GAU Res. J. 1985. 10 (2) : 85-86

Leaf Area Determination in Cluster beans (*Cyamopsis tetragonoloba* L. Taub)

A. N. Sharma, D. N. Chaudhari and R. M. Shah

Pulses Research Project, GAU, Sardar Krushinagar-385 506, Gujarat

The leaf area has great significance in the growth and development of a plant which finally contributes towards its yield potential. It is the organ where entrapping of light energy and synthesis of carbohydrates take place. Consequently, area of leaf might be considerd as an indicator for assessment of photosynthetic capacity of a plant. The measurement of leaf area without its detachment from plant might be useful in finding out the relationship between leaf-area and yielding ability of a crop.

Many authors have suggested to work out the value of a constant K for estimating leaf area by using an equation A=KLB. Montogomary (1911) successfully used maximum length times breadth multiplied by the constant K=0.75 to estimate leaf area in maize. Ashley *et al.* (1963), Bhan and Pandey (1966), and Sharma and Shah (1982) have also suggested similar techniques for cotton, rice and green gram respectively using different values of K to estimate leaf area. With these in view, the present investigation was undertaken to find out a suitable constant for measuring leaf area in cluster beans.

The study was undertaken at Pulses Research Station, Gujarat Agricultural University, Sardar Krushinagar during the *kharif* season of 1983. Ten strains of cluster beans possessing variation in leaf shape and size were selected. Ten leaflets of different sizes were selected at random from five plants of each entry. The actual area (A) was calculated by planimeter while the apparent area (B) of these leaflets was calculated by multiplying length times breadth at maximum. The mean values of A and B of each strain were then calculated. The average actual leaf area (A) was divided by the mean apparent leaf area (B). The different values calculated as above for different entries were averaged and the value of constant K was estimated, which was 0.6823. The estimated leaf area (E) was then calculated by miltiplying this constant value, K with apparent area (B). The deviation (D) from actual leaf area (A) in respect of each entry was calculated (Table 1). The significance of variance, following the pair 't' test method as described by Chandel (1975) was calculated.

The results indicated that the differences between the estimated and actual leaf area were non-significant. From these results, it could be concluded that

*Present Address: Dr. A. N. Sharma, Associate Research Scientist (Physiology), Pulses Research Project, Gujarat Agricultural University, Sardar Krushinagar-385 506 (Gujarat).

TABLE 1

Actual, apparent and estimated leaf area and deviation from actual leaf area cm² of different strains of Cluster bean (*Cyamopsis tetragonoloba* **L. Taub.**).

Entry	*Actual leaf area (A)*	*Apparent leaf area (B)*	*Leaf constant (C)*	*Estimated leaf area (E)*	*Deviation from actual leaf area (D)*
1	*2*	*3*	*4*	*5*	*6*
HG-75	27.90	40.00	0.6975	27.292	+0.608
HFG-258	23.60	34.33	0.6874	23.423	+0.177
HFG-363	22.40	31.53	0.7104	21.512	+0.888
D.P. Safed	27.50	39.26	0.7004	26.787	+0.713
Malosan	23.60	35.78	0.6595	24.412	−0.812
Suvidha	22.20	33.00	0.6727	22.515	−0.315
HF-189	23.60	34.51	0.6838	23.546	+0.054
GG. 1	23.40	34.85	0.6714	23.778	−0.378
HF-7-2/ P_2-1-2	22.00	33.00	0.6666	22.515	−0.515
HF-7-4/ P_2-1	20.70	30.74	0.6733	20.973	−0.273

Standard Error (S.E.)=0.1807.

't' value=0.0813 (non-significant) at 5%.

this constant value of K=0.6823 can easily be used for estimating leaf area instead of cumbersome conventional planimetric method for determining leaf area in cluster beans.

(*Received on 5th Dec. 1983*)

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