Accuracy of Using Leaf Blade Length and Leaf Blade Width Measurements to Calculate the Leaf Area of Solanum Aethiopicum Shum Group

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Abstract

Leaf area is an important parameter when determining growth response under normal as well as stressed environments. No attempt had been made to come up with an affordable but accurate alternative of measuring leaf size in research neglected leafy vegetable crops. Other techniques such as use of leaf area meters are either destructive, expensive or both. A study was conducted to determine leaf area in like-shaped leaves of research neglected crop plants, taking case ofS. Aethiopicum Shum group (SAS) germplasm. Data was collected on 552individual plants (including pure lines and hybrids) at eight weeks after planting where a third fully open leaf from top of each plant was considered. Leaf blade length (LBL) and leaf blade width (LBW) were linearly measured while leaf area(LA) was measured using a leaf area meter. This was followed by correlation and regression analysis of LA with LBL, LBW, and LBLþLBW. Correlation coefficients atp<0.001 ranged between 0.84 and 0.92, 0.79 and 0.88, 0.86 and0.95 for total germplasm, pure lines and hybrids, respectively.
The coefficient determination (R2) ranged between 0.72 and 0.92. The best prediction for LA wasobtained with hybrid plants (LA¼-165.82þ5.38LBLþ16.17LBW) at R2of92%. The implication is that we can accurately and affordably predict LA fromduo measurements of LBL and LBW in SAS as well as in other crops having similar leaf shapes.

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