



Total chlorophyll, growth and productivity of soybean [*Glycine Max* (L) Merrill] under different levels and sources of phosphorus and plant growth regulators in south Rajasthan, India

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ABSTRACT

An experiment was conducted at the Instructional Farm of Rajasthan College of Agriculture, Udaipur during *Kharif* 2009 and 2010 on medium clay loam soils to assess the influence of different levels and sources of phosphorus fertilization as well as plant growth regulators on productivity of soybean. Twenty seven treatments i.e. three levels (20, 30 and 40 kg P₂O₅ ha⁻¹) and three sources (Single super phosphate or SSP; phosphorus rich organic manure or PROM and di-ammonium phosphate or DAP) of phosphorus in main plots and three PGRs (water spray, benzyl adenine 50 ppm and NAA 100 ppm) in sub plots of a split plot design having three replications. Results revealed that application of 40 kg P₂O₅ ha⁻¹ recorded significantly higher pooled yield (q ha⁻¹) of grain (25.95), stover (37.34) and total biomass (63.29); crop growth rate or CGR (g m⁻²day⁻¹) between 30-60 days after sowing (DAS)(18.83) and 61-90 DAS (11.96); total chlorophyll content at 45 DAS (2.26%) and 60 DAS (2.80%); Leaf area index(LAI) at 45 DAS (1.56) and 60 DAS (3.44) and green leaves plant⁻¹ at 45 DAS (11.98) and 60 DAS (21.43). Among different phosphorus sources, SSP outperformed DAP and PROM on pooled yield (q ha⁻¹) of grain (25.12), stover (36.23) and total biomass (61.35); CGR (g m⁻²day⁻¹) between 30-60 DAS (11.22) and 61-90 DAS (10.94); total chlorophyll content at 45 DAS (2.26%) and 60 DAS (2.76%); LAI at 45 DAS (1.51) and 60 DAS (3.42) and green leaves plant⁻¹ at 45 DAS (11.77) and 60 DAS (21.35). Foliar application of NAA recorded significantly higher pooled yield (q ha⁻¹) of grain (24.23), stover (35.73) and total biomass (60.01) than benzyl adenine and water spray. However, variations recorded under NAA and benzyl adenine in CGR, total chlorophyll content, LAI and green leaf plant⁻¹ at different stages of soybean crop were statistically at par.

Key words: Crop growth rate, Leaf area index, Relative growth rate, Soybean, Total chlorophyll content