

Effects of calcium and sulphur on chlorophyll and protein contents of mungbean [*Vigna radiata* (L.) Wilczek] and urdbean [*Vigna mungo* (L.) Hepper]

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SUMMARY

The present experiment was conducted at C.C.R.(P.G.) College, Muzaffarnagar (U.P.) in the year 2002-2003. Simple RBD was followed with 4 concentrations of Ca and 4 concentrations of S along with control and 4 replications. The doses of calcium were 25, 50, 100, and 200 ppm and sulphur were 25, 50, 75, and 100 ppm. The results were found significant for both the varieties of mungbean and urdbean.

Key words : Calcium, Sulphur, Mungbean, *Vigna radiata*, Urdbean, *Vigna mungo*, Chlorophyll and protein contents

Mungbean and urdbean are generally grown in summer and *Kharif* seasons in Uttar Pradesh. Mungbean and urdbean are the second largest protein producing pulse crop of the world where as Soybean and groundnut rank first position. Since they contain 23-25% protein in their grain, they could provide an answer to the problem of protein deficiency as well as protein malnutrition (Rosario *et al.*, 1980).

The residual effect of lime and micronutrients under a rotation of soybean, rice and cowpea was studied. The treatments were 0, 2, 3 and 5 t/ha of lime and 3to5 t/ha of lime plus micronutrients. Significant increase in yield were obtained with lime and micronutrients (Alfaia and Murako, 1998).

The deficiency of calcium appears in the young leaves and near the growing points of stem and root. Margins of the leaves often appear irregular in form or often show brown scorching or spotting effects. The younger leaves may be severally distorted with the tips hooked back and the margins curled backward or forward or rolled. Sulphur deficient plants show symptoms similar to nitrogen deficiency. Marked decrease in leaf size and general paling with red or purple pigmentation is seen. Necrosis of young leaf tips and margins, leaves remain small and turn pale *i.e.* symptoms of chlorosis develop. Leaf fall is rapid and fruit formation is suppressed.

MATERIALS AND METHODS

The present trials were conducted at C.C.R. (P.G.) collage, Muzaffarnagar (U.P.) during the years 2002-2003. The seeds of urdbean var. PDU-1 and PU-19 and mungbean var. PDM-54 and PU-44 were obtained from I.I.P.R. Kanpur. The seeds were pre-soaked in different concentrations of calcium and sulphur for 12 hours. They were washed thoroughly with tap water and were sown in petridishes for germination test. The seeds (untreated) were sown directly in the plots. R.B.D. was followed with four replications. After 30 days of sowing the crop was sprayed with different concentrations of calcium and sulphur solutions.

The concentrations of calcium and sulphur were recorded as 25ppm, 50ppm, 100ppm, for calcium, 25ppm, 50ppm, 75ppm, and 100ppm, for sulphur.

Symbols of treatments:

T ₁ – 20ppm Ca	T ₅ – 25ppm S
T ₂ – 50ppm Ca	T ₆ – 50ppm S
T ₃ – 100ppm Ca	T ₇ – 75ppm S
T ₄ – 200ppm Ca	T ₈ – 100ppm S
	T ₉ – Control (c)

Determination of total chlorophyll:

The chlorophyll content in fresh leaves was determined according to Arnon (1949). The procedure for chlorophyll determination was based on the work of Mac. Kinney (1941), on the absorption of light by aqueous acetone (80%) extract of chlorophyll organic solvent 4:1 acetone alcohol was used.

0.5g fresh leaves of control and treated plants were taken with organic solvent (Aceton 80%) in clean specimen tubes. The extracts were centrifuged at 3000 rpm for 15 minutes and the volume was made upto 25 ml of each sample by adding more organic solvent.

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