

Research Article

Effect of Different Levels of NPK on Rust Disease of Groundnut Under Different Fertility Gradient of Soil in Field

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Abstract

A field study was conducted to find out the effect of different combinations of two nitrogen, three phosphorus and two potassium levels against the severity of rust disease and their effect on yield of groundnut grown in four different fertility gradient soils. The four fertility gradients of NPK were as (S₁) low = 278.3: 9.9:80.3; (S₂) medium = 290.1: 22.9: 97.0; (S₃) moderate= 296.0: 26.6: 213.5 and (S₄) high =301.8: 37.1: 282.8 kg ha⁻¹ respectively. Two nitrogen and potassium @ 20, 40 kg ha⁻¹ and three doses of phosphorus @ 20, 40, 60 kg ha⁻¹ were applied on four fertility gradient of soils. Four fertility gradients were assigned as main plot and each of the main plot were divided into 16 sub plots cover each area of 25 m² (5×5 m²) of gross total area 2000 m² consisting of 64 plots. Groundnut crop variety TAG 17 was sown on 28th January, 19th February and 6th February for three consecutive years 2011, 2012 and 2013 respectively. The result showed that two nitrogen and potassium and three phosphorus levels in different combinations under four fertility gradient soils produced different levels of rust disease severity and kernel yield of groundnut. Minimum rust disease severity in different fertility gradient soils in different NPK combinations were obtained as in low (S₁) N₂₀P₂₀K₄₀ kg ha⁻¹, (7.49 AUDPC); in medium (S₂) N₄₀P₄₀K₂₀ kg ha⁻¹(8.59 AUDPC); moderate (S₃) N₄₀P₄₀K₄₀ kg ha⁻¹ (13.13 AUDPC) and high (S₄) N₂₀P₄₀K₂₀ kg ha⁻¹(13.99 AUDPC) and kernel yield (q ha⁻¹) was also found highest in N₂₀P₂₀K₄₀ in low S₁ (23.58 qha⁻¹) in medium S₂ N₄₀P₄₀K₂₀ (21.77qha⁻¹) in moderate S₃ N₄₀P₄₀K₄₀ (24.0 q ha⁻¹) and in high S₄ N₂₀P₄₀K₂₀ (26.4 q ha⁻¹) respectively. The linear relationship between kernel yield and disease severity at different N, P & K combinations showed, only N₂₀P₄₀K₄₀, N₂₀P₆₀K₂₀ combinations were significantly, and negatively correlated confirmed by high R² value. So, testing of soils and application of fertilizers in soil may play an important role in eco-friendly management of plant protection in groundnut.

Key words: Fertility gradient, groundnut, kernel yield, NPK levels, rust disease severity

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