

Effect of lignite humic acid and inorganic fertilizers on growth and yield of onion

M. SANGEETHA AND P. SINGARAM

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See end of article for authors' affiliations
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Correspondence to :
M. Sangeetha
Regional Research Station,
Kovilangulan, Aruppukkotai,
VIRUDHUNAGAR (T.N.),
INDIA

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ABSTRACT

To study the influence of lignite humic acid on the growth and yield of onion, a field experiment was conducted during *kharif* 2003 in a sandy clay loam soil belonging to somaiyanur series (Typic Haplustalf). The experiment includes eight treatments in which lignite humic acid was applied (through soil at 10 and 20 kg ha⁻¹ and foliar spray at 0.1 % concentration) with the 75 and 100 per cent recommended dose of inorganic fertilizers. The results showed that combined application of recommended dose of inorganic fertilizers (60:60:30 kg NPK ha⁻¹) and lignite humic acid @ 20 kg per hectare significantly increased the plant height (49.5 cm), number of leaves per plant (47.2) and root length (11.2 cm) of onion. Combined application of lignite humic acid @ 20 kg ha⁻¹ and recommended dose of inorganic fertilizers had conspicuously increased (11.31 %) the bulb yield of onion over inorganic fertilizers alone.

Key words: Bulb yield, Growth attributes, Lignite humic acid, Onion.

Onion is one of the most important commercial vegetable crops grown in India. The onion bulbs are rich in minerals like phosphorus, calcium and vitamin C. The pungency in onion is due to volatile oil (allyl - propyl disulphide) (Aykroyd, 1963). Being a shallow rooted crop, onion is considered as a surface feeder and so requires heavy dosage of nutrients. But the indiscriminate usage of chemical fertilizers has depleted the soil environment resulting in decrease of organic matter content, yield and quality of crops which necessitates to find out organic supplement sources for maintaining the soil fertility and to achieve the sustainable crop production. In this context, lignite humic acid an innovative product rich in organic nutrients obtained from Neyveli Lignite Corporation is known to promote growth and yield of crops. Laboratory experiments have shown that lower molecular weight substances from humic acid are taken up by the plants and influence metabolism (Khristeva *et al.*, 1962). The present investigation was carried out with the objective of studying the effect of lignite humic acid and fertilizers on growth attributes and yield parameters of onion.

MATERIALS AND METHODS

A field experiment was conducted at TNAU, Coimbatore during *kharif* 2003 to study the effect of lignite humic acid (LHA) and fertilizers on growth and yield of onion. The soil of the experimental field was sandy clay

loam in texture with pH 8.1 and EC 0.13 dS m⁻¹. The initial KMnO₄-N, Olsen-P and NH₄OAc-K status were 221, 12.40 and 253 kg ha⁻¹, respectively. Treatments consisted of control (T₁), 75% recommended dose of NPK (T₂), 100% recommended dose of NPK (T₃), 100% NPK + 10 kg humic acid ha⁻¹ as soil application (T₄), 100% NPK + 20 kg humic acid ha⁻¹ as soil application (T₅), 100% NPK + 0.1 % humic acid as foliar spray (T₆), 100% NPK + 10 kg humic acid ha⁻¹ as soil application + 0.1 % humic acid as foliar spray (T₇) and 75% NPK + 10 kg humic acid ha⁻¹ as soil application + 0.1 % humic acid as foliar spray (T₈), were replicated thrice and laid out in randomized block design.

As per the treatments, recommended dose of NPK fertilizers 60:60:30 kg NPK ha⁻¹ (100%) and 45:45:22.5 kg NPK ha⁻¹ (75%) were applied along the ridges (N, P and K were applied as urea, single super phosphate and muriate of potash, respectively). Among these, half dose of N and full dose of P and K were applied basally; remaining half dose of N was applied at 30 days after sowing. The lignite humic acid was applied basally in the treatments receiving soil application of humic acid by sand mix. The foliar application of 0.1% humic acid was done on 20th and 40th days after sowing by dissolving required quantity of potassium humate in water. The humic acid content of potassium humate obtained from Neyveli Lignite Corporation was 65 per cent. The net plot size of the experimental trial was 5X3 m and spacing adopted was 45X10 cm. Cultural operations like irrigation, weeding *etc* were done as and when required. At the time of harvest, data on growth attributes (plant height, number