



STUDIES ON IMPACT OF NITROGEN AND SULPHUR LEVELS ON GROWTH, YIELD AND ECONOMICS OF ONION (*ALLIUM CEPA*) IN BLACK SOIL OF CHHINDWARA DISTRICT

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ABSTRACT: The present investigation resulted that the application of Nitrogen @ 140 kg N ha⁻¹ enhanced growth and yield parameter of onion variety Agrifound Light Red as compared to control. It is also reported that the combine application of nitrogen and sulphur at different levels as N₄S₂ (140 kg N ha⁻¹ + 30 kg S ha⁻¹) were exhibited maximum growth and yield parameters except for neck thickness of bulb and storage losses, which recorded minimum in treatment N₀S₀ (control). It is revealed on the study of production economics of onion that significantly maximum bulb yield of 322.71 q ha⁻¹ was obtained in onion variety Agrifound Light Red. The highest net return of Rs. 2,60,962 ha⁻¹ with benefit cost ratio 5.50 was obtained in treatment comprising N₄S₂ (140 kg N ha⁻¹ + 30 kg S ha⁻¹).

Keywords: *Allium cepa*, Agrifound Light Red, Nitrogen, Sulphur, Bulb yield

Citation: Sharma SK, Naidu AK, Mishra SP (2016) Studies on impact of nitrogen and sulphur levels on growth, yield and economics of onion (*Allium cepa*) in black soil of Chhindwara district. Indian J Trop Biodiv 24(2): 107-116

Received on : 19 Jun. 2016
Accepted on : 16 Oct. 2016
Published on : 30 Dec. 2016

Onion (*Allium cepa* L.) belongs to family *Amaryllidaceae* (Alliaceae) and locally

known as *Pyaj*. It is old world crop and it was domesticated in Iran and Pakistan i.e. Central Asia. Consumption of onions may prevent gastric ulcers by scavenging free radicals and by preventing growth of ulcer-forming microorganism. Onion is a blood thinner and platelet inhibitor. Researchers found that more pungent onions exhibit strong anti-platelet activity. Platelet aggregation is associated with diseases like atherosclerosis, cardiovascular disease, heart attack and stroke. Scientific publications on phenolics strongly advocates that the consumption of polyphenolic rich food decreases degenerative diseases particularly cardiovascular diseases, cancer, Alzheimer's, neurodegenerative diseases and diabetes (Manach et al., 2005). Phenolic compounds can offer significant anti-mellitus atherogenic protection by inhibiting the oxidation of low density lipoproteins (LDLs) (Scalbert et al., 2005).

As a nutritious vegetable, it contains carbohydrate (11.0g), protein (1.2g), calcium (180mg), phosphorus (50mg), iron (0.7mg), nicotinic acid (0.4mg), riboflavin

(0.01mg) and vitamin C (11.0mg) in each 100g of edible portion (Bose et al., 2000). The pungency in onion is due to sulphur-bearing compound which is present in very small quantity i.e. about 0.005% only. Sulphur bearing compound is allyl propyl disulphide (C₆H₁₂O₂) which is a volatile oil. The colour of the outer skin of onion bulbs is due to quercetin.

India is next to China in area, production and productivity of onion. Among the different states Maharashtra is leading state in terms of area and production. Other major onion states are Gujrat, Karnataka, Orisa, Uttar Pradesh, Andhra Pradesh, Tamil Nadu and Rajasthan. The area of onion in Madhya Pradesh is 117.3 thousand hectare, total production is 2826.0 thousand million tonnes and productivity is about 24.10 tonnes per hectare (NHB 2013-14). Onion is the valuable foreign exchange crop ranked first (1482499 MT and Rs. 316961 lakh) in the country during 2013-14 (NHB 2013-14). It is exported from India to other countries like, Malaysia, Kuwait, Sri Lanka, Singapore, Germany and U.K.

India has three growing seasons, out of which *kharif* and late *kharif* season accounts of 40% of total onion production, while the rabi season accounts of the 60% onion. Generally onion is cultivated in *Rabi* season. The