



# Agro Services International Inc.

## Interpreting the Soil Report

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**pH** is a scale that chemists use to measure acidity. Values below 7 are considered acidic, values above 7 are alkaline ( the opposite of acidic) and 7 is neutral. Most plants grow best in slightly acidic soil, usually between values of 5.8 and 6.5. Some crops like alfalfa prefer pH values above 7 while others like pineapples, tea and some ornamentals usually grow better in soils with pH values between 5 and 5.8.

Soils that are too acidic must be corrected by applying limestone. The pH value does not tell how much limestone is needed, this is calculated from the **active acidity** measurement.

The **soluble salts** analysis indicates whether there is a buildup of salts in the soil. It is not a measure of nutrient availability. Soils with soluble salts below 1250 ppm are suitable for most crops. Between 1250 and 2500 ppm, sensitive crops can be affected, above 2500 ppm only salt tolerant plants can be grown. Salt buildup occurs in dry areas and areas irrigated with high-salt water, it does not occur under high rainfall conditions. Salt buildup can also occur in covered greenhouses.

**Cation Exchange Capacity (CEC)** indicates the ability of the soil to hold onto nutrients. Values are often lower than 5 meq/100g for sandy soils and can be above 30 meq/100g in clays and soils with high organic matter content. In soils with low CEC values, nutrients (especially nitrogen, boron and potassium) can be easily leached out during rainfall. On these soils, it is better to apply small, regular doses of these nutrients than to apply a few large doses.

The **Calcium/Magnesium and Magnesium/Potassium ratios** indicate if there are imbalances among these nutrients. For example, if the Ca/Mg ratio is high, the calcium will reduce plant uptake of magnesium even if there is enough magnesium in the soil. If the ratio is good, but the total amount of both nutrients are low, they must be applied.

**Organic Matter** can reduce the effectiveness of some pesticides, the extent depends on the actual product. Organic matter levels are sometimes used to select pesticide application rates.

**Nutrient Levels** are presented in an easy to understand chart. If a nutrient level is in the “**low**” or “**below**” range, then it is too low for optimum growth and should be applied. In the “**very low**” range, high application rates are required to achieve good growth . In the “**optimum**” range, you are unlikely to get a response to the nutrient, but we may recommend a maintenance dose to replace what will be removed by the crop. In the “**high**” or “**above**” range, the nutrient level is high enough to cause nutrient imbalances; applying it is not only a waste of money but it may actually harm the crop.

The **Nitrogen Analysis** is often not as reliable as the other nutrient analyses. Crop response to nitrogen is influenced by local weather conditions, therefore it is usually better to use the results of local trials where available.

## Interpretation Guide for ASI soil analysis.

Sandy soils or soils with CEC up to 5.0 meq/100g

|              | <b>Very low</b> |        | <b>Low</b> |           | <b>Optimum</b> |           | <b>High</b> |        |
|--------------|-----------------|--------|------------|-----------|----------------|-----------|-------------|--------|
|              | Meq/100 ml      | lbs/ac | Meq/100 ml | lbs/ac    | Meq/100 ml     | lbs/ac    | Meq/100 ml  | lbs/ac |
| <b>Ca</b>    | 0-1.3           | 0-468  | 1.4-2.6    | 469-936   | 1.5-10.0       | 937-3600  | >10.0       | >3600  |
| <b>Mg</b>    | 0-0.40          | 0-87   | 0.41-0.80  | 88-174    | 0.81-5.00      | 175-1089  | >5.00       | >1089  |
| <b>K</b>     | 0-0.20          | 0-168  | 0.21-0.40  | 169-337   | 0.41-3.00      | 338-1685  | >3.00       | >1685  |
| <b>Na</b>    |                 |        |            |           | <10% of CEC    |           |             |        |
| <b>Ca/Mg</b> | 0-1.0           |        | 1.1-2.0    |           | 2.1-7.0        |           | >7.0        |        |
| <b>Mg/K</b>  | 0-1.5           |        | 1.6-3.0    |           | 3.1-15.0       |           | >15.0       |        |
|              | ug/ml           | lbs/ac | ug/ml      | lbs/ac    | ug/ml          | lbs/ac    | ug/ml       | lbs/ac |
| <b>N</b>     | 0-50            | 0-90   | 51-100     | 91-180    | 101-300        | 181-540   | >300        | >540   |
| <b>P</b>     | 0-12            | 0-22   | 13-24      | 23-44     | 25-150         | 45-275    | >150        | >275   |
| <b>S</b>     | 0-12            | 0-22   | 13-24      | 23-44     | 25-150         | 45-275    | >150        | >275   |
| <b>B</b>     | 0-0.20          | 0-0.36 | 0.21-0.40  | 0.37-0.72 | 0.41-6.00      | 0.73-10.8 | >6.00       | >10.8  |
| <b>Cu</b>    | 0-1.00          | 0-1.8  | 1.1-2.0    | 1.9-3.6   | 2.1-20.0       | 3.7-36    | >20.0       | >36    |
| <b>Fe</b>    | 0-12            | 0-22   | 13-24      | 23-44     | 25-200         | 45-360    | >200        | >360   |
| <b>Mn</b>    | 0-3.0           | 0-5.4  | 3.1-6.0    | 5.5-10.8  | 6.1-100.0      | 10.9-180  | >100        | >180   |

Loams, Clays and Organic Soils, all soils with CEC greater than 5.0 meq/100 ml

|              | <b>Very low</b> |        | <b>Low</b> |           | <b>Optimum</b> |           | <b>High</b> |        |
|--------------|-----------------|--------|------------|-----------|----------------|-----------|-------------|--------|
|              | Meq/100 ml      | lbs/ac | Meq/100 ml | lbs/ac    | Meq/100 ml     | lbs/ac    | Meq/100 ml  | lbs/ac |
| <b>Ca</b>    | 0-2.0           | 0-720  | 2.1-4.0    | 721-1440  | 4.1-24.0       | 1441-8640 | >24.0       | >8640  |
| <b>Mg</b>    | 0-1.00          | 0-218  | 1.01-2.00  | 219-436   | 2.01-12.00     | 437-2613  | >12.0       | >2613  |
| <b>K</b>     | 0-0.20          | 0-168  | 0.21-0.40  | 169-337   | 0.41-3.00      | 338-2526  | >3.00       | >2526  |
| <b>Na</b>    |                 |        |            |           | <10% of CEC    |           |             |        |
| <b>Ca/Mg</b> | 0-1.0           |        | 1.1-2.0    |           | 2.1-7.0        |           | >7.0        |        |
| <b>Mg/K</b>  | 0-1.5           |        | 1.6-3.0    |           | 3.1-15.0       |           | >15.0       |        |
|              | ug/ml           | lbs/ac | ug/ml      | lbs/ac    | ug/ml          | lbs/ac    | ug/ml       | lbs/ac |
| <b>N</b>     | 0-50            | 0-90   | 51-100     | 91-180    | 101-300        | 181-540   | >300        | >540   |
| <b>P</b>     | 0-12            | 0-22   | 13-24      | 23-44     | 25-200         | 45-360    | >200        | >360   |
| <b>S</b>     | 0-12            | 0-22   | 13-24      | 23-44     | 25-200         | 45-360    | >200        | >360   |
| <b>B</b>     | 0-0.30          | 0-0.54 | 0.31-0.60  | 0.55-1.08 | 0.61-8.00      | 1.09-14.4 | >8.00       | >14.4  |
| <b>Cu</b>    | 0-1.5           | 0-2.7  | 1.6-3.0    | 2.8-5.4   | 3.1-25.0       | 5.5-45    | >25.0       | >45    |
| <b>Fe</b>    | 0-12            | 0-22   | 13-24      | 23-44     | 25-300         | 45-540    | >300        | >540   |
| <b>Mn</b>    | 0-3.0           | 0-5.4  | 3.1-6.0    | 5.5-10.8  | 6.1-150.0      | 10.9-270  | >150        | >270   |
| <b>Zn</b>    | 0-1.5           | 0-2.7  | 1.6-3.0    | 2.8-5.4   | 3.1-30.0       | 5.5-54    | >30.0       | >54    |

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