



CORN LEAF ANALYSIS AND INTERPRETATIVE GUIDELINES

Leaf analysis of corn plants can be very useful when evaluating the adequacy of nutrients required for corn production. This process is helpful when determining the sufficiency of the fertilizer program used by the producer. The analysis of corn leaves prior to tassel formation can help the producer make decisions regarding additional fertilizer applications, particularly with nitrogen and sulfur. If nitrogen and/or sulfur deficiencies exist, these nutrients can be injected through a sprinkler system to correct the deficiencies. In addition, the analysis of the ear leaf at the time when silks emerge and before they turn brown helps the producer determine the adequacy of the fertilizer program used.

The concentration of nitrate in soils can change very rapidly. Two processes that affect the concentration are denitrification and leaching. Denitrification occurs when the soil is temporarily flooded with water and oxygen is excluded from the soil pores. When this happens, nitrate is biologically converted to nitrogen gas and lost from the soil. Leaching of nitrate occurs in soils when excessive water moves through the profile, especially sandy soils. Nitrates are not attached to soil particles and consequently, become unavailable to corn as the water moves beyond the root zone. Losses of nitrate by denitrification and leaching were problems in many soils in 2007 and will be potential problems in 2008 due to the high amount of precipitation received this spring.

An analytical tool used to determine the amount of nitrate that has been lost from the profile is to test the corn leaf sample after the plant exceeds 12 inches in height, preferable from the 8th leaf to 12th leaf stage of maturity. The procedure for corn leaf sampling is as follows:

1. Select the fully extended leaf between the 12 inch and the pre-tassel stage of maturity.
2. Separate the leaf from the plant at the base of the leaf.
3. Composite 15 to 20 leaves taken at random throughout the area sampled into one sample. The maximum area sampled should be no larger than 40 to 60 acres, depending on soil variability.
4. Place the leaf sample in a paper bag and send to Olsen's Laboratory immediately to prevent decomposition of the sample.
5. Interpretation of N and S results in fully expanded leaf samples prior to tassel and recommended amounts of N and S fertilizer to apply:

Nitrogen	>3.00%	=	0 lbs N/acre
	2.50 – 3.00%	=	25 lbs N/acre
	<2.50%	=	50 lbs N/acre
Sulfur	>0.18%	=	0 lbs S/acre
	0.15 – 0.18%	=	5 lbs S/acre
	<0.15%	=	10 lbs S/acre

Potassium and zinc can also be applied by fertigation if below the sufficient range.
6. Please refer to page 2 for the complete set of interpretative guidelines for corn samples collected at the pre-tassel and ear leaf stages of maturity.

CORN

Stage of Maturity:

1. Whole plant from seedling to 6th leaf stage.
2. Fully expanded leaf prior to tasseling.

<u>Nutrient</u>	<u>Critical Level</u>	<u>Low Range</u>	<u>Sufficient Range</u>
Nitrogen, %	2.75	2.75 – 3.00	3.00 – 3.50
Phosphorus, %	0.22	0.22 – 0.25	0.25 – 0.40
Potassium, %	2.25	2.25 – 2.50	2.50 – 3.50
Calcium, %	0.12	0.12 – 0.15	0.15 – 0.50
Magnesium, %	0.10	0.10 – 0.12	0.12 – 0.40
Sulfur, %	0.15	0.15 – 0.18	0.18 – 0.25
Iron, ppm	10	10 – 20	20 – 250
Manganese, ppm	40	40 – 50	50 – 160
Zinc, ppm	18	18 – 20	20 – 30
Copper, ppm	3	3 – 5	5 – 15
Boron, ppm	2	2 – 5	5 – 20

CORN

Stage of Maturity:

Ear leaf at early silk.

<u>Nutrient</u>	<u>Critical Level</u>	<u>Low Range</u>	<u>Sufficient Range</u>
Nitrogen, %	2.50	2.50 – 2.70	2.70 – 3.25
Phosphorus, %	0.20	0.20 – 0.22	0.22 – 0.30
Potassium, %	1.60	1.60 – 1.75	1.75 – 2.50
Calcium, %	0.10	0.10 – 0.12	0.12 – 0.30
Magnesium, %	0.08	0.08 – 0.12	0.12 – 0.25
Sulfur, %	0.13	0.13 – 0.15	0.15 – 0.22
Iron, ppm	10	10 – 20	20 – 250
Manganese, ppm	15	15 – 20	20 – 150
Zinc, ppm	15	15 – 18	18 – 25
Copper, ppm	2	2 – 3	3 – 10
Boron, ppm	2	2 – 3	3 – 10