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Understanding the Plant Report for Cotton

www.ncagr.com/agronomi/uyrpws.htm

Steve Troxler, Commissioner of Agriculture

Leaf and petiole analyses can detect nutrient deficiencies up to two weeks before symptoms appear. Timely diagnosis makes it possible to optimize yield and quality through precise fertilizer management.

Leaf blade tissue is analyzed for major nutrients (N, P, K), secondary nutrients (Ca, Mg, S) and micronutrients (Fe, Mn, Zn, Cu, B) (Table 1). These essential nutrients are required in specific concentrations for optimum growth and yield. Results are reported as percent values for major and secondary nutrients and in parts per million for micronutrients.

Nutrient index values are also provided for interpretation of laboratory results (Figure 1, Table 2). The optimum index range is 50–74. The critical value is the point at which there is a 5–10% yield loss. Below this value potential loss increases proportionately. High index values (75–99) may indicate overfertilization and, in some cases, reduced crop quality. With index values of 100^{+}, there may be growth problems due to nutrient imbalances or micronutrient toxicity.

Petiole analysis for NO_3-N best indicates the amount of soil N currently available for plant uptake. It is highly correlated with yield, especially early in the season (Figure 2). Apply additional N at the recommended rate if NO_3-N falls below the adequate level for the sampled growth stage (E4—early growth, week 4; B1 to B4—bloom, weeks 1 to 4; F5 to F8—fruit, weeks 5 to 8). Excessive NO_3-N can lower cotton quality and increase potential for disease and insect pressure.

When tissue analysis indicates nutrient deficiency, any corrective action should take into account fertilization history, soil type, environmental conditions, overall crop potential and insect/disease pressure. During the growing season, foliar applications of micronutrients are effective. Soil applications of macronutrients are most effective early in the season when the root system is most active. Soil application of N and/or K to correct deficiency is effective only through the 2nd or 3rd week of bloom. After that time, foliar application may increase yield until about the 5th week of bloom. Soil testing along with tissue analysis provides information for the best long-term corrective action.

Table 1. Abbreviations

N	Nitrogen
P	Phosphorus
K	Potassium
Ca	Calcium
Mg	Magnesium
S	Sulfur
Fe	Iron
Mn	Manganese
Zn	Zinc
Cu	Copper
B	Boron
Mo	Molybdenum
Cl	Chloride
Na	Sodium
Ni	Nickel
Cd	Cadmium
Pb	Lead
NO_3-N	Nitrate N

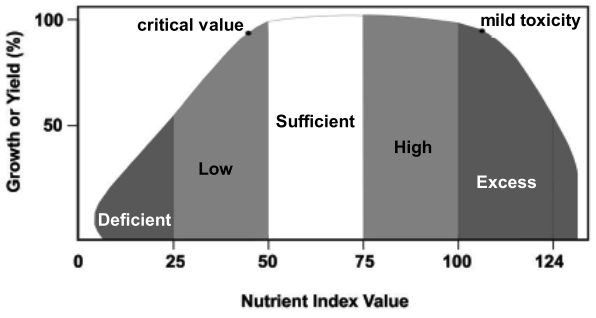

Figure 1. Leaf interpretation

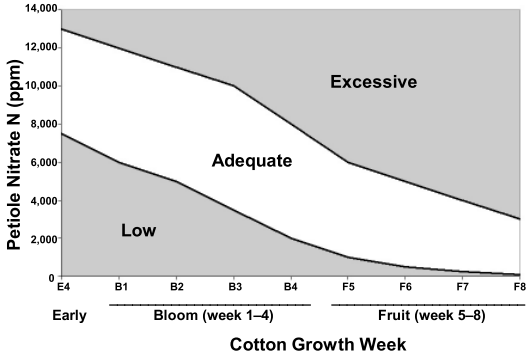

Figure 2. Petiole interpretation

Table 2. Response to nutrient applications *

Index	Interpretation	Crop Response
0–24	Deficient	High
25–49	Low	Medium
50–74	Sufficient	Low
75–99	High	None
100–124	Excess	None

***** Fertilizer history, environmental conditions, stress factors and growth stage will affect ultimate response.

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