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Varietal Difference in Photosynthetic Rate of Middle and Lower Leaves and its Relation to Seed Yield in Soybean Plants

Satoru Sagawa
1) Experimental Faxm.Fac.of Agr.Iwate Univ.

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Abstract:
Sixteen soybean cultivars of different maturity groups were grown in a field.The photosynthetic rate was measured with terminal leaflets of the 5th and 6th leaves on the main stems at the flowering stage(FWS, R1-2), pod formation stage(PFS, R3-4), and seed development stage(SDS, R5-6)in the field.The photosynthetic rate was high in the order of early>middle>late maturity groups and gradually decreased with plant age.Significant varietal differences in photosynthetic rate were obseved at PFS and SDS in early maturity cultivars, at PFS in middle maturity cultivars, and at FWS in late maturity cultivars. The photosynthetic rate teded to correlate negatively with leaf size, and positively with specific leaf weight.Seed yield did not significantly correlate with the photosynthetic rate at any stage, but was negatively correlated at PFS and SDS when pooled for all varieties It is, however, presumed that the negative correlations did not indicate a direct relation, because the photosynthetic rate of middle and lower leaves was affected by light conditions that changed with the amount and shape of upper leaves in the canopies.

Keywords:
Leaf greenness, Middle and lower leaves, Photosynthetic rate, Seed yield, Single leaf area, Soybean, Specific leaf weight, Varietal difference.

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