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ESTIMATION OF LEAF AREA IN GREENGRAM (*PHASEOLUS AUREUS* ROXB) USING LINEAR PARAMETERS

Different methods have been evolved by several workers for the measurement of leaf area on crop plants. Ashley *et al* (1963) suggested a factor method for the estimation of leaf area in *Gossypium hirsuitam* L. The regression equation and factor method of estimation was suggested by Gopalakrishnan and Samal (1974) in jute and Garg and Mandahar (1972) in tomato. Such a rapid method of estimation of leaf area from linear measurements is lacking in greengram. The computation of leaf area from the imprints of leaf on graph paper is very tedious and prolonged process. In the present study two easy nondestructive method based on the product of length and maximum width of leaves were developed and compared for the estimation of leaf area in greengram.

Thirty well developed leaves were collected from different varieties of greengram. Linear measurements of length and maximum width in respect of the terminal leaf, side leaf 1, and side leaf 2 were recorded. The actual area of the leaf was estimated using a graph paper The regression method and factor method were adopted for the estimation of leaf area from the product of length and maximum width. A linear relationship was established by the equation $y = a + bx$ for the regression method and $y = kx$ for the factor method, where y is the actual leaf area estimated by graphical method, x is the product of leaf length and maximum width, a and b are constants and k is the factor value. The k factor for each leaf was determined by the relationship $k = \bar{y}/\bar{x}$. The regression and k factor was found out seperately for terminal leaf, side leaf 1 and side leaf 2. The coefficient of determination R^2 (Snedecor and Cochran 1967) was estimated and used to compare the accuracy of the estimated values of leaf area by adopting the factor method and regression method.

Results are given in Table 1. The high values of R^2 indicate that the estimates made by the 2 methods do not differ. There was good agreement between calculated leaf area and actual leaf area measured graphically. Similar computations were made and suggested by Gopalakrishnan and Samal (1974) for the estimation of leaf area in jute using the linear measurments of length and maximum width.

The regression equations mentioned in Table 1 can hence be used for the determination of the leaf area of greengram leaves.

Table 1

Regression equation and coefficient of determination (R^2) values for Terminal leaf, side leaf 1 and side leaf 2.

Leaf	Regression equations	R^2 Coefficient of determination
Terminal	y = 0.5596x + 4.8151	0.90
	y = C.61x	0.90
Side 1	y = 0.6595x + 3.0493	0.95
	y = 0.70x	0.95
Side 2	y = 0.7084x — 0.6934	0.97
	y = 0.70x	0.97

സംഗ്രഹം

ഇലയുടെ നീളം, flDiao^eoLnsifOTO) വീതി എന്നീ രേഖീയ അന്തഃഖണ്ഡഅനുപാതങ്ങളെ (linear Parameters) ഉപയോഗിച്ച് ചെറുപയറിന്റെ അഗ്രഭാഗത്തുള്ള ഇല, വശത്തുള്ള ഇല 1, വശത്തുള്ള ഇല 2. എന്നിവയുടെ വിസ്തീർണ്ണം കണ്ടുപിടിക്കുന്നതിനു, ക്രമാനുഗതമായി y — 0.5596x + 4.8151 അല്ലെങ്കിൽ y = 0.6Ix; y = 0 6595x + 3.0493 അല്ലെങ്കിൽ y = 0.70x; y = 0.7084x — 0.6934 fflrosigjalraJ y = 0.70x എന്നീ സമാശ്രയ സമീകരണങ്ങളെ (Regression equotions) ഉപയോഗിക്കുന്നതു എളുപ്പമാർഗ്ഗമാണെന്നു സ്ഥിതീകരിച്ചു.

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College of Agriculture,
Vellayani, Kerala.

S. G. SREEKUMAR
E. J. THOMAS
P. SARASWATHY
MARY K. GEORGE

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