

Influence of varied nutrient levels on yield, oil content and nutrients uptake by castor

D.M. SRIDHARAMURTHY, S.D. SUNDAR SINGH AND N. ANANDA

See end of the article for authors' affiliations

Correspondence to :

N. ANANDA

Department of Agronomy
Agricultural College and
Research Institute, Tamil
Nadu Agricultural University,
COIMBATORE (T.N.) INDIA

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ABSTRACT

A field experiments was conducted at Tapioca and Castor Research Station (TNAU), Yethapur in Salem district, Tamil Nadu during *khariif* 2001 season to study the influence of varied nutrient levels on yield, oil content and nutrient uptake by castor. The results of the study revealed that the yield attributes *viz.*, number of spikes per plant, total number of capsules per spike, test weight were higher in the treatment receiving 120:30:30 kg of N, P₂O₅ and K₂O per ha, followed by treatment with 90:30:30 and 60:30:30 kg of N, P₂O₅ and K₂O per ha over control. Application of 120:30:30 Kg N, P₂O₅ and K₂O per ha recorded higher seed yield of 1732 kg per ha followed by 90:30:30 (1729 kg/ha) and 60:30:30 (1722 kg/ha) N, P₂O₅ and K₂O kg per ha. However, nutrient levels did not exert any significant influence on oil content. The higher nitrogen, phosphorus and potassium uptake was noticed at 120 DAS in the treatment receiving 120:30:30 kg N, P₂O₅ and K₂O kg per ha followed by 90:30:30 and 60:30:30 kg N, P₂O₅ and K₂O per ha. Application of 60:30:30 N, P₂O₅ and K₂O per ha recorded highest net returns (Rs. 17503/ha) and B: C ratio (3:10).

Key words : Nutrient, Yield, Oil content, Castor.

To increase the productivity, production, profit and benefit of the castor growing farmers of the rural areas Tamil Nadu Agriculture University has released a hybrid castor TMVCH. 1. It can be raised as a rainfed crop having the duration of 160-170 days. Information is not available on fertilizer requirement of this hybrid. Therefore, an experiment was planned to study the influence of varied nutrient levels on yield, oil content and nutrients uptake by castor.

MATERIALS AND METHODS

The experiment was conducted in a farmer's holding which is located nearby the Tapioca and Castor Research Station, Yetapur. The experiment was laid out in a randomized block design with three replications. The treatment details are as follows. T₁: Control (no fertilizers), T₂: 30:15:15 kg N, P₂O₅ K₂O per ha, T₃: 60:15:15, T₄: 90:15:15, T₅: 120:15:15, T₆: 30:30:30, T₇: 60:30:30, T₈: 90:30:30 and T₉: 120:30:30 kg N, P₂O₅ and K₂O per ha. The soil of the experimental field was sandy loam in texture having pH of 7.5 and EC 0.23 dS/m. Soil was low in available N (178 kg ha⁻¹), medium in available P₂O₅ (24 kg/ha) and high in available K₂O (300 kg/ha). As per treatment the entire quantity of nitrogen, phosphorus and potassium was applied in single dose at basal in the form of urea, single super phosphate and muriate of potash. The hybrid castor TMVCH 1 seed was treated with carbendazim at 2 g per kg of seed, 24 hours prior to

sowing. Two seeds per hill were dibbled on one-third row, keeping 5 cm away from the fertilizer row. The biometrical observations such as number of spikes per plant, total number of capsules per spike, test weight, seed yield, oil content and oil yield were recorded. Oil content in seed was estimated by using NMR (Nuclear magnetic resonance) spectrometer as suggested by Tiwari *et al.* (1974) and per cent of oil content in the seed was recorded directly. Oil yield (kg ha⁻¹) was computed by using the formula :

$$\text{Oil yield (kg ha}^{-1}\text{)} = \frac{\text{Oil content (\%)}}{100} \times \text{seed yield (kg ha}^{-1}\text{)}$$

Plant samples were collected from each treatment of the experiment and then analyzed for N, P, K uptake using methods described by Humphries (1956), Piper (1966) and Jackson (1967), respectively. The net profit (Rs/ha) was calculated by deducting the cost of cultivation per hectare from gross returns per hectare. The benefit cost ratio (B:C) was worked out by using the formula:

$$\text{Gross returns / cost of cultivation (Rs/ha).}$$

RESULTS AND DISCUSSION

The data on number of spikes per plant, total number of capsules per spike, test weight, seed yield and oil yield differed significantly due to varied nutrient levels. (Table 1).

Application of 120:30:30 kg N, P₂O₅ and K₂O per ha resulted in higher number of spikes per plant (7.82),