



MAURITIUS SUGAR INDUSTRY RESEARCH INSTITUTE

Recommendation Sheet No. 37
{December 1986}

FOLIAR DIAGNOSIS OF THE NUTRIENT STATUS OF SUGARCANE : INTERPRETATION AND IMPLEMENTATION OF RESULTS

HISTORICAL

The 'foliar diagnosis school' started in 1924 with Lagatu and Maume working on grapes in Montpellier. The first definitive work in foliar diagnosis of sugarcane was started by P. Halais in Mauritius in 1936. Working in collaboration with Craig, he developed the use of leaf analysis and established optimum nutritional values by correlating the nutrient content of leaves with field response to fertilizers. In 1962, a complete re-organization of the foliar diagnosis scheme was devised. Some 600 Permanent leaf sampling units were selected and established on millers' plantations with the objective of running foliar diagnosis on a 'follow-up' basis.

PERMANENT SAMPLING UNITS

A permanent sampling unit is a regular cane field, not less than 10 arpents, which is as representative as possible of the sector covered as regards soil type, cultural operations and fertilizer treatments. The number of PSU's should be in proportion with the extent of cane production.

SAMPLING

The leaf sampling rules are those published in Recommendation Sheet No. 36.

INTERPRETATION OF RESULTS

To even out discrepancies due to variety and age at sampling, adjustment of results is effected using appropriate correction factors, obtained from extensive field trials. To avoid the risk of hasty conclusions, interpretation of the nutritional status of the plant is made only when the results of 3 successive years are available.

The mean result for each PSU is calculated and underlined as follows :

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full green line = > optimum for each of the 3 years (high)
 broken green line = > optimum for 2 years only (doubtful high)
 broken red line = < optimum for 2 years only (doubtful low)
 full red line = < optimum for each of the 3 years (low)

The optimum leaf nutrient levels are : 0.190% for P
 1.20% for K
 1.50% for SiO₂

The optimum leaf N levels vary with ecological group.

Group I -sub-humid region : 1.90%
 Group II -humid region : 2.05%
 Group III -superhumid region : 2.10%

IMPLEMENTATION

The objective of foliar diagnosis is to monitor the nutrient status of the sugarcane plantations so as to apply corrective measures when required. Therefore to take full advantage of the system, it is important that the results obtained are correctly implemented. For nitrogen, which is the most costly nutrient, the amount of additional fertilizer required in cases of deficiency has been worked out as shown in Annexe 1.

Similarly when potassium deficiency is observed corrective measures should be taken as shown in Annexe 2.

Phosphorous deficiencies have now become rare; whenever detected, they should be corrected by using the complex fertilizer 17-8-25 instead of 17-2-27.

Annexe 1. Additional fertilizer N required according to leaf N level and ecological group

	Ecol. Group I	Ecol. Group II	Ecol. Group III
Leaf N % d.m.	Soils : P, L1, L2, L3, T, M, D, S	L4, H, B1	B2, F, G
	Additional N (kg/ha)		
1.60	75	-	-
1.65	65	-	-
1.70	55	-	-
1.75	45	95	-
1.80	30	85	70
1.85	15	70	60
1.90	0 (optimum)	55	50
1.95		40	40
2.00		20	30
2.05		0 (optimum)	15
2.10			0 (optimum)

Note :

(L) Low Humic Latosols

L1 Richelieu
L2 Réduit
L3 Ebène
L4 Bonne Mère

(F) Humic Ferruginous Latosols

F1 Belle Rive
F2 Sans Souci
F3 Midlands
F4 Chamarel

(B) Latosolic Brown Forest

B1 Rose Belle
B2 Bois Chéri

(H) Humic Latosols

H1 Rosalie
H2 Riche Bois

(P) Latosolic Reddish Prairie

P1 Médine
P2 Labourdonnais
P3 Mont Choisy

(M) Dark Magnesium Clays

M1 Plaine Lauzun
M2 Magenta

(D) Grey Hydromorphic Soils

D1 Balaclava
D2 St. André

(G) Low Humic Gleys

G1 Pétrin
G2 Valetta

(S) Mountain Slope Complexes

S1, S2

Regosols

(C) Coral sands

Lithosols

(T) T1, T2, T3

Annexe 2. Additional fertilizer K required
according to leaf K level

Leaf K% d.m.	Kg k ₂ O/arpent
0.80	75
0.90	60
1.00	45
1.10	27.5
1.20	-