Ana-Lync Golf

# Physicality & Cations

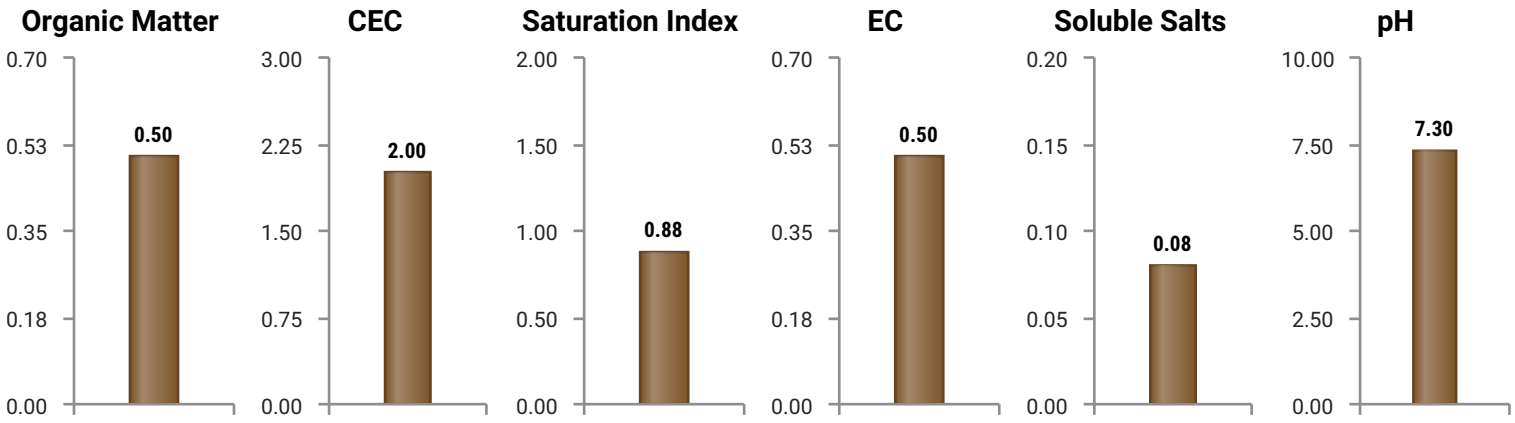
**Testing Performed by AgSource Laboratories, Lincoln, Nebraska**



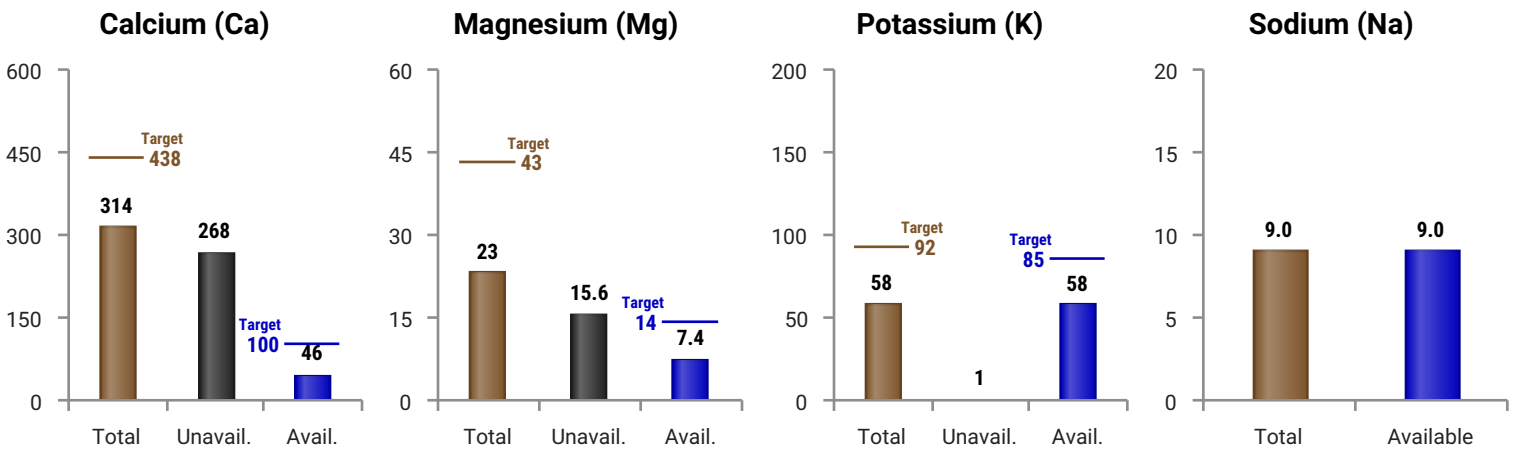
**Distributor:** GE Turf Consultants/S Fifer
**Client:** CAVES VALLEY GOLF CLUB
MD 21117

**Date:** 10/15/2025
**Info Sheet No.:** 83941
**Sample IDs:** GRN014
**Lab IDs:** DG49989

## Physicality




## Base Cations (ppm)




**Bulk Rec.**: 320 lb/acre

**Bulk Rec.**: 50 lb/acre

**Bulk Rec.**: 68 lb/acre

## Cation Percentages Vs. Amount of Nutrients

| | Nutrient | Perc. | Analysis | Target Range % | Total | Required | Analysis | Bulk Rec. |
|---|---|---|---|---|---|---|---|---|
| Total | Ca | 80.6% | Optimal | 72.0 - 87.0 | 314.0 | 438.0 | Low | 320 lb/acre |
| | Mg | 9.8% | Low | 12.0 - 17.0 | 23.0 | 43.0 | Deficient | 50 lb/acre |
| | K | 7.6% | Optimal | 4.0 - 8.0 | 58.0 | 92.0 | Low | 68 lb/acre |
| | Na | 2.0% | Not Problematic | 2.0 - 4.0 | | | | |
| | H | 0.0% | Low | 1.0 - 4.0 | | | | |
| Available | Ca | 46.4% | High | 34.0 - 45.0 | 45.7 | 100.0 | Deficient | |
| | Mg | 12.4% | Low | 15.0 - 18.0 | 7.4 | 14.0 | Deficient | |
| | K | 29.9% | High | 13.0 - 17.0 | 57.5 | 84.9 | Low | |
| | Na | 7.9% | Not Problematic | 10.0 - 17.0 | | | | |
| | $NH_4$ | 3.3% | Low | 8.0 - 13.0 | | | | |

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# Anions, Nitrogen, & Micronutrients

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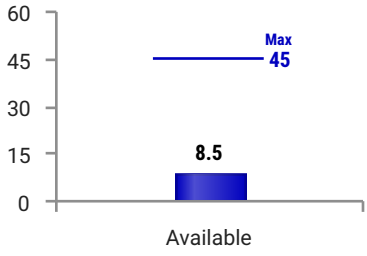
## Nitrogen (ppm)

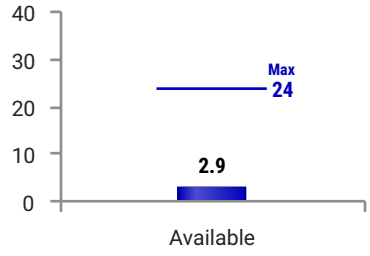
### Nitrate ($NO_3$)

**0.39** lb / 1000 sq ft



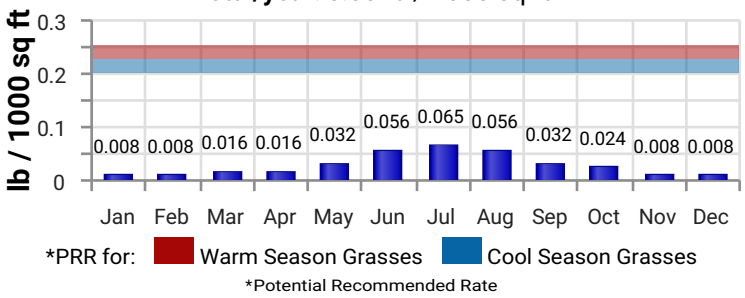

### Ammonium ($NH_4$)

**0.13** lb / 1000 sq ft




### Estimated Nitrogen Release

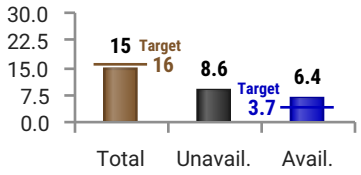
**Total/year**: 0.33 lb / 1000 sq ft




*Potential Recommended Rate

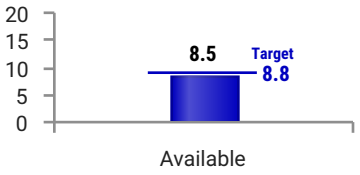
## Anions (ppm)

### Phosphorus (P)

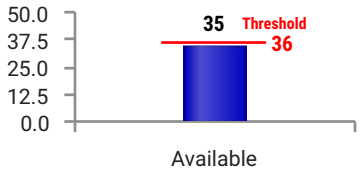



**Bulk Rec.**: 2 lb/acre

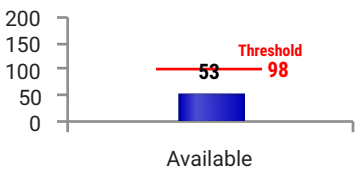
### Sulfur (S)




### Chloride (Cl)

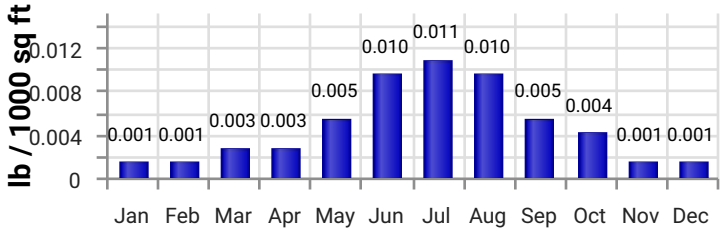



### Bicarbonate ($HCO_3$)



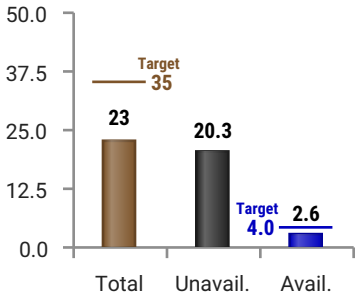

### Estimated Phosphorus Release

**Total/year**: 0.06 lb / 1000 sq ft

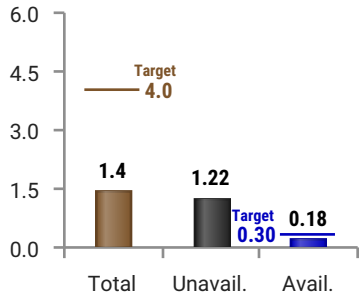



## Micronutrients (ppm)

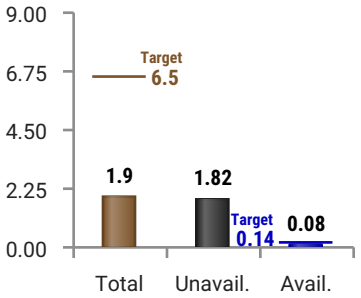
### Iron (Fe)



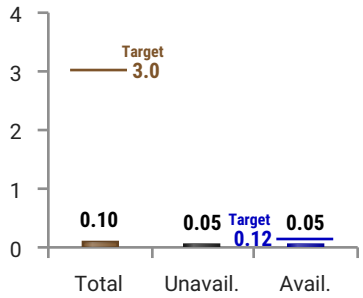

### Manganese (Mn)



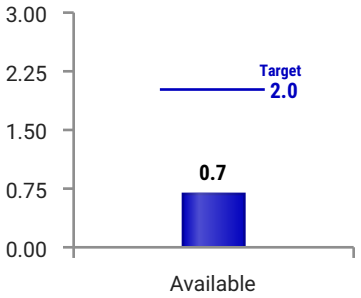

### Zinc (Zn)



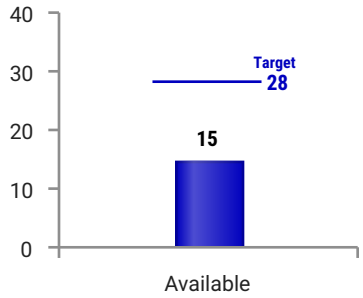

### Copper (Cu)




### Boron (B)




### Silicon (Si)




## Available Anion Percentages

| Nutrient | Perc. | Analysis | Target Range % |
|---|---|---|---|
| $NO_3$ | 13.7% | Low | 25 - 30 |
| $PO_4$ | 14.0% | High | 5 - 8 |
| $SO_4$ | 30.6% | Optimal | 28 - 32 |
| Cl | 22.1% | High | 18 - 21 |
| $HCO_3$ | 19.6% | High | 14 - 16 |

Ana-Lync Golf

# Testing Procedures & Bulk Rec.

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MD 21117

**Date:** 10/15/2025
**Info Sheet No.:** 83941
**Sample IDs:** GRN014
**Lab IDs:** DG49989

## Testing Procedures

**Nitrate:** Saturated Paste Extract
**Ammonium:** KCL Extract
**Available Nutrients:** Saturated Paste Extract
**Exchangeable Cations:** Ammonium Acetate
**Exchangeable Trace Nutrients:** DTPA
**Phosphorus: pH > 7.2:** Olsen, **pH ≤ 7.2:** Bray 1
**Sulfur:** Monocalcium Phosphate
**pH:** 1:1 Soil:Water slurry
**Boron:** DTPA / Sorbitol
**Organic Matter:** LOI (Loss on Ignition)
**Silicon:** Saturated Paste Extract
**Saturation Index:** Saturated Paste Extract
**EPR / ENR:** Proprietary
***AgSource Laboratories is an N.A.P.T./PAP certified lab**

## Bulk Recommendations

**Units:** lb/acre

| Ca | Mg | $K_2O$ | $P_2O_5$ |
|---|---|---|---|
| 320 | 50 | 68 | 2 |

This is the quantity required to achieve balance and overcome nutrient tie-ups. The amount required may not be economically or agronomically feasible in a short time period.

**Per Source:**

| $CaCO_3$ | Dolomite | 0-0-50 |
|---|---|---|
| 688 | 455 | 136 |

**Per Sample:**

| | Ca | Mg | $K_2O$ | $P_2O_5$ |
|---|---|---|---|---|
| GRN014 | 320 | 50 | 68 | 2 |

Ana-Lync Golf

# Nutrient Data

**Testing Performed by AgSource Laboratories, Lincoln, Nebraska**



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**Info Sheet No.:** 83941
**Sample IDs:** GRN014
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| Laboratory Number | | DG49989 | Avg. | Target / Threshold |
|---|---|---|---|---|
| Client ID | | GRN014 | | |
| Organic Matter % | | 0.5 | **0.5** | |
| Saturation Index | | 0.88 | **0.88** | |
| pH | | 7.3 | **7.3** | |
| Soluble Salts | | 0.08 | **0.08** | |
| Electrical Conductivity | | 0.5 | **0.5** | |
| ExcessCarbonates | | L | | |
| Calcium (Ca) | TOTAL PPM | 314 | **314** | 438 |
| | AVAILABLE PPM | 45.7 | **45.7** | 100.0 |
| Magnesium (Mg) | TOTAL PPM | 23.0 | **23.0** | 43.0 |
| | AVAILABLE PPM | 7.4 | **7.4** | 14.0 |
| Potassium (K) | TOTAL PPM | 58.0 | **58.0** | 92.0 |
| | AVAILABLE PPM | 57.5 | **57.5** | 84.9 |
| Sodium (Na) | TOTAL PPM | 9.0 | **9.0** | |
| | AVAILABLE PPM | 9.0 | **9.0** | |
| Cation Ratios | Ca:Mg | 13.7 | **13.7** | |
| | Mg:K | 0.4 | **0.4** | |
| | Ca:Na | 34.9 | **34.9** | |
| | K:Na | 6.4 | **6.4** | |
| Cation Exchange Capacity | | 2.0 | **2.0** | |
| Percent Base | Ca % | 80.6 | **80.6** | 72-87 |
| Saturations | Mg % | 9.8 | **9.8** | 12-17 |
| | K % | 7.6 | **7.6** | 4-8 |
| | Na % | 2.0 | **2.0** | 2-4 |
| | H % | 0 | **0** | 1-4 |
| Phosphorus (P) | TOTAL PPM | 15.0 | **15.0** | 15.5 |
| (Olsen) | AVAILABLE PPM | 6.4 | **6.4** | 3.7 |
| EPR | LB / 1000 SQ FT | 0.056 | **0.056** | |
| Sulfur (S) | AVAILABLE PPM | 8.5 | **8.5** | 8.8 |
| Chloride (Cl) | AVAILABLE PPM | 34.7 | **34.7** | 35.5 |
| Bicarbonate ($HCO_3$) | AVAILABLE PPM | 53.1 | **53.1** | 97.6 |
| Nitrate ($NO_3$) | AVAILABLE PPM | 8.5 | **8.5** | 39.9 |
| Ammonium ($NH_4$) | AVAILABLE PPM | 2.9 | **2.9** | 21.6 |
| ENR | LB / 1000 SQ FT | 0.33 | **0.33** | |
| Iron (Fe) | TOTAL PPM | 22.9 | **22.9** | 35.0 |
| | AVAILABLE PPM | 2.6 | **2.6** | 4.0 |
| Manganese (Mn) | TOTAL PPM | 1.4 | **1.4** | 4.0 |
| | AVAILABLE PPM | 0.18 | **0.18** | 0.3 |
| Zinc (Zn) | TOTAL PPM | 1.9 | **1.9** | 6.5 |
| | AVAILABLE PPM | 0.08 | **0.08** | 0.14 |
| Copper (Cu) | TOTAL PPM | 0.1 | **0.1** | 3.0 |
| | AVAILABLE PPM | 0.05 | **0.05** | 0.13 |
| Boron (B) | AVAILABLE PPM | 0.67 | **0.67** | 2.0 |
| Silicon (Si) | AVAILABLE PPM | 14.7 | **14.7** | 28.0 |

# Comments



**Testing Performed by AgSource Laboratories, Lincoln, Nebraska**



## Organic Matter
### Sand
**Value:** 0.5
**Evaluation:** Low

OM is low indicating a soil type that is somewhat porous and has less than optimum microbial activity. Percolation rates may be high and water holding capacity may be low. Leaching of nutrients is likely.

Humic soil amendments are recommended to increase exchange sites and provide microbial food sources.

## Organic Matter
### Pushup
**Value:** 0.5
**Evaluation:** Deficient

OM is very low indicating a soil type that is very porous and may have low microbial activity. Expect high percolation rates, low capillary water, and high leaching of nutrients. Maintain appropriate nutrient levels throughout the growth cycle.

Humic soil amendments are recommended to increase exchange sites and provide microbial food sources.

## Saturation Index
### Sand
**Value:** 0.88
**Evaluation:** Optimal

The Saturation Index shows a good balance between air space and capillary space. Good water percolation and oxygen movement in the profile are expected. Adequate moisture retention will promote optimal growth if nutrient levels are sufficient.

## Saturation Index
### Pushup
**Value:** 0.88
**Evaluation:** Deficient

The Saturation Index is very low indicating a soil type that is very porous. Expect excessive percolation rates, low capillary water, and high leaching of nutrients. Maintain appropriate nutrient levels.

A low saturation index usually indicates a sandy soil with low organic matter content. Such soils are poor in water holding capacity.

Organic soil amendments can help the biological function of the soil and improve soil physical characteristics.

## Electrical Conductivity
### Sand
**Value:** 0.5
**Evaluation:** Low

EC readings are low and may indicate a deficiency of nutrients. (See the individual nutrient assessments in this report for more details.)

Possible uptake of Na or Cl may occur.

## Electrical Conductivity
### Pushup
**Value:** 0.5
**Evaluation:** Deficient

An EC reading this low most likely indicates an overall shortage of nutrients. (See the individual nutrient assessments in this report for more details.)

Possible uptake of Na or Cl may occur.

## Available Ammonium
**Value:** 2.9 ppm
**Evaluation:** Deficient

Levels this low may indicate an overall lack of N. A lack of $NH_4$ in the soil may also induce an unhealthy uptake of Na and K. Chlorophyll formation may not be adequate.

Check $NO_3$ levels.

Application of an ammonium-based fertilizer may be required.

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## Available Nitrate

**Value:** 8.5 ppm
**Evaluation:** Deficient

Levels this low may indicate an overall lack of N. A lack of $NO_3$ in the soil may also induce an unhealthy uptake of Cl and $HCO_3$. Chlorophyll formation may not be adequate.

Check $NH_4$ levels. Mildly N deficient plants tend to have stunted growth and a general yellowing of the leaves.

Applications of a nitrate-based fertilizer are needed. Nitrate-N is highly leachable.

## Available Calcium

**Value:** 45.7 ppm
**Evaluation:** Deficient

Ca levels are deficient and may result in poor heat and moisture stress tolerance. Plants may have weaker cell walls.

Monitor applications of N to avoid aggravating calcium deficiency symptoms.

Bulk calcium sources are recommended - see page 3 of report.

## Total Calcium

**Value:** 314 ppm
**Evaluation:** Low

Soil structure may degrade and water penetration may be poor. Bulk calcium soil amendments are recommended. See page 1 and 3 of the report for bulk calcium recommendations.

The ammonium acetate soil test reports this to be a low Ca level; however, this may not be an accurate reflection of what is available to the plant. Refer to the Available Ca portion of the report for more details regarding calcium fertilization.

## Available Magnesium

**Value:** 7.4 ppm
**Evaluation:** Deficient

Mg availability in the soil may not be adequate for proper chlorophyll production and enzymatic activity.

Early season growth may tend to be slow if soils are cold and wet. Magnesium deficient plants show chlorosis of the older leaves. Magnesium deficiencies are more common on acid soils.

The application of bulk magnesium soil amendments is usually required. See page 1 and 3 for bulk magnesium recommendations.

## Total Magnesium

**Value:** 23.0 ppm
**Evaluation:** Deficient

The traditional soil test reports this to be deficient; however, this may not be an accurate reflection of what is available to the plant. Refer to Available Mg for more details.

The application of a bulk magnesium soil amendment is usually required. See page 1 and 3 of the report for recommendations.

## Available Potassium

**Value:** 57.5 ppm
**Evaluation:** Low

K levels are deficient and can result in poor stomatal operation and reduced transpiration rates. Plants may be more sensitive to frost injury.

Symptoms tend to be more severe in salty soils or during periods of hot weather.

The application of a bulk potassium soil amendment is usually required. See page 1 and 3 for recommendations.

## Total Potassium

**Value:** 58.0 ppm
**Evaluation:** Low

The ammonium acetate (total K) soil test reports this amount to be low; however, this may not be an accurate reflection of what is available to the plant. Refer to Available K for more details.

Bulk potassium sources are recommended. See page 1 and 3 of this report for recommendations.

**Testing Performed by AgSource Laboratories, Lincoln, Nebraska**



## Available Sodium

**Value:** 9.0 ppm
**Evaluation:** Not Problematic

Available sodium is optimum, therefore proper $CO_2$ movement within the cells is likely. Photosynthesis and respiration are well supported.

Additional inputs of sodium are not recommended.

## Total Sodium

**Value:** 9.0 ppm
**Evaluation:** Not Problematic

The traditional soil test reports this level to be optimum; however, this may not be an accurate reflection of what is available to the plant. Refer to Available Na for more details.

## Available Phosphorus

**Value:** 6.4 ppm
**Evaluation:** High

P levels are slightly high and any detrimental effects may be minimal. Energy transfer for enzymatic processes are good and are possible if other nutrients are sufficient.

Watch for soil tie-ups with key micronutrients, especially zinc.

Additional applications of phosphorus fertilizers may not be recommended.

## Total Phosphorus

**Value:** 15.0 ppm
**Evaluation:** Optimal

The traditional phosphorus test would indicate that P levels are optimum; however, this may not be a reliable indicator of what is available to plants. Refer to Available P for more details.

## Available Chloride

**Value:** 34.7 ppm
**Evaluation:** Within Allowable Limits

Available chloride is optimum. Efficient movement of oxygen in the photosynthetic process and stomatal operation should be good.

## Available Bicarbonate

**Value:** 53.1 ppm
**Evaluation:** Within Allowable Limits

Bicarbonate levels are optimum, therefore, no interference with soil or plant functions are expected. Detrimental impacts from bicarbonates on the plant or soil are not likely.

## Available Sulfur

**Value:** 8.5 ppm
**Evaluation:** Optimal

$SO_4$ levels are optimum to produce key amino acids.

Additional inputs of sulfate fertilizers may not be needed except in sandy soils.

## Available Boron

**Value:** 0.67 ppm
**Evaluation:** Low

Available boron may not be adequate for optimal plant function. Nitrate reductase can be interrupted.

On sandy soils, boron is subject to leaching.

## Available Silicon

**Value:** 14.7 ppm
**Evaluation:** Low

Low silicon can cause the plant to have weaker cell walls.

Additional inputs of silicon may be recommended.

## Available Zinc

**Value:** 0.08 ppm
**Evaluation:** Low

Available zinc levels may not be adequate for cell elongation, chlorophyll formation, and enzymatic functions within the plant. Metabolism of CO2, P, and carbohydrates may be compromised.

Zn deficient leaves may be yellow, small, and distorted. Deficiency symptoms are seen most often during warm weather.

## Total Zinc

**Value:** 1.9 ppm
**Evaluation:** Low

The soil test reports zinc to be a low level; however, this may not be an accurate reflection of what is available to the plant. Refer to Available Zn for more details.

## Available Manganese

**Value:** 0.18 ppm
**Evaluation:** Low

Mn availability in the soil is low and chlorophyll formation and photosynthesis may be diminished. Enzyme function and pathogen resistance may be low.

Mn deficient plants exhibit an interveinal chlorosis between veins on the younger leaves. Symptoms resemble iron deficiency.

## Total Manganese

**Value:** 1.4 ppm
**Evaluation:** Low

The traditional soil test reports this to be a low level; however, this may not be an accurate reflection of what is available to the plant. Refer to Available Mn for more details.

## Available Copper

**Value:** 0.05 ppm
**Evaluation:** Low

Copper availability may not be adequate for proper enzymatic function and protein synthesis. Plant defense mechanisms may be compromised due to poor formation of lignin in the cell walls. Nitrogen metabolism may not function properly.

Copper deficient plants are smaller and paler green and tend to wilt easily.

Roots may be stunted or twisted.

## Total Copper

**Value:** 0.1 ppm
**Evaluation:** Low

The traditional soil test reports this to be a low level; however, this may not be an accurate reflection of what is available to the plant. Refer to Available Cu for more details.

## Available Iron

**Value:** 2.6 ppm
**Evaluation:** Low

Levels of available iron may not be sufficient to support essential plant functions, including chlorophyll formation and electron transfer. Interveinal chlorosis and poor root development may occur. The deficiency could be caused by tie-ups of iron due to higher soil pH levels. Symptoms will be more severe if high bicarbonates are also present.

Iron-deficient leaves show intense chlorosis. The most common symptom for iron deficiency starts out as an interveinal chlorosis of the youngest leaves but can evolve into an overall chlorosis with only some of the veins remaining green. Symptoms are rarely uniform throughout the turf but may be worse in areas without good soil aeration.

Iron deficiency is strongly associated with calcareous soils and/or anaerobic soil conditions. Symptoms are intensified by high bicarbonate levels.

## Total Iron

**Value:** 22.9 ppm
**Evaluation:** Optimal

The traditional soil test reports this level to be optimum; however, this may not be an accurate reflection of what is available to the plant. Refer to Available Fe for more details.

Additional inputs of iron may not be needed.