

Research Paper :

Effect of nitrogen, phosphorous and potash on growth and bulb yield of onion (*Allium cepa* L.)

M.S. DUDHAT, P.K. CHOVIATIA, B.T. SHETA, H.D. RANK AND H.V. PARMAR

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See end of the article for authors' affiliations

Correspondence to :

M.S. DUDHAT

Department of Soil and Water Engineering,
College of Agricultural Engineering and Technology, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

ABSTRACT

An experiment was conducted to study the effect of nitrogen, phosphorous and potash on growth and bulb yield of onion during the *Kharif* season of the years 2003-04, 2004-05 and 2005-06. There were significant effects of nitrogen and phosphorous on bulb yield. Among the different nitrogen levels, application of 100 kg N ha⁻¹ produced significantly the highest bulb yield of 679.04, 484.28 q ha⁻¹ during the year 2003-04 and 2004-05, respectively with pooled mean of 544.70 q ha⁻¹. However, statistically it was par with the application of 75 kg N ha⁻¹ during the year 2003-04, 2004-05 and in pooled. Application of 50 kg P₂O₅ ha⁻¹ recorded significantly the highest bulb yield of 671.26, 476.03 q ha⁻¹ during the year 2003-04 and 2004-05, respectively with pooled mean of 536.76 q ha⁻¹. Though, application of potash @ 50 kg ha⁻¹ produced higher bulb yield during all the individual years and in pooled mean, but its effect was non significant. The results also revealed that increasing levels of nitrogen, phosphorus and potash, progressively increased the growth and yield attributes. With regards to economics, the maximum net returns of 70485, 68997 and 66278 Rs.ha⁻¹ and benefit cost ratio of Rs. 1.83, 1.80 and 1.76 were recorded with the application of 100 kg N ha⁻¹, 50 kg P₂O₅ ha⁻¹ and 50 kg K₂O ha⁻¹, respectively.

Key words : N, P, K, Bulb yield, Economics, Onion

Onion is an allogamous vegetable crop of global importance. It is popularly used both in immature and mature bulb stage as a vegetable and spices. It is an important vegetable crop commercially grown over a large area in the country. It is grown mainly as a *Rabi* season crop. With the increase in population, the demand for the crop has significantly increased, as a result, there is need to increase the bulb production from the available land resources. Therefore, *Kharif* onion production is also now done in several states including Gujarat. The main constraint of low production and productivity of onion crop is the inadequate supply of nutrients. The role of fertilizer in boosting agricultural productivity during past decades is now well recognized (Singh and Singh, 1998). Fertilizer is a major factor for yield performance and it is a costly input, so it should be used judiciously to get maximum monetary returns per unit cost. The information is scanty about response of onion to fertilizer in *Kharif* season under Saurashtra condition. Hence, the present experiment was under taken to find out the effect of N, P and K on growth and bulb yield of onion in *Kharif* season.

MATERIALS AND METHODS

A field experiment was conducted during the *Kharif* season of the years 2003-04, 2004-05 and 2005-06 at Vegetable Research Station, Junagadh Agricultural

university, Junagadh. Soil of the experimental area was medium black in texture, low in available nitrogen, high in available phosphorous and medium in available potash with the pH of 8.20. The treatments comprised of twelve treatment combinations of three nitrogen levels (50, 75 and 100 kg N ha⁻¹), two phosphorous levels (25 and 50 kg P₂O₅ ha⁻¹) and two potash levels (25 and 50 kg K₂O ha⁻¹) were tested in factorial randomized block design with three replications. Treatment wise full dose of phosphorus, potash and half dose of nitrogen was applied as basal dose, while remain half dose of nitrogen was applied as a top dose at 30 days after transplanting in each experimental year. The sources of nitrogen, phosphorous and potash were urea, single super phosphate and murate of potash, respectively. The seedlings were transplanted on September 9, 2003, August 23, 2004 and September 2, 2005 at 15 cm x 10 cm spacing during the respective experimental year. All the cultural operations were followed to raise a good crop of onion Cv. Agri Found Dark Red. The observations on growth and yield attributes were recorded from 5 randomly selected plants from each plot. The data were recorded for bulb yield on net plot basis and then converted on hectare basis and subjected to statistical analysis. The *Kharif* seasonal rainfall was 1274.5, 970.8 and 1191.5 mm during 2003, 2004 and 2005, respectively.