

Effect of micronutrients on seed quality and yield of soybean

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SUMMARY

Soybean [*Glycine max* (L.) Merrill.] Cultivation is increasing day by day due to its high nutritive value. The use of micronutrients in soybean is one of the way to boost up the productivity and to improve seed quality parameters. For improvement of seed quality and yield level, present investigation was undertaken at Seed Technology Research Unit, Marathwada Agricultural University, Parbhani, During *kahrif* 1999-2000. The zinc treatments like recommended dose of NPK + basal application of $ZnSO_4$ @ 10 kg.ha⁻¹ and recommended dose of NPK + $ZnSO_4$ @ 20 kg.ha⁻¹ while in boron treatments recommended NPK + boron @ 2 kg.ha⁻¹ and recommended NPK + boron @ 4 kg.ha⁻¹ had recorded positive response for test weight. The variety V₂ (MAUS-2) had recorded significantly higher test weight over V₁ (JS-335). Dry weight was increased significantly in all the treatments except recommended NPK + $ZnSO_4$ @ 10 kg.ha⁻¹ and recommended NPK + boron @ 6 kg.ha⁻¹ over control. Almost all the treatments except recommended NPK + $ZnSO_4$ @ 10 kg.ha⁻¹ showed significantly increased seed germination and vigour index over control. The varietal differences were found significant for vigour index. The variety MAUS-2 had recorded more vigour index (1623) as compared to JS-335(1422). The Oil content was increased with zinc, boron and humaur treatments. In the boron treatments recommended NPK + boron @ 2 kg.ha⁻¹, recommended NPK + boron @ 4 kg.ha⁻¹ and recommended NPK + boron @ 6 kg.ha⁻¹ showed that protein content increased with increasing rate of boron application. The treatments recommended NPK + $ZnSO_4$ @ 30 kg.ha⁻¹ and recommended NPK + Sprays of humaur at 30, 45, 60 and 75 DAS had recorded highly significant increased raw seed yield over recommended NPK. The highest raw seed yield was recorded by treatment i.e. sprays of humaur (25.18 q/ha). Highly significant varietal differences were recorded for raw seed yield by V₁ (JS-335) over V₂ (MAUS-2). In case of graded seed yield the treatments recommended NPK + $ZnSO_4$ @ 30 kg.ha⁻¹, recommended NPK + boron @ 2 kg.ha⁻¹ and recommended NPK + Sprays of hamaur at 30, 45, 60 and 75 DAS had recorded higher graded seed yield over recommended NPK.

Key words : Micronutrients, Seed quality and yield, Soybean.

Soybean is important grain legume and it is a good source of protein (40-42%) especially for vegetarians. In India, soybean crop is cultivated on an area of 63 lakh ha with production of 57 lakh tonnes and average productivity of 900 kg.ha⁻¹ (Anonymous, 1999). In Maharashtra, it occupy an area of 10.95 lakh ha with total production of 13.45 lakh tonnes and average productivity of 1230 kg.ha⁻¹. The productivity of soybean can be increased, if proper attention is given towards seed quality and for the improvement of seed quality, nutrient management is one of the important factors.

The survey of micronutrient status in Maharashtra soils showed the deficiency of micronutrients like Zn, B, Mo and Cu in some of the pockets (Dhane and Shukla, 1995). The use of micronutrients in soybean is useful to improve productivity and seed quality parameters. Among

the micronutrients Zn, B and Mo are important for increasing productivity of soybean crop (Devarjan and Planiappan, 1995). Area under soybean crop can be increased with the availability of quality seed. For improvement of seed quality in soybean, present investigation was undertaken through the use of some important micronutrients.

MATERIALS AND METHODS

A field experiment was conducted at Seed Technology Research Unit, Marathwada Agricultural University, Parbhani during *kharif* 1999-2000. Before sowing of the experiment, soil samples from 30 cm depth were drawn from experimental plot and composite sample was prepared. It was analyzed for zinc and boron content of soil. The micronutrient analysis reveled that, soil of experimental site was deficient in zinc (0.37 ppm) and boron (0.47 ppm). The experimental material for present study comprised of two varieties of soybean i.e. V₁ (JS-335) and V₂ (MAUS-2), and eight micronutrient treatments consisting of zinc, boron and humaur. The organic manures were not applied to experimental field.

Treatments details : T₁ - Recommended dose of NPK (25 kg N + 50 kgP₂O₅ ha⁻¹), T₂ - Recommended

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