

Response of long day onion cv. YELLOW GLOBE to different levels of nitrogen phosphorus and potassium under temperate conditions of Kashmir Valley

S. FAHEEMA, N. AHMED, K. HUSSAIN, S. NARAYAN AND M.A. CHATTOO

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ABSTRACT

A field experiment was conducted during *rabi* 2002-03 and 2003-04 at Vegetable Research Farm, SKUAST (K) Shalimar, to study the effect of different levels of nitrogen (75, 100, 125 kg ha⁻¹), phosphorous (40, 80, 120 kg ha⁻¹) and potassium (40, 60, 80 kg ha⁻¹) on growth, yield and economics of onion var. Yellow Globe. Maximum leaf length, number of leaves per plant and bulb size (34.58 cm, 5.47 and 39.41 cm², respectively) was recorded with highest level of nitrogen *i.e.* 125 kg ha⁻¹, while maximum bulb weight (180.38 g) and bulb yield (301.01 q ha⁻¹) was recorded with 100 kg N ha⁻¹. Similarly highest dose of phosphorus 120 kg ha⁻¹ recorded maximum leaf length (32.50 cm), while maximum number of leaves per plant (5.05), bulb size (40.50 cm²), bulb weight (180.96 g) and bulb yield (302.00 q ha⁻¹) was recorded with 80 kg P₂O₅ ha⁻¹. Potassium also showed significant effect on various growth and yield attributes of onion. Maximum leaf length (31.89 cm) was recorded with 80 kg K₂O ha⁻¹ while maximum number of leaves per plant (5.04), bulb size (39.14 cm²) bulb weight (180.06 g) and bulb yield (300.48 q ha⁻¹) was recorded with 60 kg K₂O ha⁻¹. Among various fertilizer combinations, the maximum yield (308.81 q ha⁻¹) was recorded with treatment combination 100 kg N, 60 kg P₂O₅ and 80 kg K₂O ha⁻¹, which also gave maximum net returns (Rs 72699.00 ha⁻¹) and B: C ratio (2.43).

See end of the article for authors' affiliations

Correspondence to:

S. FAHEEMA
Division of Olericulture,
Sher-e-Kashmir University
of Agricultural Sciences
and Technology (K),
Shalimar, SRINAGAR
(J&K) INDIA

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Onion is an important vegetable crop of our country. It is grown over an area of 0.5 million hectares with a production of 5.5 million tones. Its cultivation in Kashmir is gaining popularity due to increase in demand both for local consumption and export purposes. Yellow Globe is the most important cultivar grown in Kashmir because of its better cooking qualities and pungency. Proper nutrient management plays an important role in its production. To obtain good quality and higher yield, optimum doses of fertilizers, especially phosphorus and potassium, assumes special significance (Nath *et al.*, 1987) Since the information on optimum doses of N, P₂O₅ and K₂O fertilizers, for increasing growth and yield of onion under temperate conditions is limited. The present investigation was undertaken on long day cv. YELLOW GLOBE to work out the optimum dose of nitrogen, phosphorus and potassium besides working out economics of its cultivation.

MATERIALS AND METHODS

The field experiment was conducted during *rabi* 2002-03 and 2003-04 at Vegetable Research Farm Division of Olericulture SKUAST-(K) to study the effect of three levels each of nitrogen-*viz.*, N₁: 75 kg ha⁻¹, N₂: 100 kg ha⁻¹, N₃: 125 kg ha⁻¹, phosphorus *viz.*, P₁: 40 kg ha⁻¹, P₂: 80 kg ha⁻¹, P₃: 120 kg ha⁻¹, and Potassium *viz.*, K₁: 40 kg ha⁻¹, K₂: 60 kg ha⁻¹ and K₃: 80 kg ha⁻¹ on growth, yield and economics of onion cultivar Yellow Globe. Onion

seedlings were transplanted on 27th of October each year in plots measuring 2.5x1.8 sq.m at a spacing of 25x15 cm in Randomized Block Design. Fertilizers were applied as per the prescribed treatments and other cultural practices were followed as per recommended package of practices for the region. The bulbs were harvested after 210 days of planting. Data was recorded on leaf length (cm), number of leaves per plant, bulb size (cm²), bulb weight (g) and bulb yield qha⁻¹ from ten randomly selected plants from each plot and pooled data of two seasons was analysed using the method proposed by Panse and Sukhatme (1978).

RESULTS AND DISCUSSION

Effect of nitrogen:

Leaf length, number of leaves per plant and bulb size got significantly enhanced due to nitrogen fertilization. As depicted in Table 1, a linear increase in leaf length was recorded with increasing levels of nitrogen. Maximum leaf length (34.58 cm) was observed with treatment N₃ (125 kg N ha⁻¹) followed by N₂ (100 kg N ha⁻¹) recording a length of 31.79 cm. Number of leaves per plant also increased significantly with the increase in nitrogen levels maximum number of leaves per plant (5.47) was recorded with highest level of nitrogen N₃ (125 kg N ha⁻¹) which was significantly higher than the nitrogen level N₁ (75 kg N ha⁻¹) but at par with the nitrogen level N₂ (100 kg N ha⁻¹).