ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

# Plant Tissue Report

*Printed on 3/3/2017*

**Account No. 9800**
Rock River Lab - Chile
',

**Report for:**
Anagra

**Lab No:** 40716 **Field:** Maiz
**Date Sampled:** 01/09/2017 **Sample:** (FieldCorn)

## Plant Results

| | Low | Sufficient | High |
|---|---|---|---|
| N% | 3.40 | | |
| P% | 0.20 | | |
| K% | | 3.34 | |
| Ca% | 0.23 | | |
| Mg% | 0.12 | | |
| S% | | 0.19 | |
| Zn ppm | | 29 | |
| B ppm | | 5.45 | |
| Mn ppm | | 39 | |
| Fe ppm | | | 317 |
| Cu ppm | | 8.55 | |
| Mo ppm | | | |

**Al ppm** 494
**Na ppm** 27
**Chloride %**

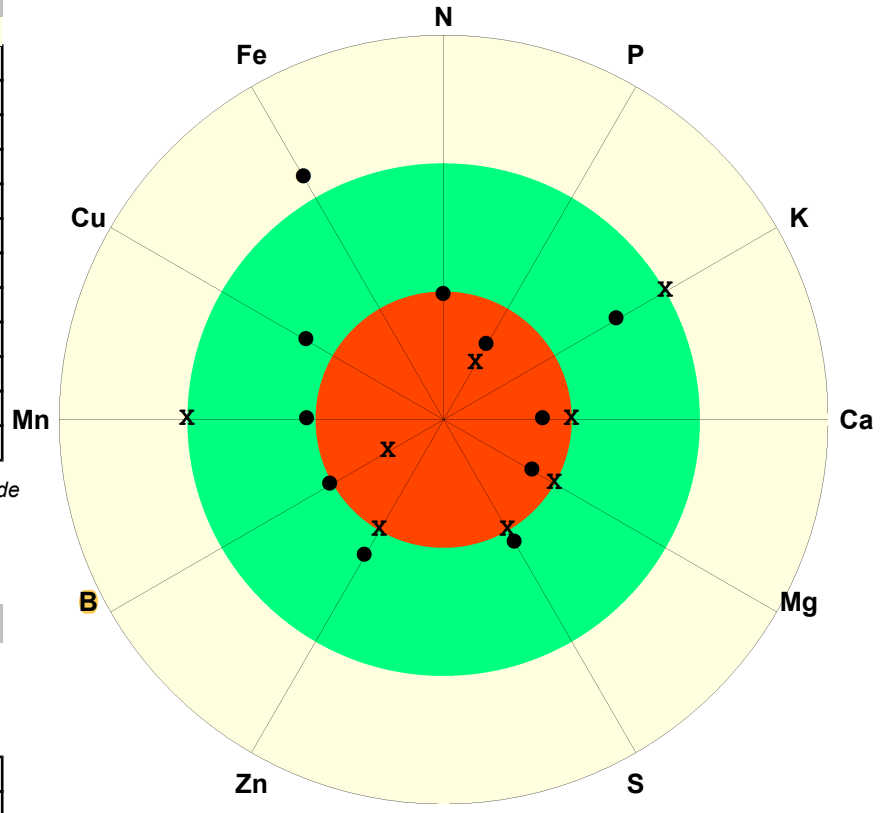
*Al, Na and Chloride are nonessential elements.*

## Soil Results

**Lab Number** **197376**
**pH** 4.8, target = 5.6
**OM** 23.4

| | | Optimum | |
|---|---|---|---|
| P ppm | 11 | | |
| K ppm | | | 99 |
| Ca ppm | 508 | | |
| Mg ppm | 54 | | |

## Sufficiency Ranges




**Key**
● Plant Result
X Soil Result
Low
Sufficient
High

| | Lower - Upper |
|---|---|
| N% | 3.50 - 5.00 |
| P% | 0.30 - 0.50 |
| K% | 2.50 - 4.00 |
| Ca% | 0.30 - 0.70 |
| Mg% | 0.15 - 0.45 |
| S% | 0.15 - 0.50 |
| Zn ppm | 20.0 - 60.0 |
| B ppm | 5.00 - 25.00 |
| Mn ppm | 20.0 - 300.0 |
| Fe ppm | 50.0 - 250.0 |
| Cu ppm | 5.00 - 20.00 |

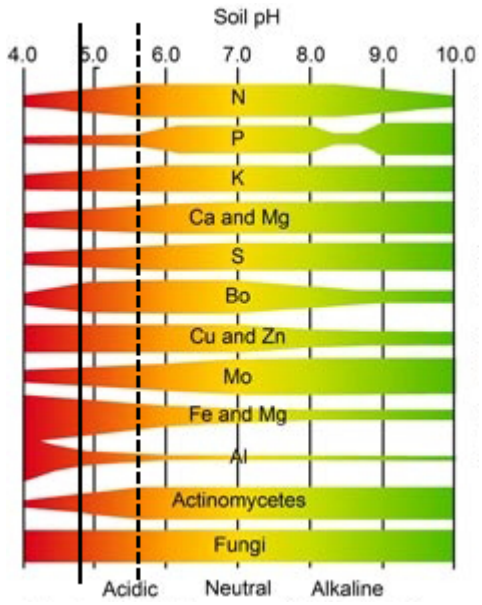
## Yield Response Interpretation Indexes

| | Almost Certain | Possible | Remote | Unlikely |
|---|---|---|---|---|
| DRIS | P:-29 | S:-16 | N:11 Zn:4 | K:30 |
| PASS INI | **P:-21** | **Zn:4 S:-3**<br>Ca:-15 B:-12 Mg:-14 | Mn:-2 | **K:26 N:12**<br>Fe:30 Cu:15 |

**PASS DNI** K:13 P:-7 N:46 Zn:-18 S:-33
**DRIS** Diagnosis and Recommendations Integrated System. DRIS yield response categories: *Almost Certain* index < -20, *Possible* -20 < index < -15, *Unlikely* index > 25, *Remote* any index not in any other category.
**PASS** Plant Analysis with Standardized Scores. INI = Independent Nutrient Index, DNI = Dependent Nutrient Index. PASS yield response categories: *Almost Certain* common response elements with INI < -10, *Possible* common response elements with INI+DNI < -10 and rare response elements with INI < -10, *Unlikely* any element with INI > 10, *Remote* any element not in any other category.

## Comments

-High levels of soil test potassium restrict plant uptake of magnesium. It is recommended that the rate of potassium fertilization be reduced.
-This plant sample is excessive in iron and aluminum. This most likely resulted from contamination of the tissue sample with soil particles and does not neccesarily reflect true iron and aluminum content.
-This plant sample is low or deficient in nitrogen, possibly as a result of inadequate nitrogen fertilization, excessively wet soil conditions, excessive rainfall and leaching on sandy soils, indadequate phosphorus fertilization or excessive potassium fertilization.
-Symptoms of nitrogen deficiency appear first as a light green coloring of the plant. As the deficiency becomes more severe, lower leaves turn yellow and may 'fire'.
-The yellowing starts at the midrib of the leaf with the leaf edge remaining green.
-This plant sample is low or deficient in phosphorus. Possible causes of this are low available soil phosphorus levels, inadequate phosphorus fertilization, poor drainage or root problems.
-The leaves of phosphorus deficient plants appear most often as dark bluish green, frequently with tints of purple or bronze and stunting occurs.
-Purpling occurs around the margins of lower leaves and plants are short and dark green.
-This plant sample is low in magnesium, possibly as a result of low soil magnesium levels, use of sludge or beet pulp, high soil potassium levels or excessive potassium fertilization. When the soil pH is below 6.4 dolomitic limestone should be used. For, situations where the pH should remain acid magnesium fertilizers should be used. Dolomitic limestone should be broadcast and magnesium fertilizers should be row applied.
-Soil test prior to next growing season and apply recommended amounts of dolomitic limestone to raise pH to crop target level.
-Tissue Ca levels are low. If lime is not needed due to the low target pH, consider applying another calcium source such as gypsum.




4.8 **pH**

5.6 **Target pH**

Soil pH is low.
The lime required for this rotation to reach pH 5.6 is 12 T/a of 60 -69 lime or 9 T/a of 80-89 lime.

## Interpretations

Plant analysis results are interpreted by one or more of three methods: Sufficiency Range (SR); Diagnosis and Recommendation Integrated System (DRIS); or Plant Analysis with Standardized Scores system (PASS). By comparing the three methods of interpretation, it should be possible to arrive at a clearer picture of the plant's nutrient status than by using only one method.

The SR system is based on the relationship between nutrient concentration and yield. If an associated soil test shows conditions that can cause nutrient deficiency (low concentration, pH problem, etc...), then an increase in supply through corrections or additions will increase concentrations in the plant. The concentration range identified as sufficient is defined to result in 95 to 100% of maximum yield. The system is sensitive to plant maturity and plant part sampled. Interpretations are reliable only when used for the specific plant part sampled at the specific growth stages where interpretations have been developed. The diagram integrates plant analysis and the soil test results where plant analysis sufficiency range and optimum soil test levels are indicated by the middle circle. The inner circle indicates deficiency or below-optimum levels, and the outer circle marks above-optimum levels. Plant nutrient concentration survey data are substituted when sufficiency range information is not available. Survey data have not been evaluated by yield response calibrations and are to be used only for general comparison.

The DRIS is a method to evaluate various combinations of ratios of nutrient concentrations rather than the actual concentrations. These ratios are combined mathematically to give an index. An index of zero is ideal. The more negative the index, the greater the potential of nutrient deficiency; the greater the index, the greater the potential for excessive concentrations. The sum of these indices for a given analysis must be zero. To avoid errors in diagnosing deficiencies when deviations from zero are really random error, an in-balance range is defined as -15 to +25. DRIS norms are available for alfalfa, apple, corn, celery, lettuce, millet, oat, potato, grain sorghum, tomato, and wheat.

The PASS system is a hybrid that combines an Independent Index (INI) as in SR, and a Dependent Index (DNI) as in DRIS. The PASS INI section is similar to SR, but instead of a nutrient category, a continuous index based on the statistical standardized score is determined and expressed on the DRIS scale. INI values between -10 and +10 are considered sufficient. An INI value of less than -10 equals the critical level and is considered deficient. The further below -10 the INI values are, the more likely the crop will respond to increased availability of that nutrient. To avoid predicting yield responses when they are unlikely, as sometimes occurs in both SR and DRIS, the nutrients in the PASS INI system are divided into two groups: those for which yield response is common, and those for which yield response is rare. The PASS DNI is similar to DRIS where paired nutrient ratios are calculated and compared to optimum values with the standardized scores approach and expressed on the DRIS scale. The DNI is best used to confirm a deficiency indicated by the INI. Only the nutrients in the common response group of the INI are included in the DNI. PASS norms are available for alfalfa, corn, and soybean.

Source: University of Wisconsin Cooperative Extension