Eastbluff
Homeowners Community Association

May 7, 2018

To: Board of Directors

Subject: Olive Tree Problem and Treatment

Last month CVL reported to the Landscape Committee and the BOD about problems with Olive Trees at three entrances to A, B and C streets. The BOD authorized tests to be conducted by plant health service companies to diagnose the problem and suggest remedies.

Attached is technical report from March 23, 2018 from Waypoint Analytical describing the problem known as, "Xylella Fastidiosa (Leaf scorch). This is caused by the Glassy-winged Sharpshooter (GWSS)that feed on sap of leaves. This is often caused by drought conditions. There is no know cure but pruning and treatment can heath heathy trees and slow down the impact on infected trees.

The HOA has a substantial investment in Olive Trees on the slopes and median of A, B and C Street entrances. The HOA has 31 Olive trees at these three locations with a value of $3,000 to $5,000 each, for total investment of approximately $125,000 if replaced at current size. CVL recommended outside advise be obtained from RPW Services, a plant heath care and pest control expert firm, for a treatment plan. Attached is report from RPW Services.

RPW Services recommends treating the trees and soil injection/drenching and truck injections. It also recommends plant heath care mix of combination of fertilizers, micronutrients, fungicides and insecticides be applied to the soil. Care recommendation also includes special pruning with sterilized tools to remove patches of dead foliage, twigs and branches. This is best industry practice to control population of GWSS and other leaf-sucking pests. If pests persist a foliar spray can be added to the treatment plan.

CVL recommends we proceed with this treatment plan. This is an annual treatment and will need to be evaluated next year to determine rate of success and need to do a second treatment. If treatment fails dead trees would need to be removed at a cost of approximately $500 to $1,000 each depending on size.

The cost of the treatments is $6,545. Detailed breakdown of recommended treatment by location and costs is provided on exhibits to the report as follows:

Exhibit A 14 trees, $2,800
Exhibit B 9 trees, $2,145
Exhibit C 8 trees, $1,600
Total Cost 31 trees, $6,545

The Landscape Committee recommends approval of funding in FY 2018-2019 budget for work to be scheduled for July. If anyone has a question, please contact me. Thank you.

Ron

Ron Rubino, President
ron@eastbluff.net
(949) 683-6130

RPW
SERVICES INC.
SINCE 1987
Fullerton, CA 92831

RPW SERVICES, INC

RESPONSIVE PEST WORK

Plant Health Care Weed Abatement Turfgrass Fertilization/Weed Control Aquatic Weed Control Rodent Control

PROPOSAL

☐ New Client ☒ Existing Client

TO:	FROM:
Morgan Wilson, Sr.	Robin Kim
COMPANY:	DATE:
Cresta Verde Landscape	4/26/2018
PHONE NUMBER:	EMAIL:
714-713-6857	morgan@crestaverdelandscape.com
PROPERTY NAME/LOCATION:	TOTAL NO. OF PAGES:
Eastbluff HOA (Alba St. entrance) Eastbluff Dr & Alba St. Newport Beach 92660	1 of 2

TYPE OF PROPERTY:

☐ Commercial ☐ Residential ☒ HOA ☐ Other: _____

IDENTIFIED ISSUE:

Xylella, or leaf scorch, is caused by the bacterium *Xylella fastidiosa*. The main vector of Xylella is a leaf-sucking pest called the glassy-winged sharpshooter (GWSS). The GWSS transmits a disease-causing bacterium infecting susceptible trees when they feed on the plant sap of leaves. Once the bacterium is transmitted into the vascular system of plants, it multiplies and clog the water conducting tissues (xylem) restricting the uptake of water. Xylella can cause yellowing and browning of foliage (leaf scorch), wilt, branch/twig dieback, sporadic patches of dead foliage called 'flagging', and tree mortality. Symptoms look very similar to those caused by drought stress but trees do not recover after irrigation. There is no known cure for Xylella-infected trees and controlling populations of GWSS before they can infect healthy trees is the most effective and best management practice. *Xylella fasidiosa* can stay dormant in trees with no noticeable symptoms for a period of time. Infected twigs and branches can be removed by cutting several inches below and away (towards the main trunk) from the infection site. Pruning tools should be sterilized (10% bleach solution minimum) to reduce the transmission of the bacteria to other trees or to other parts of the same tree. We can provide treatment to control for the GWSS with a soil injection/drench, foliar spray, and/or trunk injection. Our plant health care mix (fertilizers, micronutrients, fungicides, and systemic insecticide) can be applied into the soil. Fertilizers and micronutrients will provide the tree with the nutrients needed for healthy growth; fungicides to relieve stress to roots; and a systemic insecticide that will be taken up via the roots and translocated throughout the entire tree. The systemic insecticide will help control pest populations by ingesting the insecticide when they feed on the plant sap. The foliar spray includes several different contact and systemic insecticide and will help control populations of GWSS, psyllid, scale, and other leaf-sucking pests. Foliar sprays have a more immediate knock-down effect on pest populations compared to soil treatments since it can take up to 60 days for the

www.rpwservicesinc.com
2473 E. Orangethorpe
Fullerton, CA 92831
714-870-6352 Fax: 714-870-6485 Mobile: 657-222-5730
E-Mail: rkim@rpwservicesinc.com

systemic insecticide to be fully translocated throughout the entire tree. Treatment for Xylella can be done with a trunk injection using an antibiotic or fungicide. A small needle is inserted underneath the bark tissue to directly inject the material into the trees vascular tissue to slow/stop the progression of the bacterium and help unclog the xylem vessels. Additional applications may be required if symptoms (flagging & dieback) persist. Infected trees should be treated on an annual basis with trunk injections until symptoms cease.

During my initial inspection of the property, several of the trees were showing symptoms (flagging) of Xylella. We recommend treating for Xylella and GWSS with a trunk injection and soil treatment, respectively. A foliar spray is not necessary at this time due to little or no observable pests.

Below, you will find the recommended treatment and cost for the olive trees.

TREATMENT PLAN:
Olives (14 trees): treatment for Xylella; & tree health care

14 Trees
$ 2,800

- Trunk injection (1 application)- $170.00/tree
- Soil injection/drench (1 application)- $30.00/tree

TOTAL COST:

Trunk injection: **$2,380.00**	$ 170 x 14 = $ 2380
Soil injection/drench: **$420.00**	$ 30 x 14 = $ 420
	$ 2800

Please call me if you have any questions. Thank you.

Disclaimer

Trees are living organisms and their life span cannot be predicted. Consultations, written reports and appraisals are considered a nonbiased professional opinion and do not constitute a complete hazard assessment or warranty against continued decline or failure. RPW Services Inc. cannot guarantee that any proposed treatment will save a tree. We do guarantee that we will apply the materials correctly and at the maximum allowable rate as determined by the product label and site conditions.

www.rpwservicesinc.com
2473 E. Orangethorpe
Fullerton, CA 92831
714-870-6352 Fax: 714-870-6485 Mobile: 657-222-5730
E-Mail: rkim@rpwservicesinc.com

Exhibit B

RPW
SERVICES INC.
SINCE 1987
Fullerton, CA 92831

RPW SERVICES, INC

RESPONSIVE PEST WORK

Plant Health Care Weed Abatement Turfgrass Fertilization/Weed Control Aquatic Weed Control Rodent Control

systemic insecticide to be fully translocated throughout the entire tree. Treatment for Xylella can be done with a trunk injection using an antibiotic or fungicide. A small needle is inserted underneath the bark tissue to directly inject the material into the trees vascular tissue to slow/stop the progression of the bacterium and help unclog the xylem vessels. Additional applications may be required if symptoms (flagging & dieback) persist. Infected trees should be treated on an annual basis with trunk injections until symptoms cease.

During my initial inspection of the property, several of the trees were showing symptoms (flagging) of Xylella. We recommend treating for Xylella and GWSS with a trunk injection and soil treatment, respectively. A foliar spray is not necessary at this time due to little or no observable pests.

Below, you will find the recommended treatment and cost for the olive trees. The cost for treating the 1 large (55 DBH) olive tree is considerably higher than the other 8 olives due to their differences in size and the amount of materials that would need to be used. I have separated the cost between the two.

TREATMENT PLAN:
Olives (9 small trees): treatment for Xylella

- Trunk injection (1 application)-
  - 8 small olive trees @ $170.00/tree → $1,360.00
  - 1 large olive tree @ $455.00/tree → $455.00
- Soil injection/drench (1 application)-
  - 8 small olive trees @ $30.00/tree → $240.00
  - 1 large olive tree @ $90.00/tree → $90.00

$170 x 8 = $1360
$455 x 1 = $455
1815
$30 x 8 = $240
$90 x 1 = $90
$330

9 Trees
+ 2,145

TOTAL COST:
Trunk injection: **$1,600.00**
Soil injection/drench: **$545.00**

1360 + 240 = 1600
455 + 90 = 545
2145

Please call me if you have any questions. Thank you.

Disclaimer

Trees are living organisms and their life span cannot be predicted. Consultations, written reports and appraisals are considered a nonbiased professional opinion and do not constitute a complete hazard assessment or warranty against continued decline or failure. RPW Services Inc. cannot guarantee that any proposed treatment will save a tree. We do guarantee that we will apply the materials correctly and at the maximum allowable rate as determined by the product label and site conditions.

www.rpwservicesinc.com
2473 E. Orangethorpe
Fullerton, CA 92831
714-870-6352 Fax: 714-870-6485 Mobile: 657-222-5730
E-Mail: rkim@rpwservicesinc.com

Exhibit C

systemic insecticide to be fully translocated throughout the entire tree. Treatment for Xylella can be done with a trunk injection using an antibiotic or fungicide. A small needle is inserted underneath the bark tissue to directly inject the material into the trees vascular tissue to slow/stop the progression of the bacterium and help unclog the xylem vessels. Additional applications may be required if symptoms (flagging & dieback) persist. Infected trees should be treated on an annual basis with trunk injections until symptoms cease.

During my initial inspection of the property, several of the trees were showing symptoms (flagging) of Xylella. We recommend treating for Xylella and GWSS with a trunk injection and soil treatment, respectively. A foliar spray is not necessary at this time due to little or no observable pests.

Below, you will find the recommended treatment and cost for the olive trees.

TREATMENT PLAN:

Olives (8 trees): treatment for Xylella

8 Trees
+1,600

- Trunk injection (1 application)- $170.00/tree + 170 x 8 = 1360
- Soil injection/drench (1 application)- $30.00/tree + 30 x 8 = 240

+ 1600

TOTAL COST:

Trunk injection: **$1,360.00**
Soil injection/drench: **$240.00**

Please call me if you have any questions. Thank you.

Disclaimer

Trees are living organisms and their life span cannot be predicted. Consultations, written reports and appraisals are considered a nonbiased professional opinion and do not constitute a complete hazard assessment or warranty against continued decline or failure. RPW Services Inc. cannot guarantee that any proposed treatment will save a tree. We do guarantee that we will apply the materials correctly and at the maximum allowable rate as determined by the product label and site conditions.

www.rpwservicesinc.com
2473 E. Orangethorpe
Fullerton, CA 92831
714-870-6352 Fax: 714-870-6485 Mobile: 657-222-5730
E-Mail: rkim@rpwservicesinc.com

CVL
Cresta Verde Landscape

April 2, 2018

Eastbluff Community Association
c/o South Coast Property Management, Inc.
2973 Harbor Blvd. #415
Costa Mesa, CA 92626

Attention: Scott Smith

Regarding: Pine and Olive Recommendations

Dear Scott, Board Members and Landscape Committee

Attached is a copy of the report from the tests taken on the Pine tree located in Blue Herron Park, and one of the Olive trees from the A, B, and C Entrances.

Olive Trees at A, B, and C Entrances:

A sample was taken from one of the most infected trees, located at the Alba Entrance. As the report shows from the leaf sample, the Olive tree tested positive for Xylella. Xylella is a disease that is transmitted by the glassywing sharpshooter. This disease is wide spread and so far has been untreatable. As the report states, death is typically eminent. There have been some recent treatments that have been effective; however, it is a very small percentage. (see Olive / Comments and Recommendations on page 1)

The report shows that the soil conditions are good. There are a few nutrients that test low and these can be corrected by soil conditioners and fertilizers. (see paragraph under Olive / Soil page 1)

Action Being Taken:

To provide the Board with the needed information in order to make a decision on what action will take place, CVL is currently taking the following steps:

a. We have contacted a few companies that specialize in tree treatments. We will get their opinions and recommendations if treatment is a possibility. If treatment is a possibility, we will obtain proposals and provide a report that will outline what the treatment is and how successful it would be. (see first paragraph on page 2)
b. In the case that treatments will not work or they are too expensive based on the possibility that they will not work, CVL will provide a proposal to remove and replace the trees.

CVL
Cresta Verde Landscape

Pine Tree at Blue Herron Park:

The report shows that the Pine tree tested positive for Phytophthora (a root rot problem) and Diplodia (a fungus).

With trees being located in turf areas it is difficult to reduce the soil moisture that causes these conditions. Over the years of irrigating the areas for turf and the direct irrigation spray that trees have endured, it is not uncommon for this to happen. It is not a high percentage and usually occurs as trees age.

Applications of fungicides will help in a preventative measure. Changes can be made to irrigation that will help mitigate the issue of trunks being sprayed and area around tree canopy being over watered. Landscape changes, such as converting turf around trees to planters or other types of ground cover, will also help.

Action Being Taken:

a. CVL will provide a proposal to treat remaining trees in the turf areas of the Park with fungicides. This will be an ongoing maintenance practice.
b. CVL will assess the irrigation system to modify the spray to avoid hitting the trunks of trees.
c. Discussion with Landscape Committee will be needed if turf conversions are a direction that the Community would like to take. CVL has a few ideas that will be presented to the Landscape Committee for their review.
d. Soil conditioners, amendments and fertilizers will be applied to correct deficiencies in the soil

In Closing:

CVL will continue to gather information to provide for your review. Through working with the Landscape Committee we will develop a long term plan to address these issues. CVL will continue to update you on our actions and recommendations.

Respectfully,

Dennis Pratt
Cresta Verde Landscape
Account Manager

Waypoint ANALYTICAL

Anaheim Office
Lab No. 18-074-0003
Path No. 262
March 23, 2018

Cresta Verde Landscape, Inc
1759 E. Borchard
Santa Ana, CA 92705

Attn: Dennis Pratt

RE: EAST BLUFF-OLIVE TREE AND PINE

Plant material (leaves, stems, branches and roots) and soil from the above mentioned plants were submitted to our laboratory for pathology and soil analysis.

Olive

-Pathology

Tissues examined and cultured: Leaves, branch and roots.

Pathogen identified: Xylella Assay Method: Real-Time PCR (Polymerase Chain Reaction)
Leaf tissue tested Positive for ***Xylella fastidiosa*** the causal agent of the disease known as leaf scorch on Olives. The branch and root tissue tested negative for the presence of plant pathogens.

-Soil

According to the data nitrogen is very low. Phosphorus is below optimum but not critical and potassium is optimum. Calcium and magnesium are sufficient for plant growth. In the micronutrient category copper, zinc and iron are ample. Manganese is low. Soluble salts are safe as indicated by the ECe reading of 2.2 dS/m. Soil pH is slightly alkaline in reaction, and is suitable for many plants including Olives. Sodium is slightly elevated enough to restrict the growth of sodium sensitive plants but tolerated by Olives. Boron is safe. Qualitative lime is low.

Comments and Recommendations

This result showed that one of the main contributing factors to the poor performance/decline of the olive trees is bacterial scorch caused by *Xylella fastidiosa*. Xylella is a plant pathogenic bacterium that colonizes the water conducting tissues known as xylem. As the bacteria multiply within the xylem they clog up water-conducting vessels, which then lead to the scorched leaf symptoms. Once a susceptible plant has been infected with the bacteria, death is eminent. The disease is readily transmitted by sucking insects that feed on the xylem. These insects are known as the glassywing sharpshooters.

Halting the progression of this disease to other olives that may be on site will be challenging, if not impossible. Minimizing tree stress and judicious applications of insecticides targeting the glassywing sharpshooter vector may help slow progression, but advancement of the pathogen is ultimately inevitable.

Recently, the idea of using trunk-injected tetracycline has been gaining some traction. This is not a new development; rather it is an idea that has already been explored by the fruit tree industry where decade's old research showed the ability of such injections to cause the pathogen to go into remission. Both Maujet and Rainbow Tree Care have products that are either pending registration or are currently available in California.

Note, however, that these injections do not cure the infection; without yearly applications symptoms will return and the health of the tree will deteriorate as a result of the disease. The cost of this type of treatment will no doubt limit its use. The number of injections required may also carry unforeseen negative consequences that will have to be weighed against the benefits of the treatment.

Pine

-Pathology

Tissues examined and cultured: Branch and roots.

Pathogen identified: ***Phytophthora spp.*** was isolated from the roots and no plant pathogens were isolated from the branch sample but ***Diplodia spp.*** was isolated from the base of the leaf needle tissue.

-Soil

According to the data nitrogen is very low. Phosphorus and potassium are optimum. Calcium and magnesium are sufficient for plant growth. In the micronutrient category copper, zinc and iron are ample. Manganese is low. Soluble salts are safe as indicated by the ECe reading of 1.2 dS/m. Soil pH is strongly acidic in reaction, and is tolerable for many plants including Pines. Sodium is safe. Boron is also safe. Qualitative lime is favorably absent.

Comments and Recommendations

Contributing to the poor performance/decline of the Pine are the water mold Phytophthora and the needle blight fungus Diplodia.

Phytophthora is a well-known root rot pathogen that affects many landscape plants. Exposure to prolonged high soil moisture conditions due to excessive irrigations and/or poor drainage increases the risk of Phytophthora related root problems, and plants suffering from the disease can exhibit poor leaf color, reduced vigor, general wilt, defoliation, and branch dieback.

Control of Phytophthora is best addressed through proper management of soil moisture. Correct any drainage problems and ensure irrigations are not excessive. Keeping the root crown of the tree dry is also very important. Watering too close to the base of the plant and overspray from sprinklers tend to keep tissues moist, which can facilitate collar rot. Depending on the extent of damage suffered by the plant's root system, there could be a benefit from a fungicide application that specifically targets Phytophthora.

Materials that contain mefenoxam, fosetyl-aluminum, or a phosphorus acid derivative are industry standards for controlling Phytophthora. Consult with your preferred agrochemical provider for a specific product recommendation. Remember that unless soil moisture conditions are improved the use of any fungicide alone is unlikely to provide any long term benefits.

Diplodia is a well-known fungal pathogen that is known to incite needle blight on pines. Spores of the fungus are readily dispersed in splashing water from rain and are likely to be carried on contaminated pruning equipment. Since stress often times plays a predisposing role to infection by the fungus, making sure that horticultural requirements of the plant are met is often enough to avoid diplodia infection.

Unfortunately fungicide efficacy data is lacking for these diseases, so any treatments are likely to be experimental. With that, products of broad-spectrum activity may be your best option, and could include materials like mancozeb (Protect T/O®), azoxystrobin (Heritage®), pyraclostrobin (Pageant®), thiophate-methyl + chlorothalonil (Spectro 90 WDG®) thiophanate-methyl (Clearys 3336®, OHP 6672®, and Fungo®), and tebuconazole (Torque®). Consult with your agrochemical company to discuss specific product availability as well as recommendations.

Regarding soil fertility it is optimum for both soil samples with the exception of the very low nitrogen. Make a corrective application of blood meal in both areas at the rate of 7 lbs. per 1000 sq. ft. Follow by a thorough irrigation and in three months consider the maintenance fertilization outline below.

Recommended Maintenance Fertilization

Uniformly broadcast blood meal (12-0-0) at the rate of 2 lbs. per 100 sq. ft. with repeat applications every 90 to 120 days or as growth and color dictate. In early fall and spring, substitute a complete fertilizer such as Nature Safe (8-3-5), or equal, for the blood meal at the rate of 2 lbs. per 100 sq. ft. to ensure continuing supplies of phosphorus and potassium. Follow each fertilization with a thorough irrigation.

As noted above, some of the micronutrients are below optimum. When these nutrients are low, especially in an alkaline soil, deficiencies can sometimes show in the plants. If deficiencies show they may be addressed upon the first sign of deficiency. Symptoms of manganese deficiency may be seen as a general loss of color in the young leaves, followed by yellowing between veins and brownish-black spots appearing. If these symptoms are apparent then an application of manganese chelate at the manufacturer's label rate may improve appearance. Chelates are generally more effective on alkaline soils than some of the other forms of trace elements. One option is the Monterey AgResources line of chelated micronutrient formulations under the brand name SEQUESTAR®. These can be applied either foliar or soil applied at manufacturer's rates if deficiencies begin to show.

If we can be of any further assistance, please feel free to contact us.

Jose A. Rodriguez
Plant Pathology Department

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

SOIL ANALYSIS

Send To:	Project :	Report No : 18-074-0003
Cresta Verde Landscape, Inc 1759 E. Borchard Santa Ana, CA 92705	East Bluff	Cust No : 02464 Date Printed : 03/19/2018 Date Received : 03/15/2018 Page : 1 of 2 Lab Number : 14630

Sample Id : **Olive**

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)	2.2 dS/m					
Sodium Adsorption Ratio (SAR) *	5.68					
Boron (B)	0.34 ppm					
Sodium (Na)	14.1 meq/L					
Chloride (Cl)						
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	7.4 s.u.								Low

EXTRACTABLE NUTRIENTS

Test	Result	Sufficiency Factor	SOIL TEST RATINGS: Very Low	Low	Medium	Optimum	Very High
Available-N	4 ppm	0.1					
Phosphorus (P) - Olsen	8 ppm	0.5					
Potassium (K)	148 ppm	1.6					
Potassium - sat. ext.	0.9 meq/L						
Calcium (Ca)	852 ppm	0.8					
Calcium - sat. ext.	8.2 meq/L						
Magnesium (Mg)	206 ppm	1.5					
Magnesium - sat. ext.	4.1 meq/L						
Copper (Cu)	1.1 ppm	1.4					
Zinc (Zn)	8 ppm	2.6					
Manganese (Mn)	1 ppm	0.2					
Iron (Fe)	12 ppm	0.4					
Boron (B) - sat. ext.	0.34 ppm	1.1					
Sulfate - sat. ext.	14.0 meq/L	4.7					
Exch Aluminum							

NO3-N	NH4-N	Total Exchangeable Cations(TEC)
2 ppm	2 ppm	65 meq/kg

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

PARTICLE SIZE ANALYSIS

Half Sat	Organic Matter	Gravel: Coarse 5-12	Gravel: Fine 2-5	Weight Percent of Sample Passing 2mm Screen: Sand: Very Coarse 1-2	Sand: Coarse 0.5-1	Sand: Med. to Very Fine 0.05-0.5	Silt .002-.05	Clay 0-.002	USDA Soil Classification
14 %									

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

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

SOIL ANALYSIS

Send To:	Project :	Report No : 18-074-0003
Cresta Verde Landscape, Inc 1759 E. Borchard Santa Ana, CA 92705	East Bluff	Cust No : 02464 Date Printed : 03/19/2018 Date Received : 03/15/2018 Page : 2 of 2 Lab Number : 14631

Sample Id : **Pine**

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)	1.2 dS/m					
Sodium Adsorption Ratio (SAR) *	2.75					
Boron (B)	0.63 ppm					
Sodium (Na)	6.2 meq/L					
Chloride (Cl)						
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	5.1 s.u.								None

EXTRACTABLE NUTRIENTS

Test	Result	Sufficiency Factor	SOIL TEST RATINGS: Very Low	Low	Medium	Optimum	Very High
Available-N	23 ppm	0.3					
Phosphorus (P) - Olsen	36 ppm	0.9					
Potassium (K)	266 ppm	1.2					
Potassium - sat. ext.	1.6 meq/L						
Calcium (Ca)	2304 ppm	0.8					
Calcium - sat. ext.	6.8 meq/L						
Magnesium (Mg)	497 ppm	1.3					
Magnesium - sat. ext.	3.3 meq/L						
Copper (Cu)	2.9 ppm	1.3					
Zinc (Zn)	27 ppm	3.1					
Manganese (Mn)	3 ppm	0.2					
Iron (Fe)	156 ppm	1.8					
Boron (B) - sat. ext.	0.63 ppm	2.1					
Sulfate - sat. ext.	5.3 meq/L	1.8					
Exch Aluminum							

NO3-N	NH4-N	Total Exchangeable Cations(TEC)
16 ppm	7 ppm	165 meq/kg

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

PARTICLE SIZE ANALYSIS

Half Sat	Organic Matter	Gravel: Coarse 5-12	Gravel: Fine 2-5	Weight Percent of Sample Passing 2mm Screen: Sand Very Coarse 1-2	Sand Coarse 0.5-1	Sand 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.