

Research Paper :

Effect of land configurations and phosphorus levels on the yield of niger under rainfed condition

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ABSTRACT

A field experiment was conducted at Agronomy Farm, College of Agriculture, Latur during kharif 2006 on clay loam soil to find out suitable land configuration for moisture conservation. The results indicated that the land configuration (L_4) opening of furrow after every alternate rows and (L_2) opening of furrows after two rows were found beneficial in improving growth characters, yield and oil percentage in niger as compared to L_1 and L_3 . Application of 40 kg P_2O_5 ha⁻¹ was found beneficial in improving growth characters, yield attributes, yield and oil percentage in niger.

Key words : Land configuration, Phosphorus level, Grain yield

Niger is very important oilseed crop in terms of its oil content, quality and potentiality. The important feature of this crop is that, it gives reasonable seed yield even under poor growing conditions. A good supply of phosphorus has been associated with increased root growth; hasten plant maturity and quality of seed. Phosphate compounds have been shown to be essential for photosynthesis, the inter conversion of carbohydrates and related compounds, amino acid metabolism, fat metabolism and sulphur metabolism for oil seed crops. Application of adequate phosphorus results in increased yield and proportion of oil stored in the seed. Niger is drought tolerant crop, but if longer dry spell occurred at flower initiation to last anthesis and last anthesis to physiological maturity, there is considerable reduction in yield. Hence, there is need of rain water management in this situation to enhance the productivity. On the other hand prolonged water logging in high rainfall zone causes wilting of plants. Yield of niger under water logged condition can be increased by manipulating the land configuration. Therefore, efforts should made to standardize the land configuration for exploiting its yield potential without impairing soil health.

MATERIALS AND METHODS

A field experiment was conducted at Agronomy Farm, College of Agriculture, Latur during kharif 2006 on clay loam soil, low in available nitrogen (233.24 kg ha⁻¹), medium in phosphorus (12.81 kg ha⁻¹) and high in potassium content (612.08 kg ha⁻¹) and slightly alkaline in reaction pH-7.57. The experiment was laid out in factorial Randomized Block Design and replicated three times. Four

land configuration treatments i.e. without opening furrows (L_1), opening of furrows after two rows (L_2), opening of furrows after four rows (L_3) and opening of furrows after every alternate row (L_4) with combination of four phosphorus levels i.e. 0 kg (P_0), 20 kg (P_1), 40 kg (P_2) and 60 kg (P_3) P_2O_5 ha⁻¹ were included in the investigation. The gross plot size was 5.48 X 4.5 m² and net plot size was 4.5 x 3.6 m². The crop was sown by dibbling method at 30 x 10 cm². The total rainfall received during the period of experimentation was 583.6 mm.

RESULTS AND DISCUSSION

The results obtained from the present investigation are presented in Table 1.

Number of grains capsule⁻¹:

Among the land configuration treatments, opening of furrows after every alternate row (L_4) recorded higher number of grains per capsule than L_2 , L_1 and L_3 . The number of grains per capsule was affected significantly with increasing phosphorus levels. Phosphorus level 60 kg P_2O_5 ha⁻¹ (P_3) produced significantly higher number of grains per capsule than P_2 , P_1 and P_0 phosphorus levels. Such type of results was also observed by Patil *et al.* (1964).

Number of grains plant⁻¹:

Number of grains per plant was significantly influenced by land configuration treatments. Opening of furrows after every alternate row recorded significantly highest number of grains per plant than L_1 . In case of phosphorus level P_3 (60 kg P_2O_5 ha⁻¹) recorded