reduce uptake on account of resin flow. In palms (i.e., monocots), only one injection site is required; locate the application site 1-3' from the soil level and drill 4" deep into the stern.

APPLIC ATION EQUIPMENT: MA-jet is designed for use with the Arborjet Tree Injection Systems or with other tree injection devices that meet the label requirements and are chemically resident. For all injection systems, read carefully and follow manufacturer's directions for use.

USE OF IMA-JET: Use as formulated. Do not mix with water.

APPLICATIONS FOR USE IN LISTED TREES AND ORNAMENTALS AND FOREST AND WOODLAND AREAS

For trees less than 12" in dameter, use the lower rate for the targeted pect. If trees are severely inlected, use the highest label rate specified for control of the targeted pect, For trees than 34" dometer always use the Nathert label rate for the targeted pert.

and the set of the set	a se o a segura para	
CROP	PLST	DOSAGE
Trees & Ornamentals: Trees, Strubs, Evergreens, Interior Plantscapes, Palms	Adelgids (including Hemiboli Wobally Adelgid*), Aphids, Gall Wasps (including Brythrina Gall Wasp), Laosbugs, Leathoppers, Leaf miners, Mealybugs, Poplicis,	2.0 - 4.0 mL IMA-jet Systemic Insecticide per inch of cumulative trunk dameter at breast
Forest areas Non-utan Forests, Tree Pantations, Panted Christ- mas Trees, Paris, Rural Sheber Belts, Rangeland Trees and Wisodand Trees including Confers	Soft scales, Thrips, Whiteflies	height (SF from the ground). Space injec- son holes approximately 6" apart, around the circumference of the tree,
Trees & Ornamentals:	Adelgids (including Hemilack Wakely Adelgid*), Gall Wakes (including Erythrina	40 - 80 mL IMA-jet Systemic Insecticide per
Trees, Strubs, Evergreens, Interior Plantscapes, Palms Forest areas: Non-urban Forests, Trees Plantations, Planted	Call Wap), Retreaded Bowr (Inducing Brozer Sinh bowc Einwald air bowr) aduts, japanese Beetles (aduts), Leaf Beetles (including eini Isaf beetle), Leaf bags (including leaf Societ Geod bug), Leaf Mierr, Fine tip math Broas, Round-	
	headed Barers (including Eucleptus longharned barer), Royal paim bug. Sawfly larvae, Soft scales, Thrips, Whitefies	circumference of the tree.
PA-jet provides 1-2 years of residual control of Hemiock	Woolly Adelgid, Trees infected with Hemiods Woolly Adelgid might require two applica	tions before significant control is seen.

FOR USE UNDER USDA SUPERVISION ONLY DBH DOSE NATE HOST TREES PEST RANCE mL/DBHT Em, Maple, Birch, Willow, Box Asian 2-23" 40 mL elder, Horse Ot

	Longhomed	247+	60 mL	insta
untain Adv, Adv, Roplar,	Seetle			1,64
n Plane, Hackberry and				
				275

COMPATIBILITY

Test the physical compatibility of IMA-jet before use with other products.

European Mo.

Albinia Londo

Sycamore

NOTE: Before applying any tank mixture not specifically on this label, it is bedt to test the safety to the target tree. Do NOT apply liquid flowables expension concentrates, or dependite granules that do not completely decolve.

RESTRICTIONS

This product is not to be used on trees that will produce food within the year blowing treatment.

Do not use on syrup-producing super maples where sap is harvested.

ARBORJET MICRO-INFUSION® PROCEDURES

Ratic Arbonies Micro-Infusion® Procedures: I. Determine the datage based on target pect and tree diameter.

2. Pour concentrate into the medicament bottle and cap.

1. For Tree U/C pressurize the contents from 25 to 40 PSI and prime the lines by opening each injector value slowly to purge the air; dose the value when liquid begins to flow, or For Hydraulic Deviceconstautor the contents to 15 PSI and prime the lines by depressing the trigger and pulling back slowly on the dose-slow: 4. Determine the number and placement of injection sites around the base of the tree.

Drill through the bank then SVE into the spowpod using the appropriate sized drill bit. For best results use clean and sharp lived point drill bits.

5 Insert the Arborplug³⁴ using the set tool and malet. Use the #4 Arborplug (167 d) for most applications, including confliens. In handwoods, you may also use smaller dameter Attorplags including the #3 (9/32" d), insert the VIPER needle into the Attorplag. To dart the Tree LV, inflation, open the needle value. Close the value and remove the VEXR. needs upon completion of infusion. To inject with the Hydraulic Device, depress the trigger to apply the dose.

Alternative Arborjet STINGER Procedure:

5 Alternatively insert the #2 (702" drill bit) STEACER injector to SM" deep into the spwood in the predrilled hale with a hand push or by gently tapping the injector tip into the apwood with a mallet. Remove STINGERS upon completion of inflution process by pulling and twicting out counter-dockwise. Use a cleaner or an SPA registered deinlectant between trees when using the reusable STINIGER tips.

Use root fare injections -- MA-jet inflable insecticitie can be used with a variety of reflibble tree infusion devices. For all rejection devices, read carefully and follow all manufacturer use directions.

- allation and Application using the Rainbow Treecare Scientific Advancement M3 injector: Gamine the tree for the presence of root flaw. If fares are not visible, excause the root color Make infusion sites 5-10 inches below the top of the root flaw.
- Thoroughly bruth all dirt from the tree. A dirty root flare will dull the chill bit and increase untries time.
- Las the injectors around the tree to select injection sites. The application rate is Linjection ste for every 2 dameter indres (approximately 1 injection site every 6 indres) evenly gaced around the root-fame. Using a 11/64" or 3/16" (45 to 5 cm) HIGH HELK drift bit. dill a hole at a downward angle into each selected buttress root fare above the soil line. Dril to a depth of I to I.5 on (Wi to I/2") into healthy sylem tissue.

4.Insert the injector tip into the hole and east firmly with hand pressure. 5. Close the control value

6.Inject treatment liquid into the MD injector reservoir through the black dualabili (filling) value. 7, leject air into the M3 injector reservoir through the filling value. Do not inject more than 25 cc of air.

Note: Care must be taken when pressurizing the capsule. If the tool used to pressuize the capsule passes all of the way through the ducibili, the ducibili will not dose and the capsule will not be pressurized.

8. Open the control value just to the point where the liquid starts to flow into the tree.

3. Check for leasts. If least are found done the value, and firmly into the tree and re-ones the value. If lease pertiat the problem may be too shallow of a hole, does the value, remove the injector and re-drill to a deeper depth.

ID Uptake usually accurs within minutes. When all of the treatment liquid is out of the injector; a wath solution of water can be injected into the M3 injector and it can be re-presurised or the M3 injector can be closed and removed from the tree. Wath solutions are not compatible with all formulations. Check for compatibility prior to rinking the HB injector into the tree.

I L Remain the M3 injector from the tree and done properly for muse.

STORAGE AND DISPOSAL

Do not contaminate water; load or feed by storage or disposal.

RESTICIDE STORAGE: Store bottles in a cool, dry place above 45° F. Store in original container out of reach of children, preferably in a locked storage area.

RESTICIDE DISPOSAL: Wades resulting from the use of this product must be deposed of an site or at an approved waste deposed facility.

CONTAINER DISPOSAL: Norvefibble container. Do not muse or refit this container. Offer for recycling, if available, or puncture and dispose of empty bottle in a seniory landfill.

NOTICE OF WARRANTY

ARBCR/ETUnc, makes no warranty of fitness of this product for any other purpose, bayond its uses under normal conditions in iseping Revolutionary Plantificath Selation with the statements made on this label. Manufacture² is a maintenant instance) of Atlantic Inc.



Find the Right Equipment for You



- What types of trees will you be treating?
- How many trees will you be treating?
- Where will you be doing your applications?
- What types of pests are you treating for?
- How much are willing to invest initially?
- Do you plan on working with HOAs or municipalities?
- What labor force do you have available for applications?

Getting Started

A	В	С	D	E	F	G	Н	I	J	К	L	M	N
	Ima-jet Pric	e is approxim	ately \$299.00				Avg. Labor r	ate \$80./					
		\$299.00					\$1.33			\$6.00		\$10.00	
Tree Size BDH (inches)	Insect Control (ml) / Tree	Cost of Insect Control / ml	Total Cost of Chemical / tree	Number of Arborplugs / tree	Cost Arborplugs (50.0 cents ea)	Total Cost Materials / Tree	Labor / tree @ 1.33 / minute	Labor Time / Tree (minutes)	Total Cost per Tree	Low Billing Rate \$6/diameter inch	Low rate % profit margin	High Billing Rate \$10/diameter inch	High rate % profit margin
6	12	\$0.30	\$3.59	3	\$1.50	\$5.09	\$10.64	8	\$15.73	\$36.00	56%	\$60.00	74%
7	14	\$0.30	\$4.19	4	\$2.00	\$6.19	\$10.64	8	\$16.83	\$42.00	60%	\$70.00	76%
8	24	\$0.30	\$7.18	4	\$2.00	\$9.18	\$10.64	8	\$19.82	\$48.00	59%	\$80.00	75%
9	27	\$0.30	\$8.07	5	\$2.50	\$10.57	\$10.64	8	\$21.21	\$54.00	61%	\$90.00	76%
10	30	\$0.30	\$8.97	5	\$2.50	\$11.47	\$10.64	8	\$22.11	\$60.00	63%	\$100.00	78%
11	44	\$0.30	\$13.16	6	\$3.00	\$16.16	\$10.64	8	\$26.80	\$66.00	59%	\$110.00	76%
12	48	\$0.30	\$14.35	6	\$3.00	\$17.35	\$10.64	8	\$27.99	\$72.00	61%	\$120.00	77%
13	52	\$0.30	\$15.55	7	\$3.50	\$19.05	\$11.97	9	\$31.02	\$78.00	60%	\$130.00	76%
14	56	\$0.30	\$16.74	7	\$3.50	\$20.24	\$11.97	9	\$32.21	\$84.00	62%	\$140.00	77%
15	75	\$0.30	\$22.43	8	\$4.00	\$26.43	\$11.97	9	\$38.40	\$90.00	57%	\$150.00	74%
16	80	\$0.30	\$23.92	8	\$4.00	\$27.92	\$11.97	9	\$39.89	\$96.00	58%	\$160.00	75%
17	85	\$0.30	\$25.42	9	\$4.50	\$29.92	\$11.97	9	\$41.89	\$102.00	59%	\$170.00	75%
18	108	\$0.30	\$32.29	9	\$4.50	\$36.79	\$11.97	9	\$48.76	\$108.00	55%	\$180.00	73%
19	114	\$0.30	\$34.09	10	\$5.00	\$39.09	\$13.30	10	\$52.39	\$114.00	54%	\$190.00	72%
20	140	\$0.30	\$41.86	10	\$5.00	\$46.86	\$13.30	10	\$60.16	\$120.00	50%	\$200.00	70%
21	147	\$0.30	\$43.95	11	\$5.50	\$49.45	\$13.30	10	\$62.75	\$126.00	50%	\$210.00	70%
22	154	\$0.30	\$46.05	11	\$5.50	\$51.55	\$13.30	10	\$64.85	\$132.00	51%	\$220.00	71%
23	184	\$0.30	\$55.02	12	\$6.00	\$61.02	\$13.30	10	\$74.32	\$138.00	46%	\$230.00	68%
24 ▶ ▶ Ima	107 a-jet at \$80h	r Ima-jet 10	\$57.41 at \$80hr / Tre	17 e-age at \$80h	¢e nn r 🖉 Azasol at	\$80hr Ace	¢13 20 e-jet at \$80hr 🗸	10 Phospho-je	¢76 71 et at \$80hr	\$144.00 Propizol \$80h	// 70⁄. ◀	\$240.00	



Market Implications

TREE-äge alone can be used to effectively reduce the colonization of healthy trees by PSHB. Preventatively only. Lightly-infested trees can be therapeutically-treated with a combination of TREE-äge + Propizol at the medium label rate.

Moderately-infested trees can be therapeutically-treated with a combination of TREE-äge + Propizol at the high label rate. Bifenthrin should be applied during high pressure

Sanitation is very important: Remove highly- infested and dying trees ASAP to prevent large emergence when the trees die.



Light Infestation –

No more than 10 attack sites on the entire tree



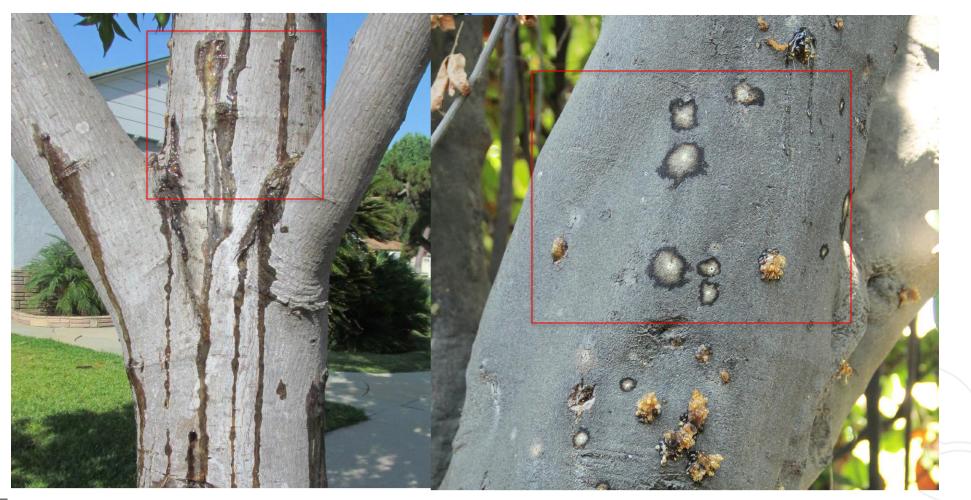




Photo Credit: Donald Hodel

Moderate level of Attack — draw one foot square on most heavily attacked

section of the tree and count less then 10 attack sites





High level of Attack – cannot draw a one foot square anywhere on the tree and count less than 10 attack sites







Isolated Attack Area - remove attacked area and treat the

tree with both insecticide and fungicide





Updated Recommendations

- Not all trees die from ISHB attacks
- More susceptible trees are Sycamore, Oak, Liquid Amber, and Willow
- Misnomer that ISHB prefers healthy trees they thrive during conditions that stress trees
- Trees should not be pruned between April & October
- Trees need micro-nutrients to bolster natural defenses against the ISHB
- Pay attention to per acre limits on neonic products



TREE-age G4

injected insecticide for two-year control of fisted insect and mite peets in decidates, condercos, and pain trees

ACTIVE INGREDIENTS

Emamentin Bercoster 4.8% _____ 100.05 TOTAL: "CAS No. 15558/d-int-8 Cantains 6.36 is emanwooth per gallon.

KEEP OUT OF REACH OF CHILDREN CAUTION / AVISO

Notes the content of the strength is a strength or all party parts and the content of the strength of the stre

EPA Reg. No. METE-10 EPA Est. No. 29678-TX-1 People at of United States SICPPL-ARU-18-L1A DR15 404100X Net Contents: 1 Quart Little Litters Manufactured for Artestyry, Inc. 20 Blueterry Hill Fauet, Websury, MA \$1821

Hazando to Humans and Domestic Animals

CALIFICIUMUSED. Madestely initialing to the real. Do not get in eyes or an oblight-protective synonex. Hamiled if availabled, Wath Thermodyly with using and water after handles and before esting, densing, sheving guer, using talacce, or using the talet. Remove and word contamented dathing before reuse.

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1011 10 Phyliothylia Early signs of information installer different papers, make dir inter-activities, and installar Fernal Variating within strends from of regulations and relative basisty following academics in genetism of the product, sport, other regions in 17 millions. advantation repeatedly, medical characteristic a target quartities of water an inexast. If families from expansion has progressed its passes server converting. The enderth of weather hash and elecbuilds initiations shauld be gauged. Appropriate supportion parentest fluid replacement Decay should be given, along odly other required supportive resources built is manufa-rance of blood predace book, and proper requiritery functionality) as indicated by divisial signs, symptoms, and measurements. In severe cases, abservations should continue for at lead several days will divised condition is static and named. Snae enamedia because a televisit to whence CABA adivity in animals, if is possibly one to avaid drugs that whence GABA activity Radatucation, bencindecorportes, valuence acted in patientic with poderdially book simply safe belowing management

Have the product container or label with you when calling a justice caribol center or declas, or party for Vestment,

HOT LINE NUMBER For 20Hear Medical Entergency Assistance (Furner or Animal), Or Chemical Entergency Assistance Digit, Loss, Fire or Ancient) Call Holos (Brunds)

Personal Protective Equipment (PPE)

Applications and other handless must send

· Langestreened she't and long period

· Chemical-resistent glaves such as barrier breasting build rubber; riskite rubber; or response NAME.

- Shore and society

Poleilize evenesi

Environmental Macarda

This product is highly level to first, manimals and aquatic invested rates. Do not apply directly to water, to sense where surface notice is present or its interliated areas below the mean high when man, Denail contentiate when depending of equipment wathroader. This product a highly loss to level equipment to direct involvement or relatives or blooming invest.

Physical or Chemical Hazards

Do not use or shore mean head or open figures.

CONDITIONS OF SALE AND LINETATION OF WARRANTY AND LINELITY

ACTICS: Read the write Conditions for Use and Conditions of Sale and Limitation of Wartanty and LateRy before buying or using this preduct. If the being are not asseptiate, relue the modual at once, anopened, and the purchase price will be refunded.

The Directions for Use of Fits predicat must be followed carefully. It is impossible to element-all risks interestly accounted with the use of Fits predicat. Crop right, its Findburness of other anotherabed consequences, may result because of such factors as moment of use an application, vesibles or only conditions, presence of other materials or other influences plastics in the use of The product, which are beyond the caribial of ARBORUET, INC. or Seller. To Die extent periodical by september law, Room and User agree to hold ANECAUT, INC. and Seller harmons for any clarin setting to had failure.

ARRONAL[®], FOC, rescription that this product services to the observation descenders on the label and a resourcedly at the the proposed added on the Conclines for Obse, subject to the relevant data informatic to the relevant of a added to an end of distributions and the market are sandiated. To the endermatic to the relevant of a added to be with distributions and the market are sandiated. To the endermatic to the service of a distribution with distributions and the market are sandiated as the service of estimat premitted by applicable lines (3 this example, does not exclude to the use of the product and bary to take instructions or under constitution and remaining transmission for a baryond the southeast before a ARDARAES, INC., and (3 they are all there assume the main of any part or. The THE EXTENT PERMITTED BY APPLICABLE LAW, ARBORATTING, MARKETING WARRANTES OF MARCHINITING OF ATTACK FOR A PARTICULAR PURPOR. NOR ANY DIVER EXPRESS OR IMPLIED WARRANTY EXCEPT AS WARRANTED BY THIS LABEL.

To the ended permitted by applicable lacy is no event shall APROPURT, INC. be lable for any residential, consequential or special demands resulting from the use or handling of this product, TO THE EXTENT PERMITTIO BY APPLICABLE LAW, THE EXCLUSIVE REVERTOR OF THE LISER OR BUYER, AND THE EXCLUSIVE LIMITLY OF ARBORUET, INC AND SELLER FOR ANY AND ALL CLARIS, LOSSES, PULKES OF DAMAGES INCLUDING CLARIE EREID ON BRACH OF WARRANTY, CONTRACT, NEGLIGINES, TORT, STRET LIVELITY OR OTHERWISE) RESULTING FROM THE LOS OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PROCEOP THE PRODUCT OR, AT THE ELECTION OF ARROWST, INC. OR SELLIN, THE REPLACEMENT OF THE PRODUCT.

ARRORATE, MC. and Setter offer this practical, and Rayer and Liker assept 8, subject to the foregong Candillons of Sale and Limitation of Wasterly and Liability which may not be madilled escept is within agreement signed to a duly sufficient representative of ARBORUET, INC.

DRECTIONS FOR USE

If is a undefine of Federal Inv to use this conduct in a manner inconsident with its Interim-

IMPORTANTE Read entire label before using this product. Failure to follow label institutions may result in pair control or live injury. Failure to failure label directors, may souce injury to propin. anomals and environment.

TRill-type for a for control of mature and immediate attrapped peets of decisions, conference, and autor, times, instanting, that wall briefled by, Wester grancing in residential and conversional brieflesspeer, parts, physical and, used exchange, and free divided lates (in private, recessor), state, bited and reduced award. THES-tope GC sampless the active expendent ensamedias bencastle and is formulated to Danalasate in the live's variable system when inpedied. This product must be placed into active subscript, and will actively control predit for an to have users.

USE DIRECTIONS

TRiff-tage fit is designed for one with live repulses devices that meet the label and date requireconds for example, the Adaptet Two inpution Systems) for the control of lated partie of trees. Follow in production's directions for excentrations.

Dokages are kased on the Diameter in instead of the tree of Brood Height (DBH). Recoil height a defined as 4.3 feet (1.37%) above the ground on the uphill sale of the time.

The discreter is determined by measuring the securiference of the time at DBH, and during the countriences in ordered by time 03. To determine 2014" for multi-devoted usable protected bib, resource the 2004 for each stein or branch and old logether for the total 2014" per time.

Placement of Application-Placebase Silves logical at the loss of the loss, logical site from other online 12 to 12 to 14 the and, but the local fiber of radio there made expanding there by the logical essentiation. Index applications the relating healty supposed. The roll input in the symplectication is not set of the symplectication of the relation of the symplectication of the relation of the symplectication of the relation of the symplectication of t and will being

Number of Deputies Silver, Mark analyd the live, specing rejector alter approximately every 4 to 8 ratios of law 6 approximately every 4

Dell'Organization of the set that then SW to 7" into the segment with the appropriate stretchild bit, Use dears, shart-dell tate. Press dans shauld be taken to sould develop areas and transforming attended incomes to other insection when

Residence Could am

In resinues confers, such as pine and spruce, shall the injection immediately after deling into Palma

Make applications with patrix 2/2 feet Fault Ster and Jevel, above the hypothesi basants. Dire System to 6 injection points may be installed. Dill into the paint boxue 6° deep, or up to 10 burns discreted.

WHEN TO THE AT

This days (2) contains the active regrestent ensuresties termante, which is a glocascie inserti-oute, it is active against ensurative and adult stages of arthropolis. The primary racts of teachy is Descept impetition.

ENVIRONMENTAL CONCETTIONS: Update of TREE-age Q2 is dependent upon the live's transpiration. For bellier uptime, acade when tool is most, and temperatures are allowe CPT, proto-ent temperatures are between 02° in 100%, and during the 30 hour period when transpiration is protect, typically terms 2.00 PAL Applications to character or tracted manufactory multi-right to the factory prior frontiened and subsequent control. And broking trees that are manifered desirable or factory trace frontiened design.

MONITOR THES HEALTH and PEST EVERTHIONS: Effective exection treatment is forward to a full campy (i.e., insure) and healthy vascular system. Once these losses are componented by arthropped dermaps Reveal galaxies, derivations, lead revenue, etc.) an effective and under to applica-tion of THE-tigs E2 may be difficult to achieve and undersport control may be pass. Cylinide, Instituted should be made preventively at least 2 to 3 venets before attraceast holocast, inter the head time. As a second of systemic machined and beyondy of THEP-base for the trees, this interval way be extended much earlier to 8 martitle shauld time dominance, advecto worlding, management, asynchronous the cycle of peeds, etc., show earlier application terring.

TREAde fit may sha be effective as a remedial treatment against some pests, such as Date with discer development or if multiple life slages same. Peak that attack for she's and learnings may decayl usuada fastury reliable in pass distribution of the product or an in-fielded time. However, control may be advised if suspectible large came into contact or find on THE &- No. LO-Dealth | Sources.

1000

Use as formulated or dilute with equivalent of 1 to 8 volumes of water. Note: to Application in Steen Table for specific instructions.

Tree Diameter (DBH) (Induct)	rel, product/free	nt. product/tree	rel. productores
4944	10-00	20-81	4940
7169	20-80	3045	6540
10 to 12	20-00	39-90	80-120
12 (6 18	30-85	494110	110-160
18 16 18	4046	89435	135-180
18-56-21	1040	60160	160010
22 16 24	86-70	70180	180010
28 16 27	6540	80/08	200-270
28 16 20	7040	80428	225-300
21 (6.22	80-100	100-310	210330
31 16 26	89-110	110-270	279310
27 (6 29	80-130	130-310	210-310
210	100040	240-300	300-600

ICALIFORMA USE RATE TABLE)

USE RATE TABLE (*)

Tree Dismeter (DBH) (Induct)	Los" rel. product/free	Medium rel. product/free	rel. productores
4 6 6	18-00	20-81	4940
7168	20-30	3048	65-90
10 (6 12	30-33	31-10	10-130
13 (6-16	31-01	494110	110-110
10.0418	4246	80-125	135-180
18 (6.21	8040	60160	160410
22 10 24	-	110-180	180-010
28 16 27	-	130-300	200-270
28 (6.30	-	149-025	225-300
31 (6 23	-	160-210	210-230
31 10 28	-	176-270	210010
27 to 29		180-210	210-310
		100.000	

The use of loss, medium, or high date per tree is based on the experienced judgment of the

Higher rates lend to provide larger residual and cardinal of more difficult to control insects. See

If the tree campy has been significantly reduced, i.e., espective tree pruning or turning trees into a finding, reduce data data accordingly.

In Palms always use the law rd. productions.

Tree Tissue	Target Pest	Application Rate ¹	Comments
Section 4	Concessors (Charaotan sep.) Clane basels (Caraotathorus sep.) Rise Color Seed Bug Bugons Satan of Lapitationus and Seyue spp. In Ber yan of Destinant)	Medium to High	For optimal control apply in the fall for early contain peck or at least 20 days before indext attack.
	Test Categolites Installing Eastern, Forest, Pacific, and Weldern Sprace Backwarn Watter Math	Law to Medium	For best results, apply at least 24 overta, before the pest has historically been present. Consult with local
	Bigeann Chrianneann Cardeneann Cardeneann Bin Spaanwarn Hit Weleann Cardenean Lathulers Lathulers Lathulers Mar Nearth Miser Phe Nearth Miser Phe Nearth Miser Nearth Categolis" Lathuler Categolis" Velade Categolis" Velade Categolis" Velade Categolis" Velade Categolis" District Near Marchaeth Rei Marchaeth Rei Nearth Miser Pher Nearth Rei Red Near Mise Red Near Mise	Lave to High	extension agent for others this will becaut in your area. For mean uniform definitution in the conveys following in differ product with enough and the to the majorithm of unifor prior to application.

Book, Book, And Seventing Reams (Instancing and Book). Clear weight Reams (Instancing). Law to Medium For Instancing, plus the status of the second from Ream and Book). Based Mathyle Coltainweight Reams (Instancing). Law to Medium For Instancing Instancing and Reams). For Instancing Instancing and a book of Instancing Book of Instancing Instancing Adams Head Reams, For Instancing Book of Instancing Instancing Adams Head Reams, For Instancing Head Reams Head	Berry Turch And, and Dequate From Pillan and Basesh Carportensors" Carportensors" Carportensors Carp	Low to Medium	ply at least 30 days.
FilteFeasibility Medium to High Figures unduring add and lowers of Ensential Add Barrel Call Whape, including Barryan Them Call Whape Medium to High Ensential add Barrel Call Whape, including Barryan Them Call Whape Medium to High Ensential add Barrel Reachmented Barrets Inscidence Add Equiphered Barrets Inscidence Add Equiphered Barrets Inscidence Add Ensential Barrets Inscidence Add Ensent	shift and lands of Emeratia Ash Barry Stern Call Wage * Roundheade Barrys Roundheade Barrys Instituting Asian Longhanead Bartiel Antipolating Bartiel Palgahapas, Stat		hatch or adult flight and to breet whote votcoder listure is not
Call Wang, including Renyan Medium to High Including Auit Stein Call Wang Featurities of working Including Califier Heaturities of the Stein St	Stern Gall Wasp* Rear-United Revers (neurolating Asian Langtonical Revelles Antipolis Revelles (including Pulgehagan Stat	Medium to High	For many uniform, distribution in the concept fishaged,
	Environdel ¹ Stadytisk (samt Lovefferd) Stadytisk (samt Lovefferd) Stadytisk (samt Proc. Bandlar) Stadytisk (samt Proc. Bandlar) Vicedare (Proc. Bandlar) Vicedare (Proc. Bandlar) Risk), Styches (Samt Bandlar)	Medium to High	regulations 1 to 5 outputs at 40 within prior to application. It valuates for full- grant application of the state application of an entropy of the state and applications of the state outputs of the state output of the distribution outputs of the two states within and states at distribution outputs of the two states and distributions of the many of states at these insertions of the states outputs of the states output

 Use medium to high rates for remedial and langer residual cardeol.
 Use of THEE-type GL to cardeol this insect may not result in the control of diseases vectored by The insect. • Rich Levelles, that alliast the tree laste

Back See the that allock the campy

Compatibility

Do not mix TREE-day Gt before injection with other products such as insecticides, fungicides, plant proofs regulators, surfactorits, adjuants, and furtilizers.

Do not apply to trees that may yield food consumed by humans or used in animal feed. TREE-lage Cid is not to be reformulated or Idended.

STORAGE AND DISPOSAL

Do not contaminate water, fault, or feed by starage and disposal.

Periods Storage Store in a coal, dry place, away from children and pets. Keep from freezing.

Perilside Dissoral

Wate multing from the use of this product may be disposed of an site or at an approved water disposed facility.

Container Hamiling

Nonrefitable container. Do not reuse or refit this container. Triple since container (or equivalent) premptly after emptying. Note rises as follows: Simply the remaining contents into application equipment or real tank and drain for 10 seconds after the flaw begins to drip. Fill the container to full with water and recap. Shate for 10 seconds, Pour insate into application equipment or a mis tests or class installs for later use or disposal. Open for 10 expands after the flow begins to disp. Repeat this procedure two more times. Then offer for recycling if available or puncture and depose of in a sanitary landfill, or by incinecation.

The ARBORJET, INC. Logo is a Trademark of Asbarjet, Inc.

CODI & Arberlet, Inc.

For non-emergency (e.g., current product information), call Arboriet, Inc. at 1-791-905-9070.

Adaript, Ing. 30 Eluciony Hill Facel Visione, Mexambateria (1901 AND ADDRESS



242 - 201-300 300-600

applicator as to what constitutes a low, medium or high intestation

Target Pest for additional information in choosing the amount of product to apply.

Print for use in the State of Collogian

Applications	in Trees		
Tree Tossue	Target Pest	Application Rate ¹	Comments
Seed and Care	Catendaria (Chrystan spd) Christians spd) Christians Rice Caten Seed Blug Blugtenskan of Laptoplanaka and Seyka spb, in The year of Deatment)	Medium to High	For optimal cart apply in the fall t early seatant pre- or at least 20 da before intend at
tal en	Test Categolium Statuting Eastern, Forest, Plastin, and Western Sprace Backwarn Watter Math	Law to Medium	For land, results, apply at least 24 controls, latitude to prest has historia later present. Cansult with lat
	Exposition Contributions Contributions Contributions Contributions Electronic Contribution Electronic Contribution Contributions	Law to High	ecterization agent where this will an it year area. For more unitary distribution in the annexy fundages, dilute product or equivalent 1 to 1 restainers of value prior to application

Propizo SYSTEMIC FUNGICIDE

ARBORJET

Date: June 16, 2015

Product: Propizol® EPA Reg. No. 74578-8

Use: Additional Pests for Control in Deciduous, Coniferous, and Palm Trees

State/District: AL, AR, CA, CO, CT, DC, DE, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, MO, MT, NC, ND, NE, NH, NJ, NM, NV, OH, OK, OR, PA, RI, SC, SD, TN, UT, VT, VA, WA, WV, WI, WY

APPLICATION IN TREES

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

The user must refer to the federally approved labels for the above noted product and read and follow all directions for use, restrictions, and precautions.

The user should have this recommendation in his/her possession at the time of use.

This recommendation for use of this product is permitted under Section 2(ee) of FIFRA and has not been submitted to or been approved by EPA.

DIRECTIONS FOR INJECTION USE

For fungi infecting vascular tree tissues causing wilt and tree dieback such as:

Laurel wilt (Raffaelea spp.)

Thousand Canker Disease (Geosmithia morbida)

Fusarium Dieback of trees including Western Sycamore (Fusarium euwallaceae)

Blue Stain Disease (G. Sma) nia clavig<mark>e</mark>ra. Leptographium longiclavatu Fusarium Wilt of Canary Drite Palms (Fis arium oxysponen Fusarium Wilt of Queen Palms (Fusarium oxysporum f. sp. palmarum,

Ganoderma Butt Rot of Palms (Ganoderma zonatum)

Oak Dieback (Diplodia corticola)

For leaf, bud, branch and stem fungi such as:

Phomopsis Canker and indirect needle cast of spruce (Phomopsis occulta)

Oak Anthracnose (Apiognomonia spp.)

Sycamore Anthracnose (Apiognomonia veneta)

Use 6-10 ml of this product in up to 1 liter of water per inch DBH. For very high disease prowhen the trees are in full leaf and actively growing for control of the next season's disease

Propizol® is a trademark of Arborjet, Inc. © 2015 Arborjet

2(ee) Registrant: Arborjet, Inc. 99 Blueberry Hill Rd. Woburn, MÁ 01801

Expiration Date: November 16, 2019 Label Code:

RESTRICTED USE PESTICIDE

DUE TO ACUTE TOXICITY TO HUMAN'S FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSON'S UNDER THEIR DIRECT SUFERVISION, AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATORS' CERTIFICATION.

-200

Date: September 12, 2014

Product: TREE-äge® EPA Reg. No. 100-1309-74578

- Additional Pests for Two-year Control in Deciduous, Coniferous, and Palm Trees Use:
- AL, AZ, AR, CA, CO, CT, DE, DC, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, State: MA, MI, MN, MS, MO, MT, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VT, VA, WA, WV, WI, WY

Manufactured for Arborjet, Inc. 99 Blueberry Hill Road, Woburn, MA 01801 SCPPLABJ 1309A-L1C 1210

DIRECTIONS FOR USE

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

The user must refer to the federally approved labels for the above noted product and read and follow all directions for use, restrictions, and precautions.

The user should have this recommendation in its possession at the time of use.

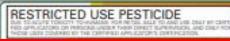
Use of this product according to this bulletin has not been reviewed or endorsed by the Office of the Indiana State Chemist.

This recommendation for use of this product is permitted under Section 2(ee) of FIFRA and has not been submitted to or been approved by EPA.

	APPLICATIO	N IN TREES		
	Tree Tissue	Target Pest	Application Rate ¹	Comments
have 2ee label	S C Bud and Leaf	Cankerworms, Casebearer, Confer Mitte Ettern Dak Loope, Elm Spanworm, Leafrollers, Linden Looper, Pine Needle Miner, Pine Needle Miner, Pine Tip Moth, Poplar Tentmaker, Variable Oakleaf Caterpillar, Yellownecked Caterpillar	Low to High	For best results, app), at least 2-3 weeks before the pest has historically been present. Consult with local extension agent for when this will occur in your area.
essure, use 20 ml of this product per inch DBH. Make applications development.	Shoot, Stern Trunk and Branch	Ambrosia Beetles (such as Polyphagous shot hole borer; <i>Euwallacea</i> <i>fornicatus</i>); ² Banyan Stem Gall Wasp, Black Oak Gall Wasp, Black Turpentine Beetle, Carpenterworm, Cottonwood Twig Borer; Walnut Twig Beetle, ² White Pine Weevil, Zimmerman Moth	Medium to High	For best results, apply at least 30 days befor historical egg hatch or adult flight and to tree whose vascular tissue is not damaged. If vascular tissue is damaged or plugged by insect galleries nematodes or fungi, uniform treatment an- control may not be achieved.

¹Use medium to high rates for remedial and longer residual control.

²Use of TREE-äge to control this insect may not result in the control of diseases vectored by the insect. TREE-äge® is a registered trademark of Arborjet, Inc. © 2014 Arborjet



-äge R10

injected insecticials for two-year control of listed insect and mite peet deciduous, broadleaf evergreen, confercus, and path trees.	N in
ACTIVE INGREDIENTI Environmenter Beneroten Otteken INGREDIENTIS	
KE WARNING / AVISO	

and understand the laket. Real advector to reader it is plut in detail. EPA Reg. No. 74879-12 EPA Eet. No. 39878-TX-1

Not Calebora: See individual containere

Manufactured in this stat by 26 Blueisers Hill Russi, Weisser, MA 21821

Hazards to Hamana and Domestic Animala WARNING/WVSO

Counts substantial but temporary eye roury. Helmitul if asseturent. Do not get in eyes or so stolling. When problems exproster igoupper, have sharid, or safely planned. Wash thoroughly with saap and order after handing and latter weeking, attoleng, docorrig pert, using takanon, of using the tasket. Heriotus and each card animated station latter record

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 State off conformation controls. How of controls with plantly of water for 10.00 convers. Call against particle protects of classific for instance) advan. 				

NOTE TO PHYSICAN) Early signs of internation values dilation of papits, measure internation, and measure are territory within one-fail hour of explorate can therein unity following accounted segretates of the product; supply after sequences to 15 minutes activization reportedby residual choicest is a being quantity of states or special. If locality how expresses has pergenerated to sought severe surviviring, the expect of redulant that and etertince insulates should be gauged. Appropriate supportion parenteral fluid explanation Warrany photolic be gover, using wells offer explored suggestive measures you'll as marker name of blood previoure events and proper requisitory functionality, as industried by official spra, completes, and reasonable in second panel, down-discus simultance for its intell several must will obtain condition is make and roomak. Since experiences because dened to enhance GMDL activity is annexity, if inpectedity wave to ownit drugs that enha VARM acturity Bandolumine, Inercladuateprines, uniprice and a patternia with public-stally Year enanetic because example

they the printed antimiter at later tarly usy offer radius parameters in the second second ducing or group for instances.

> HIT LINE NUMBER For 20Hour Medical Emergency Apolistance Inumation Internation Co Charmed Research Associations (East, East, Fen or Assistent) Col 3-800-208-2024

Personal Protective Equipment (PPE)

Mores, taatest, applicators and other handlers must seen · Long-streams short and long putits · Chemical resistant places

- Shuei ani kushti · Protective systems

. Ourng many and leading, the chemical residant olivers must be Category C such as

Same services halp raiser a 12 mills, some rabber a 12 mills, in Neoprese valuer a 12 mills. Environmental Nanas-de

The product is leadly local to fish manimum and aquatic investationing. Do not apply directly to water, or to areas where surface water is present or to interticial mean failing the wear in sater riteri. Dis not surdariante suter arter ingening et equipment suedroarier ni risade This product is highly more to been estimated to donal mediment or residues or this rough been Physical or Chemical Haussia

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NOTION Read the entire Condition for the and Conditions of Sale and Londaton of Harberts and Labelity Sefure Isaging or using the product. If the terms are not asseptible, return the talkat 51 years, stopping and the publicate prior will be televised

The Directions for the of this product must be followed carefully. It is impossible to elemente off rules alwarently assumed outly free use of this availant. Chap succe ineffectivements of other printended consequences into result because of such factors as runner of use or application. weather or unap pundburn, presence of other waterials or other influences; factors in the use of the printical which are beyond the partner of ARDOROFT INC, or failer. To the lastest periodical by applicable day, Burser and Liner agree to total AMRORAN, NC. and beine harmonic to any plants relating to such factors. AMRORAN NC. exercises that the product conterns in the phenodal description on the later and is responsibly fit for the purposes stated in the Directories for their subject to the otherwist roles inferred to about, other unedriv accontence with directions, and reference use conditions. To the extent permitted by applicable law (17) the varianty does not econed to the case of its product contrary to birst multi-advers of under conditions too resonably Exemptable to at Reyard the particulal Deley or SARDAURY, RDL, and DJ Buyer and User au same the real of any such use. TO THE EXTENT PERMITTED IN APPLICABLE UNIX AREORDER. THE MARKED REPORTED OF MERCHANTERS OF MERCHANTERS FOR DE FITTERE FOR A MERCICLE. PURPOSE NOR WY OTHER EXPRESS OR MIRLED WEREAMY RECEPT AS VIRENMEND AT THE LODGE.

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ANRONAL AND and befor offer this postant, and Baser problem append a subject to the foregoing Carialitons of Sale and Levislatian of Wareney and Lability which may not be resulted receipt by written appearant signed by a Buly sufficiant representative of MRORET /AC

DIRECTIONS FOR USE RESTRICTED USE PESTICIDE

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Registers Confilms

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Main applications into partice 2.9 feet from the soft term, along the topological taxaes. Topology only a single injection site is meeted, incorrect up to 2 injection points may be installed. Diffusion the patht-famue 4" alway, or up to 1/2 of Irunic dealershe to apply product.

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MONTOR THE HEALTH and PEET INPECTATIONS. If belies inputer tradment is favored by a full cancer it in , insum) and healthy vescular system. Once there issues are comprisinged by arthropolicitariage based general, deficiency, real ricency, etc.) an effective and underst application of THE Logs #10" may be difficult to achieve and subrequest control was be ploy. Optimally, implement structures made precentionly at least 2 to 2 senses before entropping, becausely order) the ball then As a result of epidewic missioned and torgetty of TVEE age R10⁴ is trees, the mission may be extended much earlier to 8 mission should be downers, adverse weather mariagement, asymptomous the syste of pests, etc., allow earlier application timory.

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For environmentation (e.g., surrant product information) sal Areasint, Inc. at 1-761-605-9070.

Manufactured Inc. Anigonal live. 10 Elabority 152 Peak Water, Manachasta 2100 Dec. J. 2016



Tree Removal Impacts

- Permanent loss of this Urban Forest
- Replacement forest takes generations to develop
- Increased storm water run-off
- Increased water consumption
- Enhanced Heat Island Greater heating/cooling costs
- Significant Property Value Reduction
- Loss of Neighborhood Character
- More stress on poorest neighborhoods, increasing cost to: maintain, heat, cool homes, & decreases property value.





Unanticipated Impacts of Urban Canopy Removal

- Citizen Complaints Public response can be profound
- Removing stumps in Spring, before must re-plant
- Enough Dig-Safe personnel to mark all utilities
- Forestry Crews focused on <u>nothing</u> but removals, all regular pruning suspended.
- Damage to sidewalks requiring additional funds
- Falling limbs risk, trees die rapidly after attack
- Sprouts on trees limiting vision of motorists
- Storm water flow increased
- Lawsuits due to falling branches from dying trees







City Removal & Replacement Costs

- Labor & worker-benefits, to remove the tree
- Stump grinding & chip disposal
- Equipment used in removal (rental, lease, use)
- Fuel for all these operations
- Indirect labor ex. manager; administrative
- New tree, equipment to plant that tree, & labor
- Top soil, fertilizer, mulch, & stakes
- Watering trees 1st yr, <u>or</u> replacing them 2nd yr.
- Easy to Reach \$750. \$ 1000. cost per tree







City Tree Removal & Replacement Costs

Mt. Pleasant, Michigan

145 Trees Removed for EAB

\$35,000	Salaries, Planting, Watering, Maintenance
\$34,940	Trees, Mulch, Topsoil & Supplies
\$33,151	Equipment Costs (lease/rent/use)
\$ 9,420	Fuel Expenses
\$112,511	Total Project Cost
\$776	Total Cost Per Tree to Remove/ Replace

Good Rainfall Reduced Watering Costs

<u>Akron, Ohio</u>

• Seek \$762,000 to Remove 1,075 Trees \$708 Cost Per Tree to Remove

Milwaukee, WI

- Have 36,000 Boulevard Ash Trees
- Estimate \$27,000,000 to R & R

\$750 Cost Per Tree to Remove/Replace Chicago, IL

- 81,000 Boulevard Ash Trees
- Estimate \$95 Million to R & R
- \$1,173 Cost Per Tree to Remove/Replace

Rockford, IL

- 15,000 Boulevard Ash Trees
- Estimate \$8.2 Million Just to Remove \$1,093 Cost Per Tree to Remove/ Replace

Cleveland, Ohio

Contracted Remove/Replace 300 trees \$1,000 Per Tree – Actual Cost



What Does It Really Cost? How Should Costs Be Compared?



ISHB Injection Pricing

- 78 Sycamore trees averaging 16" diameter
- To remove/replace these trees will be \$750 \$1000. / tree



- To remove/replace this one streets' trees is at least:
 - 78 trees x \$750. = **\$58,500**.
- City treatment of these trees at \$8.24 per inch of diameter
 - Treatment cost per tree \$8.24 x 16" = \$131.84
 - Retreatment every 2 years
 - Annualized cost is \$65.92/tree or \$5,142 for the street
- This street can be treated for <u>11</u> years before the cost of treatment would equal cost to remove and replace.
 - **\$58,500/\$5,142 = 11**



Questions?

Dawn Fluharty Landscape Sales Specialist, T&O Cell: 650-296-2453 Email: <u>Dawn.Fluharty@Target-Specialty.com</u> Web: <u>www.Target-Specialty.com</u>

