

FERTILIZERS**OIL PALM****EFFECT OF APPLICATION OF FERTILIZERS THROUGH DRIP IRRIGATION ON YIELD OF OIL PALM**M. S. GAWANKAR¹, P. M. HALDANKAR², K. V. MALSHE³, B. R. SALVI⁴, U. M. MAHADKAR⁵, S. ARULRAJ⁶ AND H. P. MAHESWARAPPA⁷

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ABSTRACT

Oil Palm is recognised as the major source of vegetable oil with an average oil yield level of 4 to 6 tons per hectare. However, the crop has heavy nutrient demand and high degree of sensitivity to major nutrients like N, P and K. Nevertheless, considering the importance of this crop as a potential long term source of edible oil, a field investigation was conducted with a view to study the effect of application of major nutrients through drip irrigation on yield of tenera oil palm in Konkan coastal region of Maharashtra. Six different dosage of fertilizers were followed through drip system by means of venturi and compared with fertilizer dose of 1200: 600: 2700 g NPK/Palm/Year through soil application. The experiment was carried out on 18 years old tenera oil palm orchard. The results of the pooled yield for three years by considering first three years after introduction of fertigation as a transition period indicated that fertilizers @ 1200: 600: 1800 g NPK/palm/year through six equal splits in a year in the form of Urea, Diammonium Phosphate and Muriate of potash through fertigation recorded highest bunch weight (25.0 kg/bunch), highest number of fresh fruit bunches (5.2 bunches/palm/year) and 18.8 tons of fresh fruit bunch yield.

KEY WORDS: Fertigation, Fresh fruit bunch, Oil palm, Yield.

Introduction

Oil palm is known for its exceptionally high oil yield as compared to the traditional oilseed crops and has wide adaptability to different climatic and soil conditions. Therefore, it could be considered as one of the most important source to meet the challenges of edible oil demand arising due to ever increasing population as well as per capita consumption of edible oil in near future. The palm oil also has price advantage over edible oils. It is also good raw material for manufacturing oleo chemicals used in making

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soaps, plasticizers etc., (Arulraj, 2015). Out of the major practices that are responsible for yield improvement, nutrient management by fertilizer application is the most important contributor accounting for 26 per cent of the FFB yield increment in oil palm as stated by Prasad *et al.*, 2012. However, the application of fertilizers through soils during rainy season result in leaching of nitrogenous and potassic fertilizers especially in lateritic soils of Konkan region. The advantage of fertigation over conventional method was emphasized by several workers. Fertilizer application through drip system is effective method saving fertilizer cost, reduces labour requirement and supply nutrients according to the crop demand. Subramanian *et al.* (2012) showed drip fertigation is one of the options to increase the fertilizer use efficiency in coconut. Keeping this in view, present investigation was carried out to study the effect of fertigation on fresh fruit bunch yield of oil palm under Konkan condition of Maharashtra.

Table
Effect of fertigation on yield attributes in tenera oil palm

Treatments	Pre treatment mean yield (t/ha) 2005-2008	Pooled mean yield data (2012 to 2015)		
		No. of Bunches/ palm/year	Bunch weight (kg/bunch)	Yield of FFB (t/ha)
T ₁ 300:150:300 g NPK through fertigation	13.9	4.2	23.6	14.0
T ₂ 600:300:600 g NPK through fertigation	14.0	4.4	20.9	13.1
T ₃ 900:450:900 g NPK through fertigation	14.4	4.9	21.6	14.8
T ₄ 1200:600:1200 g NPK through fertigation	14.9	4.6	23.0	15.0
T ₅ 1200:600:1800 g NPK through fertigation	15.5	5.2	25.0	18.8
T ₆ 1200:600:2700 g NPK through fertigation	15.7	5.2	22.9	16.7
T ₇ 1200:600:2700 g NPK through soil application	16.5	5.1	24.3	17.3
SE ±	1.2	0.2	0.8	0.8
CD at 5%	3.6	0.6	2.3	2.2

Material and Methods

The experiment was carried out at Agricultural Research Station, Mulde Tal: Kudal, Dist: Sindhudurg (M.S.), South Konkan coastal region of Maharashtra under All India Coordinated Research Project on Palms. The experimental site is located at 17 m above mean sea level having hilly topography and lateritic to alluvial coarse shallow soil type. Eighteen year old palms of tenera planted at 9 m X 9 m on contour constituted the experimental material. The field experiment was laid out in a randomised block design with three replications. The treatments were T₁ - 300: 150: 300 g NPK through fertigation, T₂ - 600: 300: 600 g, T₃ - 900: 450: 900 g NPK through fertigation, T₄ - 1200:600:1200 g NPK through fertigation, T₅ -1200:600:1800 g NPK through fertigation, T₆ - 1200:600: 2700 g NPK through fertigation and T₇ -1200:600:2700 g NPK through soil application. The fertilizers were applied through drip system by means of venture. The control fertilizer dose of 1200; 600; 2700 g NPK/Palm/Year were applied through soil. All the treatments were given in six equal splits in a year (bi-monthly) in the form of Urea, Diammonium Phosphate and Muriate of potash. Observations on number of bunches, weight of bunch and yield of fresh fruit bunches were recorded. The three years period i.e. from 2009 to 2011 was considered as transition period for present investigation (post treatment period) and pooled mean yield data of year 2011 -12 to 2014-15 was taken for discussion. The data was statically

analyzed by the method described by Gomez and Gomez (1984).

Results and Discussion

Yield characters:

The data regarding the effect of different levels of NPK fertilizers through fertigation on bunch production, bunch weight and yield of fresh fruit bunches (FFB) are given in the *Table*. Data revealed that treatment, T₅ and T₆ produced 5.2 bunches per palm and lower dose of fertilizers i.e. treatment T₁, T₂ and T₃ recorded significantly lower number of bunches per palm. Soil application of recommended dose of fertilizer (T₇) was at par with the treatment T₅ and T₆. The similar trend was also reported by Subramanian *et al.* (2012) in coconut where 100 per cent NPK fertigation (131 nuts/palm/year) was on par with 75 and 50 per cent NPK applied through drip irrigation.

Data on pooled mean bunch weight showed that treatment T₅ recorded significantly highest bunch weight (25.0 kg per bunch) which was closely followed by T₇ (24.3 kg). Treatment T₂ recorded lowest bunch weight of 20.9 kg.

FFB yield:

Data on yield of fresh fruit bunches revealed that treatment T₅ has produced 18.8 tonnes per hectare yield of FFB. The treatments T₂, T₁, T₃ and T₄ recorded significantly lower yield and were in range of 13.1 to 15.0 tonnes ha⁻¹. All these treatments were of lower dose of fertigation. Similarly higher dose of fertilizers

i.e. treatment T₆ and T₇ also recorded lower FFB yield nevertheless, both treatments were at par with treatment T₅. Higher FFB yield and higher monetary returns with fertigation in oil palm with 1200:600:1200 g NPK /palm/year in six equal splits at bi-monthly interval were reported at Gangavati and Vijayarai centres (Anonymous, 2014).

In the present investigation, 1200: 600:1800 g NPK through fertigation (T₅) recorded the highest yield due to production of more number of bunches and more bunch weight. The higher yield under fertigation treatment might be due to increased availability of soil nitrogen, phosphorus and potassium and production of more number of bunches with more weight. Similar results were reported by Bhat *et al.* (2007) in arecanut. Subramanian *et al.* (2012) in their study indicated that the adoption of drip fertigation is a good management technique for improving the coconut productivity. The impact of drip irrigation on arecanut–cocoa system assessed by Sujatha and Bhat 2013 also supports the present investigation.

Thus, present investigation indicated that under Konkan coastal zone fertigation @ 1200: 600: 1800 g NPK would be optimum dose for obtaining higher yield in oil palm.

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ITC aims Rs.18,000 crore revenue from agri business

Diversified group ITC is expecting nearly three-fold jump in turnover of its agri division to touch Rs.18,000 crore in the next five years, driven mostly by procurement and retail initiatives in rural markets.

ITC expects the agri business division to have a turnover of Rs.6,500 crore in the ongoing fiscal, up from Rs.5,672.07 crore in the last fiscal. A majority of the business is generated from its 'e-Choupals', a web-enabled supply chain network in villages and rural hypermarkets 'Chaupal Sagars'.

ITC Agri Business Division COO Rajnikant Rai said in the last five years, the agri division has been witnessing an average growth of 15 to 20 per cent.

"In the financial year 2009-10, we were at Rs.2,500 crore and now we are more than double of that in five years. Going forward, we have to maintain this growth. Our target for financial year 2020-21 from this division is Rs.18,000 crore," he told PTI.

Currently, the company has 6,500 e-Choupals and 25 Chaupal Sagars in 11 states. ITC sources a variety of farm produce like wheat, soybeans, coffee, shrimp, pulses, millets, barley, and jowar along with fruits such as mango, litchi, jamun, guava and pineapple.

ITC expects internal consumption by group companies to increase to almost half of its agri segment's business in the next five years.

"Out of Rs.18,000 crore, which we are expecting by financial year 2020-21, 50 per cent would be consumed internally and rest externally," Mr. Rai said. In the ongoing fiscal, internal consumption by company's various group firms is likely to account for around Rs.2,500 crore, Mr. Rai added.