

## Effect of sulphur on bulb yield of onion in relation to phosphorus addition

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### ABSTRACT

A pot experiment was conducted at Ch. Chhotu Ram (P.G.) College, Muzaffarnagar (U.P.) during the rabi season of 2004-05 to study the effect of sulphur and phosphorus on the bulb yield of onion. The results clearly indicated that onion crop responded significantly to sulphur application. Phosphorus addition also increased the bulb yield of onion significantly. The interaction effect of S x P on the bulb yield of onion was found to be non-significant.

**Key words :** Onion, Sulphur and Phosphorus.

Onion is an important vegetable crop grown in 2.6 lakh hectares with a productivity level of 14.2 t ha<sup>-1</sup>. Onion (*Allium cepa* L.) is cultivated all over the country. The major onion growing states of India are Maharashtra, Punjab, Tamilnadu, Andhra Pradesh and Bihar. Sulphur is one of the important nutrients receiving greater attention due to its proven deficiency in commercial crops grown all over the world causing 10-34 per cent yield reduction. It is estimated that annual crop uptake of sulphur in India is about one million tonne, whereas addition through fertilizers is around 0.34 million tonnes (Tandon, 1986). Role of sulphur is particularly important in the nutrition of onion as it is constituent of allin, cycloallin and thiopropanol (Schung, 1990). In onion crop, sulphur plays a significant role in quality and development of bulbs. Probably for these reasons onion crop needs comparatively higher amounts of sulphur for proper growth, development and higher yield of bulbs. Phosphorus is the second most critical element and occupies the key position in plant metabolism and energy transformation. It is needed for the formation of seeds and proliferation of roots. Phosphorus is indeed the ubiquitous and essential element in the energy transfer processes so vital to life and growth. Phosphorus is involved in the basic reactions of photosynthesis. Use of phosphorus in onion crop has been found beneficial. Keeping this in view, the present study was undertaken to evaluate the effect of sulphur on onion in relation to phosphorus with regard to bulb yield.

### MATERIALS AND METHODS

A pot experiment was conducted at Experimental Farm of Ch. Chhotu Ram (P.G.) College, Muzaffarnagar

during 2004-05. The soil collected from a cultivated field was used in this experiment. The soil was sandy loam in texture with pH 7.7, EC 0.08 dSm<sup>-1</sup>, OC 0.30%, CaCO<sub>3</sub> 0.5%, available N 110 kg ha<sup>-1</sup>, P 4.0 kg ha<sup>-1</sup>, K 205 kg ha<sup>-1</sup> and available S 0.15% CaCl<sub>2</sub> extractable 8.5 ppm. Treatments consisted of four levels of S (0, 12.5, 25 and 50 ppm) and four levels of phosphorus (0, 12.5, 25 and 50 ppm). The experiment was conducted in Factorial Randomized Design with three replications. The required earthen pots of similar size and shape were selected, cleaned and lined with polythene sheets. After mixing the soil lot thoroughly, 8 kg of soil was filled in each pot. Sulphur and phosphorus were applied through elemental sulphur and KH<sub>2</sub>PO<sub>4</sub>, respectively. At appropriate moisture level, the soil of each pot was pulverized and eight seedlings were transplanted (Va. Nasik red) on 25<sup>th</sup> of December, 2004. The plants were thinned to five when they attained 10 cm height. Pots were irrigated with deionised water as and when required. The plants were allowed to grow up to maturity and the bulbs were taken out from the soil with khurpi. The bulb yield was recorded at maturity.

### RESULTS AND DISCUSSION

The data in the table revealed that the bulb yield of onion increased significantly with sulphur application. This increase in yield was significant for each level of sulphur as compared to control. The per cent increase in bulb yield with 12.5, 25 and 50 ppm sulphur levels were 5.3, 12.2 and 5.4 over control, respectively. The maximum bulb yield of onion was obtained with 25 ppm sulphur.

Response to S application in onion and other crops have also been reported by several workers (Venkateswarlu, 1971; Pasricha and Randhawa, 1973; Aulakh *et al.*, 1977; Pathak and Tripathi, 1979 and Singh,