Class One Arboriculture
1061 Jedburgh St
Glendora, CA 91740
(818) 495-5344

October 6, 2014

****Redacted****

Per your request, I have prepared a report discussing the cause of loss for the trees at ****Redacted****. I have determined the cause of loss to be *deliberate herbicide application*.

Subject Tree Background

Subject trees are located on a hillside planting, separating the back yards of single-family residences in an HOA in ****Redacted****. The houses along ****Redacted****have back yards that face the ocean, and the houses along ****Redacted****have back yards that face east (uphill). The entire neighborhood has a prominent view of the ocean.

The hillside slope is west-facing, and there is an access path on the uphill side of the planting. Eight of the subject trees are Monterey Pines, and two are Guava.
The reported date of loss was August, 18, 2014.

Site Observations

On Friday, September 19th, 2014, I met with ****Redacted****, homeowner, and ****Redacted**** of ****Redacted****. They showed me the affected area and answered questions about the care of the site.

I observed a characteristic pattern of dead ground cover around the base of all but one of the affected Pine trees, pictured on the map in Appendix B. Although there were multiple species affected, the pattern of dead ground cover tended to center around the Pine trees only. One of the affected guava trees was immediately adjacent to an affected Pine, and another was immediately adjacent to an affected area of ground cover.

Several of the affected pine trees had completely browned out. Several of the pine trees had brown needles on the eastern (uphill) side of the canopy with live needles on the western side of the canopy only. I carefully scraped away bark on a small observable section of the affected trees and revealed living cambium tissue. All but one of the subject trees had some form of living tissue, even if the foliage had completely browned out.

I observed the irrigation system. It was functioning normally, and there was an even distribution of irrigation water over the entire hillside planting. Scott and Ahmad told me that the gas and sewer lines ran from the houses to the street, so there were no gas or sewer lines beneath the hillside planting. They also told me that shortly after the loss, they sent soil samples to a lab to test for the presence of pathogens; these tests detected no soil pathogens.

Some of the houses around the affected areas had pools, but there was no correlation with proximity of pool and dead ground cover.

Lab Testing and Analysis

Soil samples were taken from an unaffected area on the hillside and from one of the affected regions. Each of these samples was analyzed for fertility, pH, and the presence of herbicides and gasoline. Additionally, one tissue sample was taken from each of the two affected species. This tissue sample was analyzed for elemental toxicity. Lab results are shown in Appendix C.

The soil tested positive for the presence of Glyphosate and Triclopyr, two common landscape herbicides. The contaminated soil also contained toxic levels of Boron, an element that can be used in conjunction with Glyphosate to increase the effectiveness of the herbicide mix.

The tissue sample from an affected pine tree showed toxic levels of Boron as well. The tissue sample of the Guava did not show high levels of any element.

There was no significant Chloride or gasoline present in any of the samples.
The pH of the contaminated soil was strongly acidic when compared to a more neutral pH in the clean soil.

Discussion

The two most compelling observations were the presence of herbicides and the pattern of dead plant material.

Two common herbicides Glyphosate and Triclopyr were found in concentrations well above the detectable limit. This is especially compelling because they have a field half-life of about 45 days and the samples were taken more than a month after the declared date of loss. Since these two herbicides degrade in soil rapidly, it is highly unlikely that the detectable amounts were residue from an unrelated application.
Glyphosate and Triclopyr are sometimes mixed together to increase effectiveness, as shown on the example herbicide label in Appendix D. I have only attached this label as supporting evidence that the two herbicides can be mixed to increase effectiveness against pine species; I am not concluding that this specific brand of product was used.

The dead ground cover areas were nearly always centered on the affected Monterey Pines. The dead tissue tended to be on the eastern (uphill) side of the affected areas, as if the herbicide was spray-applied from the access path. The *Myoporum* ground cover had a very distinct division between living and dead tissue, and there was healthy tissue found on the same shoots as the completely dead tissue. This shows that the herbicide was neither poured into the soil nor emanated from the ground. It was only sprayed on the foliage of the trees and the ground cover. If herbicides had killed enough roots to cause the observed amount of ground cover to die, then the entire shoots would have been dead.

This same localized pattern of dead material was found on Asset 5, a Guava tree. There was a small pattern of dead material on the upper portion of the canopy immediately adjacent to the larger spray area around Asset 6. This suggests that Asset 5 was a collaterally damaged tree and

not one of the targeted trees in the spray application. Asset 4 was a Guava tree that was immediately adjacent to Asset 3, a pine. It was close enough to the affected pine that residual spray could kill it. By considering Assets 3 and 4 to be collaterally damaged trees, then the targeted trees were all one species: *Pinus radiata*.

The species of targeted tree is significant in determining a motive for vandalism. *Pinus radiata* was the only species in the hillside planting that will eventually grow to a significant height. The guava trees and bottlebrush trees typically crown out at heights of around 20 feet at maturity, but Monterey pines can reach heights of 80-100 feet in 30-40 years. This community is highly valued for its views of the ocean, as reflected by the real estate values. If these trees were to reach maturity, they could block the view, detracting from the value of the adjacent properties. It is likely that the motivation for spraying these trees was to ensure that the views from the houses along ****Redacted**** did not lose their views of the ocean.

The toxic levels of Boron in the contaminated soil relative to the clean soil indicate that Boron was mixed with the herbicides to increase its effectiveness. The extremely low pH of the contaminated soil is consistent with the herbicide hypothesis because Glyphosate tightly adsorbs to soil particles, displacing other minerals and thus lowering the pH.

The foliage sample from Asset 6 showed toxic levels of Boron which is also consistent with the spray-application hypothesis. The foliage sample from Asset 5 did not show high levels of Boron, but that is likely because the sample was taken from the interface between living and dead tissue and not from the dead tips. It is likely that if another sample were taken of the dead tips of the affected Guava tree, it too would show toxic levels of Boron.

The observation of live cambium tissue is consistent with the spray-herbicide hypothesis. Glyphosate and Triclopyr affect leaves and needles primarily. Upon contact, the outer foliage died. However, the inner cambium was not directly exposed to the herbicides. It will remain alive until the absence of photosynthesis in the canopy eventually leads to the cessation of life processes.

Other possible causes of loss were considered but ultimately rejected:

- *Climate and Weather*: Since the damage was localized to this one hillside planting within a much larger homogenous HOA planting, effects of climate, weather, and sunlight exposure could be eliminated. There were identical, healthy trees on comparable planting sites just a short distance away from the affected areas.
- *Contamination from Pool Water*: In planting areas near pools, sometimes chlorinated pool water can spill into the soil, causing a Chloride toxicity that kills the plants. This was ruled out by examining the *Myoporum* ground cover. If the *Myoporum* had been killed by its roots, then the entire shoots would have died. Furthermore, some affected areas were not near pools.
- *Contamination from Gas*: Gas and sewer lines did not run through the area, so leaks in those lines were ruled out. Furthermore, soil tests confirmed that there was no gasoline deliberately applied.
- *Soil Pathogens*: The soil tests conducted by the landscape company Artistic Maintenance showed no pathogens present.
- *Problems with Irrigation*: All of the irrigation lines were connected to the same source of potable water. Since all of the unaffected areas were irrigated with the same water, there

was no contamination in the irrigation water. All of the sprinklers were functioning well, so there was no localized issue with irrigation either.

Correctional Treatment

Although Glyphosate and Triclopyr have relatively short half-lives, Boron is extremely immobile in soil. Therefore it will be difficult to mitigate the presence of Boron and its residual toxic effects on the Assets. Left alone, the trees with affected soil that are still alive will likely die completely within the next year or two.

If the trees are replaced, the contaminated soil should be replaced with fresh, clean fill soil. Boron, Glyphosate, and Triclopyr are usually found in the top 6 inches of soil, so this is the minimum recommended depth of soil replacement.

Conclusion

From my observations, I can conclude that the loss of these trees was due to a deliberate spraying of herbicides.

Disclaimer

My investigation was limited to above-ground observations of the subject trees and the surrounding site. My investigation was based upon my site inspection on September 19, 2014 and on information provided to me by the client. All of the information provided to me by the client was assumed to be true.

I do not guarantee the safety, health, or condition of the subject trees. There is no warranty or guarantee, expressed or implied, that problems or deficiencies in the subject trees may not arise in the future.

Certificate of Performance

I, James Komen, certify:

- That I have personally inspected the trees and property referred to in this report, and have stated my findings accurately. The extent of the observations and analysis is stated in the attached report and in the Assignment section;

- That I have no current or prospective interest in the vegetation or the property that is the subject of the report and have no personal interest or bias with respect to the parties involved;

- That analysis, opinions, and conclusions stated herein are my own;

- That analysis, opinions, and conclusions were developed and this report has been prepared according to commonly accepted arboricultural practices;

- That no one provided professional assistance to the me, except as indicated within the report;

- That my compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client or any other party.

I further certify that I am a member of the American Society of Consulting Arborists, Registered Consulting Arborist #555, and acknowledge, accept, and adhere to the ASCA Standards of Professional Practice. I am an International Society of Arboriculture Board Certified Master Arborist #WE-9909B.

Please let me know if you have any questions,

James Komen
BCMA #WE-9909B
Registered Consulting Arborist #555
Class One Arboriculture Inc.
classonearboriculture@gmail.com
818-495-5344

Appendix A: Site Photos

Asset 1, looking West

Asset 1 close up of foliage

Asset 2, looking North

Asset 3, looking West

	
Asset 3, looking North. Green foliage is only on the west side of the canopy.	Asset 4, looking North. This Guava tree was immdiately adjacent to Asset 3
	
Asset 5, looking North	Asset 6, looking West

	
Asset 6, looking Northwest, showing the pattern of dead ground cover	Asset 7, looking Northwest
	
Asset 8, looking North	Asset 9, looking west

	
Asset 10, looking south	Affected *Myoporum* ground cover
	
Close-up of affected *Myoporum* ground cover with partially live shoot	

Appendix B: Site Map

Appendix C: Lab Test Results

Clean Soil

Soil & Plant Laboratory, Inc.
Leaders in Soil & Plant Testing Since 1946
4741 E. Hunter Ave, Suite A Anaheim, CA 92807 714-282-8777 (phone) 714-282-8575 (fax)
www.soilandplantlaboratory.com

SOIL ANALYSIS

Send To :	Project :	
Class One Arboriculture 1061 Jedburgh St Glendora CA 91740	San Clemente	Report No : 14-265-0008 Cust No : 07188 Date Printed : 09/25/2014 Date Received : 09/22/2014 Page : 1 of 2 Lab Number : 19735

Sample Id : **Clean Soil**

SATURATION EXTRACT - PLANT SUITABILITY

Test	Result	Effect on Plant Growth: Negligible / Sensitive Crops Restricted / Many Crops Restricted / Only Tolerant Crops Satisfactory / Few Crops Survive
Salinity (ECe)	6.9 dS/m	
Sodium Adsorption Ratio (SAR) *	7.15	
Boron (B)	0.80 ppm	
Sodium (Na)	35.0 meq/L	
Chloride (Cl)	40.4 meq/L	
Carbonate (CO3)		
Bicarbonate (HCO3)		
Fluoride (F)		

* Structure and water infiltration of mineral soils potentially adversely affected at SAR values higher than 6.

Test	Result	Strongly Acidic	Moderately Acidic	Slightly Acidic	Neutral	Slightly Alkaline	Moderately Alkaline	Strongly Alkaline	Qualitative Lime
pH	6.8 s.u.								None

EXTRACTABLE NUTRIENTS

Test	Result	Sufficiency Factor	SOIL TEST RATINGS: Very Low / Low / Medium / Optimum / Very High
Available-N	13 ppm	0.2	
Phosphorus (P) - Olsen	29 ppm	0.7	
Potassium (K)	423 ppm	1.1	
Potassium - sat. ext.	1.7 meq/L		
Calcium (Ca)	5003 ppm	0.9	
Calcium - sat. ext.	29.7 meq/L		
Magnesium (Mg)	741 ppm	1.1	
Magnesium - sat. ext.	18.2 meq/L		
Copper (Cu)	3.1 ppm	0.7	
Zinc (Zn)	6 ppm	0.4	
Manganese (Mn)	15 ppm	0.4	
Iron (Fe)	105 ppm	0.7	
Boron (B) - sat. ext.	0.80 ppm	2.7	
Sulfate - sat. ext.	62.6 meq/L	20.9	
Exch Aluminum			

NO3-N	NH4-N	Total Exchangeable Cations(TEC)
7 ppm	6 ppm	326 meq/kg

Cu, Zn, Mn and Fe were analyzed by DTPA extract.

PARTICLE SIZE ANALYSIS

Half Sat	Organic Matter	Gravel: Coarse 5-12 / Fine 2-5	Weight Percent of Sample Passing 2mm Screen — Sand: Very Coarse 1-2 / Coarse 0.5-1 / Med. to Very Fine 0.05-0.5	Silt .002-.05	Clay 0-.002	USDA Soil Classification
33 %						

Graphical interpretation is a general guide. Optimum levels will vary by crop and objectives.

Page 1 of 3

Contaminated Soil

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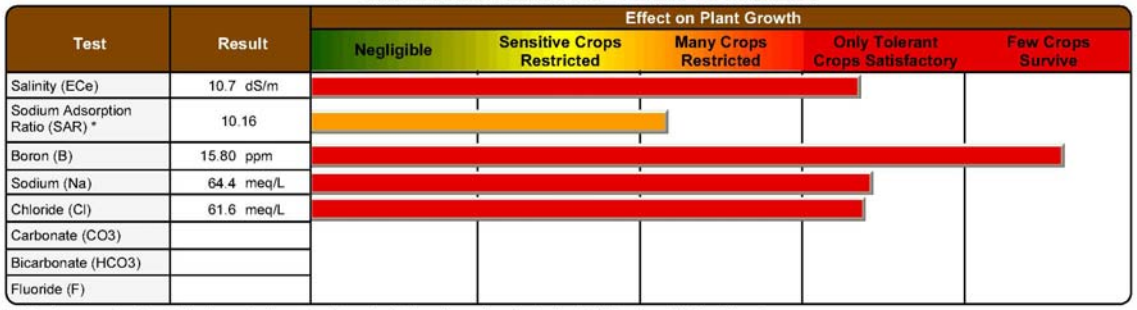
SOIL ANALYSIS

Send To :	Project :	
Class One Arboriculture 1061 Jedburgh St Glendora CA 91740	San Clemente	Report No : 14-265-0008 Cust No : 07188 Date Printed : 09/25/2014 Date Received : 09/22/2014 Page : 2 of 2 Lab Number : 19736

Sample Id : **Contaminated Composite**

SATURATION EXTRACT - PLANT SUITABILITY

Test	Result	Effect on Plant Growth: Negligible / Sensitive Crops Restricted / Many Crops Restricted / Only Tolerant Crops Satisfactory / Few Crops Survive
Salinity (ECe)	10.7 dS/m	
Sodium Adsorption Ratio (SAR) *	10.16	
Boron (B)	15.80 ppm	
Sodium (Na)	64.4 meq/L	
Chloride (Cl)	61.6 meq/L	
Carbonate (CO3)		
Bicarbonate (HCO3)		
Fluoride (F)		



* Structure and water infiltration of mineral soils potentially adversely affected at SAR values higher than 6.

Test	Result	Strongly Acidic	Moderately Acidic	Slightly Acidic	Neutral	Slightly Alkaline	Moderately Alkaline	Strongly Alkaline	Qualitative Lime
pH	4.0 s.u.								None

EXTRACTABLE NUTRIENTS

Test	Result	Sufficiency Factor	SOIL TEST RATINGS: Very Low / Low / Medium / Optimum / Very High
Available-N	72 ppm	1.2	
Phosphorus (P) - Olsen	31 ppm	0.9	
Potassium (K)	297 ppm	1.2	
Potassium - sat. ext.	1.9 meq/L		
Calcium (Ca)	2227 ppm	0.7	
Calcium - sat. ext.	28.1 meq/L		
Magnesium (Mg)	1131 ppm	2.7	
Magnesium - sat. ext.	52.2 meq/L		
Copper (Cu)	3.5 ppm	1.4	
Zinc (Zn)	10 ppm	1.0	
Manganese (Mn)	48 ppm	2.2	
Iron (Fe)	260 ppm	2.7	
Boron (B) - sat. ext.	15.80 ppm	52.7	
Sulfate - sat. ext.	121.0 meq/L	40.3	
Exch Aluminum			

NO3-N	NH4-N	Total Exchangeable Cations(TEC)
13 ppm	59 ppm	222 meq/kg

Cu, Zn, Mn and Fe were analyzed by DTPA extract.

PARTICLE SIZE ANALYSIS

Half Sat	Organic Matter	Gravel: Coarse 5-12 / Fine 2-5	Weight Percent of Sample Passing 2mm Screen: Sand: Very Coarse 1-2 / Coarse 0.5-1 / Med. to Very Fine 0.05-0.5	Silt .002-.05	Clay 0-.002	USDA Soil Classification
29 %						

Graphical interpretation is a general guide. Optimum levels will vary by crop and objectives.

Page 2 of 3

Plant Tissue Analysis

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www.soilandplantlaboratory.com

Class One Arboriculture
1061 Jedburgh St
Glendora , CA 91740

Grower : San Clemente

Report No : **14-265-0008**
Page : 1 of 1
Date Recd : 09/22/2014
Date Printed : 09/25/2014
P.O.

PLANT MINERAL ANALYSIS

Sample Id - Plant Name / Sample Description	N %	P %	K %	Ca %	Mg %	Na %	S %	Cu ppm	Zn ppm	Mn ppm	Fe ppm	B ppm	NO_3-N	Lab No
Tree 5	1.16	0.15	0.90	0.71	0.19	0.05	0.16	16	18	48	91	20		71144
								Cl = 2.07 %						
PINES (CONTAINER) / Tree 6	1.51	0.18	0.22	0.76	0.19	0.13	0.22	14	11	525	84	60		71145
								Cl = 0.220 %						

Values expressed as element in oven dried sample ground to pass 40 mesh. N nitrogen, P phosphorus, K potassium, Ca calcium ,Mg magnesium, Na sodium, S sulfur, Cu copper, Zn zinc, Mn manganese, Fe iron and B boron.NO_3-N by 2% acetic acid extraction, if requested .

LOW -NORMAL - HIGH

Analysis prepared by: Soil & Plant Laboratories, Inc.

Page 3 of 3

Herbicide and Gasoline Analysis

Report Number
14-265-0020 **Page:** 1 of 1
Account Number
07188

Send To: Class One Arboriculture
1061 Jedburgh St

Glendora , CA 91740

Project :

Soil & Plant Laboratory, Inc.
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4741 E. Hunter Ave, Suite A Anaheim, CA 92807 714-282-8777 (phone) 714-282-8575 (fax)
www.soilandplantlaboratory.com

Purchase Order :
Report Date : 09/30/2014
Date Received : 09/22/2014

REPORT OF ANALYSIS

Date Sampled :

Lab Number: 71147
Sample Id : Contaminated Composite

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Gasoline Range Organics (C6-C10) , µg/Kg	<200	200	8015B GRO	09/25/2014 19:34	SEB
Glyphosate , mg/Kg	290	18.3	HPLC (Glyphosate)	09/26/2014 10:35	NFP
Triclopyr , µg/Kg	1150	133	8151A	09/29/2014 13:52	VIC

Method Reference:
High Performance Liquid Chromatography
USEPA, SW-846, Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, 3rd Ed. Current Revision
Comments:

Page 2 of 2

Appendix D: Herbicide Label for Sample Product

FLUROXYPYR

Specimen Label

with 1 gallon or more of water and applied to an area of 1,000 sq ft. To calculate the amount of product required for larger areas, multiply the table value (fl oz or ml) by the area to be treated in "thousands" of square feet, e.g. if the area to be treated is 5,000 sq ft, multiple the table value by 5 (calc. 5,000 /1000 = 5).

Amount of ALLIGARE FLUROXYPYR HERBICIDE to Equal Specified Broadcast Rate (Mix with 1 gallon or More of Water and Apply to 1,000 sq ft)		
0.4 pt/A	0.55 pt/A	0.7 pt/A
0.15 fl oz (4.4 ml)	0.20 fl oz (5.9 ml)	0.26 fl oz (7.7 ml)

WEEDS CONTROLLED OR SUPPRESSED WITH ALLIGARE FLUROXYPYR HERBICIDE	
Weeds Controlled	**Weeds Suppressed**
Catchweed bedstraw (Cleavers)	Bindweed, field
Chickweed, common	Buckwheat, wild
Clover, white	Canola, volunteer
Cocklebur, common	Devilsclaw
Coffeeweed	Field horsetail
Flax, volunteer	Horseweed (marestail)
Grape species	Knotweed
Hedge bindweed	Mallow, common
Hemp dogbane	Marestail
Jimsonweed	Marshelder
Kochia**	Mustard, species
Mallow, Venice	Nightshade, species
Morningglory	Pennycress, field
Prickly lettuce	Potato, volunteer
Puncturevine	Russian thistle
Purslane, common	
Ragweed, common	
Ragweed, giant	
Sunflower, common	
Velvetleaf	

** Includes herbicide tolerant or resistant biotypes.

APPLICATION TO ON-FARM NON-CROPLAND

Apply as a single broadcast treatment or spot treatment to control susceptible broadleaf weeds in on-farm areas such as fencerows, building perimeters, around irrigation equipment and on-farm private roadways. Apply at a rate of 0.4 to 0.7 pt/A when weeds are actively growing, but before weeds are 8 inches tall or vining. Spot treatments should be applied at rates and spray volumes equivalent to broadcast application. See instructions for "Spot Application" above.

APPLICATION TO CONSERVATION RESERVE PROGRAM (CRP) ACRES

Do not use on CRP acres that are underseeded with desirable legumes, clovers, or other sensitive broadleaf plants.

ALLIGARE FLUROXYPYR HERBICIDE may be applied to CRP acres. For best results, apply as a single broadcast post emergence treatment using ground equipment or by air to control susceptible broadleaf weeds. Apply at a rate of 0.4 to 0.7 pt/A when weeds are small and actively growing, but before weeds are 8 inches tall or vining. Spot treatments should be applied at rates and spray volumes equivalent to broadcast application. See instructions for "Spot Application" above.

Restriction: Grazing or haying of treated CRP acres is prohibited.

NON-CROPLAND AND PINE PLANTATIONS

(Includes industrial sites, non-irrigation ditch banks, and rights of way such as electrical power lines, communication lines, pipelines, roadsides and railroads including associated areas within these sites.)

NON-CROPLAND WEEDS CONTROLLED OR SUPPRESSED WITH ALLIGARE FLUROXYPYR HERBICIDE

NON-CROPLAND WEEDS CONTROLLED OR SUPPRESSED WITH ALLIGARE FLUROXYPYR HERBICIDE			
	Weeds Controlled		Weeds Suppressed
0.4 – 0.7 pt/ A	0.7 pt/ A	1.4 pt/ A	1.4 pt/ A
Catchweed bedstraw (Cleavers)	Chickweed, common	Blackberry	Bindweed, field
Hairy buttercup	Cocklebur, common	Catsear	Buckhorn plantain
Hemp dogbane	Coffeeweed	Goldenrod	Buckwheat, wild
Kochia (1), (2), (3)	Clover, white	Henbane	Carolina geranium
Marshelder (2)	Curly dock	Hop clover	Common mullein
Purslane, common	Cutleaf primrose	Horsenettle	Cudweed
Sericea lespedeza (2)	Dandelion	Ironweed	Field horsetail
Tropic croton	Dogfennel	Lantana	Knotweed
	Grape species	Musk thistle	Leafy spurge
	Horseweed (marestail)	Ragweed, giant	Mallow, common
	Mallow, Venice	Spotted knapweed	Mustard, species
	Morningglory	Wild carrot	Narrowleaf plantain
	Prickly lettuce		Nightshade, species
	Puncturevine		Pennycress, field
	Ragweed, common		Spiny amaranth
	Ragweed, western		Yellow thistle
	Stinging nettle		
	Sunflower, common		
	Velvetleaf		
	Vetch		
	White cockle		

1. Includes herbicide tolerant or resistant biotypes.
2. Use the higher rate in the range to control these weeds.
3. For control of larger kochia at more advanced stages of growth, increase the rate per acre of ALLIGARE FLUROXYPYR HERBICIDE to 0.8 to 1.1 pt/A or tank mix with 1-2 qts/A of 2,4-D and 1-2 qts/A of methylated seed oil.

Use Restrictions:

- Do not apply more than 1.4 pt/A (0.5 lb. ai/A) per year.
- Do not make more than one treatment per crop per year.
- Preharvest Interval: Do not apply within 14 days of harvest.
- Do not apply ALLIGARE FLUROXYPYR HERBICIDE to trees less than 4-years-old.
- Do not apply ALLIGARE FLUROXYPYR HERBICIDE during bloom.

Precautions for use in Pine Plantations

Do not apply ALLIGARE FLUROXYPYR HERBICIDE to pine plantations as an over-the-top broadcast treatment during active terminal growth (from initiation of bud break/growth flush until seasonal terminal growth has hardened off and over wintering buds have formed). Directed spray applications may be made to pine plantations during period of active growth, but care should be taken to avoid spray contact with actively growing foliage.

Do not apply ALLIGARE FLUROXYPYR HERBICIDE in tank mix combination to pine plantations unless the tank mix product is labeled for weed or brush control in pines by the application method being employed.

Apply at broadcast rate of 6 to 22 fl oz/A when weeds are small and/or actively growing. Split application of ALLIGARE FLUROXYPYR HERBICIDE maybe made during a single year, provided the total amount of ALLIGARE FLUROXYPYR HERBICIDE applied does not exceed the maximum label rate of 22 fl oz/A. See listing of weeds controlled or suppressed at end of general information section.

Spot treatments should be applied at rates and spray volumes equivalent to broadcast application. See instructions for "spot application".

Brush Control: ALLIGARE FLUROXYPYR HERBICIDE may be tank-mixed with Triclopyr 4, Triclopyr 3A, Glyphosate 4+, Glyphosate 5.4, Picloram 22K or Picloram+ 2,4-D at indicated rates to increase control of pine species, shingle oak, red maple, red oak, and other woody species.

GROUND APPLICATION

Apply in a spray volume of greater than 8 gallons/acre (or greater than 80 liters/hectare) at 30 to 50 psi to ensure proper weed coverage. Flat fan nozzles of 60 or 110 degrees are recommended for optimum coverage. Nozzles may be oriented 45 degrees forward to enhance crop penetration and to give better weed coverage. Use screens that are 50-mesh or larger. Do not use controlled droplet application equipment, hollow cone-type insecticide or other nozzles that produce a fine-droplet spray pattern. A drift control or spray thickening agent may be used with this product to improve spray deposition and minimize the potential for spray drift. If used, follow all the use directions and precautions on the product label.

AERIAL APPLICATION

Apply in water using a minimum spray volume of 3 gallons/acre (or 30 liters/hectare). For best results, use a minimum of 5 gallons/acre (or 50 liters/hectare) under dry conditions or heavy weed infestations. Use nozzles that provide 200 to 350 micron size droplets for best results and to insure uniform spray coverage. Aerial applications with ALLIGARE FLUROXYPYR HERBICIDE should be made with low drift nozzles at a maximum height of 10 feet above the crop and at a maximum pressure of 30 psi. Do not apply aerially when wind speed is greater than 10 mph. Do not allow spray to drift onto adjacent crops, as injury or loss may occur.

Non-Cropland Areas, including Rights of Way (Helicopter Only): In non-cropland, do not apply this product with fixed wing aircraft.

2

Pine Plantations; Both fixed wing and helicopter equipment maybe used to apply this product on pine plantations, but fixed wing aircraft require additional drift mitigation measures.
To minimize spray drift apply ALLIGARE FLUROXYPYR HERBICIDE in a total spray volume or 3 or more gallons per acre using spray. Drift potential is lowest between wind speeds of 2 to 10 MPH. However many factors including droplet size and equipment determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high potential for temperature inversions. Spray drift from aerial applications can be minimized by applying a coarse spray as per USDA – ARS/PAASS or nozzle manufacturer's guidelines or by using straight stream nozzles directed straight back. Do not operate using a spray boom longer than 75% of wing span or 85% of rotor width. For fixed wing aircraft, maximum speed during application is limited to 140 mph and application height above the vegetation canopy should not exceed 10 ft.

See the "SPRAY DRIFT MANAGEMENT" section of this label for additional information on how to reduce drift during aerial application.

ALLIGARE FLUROXYPYR HERBICIDE TANK MIXTURES- All Uses (Except Non-Crop)

Read and follow all manufacturers' label recommendations for any herbicides, fungicides, and/or insecticides tank mixed with ALLIGARE FLUROXYPYR HERBICIDE. If those recommendations conflict with this label, do not tank mix that product with ALLIGARE FLUROXYPYR HERBICIDE. Read and follow all label instructions on timing, precautions, and warnings for any tank mix product. Follow the most restrictive labeling.

TANK MIXING PRECAUTIONS:
- Read carefully and follow all applicable use directions, precautions, and limitations on the respective product labels.
- Do not exceed labeled application rates. Do not tank mix with another pesticide product containing the same active ingredient as this product unless the label of either tank mix partner specifies the maximum dosages that may be used.
- For products packaged in water soluble packaging, do not tank mix with products containing boron or mix in equipment previously used to apply products containing boron unless the tank and spray equipment has been adequately cleaned.
- Always perform a jar test to insure the compatibility of products to be tank mixed.

TANK MIX COMPATIBILITY TESTING
Perform a jar test prior to tank mixing to ensure compatibility of ALLIGARE FLUROXYPYR HERBICIDE and other pesticides, fertilizers or carriers. Use a clear glass quart jar with lid and mix the tank mix ingredients (including water) in their relative proportions. Invert the jar containing the mixture several times and observe the mixture for approximately 30 minutes. If the mixture balls-up, forms flakes, sludge's, gels or forms oily films, layers, or other precipitates, it is not compatible and the tank mix combination should not be used.

ALLIGARE FLUROXYPYR HERBICIDE TANK MIXTURES- NON CROP

WEEDS CONTROLLED WITH ALLIGARE FLUROXYPYR HERBICIDE AND TANK MIX PARTNER		
TANK MIX	**APPLICATION RATE**	**WOODY PLANTS CONTROLLED**
ALLIGARE FLUROXYPYR HERBICIDE Triclopyr 4 EC	17-22 fl oz 2-3 qt/A	Bay Species Black cherry Dogwood Water Oak Willow Oak
ALLIGARE FLUROXYPYR HERBICIDE Triclopyr 3A	17-22 fl oz 3-4 qt/A	Bay Species Black cherry Dogwood Water Oak Willow Oak
ALLIGARE FLUROXYPYR HERBICIDE Triclopyr 3A Picloram + 2,4-D	17-22 fl oz 4 qt/A 2 qt/A	Pine Species Red Maple Red Oak Shingle Oak Virginia Pine Water Oak
ALLIGARE FLUROXYPYR HERBICIDE Triclopyr 3A Picloram 22K	17-22 fl oz 4 qt/A 2 qt/A	Pine Species Red Maple Red Oak Shingle Oak Virginia Pine Water Oak
ALLIGARE FLUROXYPYR HERBICIDE Glyphosate 4 lb ae	17-22 fl oz 4-6 qt/A	Dogwood Gallberry Pine Species Wax Myrtle

MIXING INSTRUCTIONS
Fill the spray tank with water to 1/4 to 1/2 of the required volume. Start agitation. Add different formulation types in order indicated, allowing time for complete mixing and dispersion after addition of each.
1. Add dry flowable or wettable powder tank mix products
2. Add aqueous suspensions, flowables or liquids
3. Maintain agitation and fill spray tank to 3/4 of the total spray volume and then add ALLIGARE FLUROXYPYR HERBICIDE and other emulsifiable concentrates and any solutions.
4. Add any required adjuvants
5. Finish filling the spray tank

Maintain continuous agitation during mixing, final filling and throughout application. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be re-suspended before spraying is resumed. Settled material may be more difficult to re-suspend than when originally mixed. Agitate spray tank every 12 hours to re-suspend any settled materials. Repeat until spraying can resume and the spray tank is empty.

SPRAY EQUIPMENT
For specific application equipment, refer to the manufacturer's recommendations for additional information on GPA, pressure, speed, nozzle types and arrangements, nozzle heights above the target canopy, etc.

Be sure to calibrate air or ground equipment properly before application. Select a spray volume and delivery system that will ensure thorough coverage and a uniform spray pattern with minimum drift. Use higher spray volumes to obtain better coverage when crop canopy is dense. Avoid swath overlapping, and shut off spray booms while starting, turning, slowing, or stopping, to avoid injury to the crop. Do not make applications using equipment and/or spray volumes or during weather conditions that might cause spray to drift onto nontarget sites. For additional information on spray drift refer to the "SPRAY DRIFT MANAGEMENT" section of this label.

SPRAYER CLEANUP
The spray equipment must be cleaned before ALLIGARE FLUROXYPYR HERBICIDE is sprayed. Follow the cleanup proocedures specified on the labels of the previously applied products. If no directions are provided, follow the steps outlined below.

It is recommended that during periods when multiple loads of ALLIGARE FLUROXYPYR HERBICIDE are applied, at the end of each day of spraying, the interior of the tank be rinsed with fresh water and then partially filled, and the boom and hoses flushed. This will prevent the buildup of dried pesticide deposits, which can accumulate in the application equipment.

Clean sprayer using the following procedures:
1. Drain the tank and thoroughly rinse spray tank, boom and hoses with clean water especially all visible deposits.
2. Fill the tank with water and add household ammonia to make a 1% v/v solution (1 gal/100 gal). Flush the hoses, boom and nozzles with the cleaning solution. Circulate for at least 15 minutes. Flush hoses, boom and nozzles once more and then drain the tank.
3. Clean nozzles and screens in a separate container using the 1% v/v solution of ammonia and water.
4. Repeat Step 2.
5. Rinse tank and flush boom and hoses with clean water.

Do not clean sprayer near desirable vegetation, wells or other water sources:
1. Dispose of all rinsate in accordance with pertinent regulations.
2. Check tank mix partner label for any additional clean-up procedures.

SPRAY DRIFT MANAGEMENT
Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determines the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.
The distance of the outer most nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.

Nozzles must always point backward, parallel with the air stream and never be pointed downwards more than 45 degrees.

When applying ALLIGARE FLUROXYPYR HERBICIDE in a tank mix with other herbicides (e.g. 2,4-D, bromoxynil, dicamba, MCPA, sulfonylurea herbicides) in eastern Washington, observe all applicable Washington State Department of Agriculture herbicide rules.

The applicator should be familiar with and take into account the information covered in the GEMENT section.

formation On Droplet Size
The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are der unfavorable environmental conditions (see Wind, Temperature and humidity, and Temperature Inversions).

ntrolling Droplet Size
Volume – Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
Pressure – Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
Number of Nozzles – Use the minimum number of nozzles that provide uniform coverage.
Nozzle Orientation – Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
Nozzle Type – Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length
For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

Application Height
Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment